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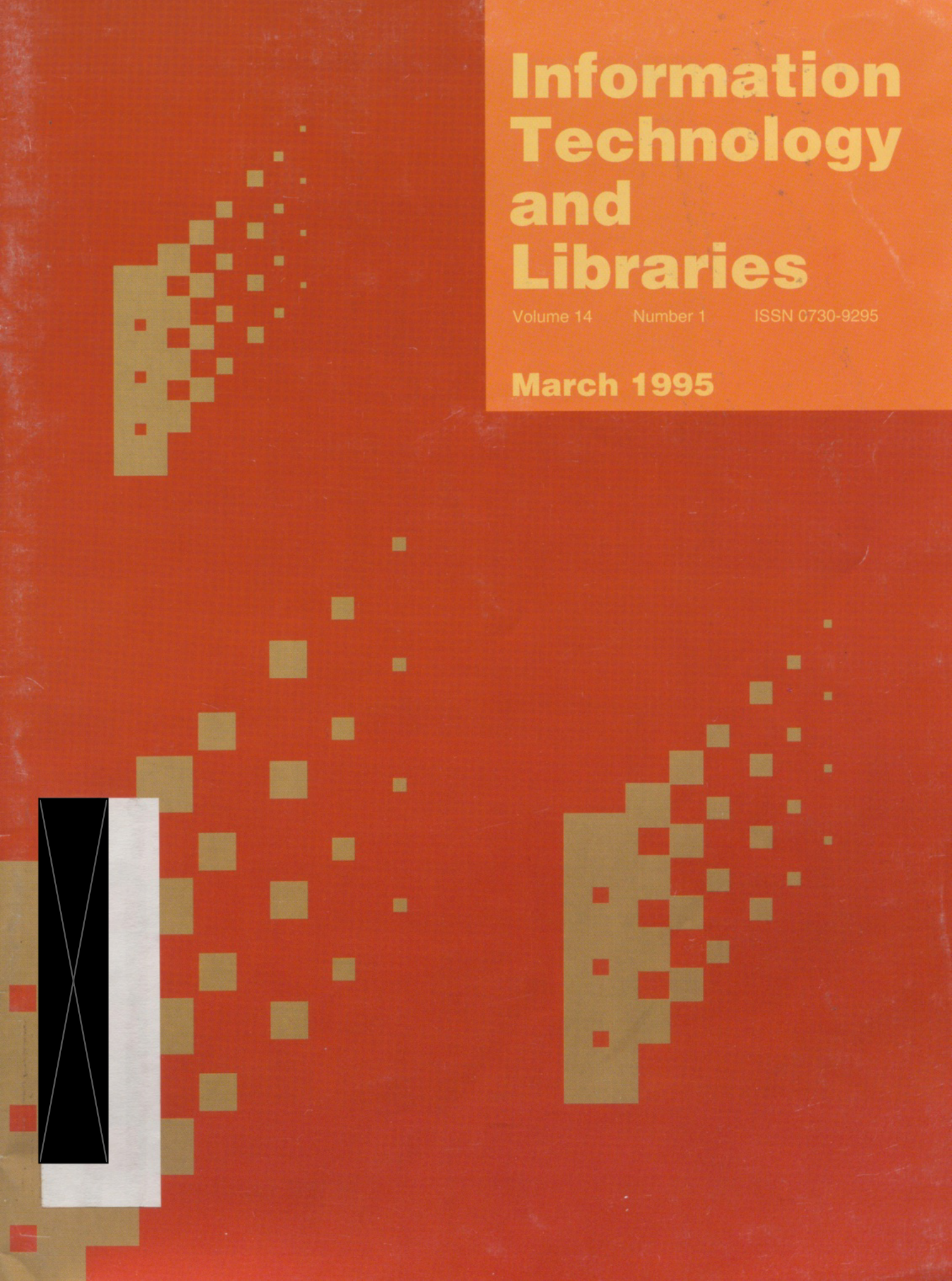

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Online Music Symbol Retrieval From the Access Angle

Barbara Henigman and Richard D. Burbank

The symbols for sharp and flat in music notation present special problems for the retrieval of music materials from online catalogs. The authors surveyed music technical services librarians to determine how these retrieval problems are dealt with in the confines of individual online catalogs, while noting parallels with their earlier study of the same problem from the perspective of online catalog vendors. The results of the study revealed that there is much variation in the music symbol retrieval capabilities of individual online systems, and that music technical services librarians are only somewhat satisfied with the manner in which different online systems deal with this problem.

In our 1992 article we surveyed vendors of online systems to determine whether or not, during the systems design process, vendors considered problems posed by music symbols in online catalogs: "Since the inception of online catalogs, librarians and patrons have discovered that trying to retrieve various manifestations of musical works containing music symbols in their titles can be an extremely frustrating experience."[1] Our conclusions indicated that vendors and designers of online systems do not always consider music symbols within the context of system design, or special retrieval needs presented by their presence in bibliographic and authority records.[2] As a result of our findings, we decided to survey music technical services librarians to find out how these retrieval problems are handled within the confines of individual library online catalogs. We hypothesized that there is a large degree of variation in the way that music technical services librarians rate various online systems in terms of music symbol retrieval. As with our earlier study, we defined the problem in terms of the musical sharp (♯) and musical flat (♭) symbols, because these symbols commonly occur in the music cataloging process and often pose serious retrieval problems.

The questionnaire for this survey was designed to encompass several issues (see appendix B). Librarians were asked to indicate how musical symbols were treated by their system during the search process. Sections of the questionnaire were devoted to searching for bibliographic records in the online catalog, as well as authority records in the online authority file. Librarians were also asked to indicate how they rated the effectiveness of their system in retrieving records containing music symbols and the effectiveness of the system supplied documentation. Survey participants also indicated whether or not they participated in discussions of their system with other users.

Because many music technical services librarians work with online systems designed by the same vendor, a population was established that would be large enough to reflect the circumstances and considerations of individuals who deal with this problem in the course of their original cataloging work, and who use online systems designed by many of the vendors surveyed in *Music Symbols and Online Catalogs: A Survey of Vendors and an Assessment of Retrieval Capabilities*.[3] Of particular interest was identifying any parallels within a broad grouping of music libraries. We also sought to identify parallels between the data reported by vendors in the earlier article and music technical services librarians who are confronted with this problem on a regular or frequent basis.

A Survey of Librarians

The population pool was designed to include a wide variety of music libraries within the United States. The population consisted of the following groups: (1) music libraries that are part of an ARL (Association of Research Libraries) library; (2) all institutions listed in the Gourman report of graduate and undergraduate programs in music[4]; (3) conservatory libraries[5]; (4) United States institutions identified as having important music collections in the noted article "Music Libraries in North America"[6]; (5) a list of music libraries considered by OCLC contributing music catalogers to perform excellent OCLC Enhance work on music materials.[7]

Some institutions appeared in more than one group. Virtually all of the institutions listed in *The Gourman Report* were already in the ARL group. Conservatory libraries were included because they possess some of the oldest collections of scores and parts in the nation. Some collections listed in the Bradley article were dropped because they were private collections owned by individuals. Also excluded were community colleges, community music schools, or any music library or institution with less than a four–year academic pro-

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gram. The resultant population, then, consisted of a broad grouping of music libraries which included academic, conservatory, public, and a few special libraries. It also included non–ARL academic libraries that have noteworthy music collections, such as Wellesley College and Vassar College, as well as several historical societies. When the final list of 177 libraries was collated (see appendix A), print sources[8] as well as many telephone calls were used to identify the institution's music technical services librarian or the individual responsible for that function.

Through a grant from the University of Illinois at Urbana–Champaign (UIUC) Library's Research and Publication Committee, the Library Research Center located on the UIUC campus was contracted to collect the data and perform the following activities: (1) mail and follow up on written questionnaires; (2) code and process data collected from returned questionnaires; (3) produce statistical printouts of data for analysis by the authors. These activities were performed from November 1991 to May 1992.

Results of Surveys

There were a total of 134 responses to the questionnaire (table 1). Of that number, 97 (72%) responded that their music library had an online catalog. Thirteen (10%) said their library had plans to implement an online catalog within a year, and 23 (17%) said their library had no plans to implement an online catalog. Because the primary concern of this survey was with online conditions affecting the music symbol problem, however, the working population total became 97. A majority of those libraries implementing online catalogs felt that symbol use was important.

The initial section of the survey sought to determine the software systems upon which those music libraries with online catalogs were based and what percentage of catalog records in the online system dealt with music symbols. The most commonly used systems were NOTIS (35%), INNOPAC (12%), and GEAC (10%).

Table 1
Responses

Library Type	ARL	Academic	Conservatory	Public	Special
Mailed	96	31	19	20	11
Received	69	26	17	15	7
OPACs	61	23	2	9	2

Table 2
Do Symbols Print/Display?

	CRT	Printer
Yes (both symbols)	40	32
No (both symbols)	43	51
Sharp only	4	2
Flat only	2	0
Don't know	8	12

Locally created systems accounted for 11% of the libraries, and 12% used other systems not individually listed in the questionnaire. Not one of the systems used, however, was used by a large majority of the respondents.

All respondents indicated that their systems accommodated catalog records for scores and sound recordings. Of these, 55 (60%) libraries said that 0% to 10% of their databases consisted of bibliographic records with one or both of the music symbols. A fairly high number—25 (27%)—were not sure what percentage of the database consisted of these catalog records. As an expected corollary, 93 libraries (98%) also indicated that uniform titles were indexed and retrievable in their systems.

The next few questions dealt with issues concerning how the sharp and flat symbols appear on CRT screens and how they print, as well as what happens when searching for the symbols. A total of 40 libraries (45%) replied affirmatively that the symbols appeared correctly on terminal screens, and 43 libraries (48%) replied negatively. A few (5%) replied that only the sharp appeared correctly, while 2% replied that only the flat displayed. The results were slightly different for printing. Affirmative responses from 32 (38%) indicated that the symbols appeared on a printout and negative responses from 51 (60%) indicated the symbols do not print. Two libraries indicated that only the sharp would print on the printer. None of the reporting libraries indicated that the flat symbol appeared on a printout (table 2).

Searching for Records with Symbols

The issue of bibliographic searching proved revealing. Most libraries (51 or 55%) replied that the sharp symbol was eliminated from the search string. In 11 cases (12%) the sharp symbol was converted to the word "sharp" (table 3). The situation with the flat symbol was differ-

Table 3
What Happens During Searching?

	Sharp	Flat
Retrievable as themselves	6	7
Eliminated	51	32
Converted into the words "flat" and "sharp"	11	26
Converted to other symbols	15	26
None of the above	13	6

ent. Only 32 libraries (34%) eliminated it from the search string and 26 (27%) converted it to the word "flat." Very few libraries (7%) indicated that the symbols themselves were retrievable as symbols. Here the authors encountered the first parallel with the results of their earlier vendor survey. For both symbols, a majority of libraries eliminated the symbol from the search string. This corresponded directly with the findings from the vendor survey that 54% of the vendors surveyed also eliminated the symbol from the search string.[9] The next highest response for the same question—26 converted the word to "flat"—also paralleled the results of the earlier vendor survey. As the authors pointed out in that survey, this issue can pose user education problems for librarians in that catalogs cannot be readily modified.[10]

Interestingly enough, however, a breakdown of individual responses revealed that some systems do allow several ways of searching for music symbols. Libraries with NOTIS, INNOPAC, and GEAC reported that both sharp and flat symbols were either eliminated from the search string or converted into words, while locally created systems offered the most flexibility. It would seem that librarians are beginning to use the flexibility provided by vendors to address the problems of symbols as they pertain to the needs of their individual libraries.

Music Symbols in Online Authority Files

Because it is also important for the correct characters to reside in an online authority file from a technical services and automated systems perspective, the survey addressed this question, too. Often, this type of file is a main source of information for catalogers, who ultimately prepare data for entry and retrieval into the online catalog. As online systems and their users become more sophisticated, online authority files have become important retrieval instruments for users. In light of these considerations, the next group of questions addressed online authority files.

A total of 62 libraries (66%) responded that they had an online authority file and 32 libraries (34%) replied that they did not. Of the 62 libraries with online authority files, 22 (36%) indicated that 0% to 15% of the authority records were headings for scores and sound recordings. A majority of respondents (30 or 48%) said they did not know what percentage of the headings were music headings. But 43 (74%) indicated that the uniform titles were also present in the authority file.

The issues of searching authority file headings with sharp and flat symbols resulted in similar responses to those for bibliographic records. A total of 28 (46%) eliminated the sharp symbol from the search string. Only 3 (5%) converted it to the word "sharp." But 15 (25%) eliminated the flat symbol and another 15 (25%) converted it to the word "flat." Comparing these responses with those pertaining to bibliographic records, it is evident that the flat symbol is dealt with more consistently than the sharp symbol. Again, a breakdown of individual responses indicated some flexibility or choice on the part of the librarian regarding how the system is set up to search these symbols.

Effectiveness of Online Systems

The next group of questions was perhaps the most important because respondents were asked to assess the effectiveness of their online catalog in terms of the music symbol problem. Not surprisingly, only 15 (16%) music technical services librarians responded that their system was "very acceptable." "Somewhat acceptable" were the systems used by 32 (34%) music libraries, and the same result came in for "not too acceptable." Another 15 (16%) said the degree of effectiveness was "not at all acceptable." Table 4 shows the degree of acceptability of each system. DRA received the most positive responses. No other commercial system came close. Locally created systems came in second. INNOPAC, DYNIX, NOTIS, GEAC, LS2000, and other systems not named individually were most often rated as "somewhat acceptable," or "not too acceptable." VTLS and WLN were rated as "acceptable." CARLYLE was considered barely acceptable, and CLSI failed entirely.

The next question asked if the music technical services librarians had documentation describing the behavior of the symbols in their system. The responses were evenly divided, with 33 (35%) responding that their vendor did provide documentation, and 36 (38%) responding that no documentation was available to

Table 4
Effectiveness of System

Acceptability	Very	Somewhat	Not Too	None
CARLYLE	0	0	1	1
CLSI	0	0	0	1
DRA	2	2	0	0
DYNIX	0	2	1	0
GEAC	2	2	3	2
INNOPAC	1	7	3	1
LS2000	0	2	1	1
NOTIS	4	12	11	5
VTLS	0	0	2	0
WLN	0	0	4	1
Locally created	4	3	3	0
Other	2	2	3	3
Total	15	32	32	15

them. Twenty–six (27%) did not know whether or not documentation was available. Almost one–third of the respondents, then, replied that their vendor supplied no documentation whatsoever concerning the treatment of these two music symbols.

The subsequent survey questions addressed music needs in terms of the initial selection of an online catalog and future system upgrades. Almost one half (44 or 45%) answered that music needs were considered in the initial selection of a system. Another 8 (8%) replied that music needs were not at all a consideration, and a majority (46 or 47%) said they did not know. As for future upgrades, 66 (70%) said music needs were considered and 13 (14%) said such needs were not considered. Here the authors noted another parallel with the previous vendor survey: 42% of the vendors in the previous survey stated they "had plans to address this topic in the future as part of the capabilities of the system."[11] Almost half of each group—vendors and music technical services librarians—indicated that the issue of music symbols was important enough to be considered in future development of online systems and that both groups were attempting to address the issue.

Finally, a majority of music technical services librarians (68 or 53%) felt that music symbol retrieval in online catalogs was a "very important" issue. Another 35% said the topic was "somewhat important." Further, 92 (72%) of the respondents indicated that they attend online system user group meetings that pertain to their individual system at local or national sessions of the Music Library Association or the American Library Association.

Conclusion

The survey results confirmed the authors' hypothesis that a wide array of variation exists in the music symbol retrieval capabilities of individual online systems, as assessed by the music technical services community. By examining the results of the survey discussed here, one can conclude that music technical services librarians are only somewhat satisfied with the way online systems deal with the search and retrieval of records containing music symbols. These results paralleled those of the Burbank and Henigman 1992 vendor survey because this subsequent survey analyzed data collated from the independent responses of practitioners in the field. These data reflected the results of individual system design and showed how limitations of access can be manifested in the music technical services environment.

By and large, music technical services librarians believe that this issue is an important one and are working with vendors of online systems to solve such problems through the future development and upgrading of various online systems. In the meantime, however, music technical services librarians continue to confer at local and national meetings of the Music Library Association and the American Library Association to discuss these kinds of problems and find ways of dealing constructively with online music symbol retrieval.

Hopefully, as the decade unfolds and the century comes to a close, online retrieval problems such as the one discussed in this article will no longer appear to be esoteric or require librarians to deal with these problems in the post–implementation phase of system design. Only when issues such as the music symbol problem are considered from the outset can the access angle be a clean one.

References and Notes

1. Richard D. Burbank and Barbara Henigman, "Music Symbols and Online Catalogs: A Survey of Vendors and an Assessment of Retrieval Capabilities," *Information Technology and Libraries* 11 (Sept. 1992): 204–9.
2. Ibid., 208.
3. Ibid., 208.
4. Jack Gourman, *The Gourman Report: A Rating of Graduate and Professional Programs in American and International Universities*, 5th ed. (Los Angeles: National Education Standards, 1989).

5. Conservatories were identified in the index to *Directory of Music Faculties in Colleges and Universities, U.S. and Canada, 1990–1992* (Missoula, Mont.: CMS Publications, 1990).

6. Carol June Bradley, "Music Libraries in North America," in *Encyclopedia of Library and Information Science* 18 (New York: Marcel Dekker, 1968–1982), 358–425.

7. This list was an informal, unpublished electronic mail survey undertaken on MLA–L (Music Library Association Listserv) by Don Seibert, Syracuse University, in 1991.

8. *Membership Directory 1991*, Music Library Association (Canton, Mass.: Music Library Association, 1991); *Membership Directory 1991*, American Library Association (Chicago: American Library Assn., 1991).

9. Burbank and Henigman, "Music Symbols and Online Catalogs," 207.

10. Ibid.

11. Ibid., 208.

Appendix A: Institutions Surveyed

American Conservatory of Music (Ill.)
American Music Center (N.Y.)
Arizona State University (Ariz.)
Arlington Heights Memorial Library (Ill.)
Baldwin–Wallace College (Ohio)
Baylor University (Tex.)
Berklee College of Music (Mass.)
Boston Public Library (Mass.)
Boston University (Mass.)
Boston Athenaeum (Mass.)
Boston Conservatory of Music (Mass.)
Bowling Green State University (Ohio)
Brandeis University (Mass.)
Brigham Young University (Utah)
Brookline Public Library (Mass.)
Brown University (R.I.)
Buffalo and Erie County Public Library (N.Y.)
California State University at Hayward (Calif.)
California State University at Northridge (Calif.)
Carnegie Library of Pittsburgh (Pa.)
Case Western Reserve University (Ohio)
Chicago Public Library (Ill.)
Chicago College of Music–Roosevelt University (Ill.)
City Library Association of Springfield (Mass.)
City University of New York (N.Y.)
Cleveland Institute of Music (Ohio)
Colorado State University (Colo.)
Columbia University (N.Y.)
Cornell University (N.Y.)
Cornish College of the Arts (Wash.)
Curtis Institute of Music (Pa.)
Dartmouth College (N.H.)
Denver Public Library (Colo.)
Detroit Public Library (Mich.)
Duke University (N.C.)
Eastman School of Music (N.Y.)
Emory University (Ga.)
Florida School of the Arts (Fla.)
Florida State University (Fla.)
Folger Shakespeare Library (D.C.)
Forbes Library (Mass.)
Free Library of Philadelphia (Pa.)
Georgetown University (D.C.)
Grinnell College (Iowa)
Hartt School of Music (Conn.)
Harvard University (Mass.)
Hebrew Union College (Ohio)
Henry E. Huntington Library and Art Gallery (Calif.)
Historical Society of Pennsylvania (Pa.)
Howard University (D.C.)
Illinois State University (Ill.)
Indiana University (Ind.)
Iowa State University (Iowa)
Juilliard School (N.Y.)
Kent State University (Ohio)
Library Company of Philadelphia (Pa.)
Library of Congress (D.C.)
Los Angeles Public Library (Calif.)
Louisiana State University (La.)
Louisville Academy of Music (Ky.)
Lowell Public Library (Mass.)
Manhattan School of Music (N.Y.)
Mannes College of Music (N.Y.)
Maryland Historical Society (Md.)
Massachusetts Institute of Technology (Mass.)
Miami University (Ohio)
Middlebury College (Vt.)
Michigan State University (Mich.)
Minneapolis Public Library (Minn.)
Moravian Music Foundation (N.C.)
New England Conservatory (Mass.)
New York Public Library (N.Y.)
New York University (N.Y.)
Newark Public Library (N.J.)
Newberry Library (Ill.)
North Carolina School of the Arts (N.C.)
Northwestern University (Ill.)
Notre Dame University (Ind.)
Oakland Public Library (Calif.)
Oberlin College & Conservatory of Music (Ohio)
Ohio State University (Ohio)
Oklahoma State University (Okla.)
Peabody Conservatory–Johns Hopkins University (Md.)
Penn State University (Pa.)
Pierpont Morgan Library (N.Y.)
Pittsburgh Theological Seminary (Pa.)
Princeton University (N.J.)
Pollard Memorial Library (Mass.)
Public Library of Charlotte & Mecklenburg County (N.C.)
Public Library of Cincinnati and Hamilton County (Ohio)
Public Library of the District of Columbia (D.C.)
Purdue University (Ind.)
Rice University (Tex.)
Rutgers University (N.J.)
St. Louis Conservatory of Music (Mo.)
St. Louis Public Library (Mo.)
St. Louis University (Mo.)
San Francisco Conservatory (Calif.)
San Francisco Public Library (Calif.)
San Francisco State University (Calif.)

Smith College (Mass.)
Smithsonian Institution (D.C.)
Southern Illinois University at Carbondale (Ill.)
Springfield City Library (Mass.)
Stanford University (Calif.)
State University of New York at Albany (N.Y.)
State University of New York at Buffalo (N.Y.)
State University of New York at Stony Brook (N.Y.)
Syracuse University (N.Y.)
Temple University (Pa.)
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University of Connecticut (Conn.)
University of Delaware (Del.)
University of Florida (Fla.)
University of Georgia (Ga.)
University of Hawaii (Hawaii)
University of Houston (Tex.)
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University of Illinois at Urbana–Champaign (Ill.)
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Vanderbilt University (Tenn.)
Vandercook College of Music (Ill.)
Vassar College (N.Y.)
Virginia Polytechnic Institute & State University (Va.)
Washington University (Mo.)
Washington State University (Wash.)
Wayne State University (Mich.)
Wellesley College (Conn.)
Wesleyan College (Mass.)
Westminster Choir College (N.J.)
Williams College (Mass.)
Wisconsin Conservatory (Wisc.)
Yale University (Conn.)

Appendix B

November 7, 1991

Dear Music Cataloger:

Since the inception of library automation, music librarians, systems librarians and music patrons have discovered that trying to retrieve various manifestations of musical works containing music symbols (*accidentals*) in their titles can be a frustrating experience.

Music symbols are often needed for proper retrieval of music materials in online systems. The most commonly used symbols are the sharp sign (♯), and the flat sign (♭). These symbols frequently appear in uniform title fields (240 $r, 700 $r), and present special problems for searching.

We are surveying music technical service librarians to determine how this problem is currently being handled in your music original cataloging process. We would be very grateful if you would take a few minutes of your time to complete the enclosed questionnaire and return it in the postpaid envelope provided. You may wish to consult your systems librarian when answering these questions.

Please return the questionnaire no later than December 1, 1991.

Thank you very much for assisting us in this project.

Sincerely yours,

Richard Burbank
Music Catalog Coordinator

Barbara Henigman
Assistant Automated Systems Maintenance Librarian

Appendix B continued

MUSIC SYMBOL SURVEY

Please answer the following questions by placing a circle around the number that corresponds to your response.

1. Does your music library currently have an online public access catalog?

Yes....**(Please skip to Question 3)**.....1
No.....2

2. Does your music library currently have plans to implement an online public access catalog system within the next year?

Yes....**(Please skip to Question 21)**.....1
No.....**(Please skip to Question 22)**.....2

3. On what software is your system based?

CARLYLE.....1
CLSI.....2
DRA.....3
DYNIX.....4
GEAC.....5
INNOPAC.....6
LS2000.....7
NOTIS.....8
VTLS.....9
WLN.....10
Locally created..11
Other.....12

4. Does your system accommodate catalog records for scores and sound recordings?

Yes.....1
No.....2

5. Approximately what percentage of your **ENTIRE** database consists of bibliographic records for scores and sound recordings?

0-5%.....1
5-10%.....2
10-15%.....3
15-25%.....4
25-50%.....5
Over 50%.....6
Unknown.....7

6. Does your system index Uniform Titles (240) in the MARC record?

Yes.....1
No.....2

7. Do the music symbols for the sharp (♯) and flat (♭) display on your terminal screens as the correct characters?

Yes.....1
No.....2

8. Do the music symbols for the sharp (♯) and flat (♭) print on your printers as the correct characters?

Yes.....1
No.....2

9. When searching online for scores and sound recordings with a title such as **Sonata in F♯ minor**, is the sharp (♯):

(Circle only one)
Retrievable as itself (♯).....1
Retrievable as hash mark/pound sign (#)....2
Eliminated from the search string.....3
Converted into the word "sharp".....4
Converted into a letter or other character.5
You can choose whether it is retrievable...6
None of the above.....7

10. When searching online for scores and sound recordings with a title such as **Concerto in A♭ major**, is the flat (♭) symbol:

(Circle only one)
Retrievable as itself (♭).....1
Retrievable as a lower-case **b**.....2
Eliminated from the search string.....3
Converted into the word "flat".....4
Converted into other characters.....5
You can choose whether it is retrievable...6
None of the above.....7

11. Does your library have an online authority file?

Yes.....1
No....**(Please skip to Question 18)**.....2

Appendix B continued

12. Approximately what percentage of your authority file consists of authority records related to catalog entries for scores and sound recordings?

0-15%.....1
15-30%.....2
30-50%.....3
Over 50%.....4
Unknown.....5

13. Are Uniform Titles (100) for music indexed in the authority file?

Yes.....1
No.....2

14. When searching the online authority file for a name-uniform title heading such as: **Haydn, Joseph, $d 1732-1809. $t Symphonies, $n H. I, 45, $r F♯ minor**, is the sharp (♯) symbol in $r:

(Circle only one)
Retrievable as itself (♯).....1
Retrievable as hash mark/pound sign (#)....2
Eliminated from the search string.....3
Converted into word "sharp".....4
Converted into letter or other character...5
You can choose whether it is retrievable...6
None of the above.....7

15. When searching the online authority file for a name-uniform title heading such as **Beethoven, Ludwig van, $d 1770-1827. $t Symphonies, $n no. 3, op. 55, $r E♭ major**, is the flat (♭) symbol in $r:

(Circle only one)
Retrievable as itself (♭).....1
Retrievable as a lower-case **b**.....2
Eliminated from the search string.....3
Converted into the word "flat".....4
Converted into another character.....5
You can choose whether it is retrievable...6
None of the above.....7

16. Do the music sharp (♯) and flat (♭) symbols appear in authority records in the online authority file as the correct characters?

Yes....**(Please skip to Question 18)**.....1
No.....2

17. If you answered "No" (to Question 16) what appears instead of the music sharp (♯) and flat (♭) symbols in authority records in the online authority file?

(Circle only one)
Diacritic/special character.....1
Punctuation mark.....2
A letter (e.g., lower-case **b**).....3
A word (e.g., "sharp", "flat").....4
Nothing.....5

18. All things considered, how effective is your system in handling the music sharp (♯) and flat (♭) symbols?

Very acceptable.....1
Somewhat acceptable.....2
Not too acceptable.....3
Not at all acceptable.....4

19. Does your system provide any documentation such as technical manuals for librarians or programmers, or documentation for users that explains the use of these symbols?

Yes.....1
Unknown.....2
No.....3
Not applicable.....4

20. Are music needs in general now a part of the ongoing maintenance or upgrade of your system?

Yes.....1
Unknown.....2
No.....3
Not applicable.....4

Appendix B continued

21. In selecting your system were your library's music needs made known to the vendor of your system?

Yes.....1
Unknown.....2
No.....3
Not applicable.....4

22. How important to you is the proper use and adequate incorporation of music symbols for the original cataloging and retrieval of music materials?

Very important.....1
Somewhat important.....2
Not too important.....3
Not at all important.....4

23. Do you (or a representative of your music library) attend online system user group meetings at local or national meetings of the Music Library Association or the American Library Association?

Yes.....1
No.....2

Thank you for answering this survey.

Please use this space to add any other comments you may have.

Optional Information:

NAME:_____

TITLE:_____

This is the end of the questionnaire.

Please return the completed questionnaire in the postpaid envelope provided.

Access to Information in Both CitaDel and FirstSearch: A Comparative Study of Dissertation Coverage

Stephen Perry and
Lutishoor Salisbury

Theses and dissertations submitted to universities and colleges in the United States are accessible in many different formats and through many different vendors. Electronic access is provided by such vendors as DIALOG, BRS, FirstSearch (OCLC), and CitaDel (RLIN), and CD-ROM access is also available.

This article presents a comparative analysis of CitaDel and FirstSearch. The effectiveness and ease of use of these two systems in providing end-user access to thesis/dissertation information, and the strengths and weaknesses of the searching capabilities of these two systems are discussed. Examples of direct retrieval comparison of thesis/dissertation information from the FirstSearch WorldCat *database and* Dissertation Abstracts *on CitaDel are provided.*

It is concluded that both FirstSearch and CitaDel offer great potential to libraries seeking convenient access to dissertations and theses. FirstSearch WorldCat *offers the added advantage of providing the option for users to pay for information as they use it, whereas CitaDel's* Dissertation Abstracts *database can be subscribed to only through an annual fee. One drawback to searching for thesis/dissertation information through the* WorldCat *database, however, is that, unlike CitaDel, this source provides no abstract.*

Given the fact that both systems offer benefits and that both retrieved unique citations not duplicated by the other, it is concluded that both systems should be used for truly comprehensive thesis/dissertation retrieval.

Access to dissertations and theses poses a real challenge for the academic librarian. It is well known that, for many disciplines, the "cutting edge" of current practice, application, and research design is first evidenced in dissertations, which is one reason scholars demand access to them.[1] Yet efficient methods of accessing dissertations and theses have vexed many librarians as they attempt to balance judicious access to this source of information with the least amount of frustration to the user. In fact, problems posed by locating, cataloging, and storing dissertations, not to mention thorny collection management issues, have been the focus of much solid research in the field. Joan Repp and Cliff Galviano, in an article published in *College & Research Libraries*, suggested as a topic worthy of further research the "full study of the content and coverage of various general dissertation indexes with the intent of determining their reliability in providing full availability of dissertation information to prospective disciplines."[2] It is partially with this aim in mind, that we offer our own comparisons of dissertation coverage as provided by both CitaDel and FirstSearch.

Theses and dissertations submitted to universities and colleges in the United States are accessible in many different formats and through many different vendors. Major hard copy sources include *Comprehensive Dissertation Index, 1861–1972; Dissertation Abstracts International (DAI), Sections A and B; American Doctoral Dissertations*, and *Doctoral Dissertations Accepted by American Universities.* Access to masters' theses is provided by *Masters Abstracts* and *Masters Abstracts International.*

Electronic access to theses and dissertations is provided by such vendors as DIALOG, BRS, FirstSearch (OCLC), and CitaDel (RLIN), and in addition, CD-ROM access to dissertations is now also available.

The CD-ROM product available for dissertations, Dissertation Abstracts OnDisc, is made available by UMI utilizing their Proquest software. Currently, the usefulness of this format is limited to either single-user access or networked access, if the library has signed the appropriate licensing agreements for this product. The usefulness of the CD-ROM format is also limited by the nature of the Proquest software. Kathleen Kluegel, in her review of this database, noted that one major flaw is its inability to "streamline the search process of changing a disc," a problem encountered when searchers need to search the same keywords on more than one disc.[3] Other barriers to searching the CD-ROM product effectively are built into the software itself, a problem compounded by inadequate documentation, lack of an index, and poor organization that fails to provide sufficient support.

At the time of this writing, the options provided for unlimited institutional access to dissertation information through an annual subscription are limited to RLG's CitaDel and OCLC's FirstSearch. Therefore, we have chosen these two systems as the focus of our study

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in an effort to recommend the best and most comprehensive access to dissertations from remote locations.

In February 1992, the University of Arkansas evaluated the FirstSearch system during a month of free trial use and subsequently evaluated the CitaDel service during the months of October and November of the same year.[4]

The results of these evaluations have proven useful in assessing patron response to both systems and in demonstrating the effectiveness of both systems for retrieving information under various subject areas. This particular study attempts to provide a comparative analysis for end-users of these two vendors by proving their effectiveness and ease of use in providing needed citations to theses and dissertations. The strengths and weaknesses of the searching capabilities of the two systems are highlighted and pricing options are discussed. Finally, a comparison of the retrieval of thesis/dissertation information from the FirstSearch *WorldCat* database and *Dissertation Abstracts* (*DSA*) on CitaDel is presented.

FirstSearch

FirstSearch is a comparatively inexpensive online interactive search service introduced by OCLC and geared to the end user. It presently contains over forty-three databases with more to be added in the near future. FirstSearch caters to the general patron by providing popular citation databases such as *Newspaper Abstracts, Periodical Abstracts, Reader's Guide to Periodical Literature, Reader's Guide Abstracts,* and *Business Periodical Abstracts,* among many others. It caters to the subject-specific user by providing access to many databases in the humanities, social sciences, and business. It further provides access to science and technology information by making available databases such as *Biosis/FS, General Science Index, GeoBase, INSPEC, Biological and Agricultural Index, Concise Engineering Index,* a subset of the Compendex Plus database, and *Applied Science and Technology Index.* FirstSearch is also offering a full-service document-ordering service for some of its databases.

CitaDel

CitaDel is a bibliographic service provided by the Research Libraries Group (RLG) that is also targeted for end-user searching. It provides access to citation databases and, like FirstSearch, also offers a full-service document delivery component. Databases such as *Periodical Abstracts, Newspaper Abstracts, ABI/Inform,* and *PAIS 80* focus on the general user. Another category targets graduate students and researchers by providing access to *Dissertation Abstracts* (*DSA*) and *EIPageI.* Three specialized files are also available on CitaDel; these include the *Hispanic American Periodicals Index, Current Bibliography of the History of Science and Technology, Index to Foreign Legal Periodicals,* and *Index to Hispanic Legislation,* with others to come in the near future.

Coverage

FirstSearch and CitaDel both offer open access to multiple users, thus avoiding the headaches and cost of mounting and maintaining databases on a local system. This ease of access has become more apparent as institutions are realizing that licensing tapes and mounting them locally represent an enormous investment. Instead, libraries often decide to integrate into their local systems only those databases that are critical to their curricular needs.

Vendors like FirstSearch and CitaDel, however, are presently offering the option of providing end-user access to a wide range of databases that have never been offered before in this type of institutional setting. While both systems offer databases for general and specific interests, the scope of coverage in FirstSearch is somewhat larger, catering to the current awareness needs of clientele by providing access to databases in all disciplines. For example, FirstSearch recognizes the needs of scientists and technologists by offering select databases in these subject areas, databases that previously were never offered before at a price users and libraries could afford.

Pricing Policy

FirstSearch offers two pricing options. The first allows patrons to control costs by charging by the number of search statements rather than by the number of online connect hours or by records printed or displayed. Libraries or individuals may order access to the FirstSearch catalog in open and/or card blocks of 500 searches each. Open blocks provide access under a single authorization number with multiple log-on capability. Card blocks act as a series of subauthorizations to a main account. These card blocks allow libraries to distribute searches in a controlled manner with either 10, 25, or 50 searches per card. The cost per search depends on the number of searches purchased. For example, if

500 searches are purchased, the cost per search is 90 cents, whereas if 40,000+ searches are purchased, the cost per search is 50 cents.

The second option offers institutions annual subscription pricing for selected databases. Under this option, a base package is required for purchase. Using this method, one simultaneous log-on with access to *WorldCat*, *Article1st*, and *Contents1st* would cost $6,500 annually, while ten simultaneous log-ons would cost $65,000.

Through CitaDel, institutions pay a fixed annual fee for access to each citation database they select. Subscription pricing is available for all files on CitaDel. The price is determined by the file and the number of simultaneous users. For example, the cost to access *Dissertation Abstracts* is $12,000 for 1 to 10 simultaneous users, whereas for 51 to 100 simultaneous users the cost is $34,500.

With this pricing policy, libraries do not have to keep track of searches and be concerned if their budgets have been exceeded. Indeed, libraries can budget up front for this service. However, the challenge then would be for the library to market the service aggressively to get the best return for dollar value. Libraries that subscribe to these databases would have to budget substantial time and effort at the initiation of these services to understand users' needs thoroughly and to decide which database(s) to subscribe to in order to gain maximum benefit. However, with this pricing policy, libraries with a limited number of potential users in any one particular area might find the cost of subscription prohibitive. CitaDel does allow a free 30-day trial, however, so that the institution can determine if any of the available files is a good "fit." In addition, FirstSearch offers the option of an open authorization account that could make the databases accessible from both local and remote locations. If libraries opt for this open authorization method, the urgent need to analyze the information needs of users would be greatly minimized in preference to providing information from a wide range of sources in all subject disciplines. In the long run, this method would seem more logical for an institution struggling to maintain access to a wide range of services for a diverse clientele at a moderate cost. It will also provide information from the less popular sources on demand that would not have been available otherwise at such a reasonable cost. The other option of individual passwords or authorization cards for FirstSearch could be awkward and a nightmare to administer and monitor in large libraries. However, this option meets the needs of the individual who is not attached to an institution, because many institutions may, at their discretion, decide to sell card blocks of searches to individuals having a legitimate research need. These cards can then be used to search any of a number of databases from any remote location.

Methodology

Similar searches were performed in both the CitaDel *DSA* database and OCLC's *WorldCat* to critically examine the capabilities of these two systems for searching and retrieving thesis and dissertation information. These two databases were chosen because they were the most comparable. The results are presented in tables 1–7. It should be noted that this study is a comparison of databases just as much as it is a comparison of the two systems themselves.

Discussion

Both FirstSearch and CitaDel provide access to theses and dissertations in the *WorldCat* and *DSA* files, respectively. These files provide fairly comparable access to theses/dissertation information, but with distinct advantages and disadvantages posed by each system. Table 8 provides a listing of the search characteristics of the two systems.

One of CitaDel's principal advantages is that it allows for Boolean searching using the OR operator, with the practical result being that several search terms or synonyms can be strung together in a single statement. Certainly, the chief complaint against FirstSearch is by now familiar. Not only is there no provision for a search history, but also synonymous terms must be typed in separately. Even though FirstSearch just recently introduced the OR Boolean operator, still only two of them may be used per search statement. After that, each group of three synonymous terms incurs a separate charge.

However, *WorldCat* in FirstSearch does provide for maximum retrieval using a controlled vocabulary in the form of Library of Congress Subject Headings (LCSH). Although *Dissertation Abstracts* in CitaDel does not provide for searching using LCSH headings or other controlled vocabulary, it does allow freetext searching of the abstracts, which *WorldCat* does not include. The ability to search by words in the abstract is an important retrieval feature in *Dissertation Abstracts* via CitaDel.

In the example concerning gender or sex differences in conflict resolution (see table 2), CitaDel enables a searcher to construct a single search query using the two synonyms together for ease in retrieval. FirstSearch provides the searcher with the ability to do this by using the appropriate LCSH heading, thus avoiding the entering of synonymous terms. This feature, however, assumes that synonym variations are in fact subsumed under the appropriate subject heading (as in the example where "sex differences" also retrieves "gender dif-

Table 1
Topic: Quality Circles

CitaDel				WorldCat			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
Title Keyword Search:	2	1984	M.B.A.	Search query combining controlled vocabulary with title keyword:	17	1984	M.B.A.
		1988	ED.D			1986	D.P.A.
						1986	D.P.A.
tw quality circles and tw industry						1986	M.S.
				sh: quality circles and ti: industry and nt: thesis		1981	M.P.S.
						1985	M.A.
						1987	M.S.
						1985	M.S.
						1987	M.B.A.
						1985	B.B.A.
						1985	M.S.
						1983	M.S.
						1988	D.P.A.
						1985	M.B.A.
						1985	M.B.A.
						1985	M.B.A.
						1989	D.SHRM
				Title Keyword Search:	7	1986	M.S.
						1981	M.P.S.
				ti: quality circles and ti: industry and nt: thesis		1985	M.A.
						1985	B.B.A.
						1985	M.S.
						1987	M.B.A.
						1988	M.B.A.
				Subject Keyword Search combined with title keyword search:	16	1986	D.P.A.
						1986	D.P.A.
						1986	M.S.
						1983	M.P.S.
				su: quality circles and ti: industry and nt: thesis		1985	M.A.
						1987	M.S.
						1985	M.S.
						1987	M.B.A.
						1985	B.B.A.

CitaDel				WorldCat			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
						1985	M.S.
						1985	M.S.
						1988	M.B.A.
						1983	M.B.A.
						1983	M.B.A.
						1983	M.B.A.
Title Keyword Search:				Title Keyword Search:		1989	D.SHRM
tw quality circles and manufacturing	1	1989	Ph.D	ti: quality circles and ti: manufacturing and nt: thesis	5	1986	M.S.
						1986	M.S.
						1988	M.B.A.
						1985	Ph.D
						1983	M.B.A.
				Subject Keyword Search combined with Title Keyword Search:	12	1984	Ph.D
						1984	Ph.D
						1983	Ph.D
						1983	M.S.
				su: quality circles and ti: manufacturing and nt: thesis		1986	M.S.
						1988	M.B.A.
						1987	Ph.D
						1985	Ph.D
						1985	M.S.
						1983	M.B.A.
						1992	M.B.A.
						1989	Ph.D
				Controlled Vocabulary Search combined with a Title Keyword Search:	11	1984	Ph.D
						1984	Ph.D
						1984	Ph.D
						1983	M.S.
				sh: quality circles and ti: manufacturing and nt: thesis		1986	M.S.
						1988	M.B.A.
						1984	Ph.D
						1985	Ph.D
						1985	M.S.
						1983	M.B.A.
						1992	M.B.A
Total	1 M.B.A., 2 Ph.D			Total	1 B.S., 12 M.S./M.B.A., 6 Ph.D		

Table 2
Topic: Gender Differences and Conflicts

CitaDel				WorldCat			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
Title Keyword Search:	11	1975	M.A.	Controlled Vocabulary Search:	8	1986	M.A.
		1989	Ph.D			1989	Ph.D
tw gender differences or tw sex differences and tw conflict#		1988	Ph.D	sh: sex differences and sh: interpersonal conflict and nt: thesis		1987	B.A.
		1961	Ph.D			1991	M.A.
		1982	Ph.D			1990	M.A.
		1991	Ph.D			1990	M.A.
		1985	Ph.D			1991	MA.
		1989	M.A.			1988	M.A.
		1980	Ph.D				
		1969	Ph.D				
		1985	Ph.D				
Title Keyword Search:	0			Controlled Vocabulary Search combined with a Title Keyword Search:	2	1981	M.A.
						1990	M.A.
(tw gender differences or tw sex differences) and tw argument#				sh: sex differences and ti: argument+ and nt: thesis			
Total 2 M.S., 9 Ph.D				Total 1 B.A., 7 M.A., 1 Ph.D			

ferences"). If there are no appropriate LCSH or MeSH headings, then FirstSearch protocols require users to enter all appropriate synonym variations for a truly comprehensive search. Again, groupings of synonyms must be entered in separate search statements, with a separate charge for up to three synonyms. This is unfortunate, because experience shows that it takes an average of anywhere from six to twelve searches in FirstSearch to get the desired result.[5]

What is curious about this particular comparison of synonym construction is that, in most of the search examples FirstSearch retrieved more master's theses than did CitaDel; however, both systems retrieved an approximately equal number of dissertations. In fact, in many of the search examples, CitaDel typically retrieved dissertations extending further back in time. Another curious anomaly in most of the examples was the relative paucity of common citations, especially of dissertations, retrieved by both systems.

In the search example on feminist criticism of Latin American literature (table 3), CitaDel generally located more citations in one statement due to the fact that the truncation symbol (#) represents true truncation, retrieving all variations of the word "feminist"; while with FirstSearch, the + symbol merely retrieves simple plurals and possessive forms of the word. Luckily, in the aforementioned search example, "Literature, Latin American" was a valid subject heading in CitaDel's *DSA*; without this provision, several other search queries would have had to be constructed. (For example, the search command "fin tw Latin American Literature" retrieved nothing.)

Table 3
Topic: Feminism in Latin American Literature

CitaDel				*WorldCat*			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
Title Keyword Search combined with Subject Keyword Search:	12	1983	Ph.D	Controlled Vocabulary Search:	3	1989	Ph.D
		1990	Ph.D	sh: Latin American literature and sh: feminist literacy criticism and nt: thesis		1989	Ph.D
		1986	Ph.D			1991	Ph.D
tw feminis# and sw Latin American Literature		1985	Ph.D				
		1986	Ph.D	Subject Keyword Search:	0		
		1990	Ph.D	su: feminist and su: Latin American Literature and nt: thesis			
		1991	Ph.D				
		1986	M.A.				
		1981	Ph.D	Controlled Vocabulary Search combined with a Title Keyword Search:	3	1986	Ph.D
		1987	Ph.D			1986	Ph.D
		1990	Ph.D			1990	B.A.
		1990	M.A.	ti: feminist and sh: Latin American Literature and nt: thesis			
Title Keyword Search:	0			Subject Keyword Search combined with Controlled Vocabulary:	5	1986	Ph.D
						1986	Ph.D
tw feminis# and tw Latin American Literature						1990	M.A.
				su: feminism and sh: Latin American Literature and nt: thesis		1987	Ph.D
						1990	B.A.
				Title Keyword Search combined with Controlled Vocabulary:	0		
				ti: feminism and sh: Latin American Literature and nt: thesis			
Total	2 M.A., 10 Ph.D			Total	2 B.A., 1 M.A., 5 Ph.D		

In FirstSearch, several different queries had to be pieced together to approach the success of CitaDel's one statement. Feminism had to be entered in two different ways (su:feminism and su:feminist), whereas CitaDel was able to process both variations (Feminis#) with one search statement. Even considering that the LCSH for Latin American Literature was used in FirstSearch, five different search statements had to be entered. Cumulatively, none of these statements was as successful as CitaDel's one successful query, and the citations retrieved were not duplicated by any in CitaDel.

In the two queries on quality circles and industry and biological control of agricultural pests in corn, rice, and soybean, FirstSearch's *WorldCat* retrieved more citations, even on a one-to-one comparison of title searches. Again, FirstSearch was favored by its ability to search the LCSH "Quality Circles," as well as its ability to search several fields at once, with the **su:** command,

Table 4
Topic: Biological Control of Agricultural Pests in Corn, Rice and Soybean

CitaDel				*WorldCat*			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
Title Keyword(s) Searches:	0			Subject Keyword Searches:	18	1990	M.S
						1984	M.S.
tw: biological control and tw agricultural pest and tw corn				su: biological control and su: pest+ and su: corn and nt: thesis		1984	Ph.D
						1985	Ph.D
						1985	M.S.
						1987	Ph.D
tw biological control and tw pest# and tw rice	0					1986	Ph.D
						1954	
						1981	M.S.
tw biological control and tw pest# and tw SOYBEAN	2	1988	Ph.D			1980	M.S.
		1983	Ph.D			1985	Ph.D
						1979	Ph.D
Abstract Keyword Search:	2	1988	Ph.D			1987	M.S.
		1983	Ph.D			1965	Ph.D
ab biological control and ab pest# and ab soybean						1971	M.S.
						1985	
Subject Keyword Search:	0			Subject Keyword Searches:	29	1987	Ph.D
						1989	M.S.
sw biological control and sw pest# and sw syobean				su: biological control and su: pest+ and su: soybean and nt: thesis		1980	M.S.
						1979	M.S.
						1983	Ph.D
						1983	Ph.D
						1989	M.S.
						1984	Ph.D
						1979	M.S.
						1980	M.S.
						1980	Ph.D
						1989	Ph.D
						1988	Ph.D
						1984	M.S.
						1984	M.S.
						1984	Ph.D
						1985	M.S.
						1988	Ph.D

CitaDel				*WorldCat*			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
						1976	M.S.
						1992	M.S.
						1981	Ph.D
						1982	Ph.D
						1982	Ph.D
						1982	Ph.D
						1975	M.S.
						1983	Ph.D
				Subject Keyword Searches:	6	1982	M.S.
						1985	M.S.
				su: biological control and		1978	M.S.
				su: pest+ and su: rice and		1981	M.S.
				nt: thesis		1981	Ph.D
						1989	M.S.
Total	2 Ph.D			Total	23 M.S., and 20 Ph.D		

Table 5
Topic: Downy Mildew in Grapes (Plasmorpara viticola)

	CitaDel				*WorldCat*		
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
Title Keyword Search:	3	1981	Ph.D	Title Keyword Search:	2	1981	Ph.D
(tw grape# or tw Plasmor-		1914	Ph.D	ti: downy mildew and ti:		1956	Ph.D
para viticola) and tw downy mildew		1956	Ph.D	grape+ and nt: thesis			
Abstract Keyword Search:	1	1981	Ph.D	Subject Keyword Search:	2	1956	Ph.D
(ab grape# or ab Plasmor-				su: grape and su: downy		1987	Inaugural
para viticola and ab downy mildew)				mildew and nt: thesis			Disser- tation
Total	3 Ph.D			Total	3 Ph.D, 1 Inaugural Dissertation		

Table 6
Topic: Protocalliphora

CitaDel				WorldCat			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
Title Keyword Search:	1	1990	M.A.	Subject Keyword Search:	5	1989	M.S.
tw protocalliphora				su: protocalliphora and nt: thesis		1980	M.S.
						1969	M.S.
Subject Keyword Search:	0					1946	M.S.
sw protocalliphora						1976	Ph.D
Total 1 M.A.				Total 4 M.S., 1 Ph.D			

Table 7
Topic: Apple Diseases

CitaDel				WorldCat			
Search Statement	No. Ret.	Years	Degree	Search Statement	No. Ret.	Years	Degree
Abstract Keyword Searches:	3	1990	Ph.D	Title Keyword Searches:	3	1944	M.S.
		1982	Ph.D	ti: apple and ti: bitter rot and nt: thesis		1979	M.S.
(ab apple# or ab Malus) and (ab Bitter Rot or ab white rot or ab black rot)		1989	Ph.D			1980	M.S.
				ti: apple and ti: black rot and nt: thesis	3	1982	Ph.D
Title Keyword Searches:	2	1982	Ph.D			1969	Ph.D
(tw apples# or tw Malus and (tw bitter rot or tw white rot or tw black rot)		1969	Ph.D			1973	M.S.
				ti: apple and ti: white rot and nt: thesis	2	1980	M.S.
						1992	M.S.
				ti:apple and ti:bitter rot and nt:thesis	3	1944	M.S.
						1979	M.S.
						1980	M.S.
				ti:apple and ti:black rot and nt:thesis	4	1982	Ph.D
						1969	Ph.D
						1973	M.S.
						1916	Ph.D
				ti:apple and ti:white rot and nt:thesis	2	1980	M.S.
						1992	M.S.
Total 4 Ph.D				Total 6 M.S., 3 Ph.D			

Table 8
Comparison of Searching Characteristics

	CitaDel—DSA file	FirstSearch—*WorldCat*
Boolean operators	AND, OR, and NOT	AND and NOT. OR allowed up to two times per search statement. Repeat search statement using synonyms for maximum retrieval. Causes duplicate retrieval. Those could be eliminated by AND NOT, but expensive and awkward.
Controlled vocabulary	This is file specific. In DSA, very broad controlled vocabulary. Almost useless in specific inquiry.	This is file specific. In *WorldCat,* very good controlled vocabulary using LC subject headings and MeSH. Wordlist action verifies a bound phrase before searching at no cost.
Document delivery/ Holding information	Provides document delivery via RLIN ILL. Patrons have no way of knowing whether documents are in their library's collection or a neighboring library's collection.	The Libraries field at the end of each record contains a list of three-letter symbols indicating libraries that own an item. Enables direct borrowing or through OCLC ILL system. For patrons searching online, will get an indication of whether items being viewed are available in their own library.
Download and print options	Printing/downloading one record at a time. A record could contain up to several cardlike displays to print/download. A command must be given for each cardlike display to print/download.	Printing/downloading one record at a time. Once P full is set, a full record is printed/downloaded.
End-user access	Tied to an institution's subscription.	Two methods: (1) open authorization (2) individual authorization. Not tied to an institution's subscription.
Field searching	Only field searching. Leads to duplication of retrieval. Duplicates could be eliminated by the NOT operation but it is tedious and cumbersome. Combining search instructions across different fields gives better retrieval, but this is left to trial and error in formulating search strategy.	One can search in groups of fields (e.g., su: searches subject headings, titles, contents and other notes). Can search without specifying a field, in which case all fields are operated on. Can specify a single field.
Limiting fields	Year, language only.	Years, language, and in *WorldCat* by type of documents.
Online dictionary	None is available.	WorldList online, even though not 100% complete, is helpful to look up terms and spelling of terms before a search session.
Proximity searching	TP allows phrase searching which implies adjacency.	Proximity searching is possible. Uses W (with) and N (near) to specify order and closeness of words in search.
Screen design and help messages on screen	Instructions appear when a searcher logs into DSA and on subsequent screens. No context-sensitive help.	Instructions appear when a searcher logs into *WorldCat* and on subsequent screens. No context-sensitive help.
Truncation	To find variant terms, the truncation symbol # is used within a word or at the end of a word.	Simple plurals and possessives only.

continued on page 28

Table 8 (continued)
Comparison of Searching Characteristics

	CitaDel—DSA file	FirstSearch—*WorldCat*
User prompts	Does not indicate the non-existence of single word items in database.	Prompts user when system does not find a word in database, allowing user to look for spelling alternatives.
Word wrapping	Does not permit word wrapping but much more tolerant of typographical errors and subsequent backspacing.	Word wrapping is possible. Typing errors are not easily corrected.

which searches titles, notes, contents, as well as subject headings. Even given the fact that Citadel's search engine is essentially one that is title- and abstract-driven and that there is little provision for true subject searching in CitaDel's *DSA* (beyond UMI's very broad subject constructs), the key point seems to be that when *WorldCat* was also commanded to search for titles only, it still located more citations. In the search on Protocalliphora, for example, *WorldCat* retrieved five citations, including four master's theses and one doctoral dissertation, with dates ranging from 1946 to 1989, while *DSA* retrieved only one dissertation.

Similarly, in a search for biological control of agricultural pests in corn, rice, and soybean (table 4), a search in *WorldCat* found seven master's theses and seven doctoral dissertations, whereas the same search in *DSA* retrieved only two doctoral dissertations. This is also true for a search on apple diseases as in table 7, where *WorldCat* retrieved six master's theses and two doctoral dissertations, whereas *DSA* retrieved just four doctoral dissertations.

One possible explanation for FirstSearch's higher retrieval ratio is that libraries typically catalog theses and dissertations as soon as they are available and then input the cataloging data into OCLC's Online Union Catalog (updated daily), which in turn makes this information available immediately to *WorldCat*. The scope of coverage in *WorldCat*, in any case, far exceeds that of *DAI*. Over 16,000 libraries entered their cooperative holdings into the *WorldCat* database, whereas *DAI* contains citations for dissertations and master's theses from about 550 universities, including North American graduate schools and many European universities. There are 2,611,017 theses and dissertations listed in *WorldCat*, with only 1.3 million records in *DAI*, as of December 1993. To its credit, *DAI* does include many, if not most, of the top-level graduate schools, while *WorldCat* would *not* contain records from major research institutions if they are not OCLC member libraries. Furthermore, *DSA* covers dissertations back to 1861 and master's theses back to 1962. Moreover, *DSA* has a greater number of doctoral dissertations than master's theses, and it contains no bachelor's theses.

In general, *WorldCat* retrieved more theses of all types (bachelor's theses, master's theses in all fields, etc.), as well as unique dissertations, than did a comparable *DSA* search, even when the fields searched on both systems were as similar as possible. The conclusion reached by the authors is that CitaDel is handicapped by the lack of a field qualifier capable of searching several fields at once, such as the **su:** field in FirstSearch, which, when used consistently, retrieved several more citations than did any comparable field qualifier in CitaDel due to FirstSearch's ability to search for content notes, titles, and subjects through this one qualifier. FirstSearch, however, is equally handicapped by the lack of the OR Boolean operator.

It may be concluded, then, that CitaDel's *DSA* appears to be much more restrictive in its dissertation coverage. It certainly does not seem to cover the full range of master's theses that *WorldCat* seemingly indexes in abundance due to *WorldCat*'s many optional fields for searching. *WorldCat*, moreover, is favored by its provision for using exact LCSH and MeSH headings for maximum retrieval, with the advantage that in these cases the searcher does not have to construct a list of possible synonyms for words that might be in the title, as the searcher is required to do in *DSA*.

In CitaDel, however, the searcher is capable of searching words in the abstract as well as constructing synonyms using the OR Boolean logical operator. Also, CitaDel does include dissertations from many prestigious graduate schools, many of which are not OCLC member libraries, and the dissertations retrieved tend to extend further back in time than those retrieved through *WorldCat*. Furthermore, CitaDel is more forgiving of backspacing and typographical errors than is FirstSearch, which, when searched through the Internet,

does not typically forgive any spelling errors—even one that is immediately corrected, and as a consequence, search terms are sometimes misinterpreted by the system, with the result that the searcher is still charged for a search statement. As a general rule, all these CitaDel features result in searches that tend to be less expensive—and less cumbersome—than FirstSearch.

Conclusion

Requests for locating dissertations, as noted in the introduction, represent one of the most frequent challenges for academic librarians. This challenge is made more difficult by the interdisciplinary nature of many dissertations and by historical problems with poor bibliographic control.[6] Given the additional fact that many librarians have found the CD-ROM product to be less than perfect in this regard, both FirstSearch and CitaDel offer great potential to libraries seeking convenient access to dissertations and theses. In addition, both systems provide retrospective and current information in the form of several databases to meet the needs of their diverse clientele. These benefits are especially important in an environment where funds are scarce and ownership and control have become paramount issues. FirstSearch offers the added advantage of providing the option for users to pay for information as they use it, whereas CitaDel's databases can be subscribed to only through an annual fee. Access to FirstSearch's *WorldCat* database especially offers great potential for thesis/dissertation information at an affordable price. One drawback to searching for thesis/dissertation information through the *WorldCat* database, however, is that unlike CitaDel, this source provides no abstracts. Therefore, many patrons feel that the value of the summary is lost and that they may still need to locate the abstract through the paper copy of *DAI* to decide on the relevance of methods or procedures employed. Given the fact that both systems have beneficial qualities and that both retrieved unique citations not duplicated by the other, we are forced to conclude that both systems *should* be used for truly comprehensive thesis/dissertation retrieval.

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SPECIAL SECTION: LITA International Relations Committee Program, Miami Beach, June 1994

Evelyn Schelm Murphy, Program Chair

Introduction

Evelyn Schelm Murphy

As the role of information technology in libraries increases and the ability to communicate globally becomes commonplace, exchanging knowledge about these advances across boundaries is inevitable. An ideal forum for such discussion is within the programs presented by the Library Information Technology Association International Relations Committee during the American Library Association's Annual Conferences. The most recent presentation in Miami Beach in June 1994 proved to be such a situation. The Committee presented the program, "Librarians Abroad: Myths and Realities in Creating a Technological Infrastructure." Following the format used in previous programs by this committee, three speakers presented: (1) an overview of library and information technology in one world region; (2) a perspective from one country within the region; and (3) the viewpoint of a Library Fellow who had worked in the region.

Because of the Miami location, the Committee chose Latin and South America as the featured region.

Louella Wetherbee set the stage for the following two speakers by presenting a general overview of library development in Latin America. She also talked about some implications of Internet access for librarians and library networks. Saadia Sanchez-Vegas (National Library of Venezuela) spoke about libraries and information technology in Venezuela. Access to information is important for strategic sociological and economic development. David Martin (University of Iowa) described his experiences during a six-month period in 1991 as an ALA/USIA Library Fellow in Venezuela.

Wetherbee, a Dallas-based consultant, made the following points. New information technology, especially the Internet, provides a great opportunity for improved global communication. Because the profile of library development and networking varies widely from country to country, there is no such thing as a single Latin American library environment. University and research libraries contain almost all the Internet connections, whereas public, provincial, and school libraries are not as well developed. National libraries are often underdeveloped and underfinanced, except for the National Library of Venezuela.

The lack of a committed core of knowledgeable and interested librarians affects network development. A high percentage of public libraries lack professional librarians as heads. There is a scarcity of available materials to share, and many libraries function with little money.

For cooperative development, there is a need for a reliable source of union listing with available resources. Librarians are reluctant to entrust materials to mail and courier services. There are many examples of automation in libraries, but not of shared networks. Librarians need to make firm cooperative arrangements before they can work on developing networking standards.

Mexico has the most sophisticated technology, as a national network of libraries exists. Half of all research takes place at the national university in Mexico City. Of the interlibrary loan requests, 40 percent have to be filled outside Mexico. The Internet could solve remoteness in rural areas. In some places, library cooperation in resource sharing is nonexistent, requiring the need to build trust and confidence.

There is a long-standing agreement among libraries in Nicaragua, and they do much sharing of resources. In Chile, one of the most advanced Latin American countries in using the Internet, a database is mounted on the NOTIS system. Brazil's network uses a coupon-based database with document delivery.

The Organization of American States is charged with building a network in Latin America. There are few libraries connected to the Internet. Some library catalogs are on the Internet, but Internet access and use are very limited.

The implications of Internet access in the short run are the same in Latin America as elsewhere: faster and more readily accessible information and improved communication for researchers. The downside is that Internet access will emphasize the library "haves and have nots." Latin American libraries will emphasize access to United States and European resources and de-emphasize access and regional development in Latin America. Wetherbee suggested that they mount their own resources on the Internet.

Often there is a lack of adequate phone lines, hardware, and software in these countries. Access will improve greatly for those with hardware and software. Not much thought has been given to the benefits of Internet access within Latin America. Library networks will seize upon the Internet as an opportunity to build gateways and mount unique resources.

After being selected as an ALA/USIA Library Fellow, David Martin found that things are not always as they first appear. At the beginning of the six months he had to prepare for his assignment in online searching in Venezuela, he was assured that computers with databases would be available and that the students would understand

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English. Six weeks before his arrival, he was informed that they did not have computers and that he should teach business information. Upon arrival, he found that the students knew little English, and so he taught in Spanish. However, he had underestimated his ability to speak in Spanish.

While in Venezuela, Martin taught courses for the Graduate Program in Information Management at Símón Bolívar University. Most students had no experience with the Internet, and scientists and technicians did not understand the concept of an online catalog. A private business school had a beautiful library, but it was not automated. They wanted an online catalog. Because David was an expert on online searching, it was assumed he knew all areas of automation. The administration needed David as a catalyst to get the technology people and the librarians to talk with each other about designing an automation plan for their library. He also worked as a consultant with MegaPlus, a private company, in planning and delivering a workshop on the use of online databases for business and market intelligence.

Things we take for granted, such as overhead projectors, facsimile machines, and photocopiers, were either nonexistent or did not work well. This last speaker advised that with technology, one must deal first with the people.

David Meets Goliath on the Information Superhighway: Venezuela in the Context of the Electronic Communication Networks

Saadia Sanchez-Vegas

For Latin Americans, information is a resource and an important factor in the creation of wealth. The answers or obstacles to information and electronic communication appropriation are more of a political and socioeconomic nature than of a technical nature. In Latin American countries, the design and implementation of networking projects should be done in accordance with their economic and social needs. That is, in accordance with well-defined developmental goals. Within each country's developmental strategies, national information and technology policies have to be designed and implemented.

The author addresses three aspects related to the information and communication technologies present specifically in Venezuela and, in more general terms, in Latin America. The first aspect briefly describes Venezuela's communication technology infrastructure and usage patterns. The second aspect deals, from a critical point of view, with Venezuela's future networking plans, and finally, the third aspect addresses some political considerations linked to the information and technology problem present in this country.

Today, social scientists refer to the world economy as an interdependent and integrated economy. The newly developed electronic communication and information technology, with its unlimited capability to overcome time and space, is considered as the "engine" of global socioeconomic changes. Information is treated as a critical resource at the national and international levels, and is traded in the international marketplace, in which there are buyers and sellers. Controlling and/or attaining control of information is fundamental if a country is to remain competitive in terms of international business and in providing internal, as well as international security. For the so-called underdeveloped nations, access to information and information technology is essential for strategic socioeconomic change. The adoption and utilization of information and communication technology has political and social implications as well.

This paper addresses three aspects related to information and communication technologies present in Venezuela and, in more general terms, in Latin America. The first part deals with a brief description of Venezuela's information and communication technology infrastructure and usage patterns. The second part discusses some of our future networking plans, and finally, the third part addresses critical issues linked to the information and technology problem, from a Latin American perspective.

The Technological Infrastructure: The Case of Venezuela

The origin of Venezuela's networking technological infrastructure goes back to the early 1980s, when

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the Concejo Nacional de Investigaciones Cientificas y Tecnologicas (CONICIT; in English, the Science and Technology Research National Council) had the initiative to launch its own data-transmission network as part of a project known as SAICYT (Sistema Automatizado de Informacion Cientifica y Technologica or Scientific and Technological Information Automated System). The network was based upon the X.25 protocol and offered limited services (i.e., access to international databases and online searching on Dialog) to a restricted community of scientists. By 1990 the registered user population did not exceed 50 active users (Valdez 1994).

By the end of 1991, SAICYT established its connection to the Internet through the JvNCnet (John Von Newman Computer Network) of Princeton University. By May of 1993 SAICYT was completely based upon the TCP/IP protocol. SAICYT has a hierarchical structure. It counts with three primary nodes in the cities of Caracas Barquisimeto and Puerto La Cruz, and four secondary nodes in the cities of Merida, San Antonio, Maracaibo, and Puerto Ordaz. The connection between the nodes is possible through dedicated lines at 9600 bps.

At the present time, fifteen organizations, including national universities, research centers, an oil company, some hospitals, and the National Library of Venezuela, are interconnected within the network and have access to all functions provided by the Internet and other public communication networks in the United States and Europe.

SAICYT: User's Profile

Currently, SAICYT offers communication access to nearly nine thousand users out of a total population of approximately 20 million. The use of our most important communication network experienced a rapid increase from 1990 to 1993. The goal of SAICYT is to provide efficient and effective intercommunication among national universities and research centers, as well as to provide international access to the most important data and knowledge banks through the Internet and other public communication networks.

In a recent study done on the impact of academic networking, the case of SAICYT (Chacon and Pingiotti 1993), some interesting results were obtained. The research sample included 537 active users. The return rate was 20 percent, with a total of 108 respondents. Some of the results were as follows: 90.7 percent of the users were men, and of them, 77.8 percent had completed graduate-level degrees, including doctoral (24.1 percent) and post-doctoral (13 percent) degrees. Of the studied population, 77.8 percent live in Caracas, and in regard to their areas of specialization, a predominant segment (32.4 percent) of the users fall into the telecommunications and computer science area, 14.8 percent fall under engineering, and 15.7 percent fall under physics and chemistry.

Two important aspects of this user profile deserve special attention. One is the almost absolute absence of information providers: librarians and information specialists from the active users of the network. This situation has not changed substantially in the last two years. Although the National Library has made important contributions in the development of electronic communication in the country, the profession as a whole has not.

It is the author's opinion that this has had a negative repercussion in the whole process of incorporating electronic information throughout libraries and information centers in the country. A second important aspect is that, according to the authors of this study, some fields that are fundamentally linked to our developmental goals do not seem to benefit from our costly electronic access to information. Some of these fields include: economics and financing, agronomy, business administration, and marine biology (Chacon and Pingiotti 1993, 130). When these two aspects are considered, they seem to indicate a lack of understanding in terms of the strategic value of information and the communication technology to enhance our decision-making processes, and ultimately, to support our social and economic growth.

A critical evaluation of SAICYT would reveal that the potential of electronic information access currently provided is far from being fully exploited. The basic problem is not one of a technical nature, although undeniably our telecommunication infrastructure—currently in the hands of one American company, GTE—is underdeveloped, and the technological platform could possibly be enhanced if adequate funding is provided. Fundamentally, the problem is political in nature and deals with the design of an information and technology strategy and a formal information policy, which includes adequate diffusion, user support, and programs and services in close accordance with the demands of the country's developmental goals and objectives.

Nevertheless, it should be mentioned that important cooperative efforts are being advanced by some private organizations and individuals in the creation of conferences. These conferences are designed to discuss technological and managerial issues, and also to give political support to community nonpartisan organizations.

An effort that deserves special attention is the design and implementation of business/banking networks, as well as the participation of an important segment of the business sector in the Delphi international network. The Delphi project is

a successful private initiative that provides access to business- and industrial-related information of particular interest to the Latin American region. Cooperative efforts and solid commitments between mostly private companies have allowed relatively low costs for its members, and an efficient usage of the services provided by the network. In Venezuela, access to Delphi may be done through VENEXPAQ (a national network launched by the phone company), Sprint, and SAICYT (Lepervanche 1993).

Another important effort has been the creation of the ACAL network launched by the Latin American Science Academy as part of its regional program to promote the integration of the scientific regional community through the effective access and usage of the electronic communication networks. ACAL may be accessed through SAICYT of Venezuela, and offers important services such as a directory of 2,250 research centers in science and technology from twenty Latin American countries. Other services such as information on regional events, scholarship and funding for regional research, job offers, regional graduate programs, as well as a directory of Latin American researchers living outside the region are provided. Finally, ACAL participates in the Board of Management of the International Network for the Availability of Scientific Publications (INASP), which was designed to promote a program of donations of scientific literature for underdeveloped countries.The ACAL network provides information regarding all the services offered by the INASP.

Other networking efforts are being advanced by international agencies, such as the Organization of American States (OAS), UNESCO, and the Sistema Economico Latinoamericano (SELA; in English, Latin American Economic System). Twenty-seven countries are members of the system. SELA is pursuing important networking projects, among them, the implementation of a social information system and related knowledge and databases to support policymakers' decision-making processes. Another interesting project is a Latin American network of information services networks. Their main objective is to organize the information relevant to areas identified as critical for developmental purposes and regional cooperation and integration, such as health, foreign trade, and commercial exchange, as well as socioeconomic information.

Future Plans of Networking in Venezuela, or Where David Meets Goliath

The National Science and Technology Research Council (CONICIT) has advanced a program called REACCIUN, which is an academic and research cooperation network. It will be based upon the SAICYT data transmission network and will be organized as a private, not-for-profit organization. The main objective is to promote a "homogeneous telecommunication environment for the Venezuelan scientific community." In the immediate future the answer seems to be technical. CONICIT will install a high-capacity satellite to enhance our international link to the Internet. The design and future implementation of REACCIUN has been surrounded by a heated controversy. The most important argument against the program is precisely the fact that mostly technical matters are being considered. Nevertheless, important efforts are advanced by REACCIUN experts to design information services, such as access to national and international databases and national online public catalogs, and to provide technical advice regarding the design and access to digital information products. However, it is the author's opinion that the REACCIUN program has to be considered as part of a coherent information and technology national policy. Otherwise, the potential contribution of the program toward any economic or social change is questionable.

Those who criticize the REACCIUN program, among them the electronic association called CONEXION, recently made a proposition to President Dr. Rafael Caldera. It advocated the development of a computer and telecommunication infrastructure, with an emphasis on the development of services, for the national academic and scientific community. It also proposed an interdisciplinary cooperative effort to implement and manage the network. This proposal is an attempt to guarantee that Venezuela remains competitive on the information superhighway, in the international arena. From this proposal, it is clear that access to electronic information and communication would be restricted to the scientific and academic community.

The National Library of Venezuela, in an effort to pursue a democratization of information, has made the implementation of a Cooperative National Reference Center a priority for the next five years. It will be based upon a well-developed technological platform with an emphasis on the access and provision of electronic information in all its formats.

Critical Considerations

When discussing the information and technological issues present in Latin America, it is necessary to identify some critical and often overlooked considerations.

The generation and distribution of information and information technology are not evenly dispersed in the world and neither are their

benefits. In fact, the inequity of access to information is generating new forms of dependency between the "information-poor" and the "information-rich" countries. In this sense, it is more precise to state that the globalization and interdependency of the world economy is actually translated into an *asymmetric* interdependency that works primarily in the interest of the developed/information-rich nations. Another interesting aspect is the notion frequently used by information and computer specialists of the *globalization* effect of electronic communication and information technology. This notion of globalization underlies the electronic superhighway model (National Research and Education Network model), or as David Ives (1993) calls it, the universal access model. The globalization effect is undeniably occurring given the fact that time and space are no longer obstacles in the flow of communication and access of information services around the world. Nevertheless, a critical consideration of the structure of the information market will add a new dimension to the notion of globalization or the universal access model.

On one hand, production and distribution of information products and technology are highly concentrated in developed countries. Moreover, information is a commodity, and market forces—led by transnational corporations—determine the information and technology transference.

On the other hand, accessibility is perhaps the most critical concern regarding the globalization notion that underlies the information superhighway model. And the key elements of accessibility and usage are affordability and expertise. If information is a commodity, and this is a fact, the access to it has a price. At the moment, costs to access the Internet may be hidden to the end user. However, it is only a matter of time, particularly for Latin-American communities, until access will depend upon the user's buying power, whether this is an individual or a parent organization. If the accessibility obstacles—funding, ownership and costs—are not adequately addressed and resolved, then only the elite (within and among countries) will benefit from this immensely powerful information superhighway. The information superhighway gives power to the providers and users of this technology. Once we understand that accessibility is critical, then the whole question of usage becomes a social and political issue.

Therefore, in economic terms, the reality of this unequal capability regarding the control, technological innovation and expertise, and most importantly the access to information and communication technology, not only threatens the whole notion of "globalization" and universal access ("all of the information all of the time for all of the people" [Ives 1993, 175]), but furthermore, seems to confirm that the gap between information rich and information poor countries could be widening.

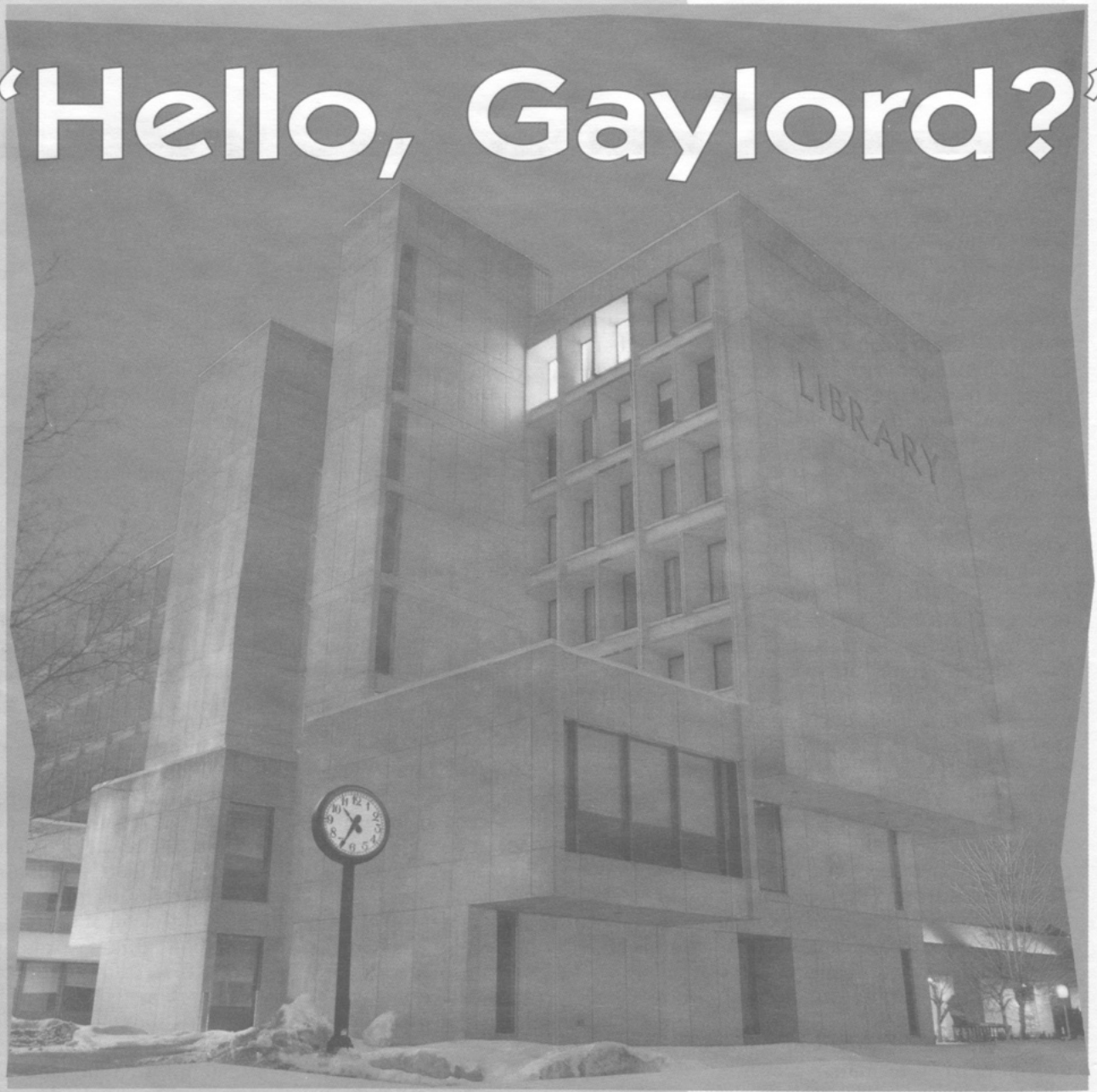
Will what can be a tremendous unifying mechanism become in reality a tool to further divide the so-called first world from the third world? For Latin America, there has to be a clear understanding that information is a resource and an important factor in the creation of wealth. Information properly applied in the pursuit of well-defined development objectives becomes a fundamental comparative advantage. As Wionczek once stated, "Information is not neutral, and its usefulness certainly depends more on the precision of its application than on its availability" (1983, 151). In this sense, Latin American countries will have to improve their capacity to utilize information and communication technology in accordance with their economic and social needs; that is, in accordance with well-defined developmental goals and objectives. Fundamentally, and from what has been presented in this paper, one could state that the answers (or obstacles) to information and electronic communication appropriation are more of a political and socioeconomic nature than of a technical nature.

More equity, in terms of the access to information and communication technology, and more power in terms of the use and handling of information, is dependent upon interregional cooperation plans among Latin American countries. They must continue to identify suitable areas of collaboration, political commitments, and the design of specific programs such as users' education regarding the strategic value of information for their decision-making processes, users' training, support to the user, diffusion of the technology, information guides, programs for global access, information services, as well as more technical assistance.

On a national level, within each country's developmental strategies, national information and technology policies have to be designed and implemented. The design of these policies should be an interdisciplinary effort. Funding from different national and international sources, and negotiation with the telecommunication companies for fair costs, have to be pursued.

Information and communication technology can be contributing factors to development only if they are developed as a national project and as part of interregional cooperative efforts. Only then, would Latin American countries pursue our most important challenge: to build a more equitable future.

"Hello, Gaylord?"



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SPECIAL SECTION
VTLS Proceedings

Introduction

Gail Gulbenkian, Information Officer, VTLS Inc.

Mountain Lake, Virginia, was the sparkling venue for the Fourth Annual Directors' Conference, which drew more than eighty participants for three days in September. Eight distinguished speakers, whose presentations registered as crisp and clear as the weather, addressed the theme of "Digitization and the Creation of Virtual Libraries." The topic resumed the exploration of various aspects of multimedia virtual libraries—an exploration begun at the First Directors' Conference—with an accent this year on digitization and imaging.

VTLS President Vinod Chachra launched the conference presentations with "Creating and Accessing Virtual Libraries," in which he elaborated on his five-part model of the virtual library.

M. Stuart Lynn, president of the Commission on Preservation and Access, spoke on "Digital Technologies: Ensuring Continuing Access to the Historical Record." Predicting that the digital age will be seen in retrospect as "another historical moment that embraced a significant shift of the locus of human memory," Lynn outlined the implications and challenges of digital technologies for preservation and access and noted obstacles to be overcome to turn the promise of digital technologies into reality.

Our third speaker was Howard Besser, information science analyst for the Canadian Centre for Architecture and lecturer for the School of Library and Information Studies at the University of California, Berkeley. Besser delineated the major issues facing imaging projects; the usefulness of imaging for educational activities; imaging tools and processes; and other specific issues such as file size, bandwidth, topology, resolution needs, and color consistency. "The critical issue for multimedia files is consideration for their size," he said. "File sizes cause enormous problems for storage and access."

Laverna Saunders, dean of the library at Salem (Massachusetts) State College and editor of the "Internet Librarian" in *Computers in Libraries*, spoke on "Transforming Acquisitions to Support Virtual Libraries." For Saunders the reality of the virtual library has forced a reexamination of library acquisitions. She posed numerous questions that librarians need to answer to redesign their work processes and "transform not only their libraries but also themselves" to accommodate the new technologies.

Roy Tennant, head of Information Systems Instructions and Support at the University of California at Berkeley Library, addressed the issue of staff training and development in the virtual library in his presentation, "The Virtual Library Foundation: Staff Training and Support." "The importance of staff training in the creation of virtual libraries," said Tennant, "cannot be overemphasized...and requires a firm commitment from library administration."

Charlene Hurt, director of libraries at George Mason University (Virginia) and chair of the Virginia State Networking Users Advisory Board, gave an overview of the birth, development, and challenges of the statewide virtual library in Virginia in her talk, "Getting Started and Funding the Virginia Virtual Library."

Eileen Henthorne, assistant head of the Princeton University Library System Office, demonstrated the use and benefits of Princeton's image card catalog, which was a joint imaging project of VTLS Inc. and Princeton University.

The guest speaker at the welcoming banquet was Anita Puckett, assistant professor of humanities at Virginia Tech, who enlightened us about "Social and Linguistic Problems in Digital Access in Appalachian Communities."

Assessing the colloquium, one attendee noted that "all the speakers addressed the theme of the conference very well," while another remarked that the "highly specialized subject [was] made easy to understand by the speakers."

"I was particularly impressed with the level of connectivity provided from Mountain Lake to your [VTLS'] office, which made possible some interesting Internet demonstrations," said Tennant.

Formal papers as submitted by Saunders, Tennant, Hurt, and Henthorne follow.

Digitization and the Creation of Virtual Libraries

The Princeton University Image Card Catalog—Reaping the Benefits of Imaging

Eileen Henthorne

History of the Project

An OPAC was installed at Princeton University in the Firestone Libraries in 1981. Approximately six million pre-1981 catalog cards were not converted to the OPAC, but were still very much used. These catalog cards, stored in 5,107 drawers, represent 1.75 million items owned by the library.

Several years ago, the Princeton University Library and Princeton's Computer and Information Technology Department (CIT) began to search for ways to preserve and convert the pre-1981 public card catalog. The goal for the project was to automate the card catalog in order to provide patrons a more easily accessible information resource.

A number of vendors were solicited for information regarding many conventional retrospective conversion practices. The responses received indicated that it would cost millions of dollars and take years to complete the conversion project. In addition, Princeton had not updated its shelflist and therefore needed to ship the public catalog cards to the vendor. This would have left the library without a public card catalog for the duration of the project. Digitization of the card catalog kept entering the picture so university officials pursued an intensive evaluation of imaging options and systems developers.

Eileen Henthorne is Assistant Systems Librarian, Princeton University Library System Office, Firestone Library, Princeton, New Jersey.

Proceeding with the Project

As with any project that incorporates the use of new concepts and new technology, the library needed to show monetary as well as operational benefits before undertaking such a large-scale project. Significant factors in the decision to proceed with imaging were:

1. Labor costs for handling the catalog cards had increased and would continue to do so.
2. A study conducted on a randomly drawn sample of 1,500 cards indicated an 11.13 percent deterioration rate of the cards, with a margin of error of plus or minus 3 percent when projected over the entire card catalog. The cards evaluated for this study included handwritten, typed, Library of Congress, and OCLC cards. One of the problems encountered was the old card stock, but there were also problems with newer cards that were used frequently.
3. The bids received from the hardware vendors showed that storage and computing costs were rapidly decreasing, reducing the storage costs for the images considerably.
4. Optical character recognition (OCR) technology was continuing to improve.
5. Retrospective conversion was too costly and time-consuming.
6. A strong commitment was received from VTLS Inc. that the project would be satisfactorily completed under the budget guidelines.

The benefits of this project were that the information on the cards would now be preserved and easily accessible by Princeton's patrons. Both benefits coincided with the library's mission. These benefits alone gave the library administration the momentum to proceed with the project. An added benefit of the project was the last phase. In this phase the library would use optical character recognition technology to convert each digitized image to fully tagged and indexed records of text in a standard MARC format.

Project Implementation Outline

The project plan outline was as follows:

1. Clean the card catalog.
2. Index the card catalog.
3. Scan the cards.
4. Quality control of the scanned cards.
5. Rescan rejected cards.
6. Quality control of the rescanned cards.
7. Implement the VTLS ImageBrowser.
8. Train staff and faculty to use the VTLS ImageBrowser.
9. Convert the scanned images into a MARC format using OCR technology.

Selecting a Vendor—VTLS Inc.

When Princeton submitted proposals to vendors, we already knew our needs. We were looking for a vendor that could manage the entire project—one that could supply a turnkey solution. The vendor chosen needed to have expertise in imaging hardware and software and to have or be able to develop the unique software applications required for this project. We were also adamant that the vendor work with us, allowing the library to hire the personnel to do

the work. Even though these points were stressed, no vendor presented us with a viable solution, until we met with VTLS Inc.

A colleague and I attended the ALA Annual Conference in San Francisco in 1992 in search of a vendor. We visited the VTLS Inc. booth, and Vinod Chachra, president of VTLS Inc., gave us a demonstration of the VTLS InfoStation, which became part of the solution. Chachra listened intently to our needs and submitted a solution shortly after the conference. After much more planning and the cooperation between the VTLS and Princeton University staff, we signed a contract in May 1993.

Preparation of the Cards

Within the catalog drawers, tabs were not evenly distributed, and the guide tabs as they existed would not work as an index to our file. Our research indicated that the optimum number of cards for the best retrieval rate was 250 cards per index. With this figure as a guide, we developed our own scheme for indexing. The majority of index points had 200 cards within the indexed section. However, adhering to this figure was not always practical. Because some subject areas needed subdivisions, we created some index points with as few as five cards and some with as many as 300 cards.

In addition to indexing the card catalog, we also cleaned each drawer. We removed the glassine covers that previously indicated the temporary location of a book or the paper copies of a card that had been removed. We also looked for cards that were beyond repair, those with broken corners or those that were smudged so badly the call number could not be read. During 1992 some of the cards were either typed and placed in the card catalog for scanning or were converted and are available through our online system. In retrospect, many more cards were pulled than was planned. However, both databases have been significantly enhanced by our tenaciousness.

To mark each index point, Princeton designed yellow index cards that were slightly larger than the 3 x 5 catalog cards. We used an alpha followed by four numbers and a bar code on each card. These yellow index cards were also scanned. When the indexing portion of the project was complete, we had used approximately 65,000 index cards.

Creating the Index

While the search for a vendor took place, we began to index the card catalog. The CIT department tested software programs we could use to build the index. Two major criteria in the selection process were that the software run on the Macintosh computers already owned by the library and that the software allow us to build the index in an outline form. CIT tested several software packages before purchasing one. The library then selected ten professional staff to do the indexing and cleaning of the catalog card drawers. Three Macintosh workstations were set up in the public card catalog area and the indexing began on May 15, 1992.

Each indexer was responsible for indexing 500 drawers. Each indexer was able to clean and index six to ten drawers per day. As the professional staff entered the index on the computer, four cataloging managers verified each indexer's work from the previous day.

The indexing was completed in mid-September 1992. In October the CIT department tested the index to see if it could be broken. They looked for duplicate numbers, missing drawer numbers, missing index numbers, misspelled words, etc. The final copy was completed in February 1993.

The Scanning Process

Three Ricoh IS-510 single-sided scanners were installed in a reading room located near the card catalog. A special hopper to feed the 3-by-5-inch cards through the scanner was developed.

Because of the size of the file and the amount of storage required for the scanned images, we determined that 300 dots per inch was the optimum resolution to use. There was information on the back of only 20 percent of the catalog cards. Therefore, it was decided to scan only one side of the card. During the year before the scanning process, the Database Management Department decided what information was important and had the staff either print the information on the front of the cards or remove those cards from the catalog. The scanning process began June 16, 1993. In order to keep to the budget, six students were hired to scan the cards. The operators worked in two shifts, from 7:30 a.m. to 11:30 p.m., Monday through Friday. Each scan operator completed twelve to fifteen drawers per day.

Quality Control

The quality control portion of the project was time-consuming but necessary. Fifteen students were hired and trained to perform quality control. Because the quality control process is so tedious, each student worked only two hours per day between 7:30 a.m. and 5:30 p.m. Using VTLS-QC, the special quality control software written by VTLS, the students viewed every fifth image. Viewing every fifth image was a high standard deliberately set by the library. It forced the rejection of many cards that had to be rescanned. This rescanning process was very time-consuming, but the end result was a much more accurate and cleaner database.

The students performed quality control of the images through August 1993. When the students returned to class, forty Princeton library staff were trained to perform quality control of the images. Each staff member worked one hour per day until all the cards had been scanned and quality control was completed.

During the quality control process each drawer was reviewed and the rejected cards were automatically recorded using the VTLS Imaging Workflow Manager software. Staff trained to handle the rejected card images received a rejection report written by VTLS that listed the rejected TIFF numbers. The drawers were then pulled and a quality control operator used the VTLS DOCPrep software to pull up the rejected image of each card. This card was marked in the drawer and the scan operator then used the VTLS Imaging software located on the scan equipment to verify the rejected card and determine what needed to be done to correct the image. Most images were rejected because the call number could not be read. Other images were rejected because the image was too dark or too light or the card was skewed. The VTLS Imaging System was used to dither, deskew, and scale all images. Some of the images that had a higher skew rate were detected manually by the quality control operators.

During the quality control process, we discovered that rescanning the cards did not always give us a clear image because some of the cards were just too smudged—a low-quality original produces a low-quality image. For example, we retyped the call numbers on the cards that had smudged call numbers. Surprisingly, the typing of the new call number did not take much time and it gave us a very good rescanned image.

The rescanning process took much more time than anticipated. We had hoped that five of the scan operators would scan new material and that only one operator would rescan rejected cards. However, two operators were needed to get the rescanning done.

After the rejected cards were rescanned, they once again had to go through the quality control process. When an entire catalog drawer was complete and accepted by the professional cataloger, the images for that drawer were backed up on tape, scaled down and placed on the server for online access.

Stored Images

The scanned images were scaled to 150 dots per inch for viewing. These images are being stored on an IBM 7051 with twenty-one disks using a total of 44 GB of storage. The TIFF images are stored in CCITT Group IV compressed format.

Future Use of the Images

In the future each digitized image will be converted to the MARC format using OCR technology and then added to the Firestone Library's OPAC.

Final Product

The scanned image database has been available on campus in the Firestone Library and at fourteen branch libraries since the summer of 1994. The Firestone Library purchased forty workstations. Each 486 66 MHz workstation is configured with 24MB of RAM, a 350MB hard drive, a network card, the NeXTStep operating system, and a seventeen-inch color display. Twenty-seven workstations are used in the public access areas of the libraries; four are in the database maintenance department, where the daily maintenance of the catalog is done; and nine are located in the various library departments.

The Benefits of the image card catalog and the VTLS ImageBrowser software are numerous. By using VTLS ImageBrowser, the librarians at the fourteen branch libraries no longer have to call the Firestone Library to find out if an item is in the card catalog, saving them a great deal of time. The students and faculty have found the image catalog conveniently accessible and the ImageBrowser easy to use and fast. The catalog is now more available since workstations are in each branch and in clusters on every floor of the Firestone Library. The students and faculty are also very satisfied with the speed of the VTLS ImageBrowser, which allows them to retrieve a set of cards in only seconds. The library staff are delighted that they no longer have to visit the catalog to delete, stamp, or correct a card. Each department that maintains the card catalog has at least one workstation. Their work is quickly done now, and the users see the results immediately. The staff who have been involved with this project over the last two years are extremely satisfied with every aspect of the end product.

Project Contacts

For more information about this project, contact either Eileen Henthorne, Assistant Systems Librarian, Princeton University Library System Office, Firestone Library, Princeton, NJ 08544, e-mail: henthrne@firestone.princeton.edu; or Sandeep Somaiya, Multimedia Systems Design Engineer, VTLS Inc., 1800 Kraft Drive, Blacksburg, VA 24060, e-mail: somaiya@vtls.com.

Transforming Acquisitions to Support Virtual Libraries

Laverna M. Saunders

Libraries are intrinsically involved in the current evolution from paper to digital resources. Printed materials such as books will always be a part of library collections, but the ratio of print to electronic resources will continue to shift toward electronic. The phenomenon of the virtual or electronic library presents new challenges and opportunities for collection development and acquisitions. As part of the process of rethinking library collection development and acquisitions, we should begin by asking appropriate questions. The following definition will set the stage: "The reengineering process requires a critical reexamination of *all* basic assumptions about the way things are done. It involves redesigning work processes based upon new assumptions about service and quality, molded to fit both existing and emerging technological capabilities" (Penrod and Dolence, 2). The purpose of this presentation is to pose holistic questions that will contribute to the reengineering of collection development and acquisitions to support the virtual library.

We can begin by asking, What is the virtual library? The virtual library is a metaphor for the networked library, consisting of electronic and digital resources, both local and remote. In an article titled "The Network Is the Library," Kibbey and Evans elaborate on the concept that "the ideal electronic library is a range of services and collections made accessible through networks that reach beyond individual campuses or research libraries" (p. 16). Peter Lyman distinguishes between an electronic library and a digital library: "In evaluating technology in the library, there are two levels of innovation: *the electronic library*, which consists of online delivery of knowledge that developed from print formats; and *the digital library*, which consists of new forms of knowledge based upon information technologies (p. 37). The most practical definition, at this stage of the evolutionary process at least, is that stated by D. Kaye Gapen:

> The virtual library has been defined as the concept of remote access to the contents and services of libraries and other information resources, combining an on-site collection of current and heavily used materials in both print and electronic form, with an electronic network which provides access to, and delivery from, external worldwide library and commercial information and knowledge sources. In essence the user is provided the effect of a library which is a synergy created by bringing together technologically the resources of many, many libraries and information services. (p. 1)

We have a long way to go in realizing either the electronic or the digital library, however. We are still a paper-based society, especially within academe. As one example, a faculty member who published a paper in *The International Journal of Hospitality Research*, an electronic journal, had to submit a paper printout of her article in order to prove that it had been published. Many academic departments still have lists of preferred refereed journals in their discipline, which carry higher value in satisfying the requirements for promotion and tenure.

The Philosophical Issues of Library Acquisitions

Before we begin to reinvent library collections and the acquisitions process, we need to state our vision. What are we trying to accomplish? What are our operating assumptions? What information is most appropriately stored and accessible in electronic form? What content is best retained in paper or other formats such as video or microform? What opportunities are available for electronic publishing and local digitizing projects? What is the role of the library in faculty development with regard to creating new multimedia instructional packages?

How we view library collection development and acquisitions depends in part on how we define the library. Is it the building or the structure? Is it a social and intellectual phenomenon associated with a place? Is it the collections of material and information? Is it a catalog of access points? Here we need to define catalog as represented by an online public access terminal (OPAC). The OPAC is becoming an amorphous box which is a gateway to much more than the local holdings. It can be configured as a gateway to other libraries and Internet resources. But what do users need access to and how can they get it? Is the library also the librarians communicating with users to solve problems and create new knowledge?

What impact will the evolution of virtual libraries have on the way that libraries have traditionally operated? There will be high overhead in creating digital libraries. How will libraries recoup this cost? Or will libraries have to absorb the expense? Will there be a physical library, an archive for original documents and items that cannot be digitized? Will the virtual library eventually be a portable device with a voice synthesizer that provides access to digital documents?

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What Do Users Want or Need?

Users cannot always articulate what they want or need. Generally they want what they want whenever they want it. They want equitable, easy, and convenient access to information. Faculty know that they want journal subscriptions—particularly print journal subscriptions. Here is where libraries are caught in a bind. Librarians realize the importance of electronic books and journals, while faculty, depending upon their discipline, are anchored in a print-based world. The popularity of the Internet is changing this phenomenon as faculty learn about online resources. It will take time, however, for electronic journals to develop the prestige that key scholarly journals have had.

One thing is certain, however. User expectations will increase over time. As they become accustomed to using online catalogs, various online indexes, and full-text electronic resources, patrons will want more and more. They will request links from indexes to library holdings and ILL or document delivery requests. They will want online access to collections and images previously housed in archives. For the library, this will create a demand for additional storage capacity and computing power.

How Do We Move from Where We Are to Where We Are Going?

The first step in moving into the virtual library realm is doing strategic planning. Strategies that relate to library collection development and acquisitions include the following:

- *Identify a niche.* What are the strengths of the existing print collections? What subject areas are appropriate for the purchase of electronic texts, especially as publishing trends shift? What unique collections exist within the library, particularly in special collections and archives? Does the library own the copyright on materials that could be digitized and shared with others? What framework is necessary for obtaining the rights to reproduce and distribute locally produced digital resources?
- *Develop resource sharing agreements.* Within existing networks, identify the subject areas that are specialties of the institution or community. Describe in the collection development policy the topics and formats that will be purchased and collected, and designate those that will be borrowed or obtained through document delivery. Also consider which materials should be duplicated by each library as necessary to a core collection to support undergraduate or public needs.
- *Complete retrospective conversion.* Knowing the holdings of any library is essential. An online public access catalog benefits local users and is an absolute prerequisite for remote users. The virtual library is based on the foundation of a functional and user-friendly OPAC to which other databases and gateway access can be added.
- *Invest in staff training.* Some libraries still have manual acquisitions and fund accounting systems. Other libraries have second- or third-generation integrated systems with electronic ordering and claiming and sophisticated management reports. The functionality of the system and the ability of the library to migrate and upgrade systems are enhanced by capable staff who see possibilities rather than excuses. Staff training is needed in personal computer use, online system features, Internet resources and searching tools, and campus or community information systems. One vision is that staff should use interconnected networks for the performance of daily work and the delivery of services and be able to handle electronic information (Kennedy-Olsen, 355–56). Knowledgeable and flexible staff are critical to the development of the virtual library.
- *Differentiate between short-term survival and long-term evolution.* In the past five years many academic libraries have eliminated paper journal subscriptions and subsidized document delivery services. Budget realities have forced the cancellation of print indexes when the comparable CD-ROM version was available. The percentage of the materials budget allocated for serials is typically 60 to 70 percent for a general university library, with technical school collections approaching 90 percent. The shift to electronic texts, CD-ROMs, and online indexes must be viewed in a long-term context. Will the information be available in ten or twenty years? Should microforms be purchased to leave a legacy for future generations? When a materials budget is slanted toward access, what happens to the on-site collection? Collection development officers and administrators must think about these issues and be prepared to defend their decisions.
- *Expand the concept of publishing.* Libraries have traditionally acquired materials that have been produced by commercial publishers and possibly reviewed in a recognized selection resource such as *Choice* or *Library Journal*. The publishing industry is undergoing a transformation from format-based products such as books to intellectual properties in multiple formats that best

meet customers' multiple information needs (Eisenhart). Libraries may have a choice of book, multimedia or text CD-ROM, online text with license, pay-per-use text, or other combinations of format. Libraries and universities also have the opportunity to develop local electronic files that may be sold, leased, or distributed without cost. The future for collection development will be more complex, but richer in possibilities for users to search and use information.

- ***Experiment.*** The demand for a wider variety of formats will create additional stress for collection decision-makers. Some formats will be more successful than others and will survive. Others will perish like Beta videotapes and eight-track audiotapes. Funds should be allocated for trial purchases and local experimentation in database development and distribution.
- ***Acknowledge the change process.*** The key term associated with evolution is *change.* Change can be uncomfortable, even painful. Evolutionary change is associated with a gradual process such as print indexes becoming available as CD-ROMs and online resources. Planned and spontaneous change also occurs as systems are upgraded and new storage media are developed. We are in a period of changing equilibrium with library acquisitions. The driving force of new technology is meeting the resisting force of print resources. There is discomfort for users and staff in understanding and accepting new formats. Experience has shown that print on paper will continue to be an important and necessary storage medium for libraries to acquire. We need to be open to change, accommodate reasonable change, and work toward a new equilibrium.

The Practical Issues of Library Acquisitions Collection Development

A discussion of library acquisitions must consider two primary facets: collection development or policy aspects, and the technical services or procedural aspects. The philosophical issues discussed previously influence the development and redefinition of collection policies and procedures for the virtual library. From the extensive literature on changing collection development patterns, one recent article has been selected for the way that it illustrates current models. The key issues for redefining a collection development policy include balancing ownership and access, cooperative efforts, and evaluation.

A schematic developed by Harloe and Budd (p. 84) is useful for illustrating the shift that libraries are making. In the "library as storehouse" model, there is emphasis on the use of traditional print collections that are stored locally and are physically browsable. Value and measurement of quality are based on the size of the collection. The phrase "just in case" can be used to describe the goal of acquiring resources. By contrast, the "library as gateway" model has a different set of attributes. There is emphasis on providing access to resources that are networked and browsable electronically. Value is placed on the availability and deliverability of information. Finally, the "just in time" approach depends on a high reliance on expedited document delivery.

Collection development policies should document the strategies used for selecting resources in paper, electronic, and other formats. Electronic journals, for example, present an opportunity for policy development. The 1994 edition of the Association of Research Libraries' *Directory of Electronic Journals and Newsletters* list 1,800 scholarly lists, and 440 electronic journals, newsletters, and other titles. A recent study conducted by Parang and Saunders of the 119 members of the Association of Research Libraries sought to determine the extent to which research libraries were providing access to electronic journals. Of the seventy-five libraries responding (62 percent), thirty-five are currently receiving electronic journals, but only five have collection development policies that address how this format is made available to users (see SPEC Kit 202 for a full review of data).

A draft policy for selecting electronic journals at the University of Nevada, Las Vegas, illustrates criteria that should be considered for electronic formats.

1. Content supports curriculum/faculty research interests.
2. Timeliness of information is critical.
3. Faculty request subscription.
4. Price is reasonable.
5. Interactive or online format is important.
6. Library subscription and access is better than multiple individual subscriptions.
7. Scholarly/refereed titles are preferred over newsletters.
8. Long-term archival access is not essential.
9. Indexing is not critical.

Since 1992, when this draft was created, the mechanisms for providing access to electronic journals have changed. Many libraries now provide e-journal access through Internet gophers. Local selection and storage is a minor issue.

Finally, collection development policies should cover the issue of cooperation and remote access. Many library networks and consortia are now working toward group contracts to license fee-based elec-

tronic resources, including indexes and full-text databases. This trend will continue to influence reference and serials collections as publishers and vendors increase the availability and transfer traditional paper titles to electronic formats.

Technical Services

As the nature of library collections and access shifts, the support functions provided by technical services must also change. This includes cataloging and preservation issues, although the discussion here is limited primarily to acquisitions. All aspects of acquisitions work will be challenged, most notably budget and finance, vendor relations, and internal procedures.

Budget and Finance

The design of new budgets might be the responsibility of administration and collection development, but acquisitions staff should also participate. The need for increasingly diverse materials budgets was stated by Herbert White a decade ago:

> If we are to extricate access as a significant priority, we need access budgets, and we need them as a broader substitute for the more specific materials purchase budgets. By far the greatest portion of the expenditure will still go for purchase, but some for interlibrary loan costs, some to bibliographic access, some to copyright royalty payments, some to photocopying, some to payments for commercial services, some for the development of even faster, more accurate and higher quality delivery mechanisms. It is after all part and parcel of the same problem. (pp. 4–5)

Libraries today include the costs of network memberships, document delivery, CD-ROM and online full-text electronic indexes, licensing fees, and in some cases even OCLC cataloging as elements of their materials budgets.

Four factors need to be kept in mind as budgets are restructured: the requirements of the parent institution, fiscal accountability, efficiency, and standards. Political and legal considerations are realities that need to be addressed and changed. Access is a worthy concept, but beware the trustee who makes a visit to "see" what last year's budget purchased. Likewise, presidents, provosts, administrators in fiscal affairs, and state auditors need to be educated about the changing needs of library budgets.

Efficiency and standards are somewhat related. Budget codes can be used to generate management reports if they are created properly when an automated system is set up. Standardization is important and should be anticipated for tracing various types of access in addition to categories of print materials. Staff time is valuable; therefore the coding scheme should be local, consistent, and efficient. External standards for the electronic transmission of financial information also need to be considered as essential to systems support and staff efficiency.

Vendor Relations

The changes affecting publishers and libraries are likewise creating pressures for the vendors that serve libraries. The dynamics of the market are such that vendors are being asked, and possibly even forced, to change in areas that they would rather not. For example, libraries are requesting precataloged and preprocessed books from jobbers. This forces the company to question its primary business and how it can or whether it should adapt to meet its customers' needs. The outcome is the development of strategic partnerships between companies to offer various services. Thus cataloging may be outsourced by the jobber to a service bureau. The relationship between the library and its vendors is likewise a strategic partnership that should work to mutual advantage.

Another example of the current evolution in vendor services is the way that the major periodicals jobbers have shifted to document delivery and full-text electronic database management. The trend of libraries cancelling journal subscriptions created a crisis for the jobbers that handled subscriptions. Technological and economic changes at the point of publishing drive product and service changes for vendors, which in turn influence how library acquisitions are managed. Concurrently the demand from libraries as consumers affects how vendors and publishers create electronic products and services.

Internal Procedures

For acquisitions staff the bottom line is how they do their job. Philosophy and policy may be developed in other areas, but book orders must still be processed. At a broad level, acquisitions workflow and tasks have not changed much. Materials are selected, ordered, claimed, received, and paid for. But the methods for accomplishing these functions are changing and will continue to change in a virtual environment.

First, staff should be challenged to find ways to integrate use of the Internet into workflow. Bibliographic citations can be verified in online catalogs available through the Internet. Vendors have developed new services that rely on the Internet as a transport medium. Yankee Book Peddler, for example, offers the Folio system to its approval plan customers. A bibliographer or an acquisitions staff member can search the database to determine if a

particular title will be shipped on approval. The title can be flagged for firm order and inclusion with the next approval shipment if desired. Approval records can be moved from a vendor's computer system to the library by Internet FTP, saving valuable time and telephone charges. The electronic ordering modules of online systems should also rely on the Internet.

Two additional capabilities enhance the way the acquisitions staff perform work tasks: systems that interface and multifunction workstations. A library can outsource cataloging as part of the acquisitions process only if the bibliographic records can be loaded into the online system. This issue includes standards such as MARC and Microlif, tape/cartridge loading, and compatibility of systems. Often acquisitions staff must rekey data because OCLC terminals are not connected to the online system or the system will not accept data from verification tools such as *Books in Print* on CD-ROM (*BIP Plus*). Using networked PCs instead of dedicated dumb terminals, staff can perform more functions on one workstation. The concept of the cataloger's workstation can be extended to the acquisitions workstation as well. The need exists for more flexibility and efficiency in systems design and compatibility as the Internet and additional electronic working tools are incorporated into workflow.

The need for "smarter" tools and hardware and more efficient and effective workflow has an impact on job design and staffing. When staff have performed the same tasks for many years, they may be resistant to change or unable to learn new procedures. In most cases, however, staff want to improve their skills and be competent with the latest technology. Supervisors must make the commitment to providing release time and training for staff to grow into redefined positions. Staff should be challenged to redesign their own positions as their knowledge and skills develop.

Conclusion

The evolution of virtual libraries challenges the concept of what libraries are and should or can be. Printed materials such as books will always be a part of library collections, but the shift toward networked and local electronic resources presents exciting possibilities for reengineering collection development and acquisitions processes. At this time there are many philosophical questions and too few practical answers. The following strategies from D. Kaye Gapen offer direction for the transformation process:

> (1) we must understand how we can transform our online library systems into knowledge management systems (including the linkages to the virtual library universe); (2) we must understand that we are transforming ourselves as librarians, identify the steps we need to take, and identify the paths we need to follow; (3) we must build the coalitions with other experts in order to design the new organizing, storage, and retrieval tools, as well as the interpersonal environments we wish to establish and the skills we will need to establish those environments; (4) we must acknowledge and accept that we are not foregoing our ancient mission and our present professional commitments. (p. 12)

Thus library acquisitions will be transformed as we work through the process of transforming ourselves and our systems.

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The Virtual Library Foundation: Staff Training and Support

Roy Tennant

Special Note: This article contains references to a number of online examples of items covered in the article. These may be accessed using World Wide Web client software (such as Lynx or Mosaic) and entering the Uniform Resource Locator (URL) provided in the manner appropriate to your client software. For best results, a graphical web client is recommended. This article can also be read online, with all appropriate links active, at URL: http://infolib.berkeley.edu/ISIS/ITAL.html.

The creation, management, and support of virtual libraries require at all stages skillful and knowledgeable support of library staff. However, the knowledge and skills required of virtual library staff have only recently become part of library school curricula, and in many cases are still absent. Virtual library staff may need to know what SGML, HTML, URL, and many other acronyms mean, and may also need sophisticated knowledge of these and other areas. In addition to this new knowledge that is required, it is also often necessary to merge virtual library services with existing print-based services to provide a cohesive information service for a particular clientele.

Accomplishing this goal usually requires a major retraining effort to provide library staff with the skills, knowledge, and experience they need to create, support, and manage virtual libraries. This training effort can take a number of forms and should be accompanied by an ongoing support program as well.

The importance of staff training in the creation of virtual libraries cannot be overemphasized. Adequate staff training requires a firm commitment from library administration. Although a financial commitment is important, what is essential is allowing and encouraging staff to take the time to learn and utilize new methods. Staff is a library's single most expensive resource and should be treated that way. Any investment made in retooling staff skills to meet the challenges and opportunities of the electronic age will be repaid many times over in better service to clientele and a vital and engaged workforce.

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Instruction and Training

Instruction and training are the cornerstone of any effort to retool library staff to meet the challenges and opportunities of electronic-based information. Training can take many forms, and each library should use the mix of training strategies that best meets their needs. Among the methods of delivering instruction are:

- ***In-House Training Program.*** Creating an in-house program is both the best and most difficult way to train staff. Typically, the staff assigned to conduct the training program must first obtain the knowledge and experience needed to teach the topic before a course can be offered. This can take some time to accomplish and will therefore postpone the entire program.

  A common pitfall of internal instructional programs is to select individuals to do the training who already have the knowledge, regardless of their teaching

ability. If a poor choice is made, this expedient solution can exact a price over time that can range from staff dissatisfaction with the training (at best) to a training program that actually repels staff from learning the topic. If one were to err on one side or the other, clearly it would be better to select an individual capable of distilling a topic to its essentials and presenting it clearly and understandably over someone who knows the topic. A capable trainer can learn a topic more easily than an individual who knows the topic can learn to be a capable trainer.

- ***Training Vendor Contract.*** If the development of an in-house training program is too expensive or daunting, there are many training vendors that can offer instruction in using computers to library staff. Even if an in-house training program is utilized, it may still be beneficial to employ an outside training vendor to provide specific classes.

  A contract for a specific set of courses can be negotiated, or training can be purchased as required in either group classes or for individual attendance at an off-site location.
- ***Outside Training Opportunities.*** Many commercial training organizations offer classes that are appropriate for virtual library staff. One of the drawbacks of such outside training, however, is that it tends to be aimed at business users rather than libraries, and therefore may reflect a bias toward particular types of information or activities.
- ***Self-Paced Instruction.*** In general, self-paced instruction will be your last resort. The method of delivery of this kind of instruction is most often videotapes, audiotapes, workbooks, and the like. It demands a high degree of individual fortitude and tenacity. On the other hand, it offers learning opportunities at the individual's discretion, rather than being tied to a particular day and time for a class. Some individuals may find this kind of training opportunity preferable, as they can then learn at their own pace and convenience.

Documentation

Documentation can consist of a wide variety of instructional documents, manuals, and handouts. Of the varieties of documentation, manuals are probably the least used for instruction. Manuals are typically better used as reference documents rather than as tutorials, although many strive to fulfill the latter function. Better for learning are short, succinct, and easy-to-understand handouts provided in conjunction with classroom instruction. The best handouts will also stand on their own, independent of a live demonstration or explanation. Of this type of document, a few of the most common types are discussed below.

- ***Command Summaries.*** Command summaries are brief listings of the commands required in a particular environment and are essential aids to modern computing (especially when users are working in several environments). They are often called "cheat sheets" because they allow users to "cheat" by looking at them to jog their memory about a particular command. *[Example: handout "Gopher: The Unix Gopher Client" http://infolib.berkeley.edu/ISIS/unixclient.html]*
- ***Procedures.*** Procedure documents describe the steps required to accomplish a particular task. These documents are best written to apply to a specific environment in which students are likely to find themselves and written in a very specific, step-by-step fashion. A general discussion at the beginning or alongside the instructions will serve to give the reader an understanding of the major steps and what the procedure will do or why it is necessary. *[Example: handout on "How to Print a Postscript File" at http://infolib.berkeley.edu/ISIS/postscript.html]*
- ***General Overview Documents.*** Overview documents are usually designed to answer the basic who, what, when, where, why questions someone may have about a particular virtual library technology, such as the World Wide Web. These kinds of documents are useful in giving students a quick overview of a topic that can then be filled in with details in a classroom situation or with other, more specific handouts. They can also serve to reiterate, reinforce, or add to what may be covered in lecture or demonstration. *[Example: handout on "The World-Wide Web" http://infolib.berkeley.edu/ISIS/www.html]*

Current Awareness

Once one is trained, it becomes essential to keep abreast of changes in technologies and methods of accessing and delivering electronic information. Staying up to date with the latest information is difficult and often time-consuming. Therefore, any strategies that make it easier to stay informed can be vital. Some of the most common methods of maintaining current awareness are included below.

- ***Newsletters.*** Newsletters tend to be more effective for current awareness than professional journals, as they can be much more timely. Newsletters' relatively short production schedules, lack of peer review, and fre-

quently more informal style allow them to cover the latest information on virtual library technologies. *[Example: PACS News at gopher://info.lib.uh.edu:70/11/articles/e-journals/uhlibrary/pacsnews]*

- ***Bibliographies.*** Selected bibliographies of current literature can provide an excellent filtering function, in that they will highlight only those items that best cover the subject area of the bibliography. If the citations are annotated, bibliographies may for some purposes even provide an adequate substitute for the article itself. *[Example: Current Cites at http://infolib.berkeley.edu/ISIS/current-cites/]*
- ***Professional Journals.*** Although journals published by professional organizations can be very helpful in learning new technologies and discovering what others are doing to advance the virtual library, they do not tend to be as current as other publishing media due to their long time-lines for manuscript submission, review, and publishing. However, electronic journals often successfully shorten this time frame by removing the constraints imposed by paper publication and distribution. *[Example: PACS Review at gopher://info.lib.uh.edu:70/11/articles/e-journals/uhlibrary/pacsreview]*
- ***Electronic Discussions.*** For simple currency of information, it would be difficult to beat electronic discussions. From these often informal discussions, it is possible to discover the very latest virtual library advances from those working on the projects, should they share their trials and tribulations on such a forum. *[Example: Web4Lib at http://infolib.berkeley.edu/ISIS/web4lib.html]*
- ***Conferences and Trade Shows.*** Professional conferences and trade shows (e.g., INTEROP, COMDEX, and Seybold) can be an important way to keep current. Program speakers are likely to highlight some of the latest technologies and most impressive developments in information technology. The trade shows in particular are likely to demonstrate technologies that are just being released. *[Example: ZD Expos at http://www.interop.com/]*

Information Filtering

The amount of information relating to electronic information technology is truly staggering. Keeping up with that which is vital while not wasting time on that which is not is essential for modern information professionals. Although most of us have our own methods of accomplishing this, technical solutions exist that try to address this problem.

- ***Selective Dissemination of Information (SDI).*** Some library systems are now implementing features that allow users to save a search and have it run against a database of items added to the system on a regular basis, with the results of the search sent by electronic mail in whatever format they specify. This kind of SDI service is currently enjoyed by the faculty, staff, and students of the University of California through the MELVYL system. *[Example: MELVYL at telnet://melvyl.ucop.edu; enter "e update" when you get to the welcome screen]*
- ***E-mail Filtering.*** One of the major conduits of information for many librarians is electronic mail—particularly from electronic discussions. Depending upon one's e-mail environment, there is often a method for filtering the e-mail. Filtering can consist of parceling out messages into preset folders for each type of mail, or perhaps even holding up each message against instructions that specify messages of certain types (such as the perennial and incredibly annoying misdirected subscription/unsubscription messages) to be deleted unread. Library staff are increasingly clamoring for this kind of electronic assistance to allow them to spend more time reviewing the information they need to do their jobs.

Consciousness Raising

Besides accomplishing what is possible today, one must also remain aware of what may be possible in the future. Technologies on the horizon today may be essential components of the virtual library tomorrow. Consciousness-raising techniques can be employed to increase library staff awareness of new options that might encourage them to think of new library services or new ways to accomplish existing ones.

- ***Guest Lecturers.*** Bringing in someone from outside the library to speak about a particular technology can be a good way to expand staff awareness of what is possible.
- ***Demonstrations.*** Seeing is believing, and seeing something demonstrated that you didn't know could be done is much more effective than hearing it described. Demonstrations can be staged by in-house staff who are knowledgeable about a particular application, but if local experience is lacking, it usually is not too difficult to bring in vendors or others who have experience with an application to demonstrate it.

Cross-Pollination

Virtual libraries cannot be built without the able assistance of professionals in other fields, such as com-

puting and telecommunications. To help gain additional perspectives, library staff may wish to use some of the following methods to "cross-pollinate."

- ***Conferences Outside of the Profession.*** Attending appropriate conferences outside of the library profession can broaden one's perspective and offer opportunities for establishing new sources of information.
- ***Cross-Institution Committees.*** Some large institutions tend to become fragmented, with one arm of the organization being almost entirely ignorant of related developments in another arm. The opportunity to serve on a committee with staff from other areas of the organization can provide an excellent opportunity to both share your experience and learn from that of others, often relating to the same problems. These experiences can also serve to foster better and closer relations between divisions and possible future cooperation in areas of mutual interest.
- ***Electronic Discussions.*** Probably the easiest and also one of the most effective ways to gain new perspectives from other, related professions is to participate in electronic discussions with a cross-profession membership. This is not very difficult, as many discussions attract individuals from a variety of professional perspectives. Even if a discussion has an explicit library perspective (such as PACS-L or Web4Lib) it can attract nonlibrary subscribers.

Mentorship

Mentorship can be an important and yet often overlooked form of training for virtual librarians. A mentorship arrangement, either formal or informal, can pair an experienced librarian with a new hire or someone with less experience with virtual library technologies in an arrangement that can be productive for all involved. Formal mentorship arrangements can be brokered with local professional organizations or library administration, while informal arrangements can be made by any two or more interested library staff.

Support

Virtual library staff cannot be expected to be self-supporting, no matter how much they know. Staff will require support in areas that are not and should not be a part of their responsibilities. At some institutions, certain staff members may become the ad hoc support persons by virtue of their interest or knowledge. This kind of informal arrangement can be debilitating to the staff members assigned to it (unless it becomes a part of their responsibilities through mutual agreement and they receive formal recognition of the role) and dangerous to the institution that relies on it. Support is much too important to rely upon casual arrangements.

In-House Support Staff

An internal program for systems support can provide the highest level of responsiveness and provide a service tailored to your specific needs. However, it may be too costly or difficult to create and manage. Typically, larger institutions can justify an internal support program, while smaller ones may end up relying on informal arrangements for staff support. If an individual or small group of individuals emerge as the default support staff, whether through experience or desire, library administration should formally recognize the role in revised position descriptions and adequate compensation and recognition.

Support Vendor

Many organizations do not have internal staff providing support for systems-related problems. In some cases staff may be "on their own" in solving the problem, or an outside support vendor may be required to, for example, fix broken hardware or perform on-site troubleshooting.

The Goal

The goal of virtual library staff training and support should be creation of a staff capable of creating, maintaining, and expanding virtual libraries; capable of constant learning or "retooling"; and most importantly, capable of imaginative innovation, without which today's cutting-edge virtual library will be tomorrow's actual disaster.

Building the Foundations of Virginia's Virtual Library

Charlene Hurt

In 1993 the directors of the academic libraries of Virginia proposed a budget initiative designed to radically increase the amount of resource sharing by their libraries by building on their history of cooperation through use of new technological developments. The impetus for the initiative came from the Council of Higher Education of Virginia, and the proposal was developed by a subcommittee of the Library Advisory Committee of SCHEV. Funding of $5.2 million for the biennial budget of 1994–96 was approved by the general assembly for "Building the Foundations of the Commonwealth's Virtual Library."

During the two years prior to the budget proposal, Virginia's state-supported academic libraries accomplished several initiatives to improve resource sharing.

Establishment of VALC

The Virginia Academic Library Consortium (VALC) built on the success of a pilot project conducted during 1991–92 in which James Madison University (JMU), the University of Virginia (UVA), and Virginia Tech demonstrated the feasibility of substituting access to materials for ownership when prompt delivery of those materials could be ensured. The VALC agreement consists of a number of specific points to which the academic libraries agreed, including increasing the kinds of materials available through interlibrary loan, using fax and digital technology and alternative package delivery services to speed up loan transactions, adhering to copyright regulations and royalty payments as appropriate, and refraining from levying fees for this service. Most importantly, the VALC libraries agreed "to strive to respond to requests for interlibrary loans from all state-supported academic libraries, including the community colleges, within 24 hours of receipt, and to process the requests within 48 hours of receipt."[1]

Cooperative Collection Development

During this period the libraries also developed a joint database of their major microform holdings and began sharing lists of journal titles being considered for deletion or addition to their subscription lists. Five of the doctoral institutions jointly purchased the *English Poetry Full-Text Database*, a database of the entire corpus of English poetry up to 1900, and agreed to load it onto the computer at the University of Virginia and make it accessible over the Internet.

Purchase of Software Designed for Resource Sharing

The three NOTIS institutions (GMU, UVA, and VCU) began the process of purchasing software that would enable them to provide each other's online catalogs—including call number, location, and status information—as part of their online information systems and permit user-initiated interlibrary loan. Since then William and Mary and the Virginia Community College System have also become NOTIS sites, and other library systems are developing a similar capability through development of Z39.50 interfaces.

Concurrent with these developments was the establishment of the Virginia Library and Information Network (VLIN) by the Virginia State Library and Archives. All of the academic libraries are participants in that network, and the proposal was designed to build on the network and allow future expansion to other types of libraries through VLIN.

When the opportunity to develop a budget proposal was presented to the Library Advisory Committee, the group had already given considerable thought to what was necessary for any effective expansion of resource-sharing activities. All agreed that effective resource sharing required being able to quickly deliver requested information to faculty and students, regardless of where it was stored. Therefore, they started with an assumption that improved delivery of information was as necessary as providing access to information about each library's holdings. They were also determined that the virtual library should provide increased and equitable access to *more* information, and that the total resource base of Virginia should be enriched by the purchase decisions made. Although the project was initially designed for state-supported academic libraries, representatives of private colleges and of the state library were part of the planning process, and the goal from the first was to design a virtual library that could eventually be expanded to serve all the citizens of the commonwealth. At first this goal will be met by the inclusion of all of the community colleges of Virginia, which provide geographic distribution throughout the state and which are open for use to citizens in their areas. Librarians from private colleges are also serving on committees of the project with the possibility of

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buying into those portions where such expansion is feasible.

The project has two major components, both of which were funded fully by the general assembly: regional electronic resource centers and the enhanced Virginia Academic Library Consortium.

Regional Electronic Resource Centers

The cornerstone of the virtual library will be a distributed electronic system to which all libraries will contribute and have access. This system will provide the means for users to find online information from their home libraries and computers, via electronic networks, regardless of the location of the material sought. Regional electronic resource centers in each of the doctoral institutions will maintain and manage segments of the system. The virtual library will provide a common system of easy-to-understand menus, a powerful search mechanism, and other design features that users can easily follow as they seek information. To the user the search for information should be seamless.

The focus of most library automation during the past two decades has been on automation of bibliographic and citation information. Although that information will be a part of the virtual library, it is also our intent to provide full-text information in an electronic format. A major challenge in providing this information is including graphic images, numerical databases, sound, and moving images. The six regional resource centers will divide responsibilities among themselves to maximize the development and use of local expertise. One of the major challenges of implementing this project will be deciding how that determination will be made. Traditional resource-sharing models have used a disciplinary division, but in the virtual library there are other reasonable possibilities, including division by type of software needed, sharing of the network load, or distribution by ability to provide reference assistance. The committee to make these recommendations may well come up with other possible scenarios.

All participating colleges and universities in the state will be encouraged to contribute online materials to the virtual library, either by providing them electronically to the appropriate electronic resource center or by linking their online resources directly to the system. Thus we have a system of networked resources using distributed client-server architecture and exploiting the enormous potential of the Virginia Research Network to link libraries and educational institutions together. Because the information is cooperatively acquired and maintained by the regional resource centers and patrons are assured easy access, libraries will no longer need to duplicate holdings of materials.

The electronic resource centers portion of the project includes an education and training component designed to build bridges between users and the information by training the educators (faculty and librarians) to integrate teaching the use of the virtual library into all aspects of the educational experience.

Enhanced Virginia Academic Library Consortium

Although electronic resources are increasingly available and important to researchers, most information resources are still in traditional printed, microform, and media formats. An integral part of the development of the virtual library is a plan to increase access to these resources in a number of ways. Each of these is an extension of the VALC agreements already reached, and each has as its focus the delivery of information to the users of that information. The proposal has three parts:

- ***Funding for one full-time classified position for each of the doctoral libraries,*** which provide the overwhelming majority of interlibrary loans to libraries throughout the state. Interlibrary loan activity has increased rapidly as more bibliographic information becomes available, and interlibrary loan departments are frequently unable to respond to the high volume of requests received. The agreement by VALC libraries to respond within twenty-four to forty-eight hours has put additional pressure on lending libraries, which has resulted in reallocation of positions in the libraries and higher costs for filling loans. In many cases VALC libraries have been unable to respond to loans from any other libraries outside the VALC agreement, thereby depriving public, school, and special libraries of valuable resources. Additional full-time staff should help alleviate this problem.
- ***Provision of scholars' workstations in all participating libraries.*** Several of the libraries possess commercially available software and hardware that allows them to send articles electronically via the Internet. This system saves on long-distance charges and delivers a better-quality image that can be further stored and transmitted electronically. The project will provide workstations with the appropriate software to all VALC libraries, thereby improving the speed and quality of document transmission.
- ***Interfaces to connect the online catalogs.*** The project provides funding for the purchase of Z39.50 interfaces for all the libraries' systems so that patrons at every library will be able to

search the systems of all other libraries without having to learn different search strategies for each system. This expands the information available in the online catalog from simply bibliographic information to information about holdings, location, and status, thereby enabling a patron to more precisely identify where the needed material is and whether it is available. By reducing the number of requests that cannot be filled, this capability should help lower the high costs of filling interlibrary loan requests and allow lenders to process a greater number of requests.

- *Patron-initiated interlibrary loan.* Once the online catalogs of Virginia's academic libraries are linked using the Z39.50 front end, it becomes possible to implement a software feature to allow library users, rather than library staff, to place interlibrary loan requests. Even if those requests are reviewed by library staff (which seems likely with the current systems available) the bibliographic citation will be generated by the correct online record and the patron information will be entered by the patron, with verification by the system. This development promises substantial savings for libraries and much more efficient and effective retrieval of information for library users.

The budget of $5.2 million is divided among the various components of the project in the following way:

- $500,000 for 1994–95 for the purchase or creation of electronic collections
- $1,500,000 for 1995–96 for electronic collections
- $225,700 in 1994–95 for equipment for resource centers, plus $33,800 in 1995–96 for maintenance costs
- $193,800 in 1994–95 for workstations in all fifty-one libraries for access to electronic materials, plus $29,000 for maintenance in 1995–96
- $32,000 in 1994–95 and $13,000 in 1995–96 for training in the use of electronic collections
- $123,400 for both years for staffing support for the six doctoral libraries for expediting interlibrary loan
- $2,108,900 for software and hardware for Z39.50 and patron ILL in 1994–95 and $316,300 for maintenance in 1995–96
- $21,800 in 1994–95 and $16,800 in 1995–96 for resource sharing training

Viewed another way, the budget is divided among the two components of the project as follows:

- $2,527,400 for electronic resource centers
- $2,710,700 for VALC enhancement

In order to organize this enormous effort in cooperation, the libraries have been meeting regularly since the initiative was approved. In addition, a meeting was held at Piedmont Virginia Community College in Charlottesville on April 25, 1994, to present the project to the academic librarians of Virginia. The keynote speech was delivered by John Casteen, president of the University of Virginia, who said, "The virtual library initiative is based on the notion that Virginia's academic libraries, by acting cooperatively, can provide access to electronic information and services in cost-effective ways that simply could not be achieved if each college or university acted independently."[2] The general outline of the project was presented by Charlene Hurt as chair of the Subcommittee on Networking, and then the attendees broke up into four groups to discuss a series of questions related to the implementation of the project.

Following the meeting on April 25 an ad hoc steering committee was formed consisting of the members of the Subcommittee on Networking (with representatives from all types of academic libraries) and the remaining directors of the doctoral institutions. This steering committee met every other week to prepare for a June 9 meeting in Williamsburg of all members of the Library Advisory Council to discuss the virtual library initiative. The group decided to jointly fund the services of a library consultant to help facilitate the meeting and provide a national perspective on the project. As a result, Howard Harris of RMG was invited to assist us in a morning planning meeting and in the afternoon general session.

At the end of the day the group had agreed on an organizational structure for the virtual library project and agreed to nominate librarians to serve on each committee, which will be chaired by a member of the Steering Committee. The Library Advisory Council also agreed to name Kathy Perry of George Mason University to coordinate the project on a statewide basis and to announce the project to librarians and library media as soon as possible. The organizational structure begins with the Library Advisory Committee, which serves as the oversight committee for the project and will receive quarterly reports from the Steering Committee. The Steering Committee consists of Charlene Hurt, chair, George Mason University; Barbara Ford, Virginia Commonwealth University; Joanne Eustis, Virginia Polytechnic Institute and State University; Jean Major, Old Dominion University; Nancy Marshall, College of William and Mary; Carol Pfeiffer, University of Virginia; Wendell Bar-

bour, Christopher Newport University; Dennis Robison, James Madison University; Theresa Byrd, J. Sargeant Reynolds Community College; Lew Terpstra, Virginia Community College System; and John Jaffee, Sweet Briar College. Other committees and their chairs are: Technical Issues, Charles Litchfield, VPI; InterLibrary Loan Enhancements, Dennis Robison, JMU; Selecting Electronic Collections, Carol Pfeiffer, UVA; and User Services, Wendell Barbour, CNU. The assumption is that there may be additional or different committees needed in the future and that membership may change over time as needs develop.

The success of this legislative initiative can be attributed to several essential ingredients: the strong support of the Council of Higher Education, the willingness of different libraries to fund pilot projects that provided us with a base of experience, the consistent involvement of the directors of the libraries in the design of the project, and the high degree of mutual trust that these directors were able to develop. All of these ingredients will need to remain in place as the first phase of the project is implemented. The Steering Committee members are determined to be thoughtful about issues of representation and equity as they develop the project and to build a virtual library that will provide a firm foundation for a virtual library for all citizens of the Commonwealth of Virginia.

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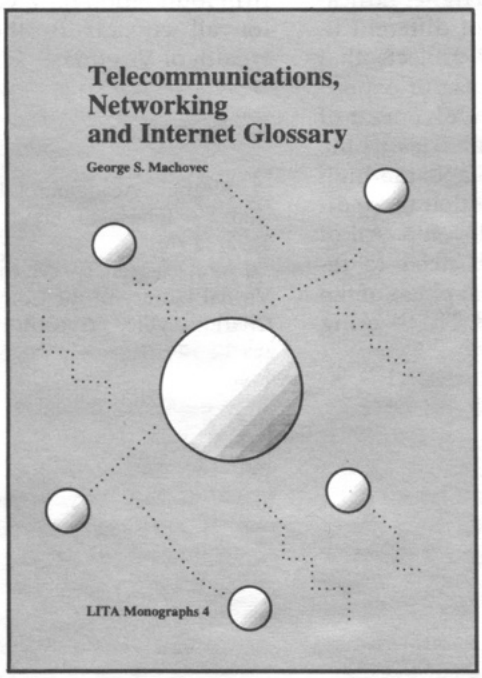
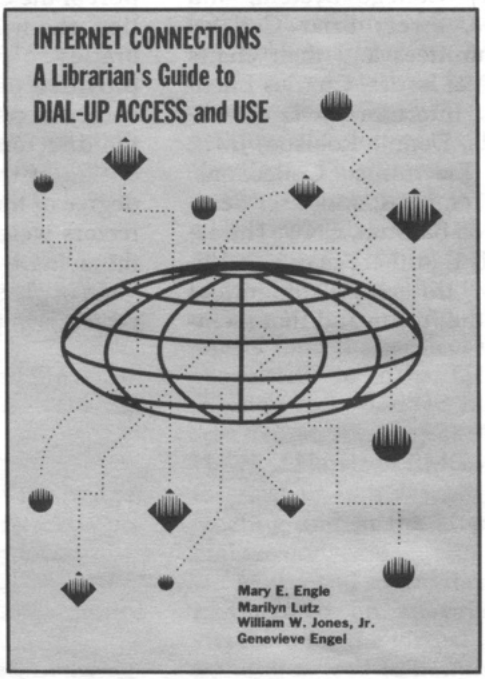
KEEP CURRENT WITH TELECOMMUNICATIONS AND INTERNET





Telecommunications, Networking and Internet Glossary, by George S. Machovec. (LITA Monographs No. 4) 106p. pbk. ISBN 0-8389-7697-2 $18.00

Developed to assist librarians, information managers, and students in remaining current with the constantly increasing amount of new terminology in the high-growth communications field, this new glossary from CARL (Colorado Alliance of Research Libraries) technical coordinator George S. Machovec provides hundreds of definitions to telecommunications, networking and internet terms that frequently appear in library automation technology. A handy reference for today's librarian.

Internet Connections: A Librarian's Guide to Dial-Up Access and Use, by Mary E. Engle, et al. 166p. pbk. ISBN 0-8389-7677-8 $22.00

This guide is for librarians and library patrons who are not already members of the Internet family of users. It is a snapshot of the networking services available at the time of publication, a discussion of the concepts and terms in use, and a bibliography of the notable guides that document the search techniques, navigational tools, and information resources available. It is designed to help you get started right away.

To order, call 1-800-545-2433 and press 7. Call between 8:30 a.m.-4:30 p.m. CST.

LITA Library and Information Technology Association
a division of the
American Library Association

Book Reviews

Susan B. Harrison, Editor

Cataloging Government Publications Online

Edited by Carolyn C. Sherayko. New York: Haworth, 1994. 223p. $34.95 (ISBN 1-56024-689-8).

A milestone in the cataloging of government publications occurred in 1976 when the Government Printing Office (GPO) began standard cataloging of documents in the MARC format using OCLC to compile the *Monthly Catalog of U.S. Government Publications*. Also published as volume 18, numbers 3/4 of *Cataloging & Classification Quarterly*, this collection of fourteen articles provides glimpses of the experiences of several American university libraries with government documents, primarily GPO MARC records, in their online catalogs. Reports on projects at state libraries in Australia and South Africa show that the issues discussed are not confined to American libraries.

Some of the articles focus on planning and workflow. Linda B. Johnson and Sushila Selness' description of how they developed a proposal to load GPO MARC records into the online catalog emphasizes workload and workflow issues. The article includes the survey questions asked of other libraries in preparation for writing the proposal. They also provide a brief review of the literature and evaluate the issues relating to GPO cataloging records and their inclusion in online catalogs.

The availability of inexpensive cataloging records in machine readable format has allowed expertise to be shared between the cataloging and documents departments and documents in some libraries to be mainstreamed. For example, the cleanup of problems discovered after the original, retrospective GPO tapeload and the need for continuing database maintenance functions as new documents and current tapes arrive, resulted in the reassignment of some documents responsibilities at Northern Michigan University, incorporating many documents functions into the library's overall workflow. At Montana State University, to the extent possible, all documents are mainstreamed into either the serials or the documents processing track. Mainstreaming occurred there due to reorganization, budgetary pressures, and increasing electronic sophistication, factors common to most libraries today. This trend is also seen in the report on integration of documents into the monograph and serials processing units at the state library of New South Wales, Australia.

The problem of the time lapse between the receipt of documents and the appearance of the cataloging record is shared by all libraries relying on GPO cataloging. The local creation of brief records at the time of receipt of the publication to be later replaced by full GPO bibliographic records purchased from a vendor is the solution chosen by the Claremont Colleges.

Several of the articles deal with special topics within documents cataloging. The subjects covered include the original cataloging of individual titles on a CD-ROM (the Florida Agricultural Information Retrieval System (FAIRS)); the extent to which GPO meets its stated priority of quickly cataloging high use publications, measured by determining the availability of records for a reference documents collection; and special problems of cataloging CD-ROMs such as uncertain titles and format designations.

Most of the U.S. depository libraries described in these articles use Marcive as their vendor to provide retrospective and current customized and cleaned up GPO tapes. Ball State University's positive experience with OCLC's GOVDOC service for current records is briefly described. The University of Pittsburgh uses the entire GPO tape file as a resource file for retrospective cataloging of its large documents collection. This approach eliminates the problem records inevitably resulting from tape "dumps," no matter how careful the profiling.

Taken together these articles provide an interesting but generally rather superficial look at many of the issues surrounding cataloging government documents in an electronic environment. These case histories would be of most interest to documents librarians and catalogers in depository libraries considering adding government publications to their online catalogs.—*Nancy Macomber, Queens College, City University of New York*

Finding It on the Internet: The Essential Guide to Archie, Gopher, Veronica, WAIS, WWW (including Mosaic), and Other Search and Browsing Tools

By Paul Gilster. New York: Wiley, 1994. 302p. paper, $19.95 (ISBN 0-471-03857-1).

Paul Gilster, author of *The Internet Navigator*, has written a very useful guide to searching for information on the Internet. Once one has gained access to the Internet, knows its basic functions, and has become conversant with them, the question quickly arises: "So much information is out there, but how do I find what I want?" This is especially true for librarians, many of whom see the Internet as a vast and potentially great reference tool with no direct charge for its use. Gilster's book is aimed at those who want to make efficient use of the Internet's varied searching tools to identify and retrieve desired information.

The book is composed of ten

chapters, a glossary, and an index. Topics covered include Archie, Gopher, Veronica, WAIS, the World Wide Web (WWW), HYTELNET, various methods of finding people, and use of electronic mail to access these tools in an noninteractive way. The book concludes with a look at the Clearinghouse for Networked Information Discovery and Retrieval (CNIDR) and its work with Internet searching tools.

The glossary is fairly extensive, and the book is copiously illustrated with sample screens. Gilster's focus is on the lowest common denominator—that is, he covers character-based tools in the Unix environment most extensively. Although he briefly covers Mosaic and is clear about what is required for the home user to use this software, he has pitched his information toward what most people will have available: VT100 emulation connections. He even offers help for those with Internet access that is limited to electronic mail use, as mentioned above.

Gilster's overall theme is the importance of learning all of the different searching tools available on the Internet, since different tools will be best for different kinds of information. When one learns their strengths and weaknesses, one is more likely to make the best match between information need and type of search. He gives step-by-step instructions, provides several sample searches for each tool, and gives hints that are set off in shaded boxes.

There are few reasons to criticize this valuable book. Gilster doesn't sufficiently acknowledge that many information needs cannot be filled on the Internet, so that the searcher may need some help in deciding when she has searched enough and the information is unavailable. He also provides little help regarding the need to determine the accuracy of information found on the Net. Finally, his concluding chapter on CNIDR overemphasizes one of the many projects aimed at developing Internet searching interfaces. It might have been better replaced by a summary overview showing the process involved in deciding which tool or tools could best be used for filling a particular information need. Gilster's search examples are fairly realistic, but smack a bit too much of being canned, "I already know where and how to find this" examples.

That said, this is a vital book for all libraries with Internet access, and its value for cost is considerable. It is just the focus that is needed for reference and research work. The Internet novice may not yet appreciate the need for it, but he will as soon as he reaches the point where he has found a lot of neat stuff he didn't need to know by browsing and starts to wonder, "How do I find exactly what I want?" George Brett, the director of CNIDR, compares the Internet to "electronic Kudzu." This book provides some excellent help for finding treasures underneath all the fast-spreading network "vines."
—Pat Ensor, University of Houston Libraries

Government CD-ROMs: A Practical Guide to Searching Electronic Documents Databases

Edited by John Maxymuk. Westport, Conn.: Mecklermedia. 1994. 324p. paper. $47.50 (ISBN 0-88736-887-5).

This *Practical Guide* is the book all government documents librarians would write if there were only enough time. Maxymuk and eleven other librarians have succeeded in delivering "a practical, hands-on approach to a variety of popular and useful government-produced CD-ROMs," most of which have arrived in libraries with little or no technical documentation and very few user manuals. CD-ROM titles and software covered in the book are: EXTRACT; using dBase with depository CD-ROMs; 1990 Census products; 1987 Economic Census products; Foreign Trade Data; Census of Agriculture; County Business Patterns; County and City Data Book, and USA Counties; TIGER, GIS, and the Census; NTDB and NESE*DB; National Health Interview Survey; and Toxic Release Inventory.

The coverage is not meant to take the place of detailed technical documentation but rather centers on those commands and tasks most likely to be used with depository CD-ROMs. Chapters contain hardware and software requirements, loading information for the discs, excellent descriptions of each product's uses, pertinent definitions, sample exercises, and many screen illustrations. Susan M. Ryan even demystifies dBase by limiting the number of commands discussed, listing only relevant definitions, and presenting germane practice exercises based on plausible census queries.

Included also are chapters on the federal government's widespread acceptance of CD-ROM technology as a cost-conscious way to distribute huge data files and on setting up a public workstation with a Pioneer Six-Changer, as well as an annotated list of GPO CD-ROMs originally compiled by SIGCAT (Special Interest Group on CD-ROM Applications and Technology). Policy issues and changes necessitated by CD-ROM technology are also discussed.

One could quibble about specific CD-ROM titles included and omitted, but for the most part emphasis is given to those government products that serve a broad audience. While the chapter on GIS software contains useful background information on TIGER and GIS basics, too much emphasis is given to one commercial software product, GeoSight FactFinder by Sammamish Data Systems. It would have been more useful to include basic explanations, costs, etc., for more than one soft-

ware product, and to have included ArcView (from ESRI, Inc.) software, which is used by approximately sixty academic libraries participating in the ARL/GIS Literacy Project. Enough new products have arrived on deposit since this book went to press to fill yet a second edition, one that could reveal how to make the Statistical Abstract CD-ROM more useful plus explore the potential of the LandView mapping software included on each TIGER/line disc.

Those who know some or all of the discs and software covered will still benefit from reading this book. *Practical Guide* is highly recommended for those who use federal government CD-ROMs, particularly Department of Commerce products. It contains straightforward information, has a usable index (which reduces the need to flip through pages when looking for help with a particular problem), and may encourage busy librarians and other users to move beyond "GO"-type software and explore the full potential of depository CD-ROMs.—*Mary McInroy, University of Iowa*

Libraries as User-Centered Organizations: Imperatives for Organizational Change

Edited by Meredith A. Butler. New York: Haworth. 1993. 256p. $34.95 (ISBN 1-56024-616-2).

The sixteen contributors to this volume speak to the profound economic, demographic, technological, publishing, and management trends causing organizational change in institutions of higher education and their research libraries. The thrusts of such external forces require a critical review of the traditional library mission from information repository to information gateway. Accessing information is as critical as ownership in meeting the needs of users in new ways. Explored in this volume are how research institutions and their libraries are responding to these trends and how organizations and activities are being revised to be more rewarding for staff and more responsive to clientele.

Several chapters explore the trends producing organizational change. James Michalko discusses economic forces and suggests the "Production Function" concept as a framework for consideration of the trends in higher education, the responses of higher education institutions, and implications for their libraries. Karen Hunter describes current market demands and responses in publishing. Miriam Drake explores technological innovation as it changes the nature of work and organization in research libraries.

In her article, Sue Faerman presents a structure for viewing organizational change and leadership styles. James Neal and Patricia Steele describe the experience of the Indiana University Libraries in organization and structure change and the process developed to sustain and expand staff. Three librarians from the University of Arizona, Janet Fore, R. Cecilia Knight, and Carrie Russell, discuss leadership issues that have developed in their process of change to a more user-centered library.

Sheila Creth speaks to opportunities for collaborative relationships between libraries and computing centers in creating a virtual information organization and describes successful examples. The successful collaborative effort of networked services by the New York State Library is described by Jerome Yavarkovsky.

As a researcher, scholar, and academic administrator, Francis Lees of Rockefeller University questions the relevance of a "library" in a new environment of researcher needs, transitory information, and information technology.

Meredith Butler and Gloria DeSole offer a call to action for library administrators and educators to create multicultural organizations responsive to diverse populations. In her paper, Kriza Jennings identifies changes needed in recruiting new populations to the library profession.

Kathleen de la Peña McCook and Tosca Gonsalves discuss the new process of education for librarianship they envision to reposition librarians within the higher education establishment. Rethinking librarianship to position it as a leading profession in the twenty-first century is a grassroots effort and vision described by Sue Martin. JoAn Segal examines the concept of user-centeredness in organizations and applies this to professional associations. Joan Lippincott describes the Coalition for Networked Information, an organization formed to respond to new user needs.

The contents of this book have also been published as *Journal of Library Administration* (Haworth Press), vol. 19, nos. 3/4, 1993.

While this book focuses on user-centered organization in academic institutions and their research libraries, readers should not be limited to academia. Librarians from every type of library dealing with external forces demanding change should find the contributions by every author in this book useful and thought-provoking.—*Lois M. Kershner, Lois Kershner & Associates*

Publishing in the Information Age: A New Management Framework for the Digital Era

By Douglas M. Eisenhart. Westport, Conn.: Greenwood, 1994. 296p. $55 (ISBN 0-89930-847-3).

In order to facilitate the emergence of the new Information Age publish-

er in the digital era, the author posits a new management framework around what he describes as the seven M's of publishing. These are five value-added M's—material, mode, medium, means, and market, plus the two M's which he says form the essential infrastructure of all businesses, management and money. He breaks down these seven categories into forty-five core concepts covering various themes delineating the publishing paradigm in the emerging digital age.

This is a nontechnical study of the evolution of publishing from print-based to electronic media. The author, who has held several major management positions in the publishing industry, admits to having a market-based rather than a technology-based perspective. His focus is on business strategies, not technological applications. His work is primarily intended for managers in the publishing industry who are responsible for implementing change in an effective and profitable fashion. While this work is well written and well organized, and makes many interesting observations, it unfortunately often appears to be more of a pep talk for publishing executives rather than a serious contribution to the understanding of the future of electronic publishing. Its treatment of hot issues of interest to libraries such as the Internet, digital libraries, hypermedia, CD-ROM, copyright, and site licensing is superficial. There is a selected bibliography covering six pages that includes only a handful of items published in the last five years. The relevance from the library perspective of this work to the realities of electronic publishing today, which has witnessed such rapid changes the last few years, is questionable.—*Thomas A. Bourke, the New York Public Library*

Reference Services Planning in the 90s

Edited by Gail Z. Eckwright and Lori M. Keenan. Binghamton, N.Y.: Haworth, 1994. 222p. $29.95 (ISBN 1-56024-619-7).

Rarely is it a compliment to a book to say that it reads like a textbook. In the case of *Reference Services Planning in the 90s*, it is indeed meant as one. Gail Eckwright and Lori Keenan have edited a book that is equally interesting and relevant to both the graduate student taking "Introduction to Reference" and the experienced head of Reference. The range of topics covered is broad. Areas written about include the use of paraprofessional staff at the reference desk, the role of the head of Reference, online reference, cooperative reference services, continuing education, and educating new reference librarians. Two areas that are often overlooked in reference literature, off-campus service and rural library reference, are also covered.

One of the more interesting articles is "The High Cost of Reference: The Need to Reassess Services and Service Delivery," by Karen Storin Summerhill. In it, Summerhill writes about how the "tyranny of the desk" is communicating to patrons that reference service is an emergency service available whenever the patrons wishes to stop in. This does not always lead to the best available service. It does not help librarians portray themselves as professionals, either. Summerhill's arguments for reduced desk time and increased consultation by appointment are both highly provocative and intriguing.

Another interesting article is "The Challenge of CD-ROMs for Libraries," by Robert L. Borin. In it, Borin looks at the many advantages of having CD-ROM technology in the library while taking a brief look at the technology. CD-ROM technology has brought many benefits for libraries. In Borin's opinion, it "has freed us from the financial, technical, and bureaucratic shackles imposed on very large computers" (p. 118). The main point of Borin's article is that CD-ROM technology has given even the smallest libraries the opportunities to be large information suppliers.

Any book trying to cover the entire range of reference services is bound to lack real in-depth coverage on many topics. This is indeed the case with this book. One of the most important trends in reference services is the development of the Internet. While the Internet is discussed in "Part IV: The Computer Connection," it is not given the space it deserves. Perhaps a section on the Internet and reference would have been appropriate. But then again, this book is clearly designed as an overview, and the interested reader can use the bibliographies and the end of each chapter to explore a topic in more detail.

This book was copublished simultaneously in the journal *The Reference Librarian* as issue number 43. Libraries that already received the journal will not need to buy this book. The book contains an index as well as ample bibliographies after each article. Highly recommended.—*Michael Lorenzen, Ohio University at Zanesville*

The Internet Business Book

By Jill H. and Matthew V. Ellsworth. New York: Wiley, 1994. 376p. paper, $22.05 (ISBN 0-471-05809-2).

Major sections of this primer include "The Internet: What It Is, and How to Get Started"; "Creating a Business Presence on the Internet"; "Internet Tools and Resources, Doing Busi-

ness on the Internet"; and "Professional and Business Resources on the Internet." Appendixes include "Finding, Configuring, and Installing Hardware and Software"; "Sending and Receiving Files"; and "Some Useful UNIX Commands." The work is well indexed.

This is a step-by-step guidebook that assumes no knowledge of computers. The Ellsworths' practical, experienced approach indicates a firsthand working knowledge of the Internet for business activities. They are sensitive to the culture of the Internet as a collaborative and cooperative enterprise and provide guidance designed to prevent novices from damaging a business's reputation through inappropriate behavior. They also suggest etiquette guidelines for contributing to the Net.

In particular, the authors detail techniques for creating a business presence on the Internet, including examples of the fine distinction between advertising and providing information. The major portion of the book is dedicated to detailed, how-to information on topics such as e-mail, discussion groups, and file transfer protocol (FTP). For the uninitiated, the section on Gopher, Veronica, Archie, Mosaic, and other hypertext-based information is lucid. Resources for doing business on the Internet—listing everything from libraries to commercial data and service providers—are described with sufficient detail for novices. In every case, the authors provide character-by-character scripts and computer-to-computer dialogues that allow the reader to execute their suggested strategies.

Jill Ellsworth is a university professor and Internet consultant for Fortune 500 companies and an active speaker at conferences. Matthew Ellsworth researches and writes about the Internet and publishes *The Internet Demystifier and Monthly Gazette*. The Ellsworths clearly are Internet participants and enthusiasts who advocate jumping into the Net. If anything, they neglect the frustrations of a frequently disorderly world which is constantly changing. While much of the material is available elsewhere and is somewhat dated by the time it is published, the book will serve its purpose as an accessible, one-stop introduction for do-it-yourself types or as a course text.—*H. E. (Chuck) Broadbent III, Dowling College*

Using Subject Headings for Online Retrieval: Theory, Practice, and Potential

By Karen Markey Drabenstott and Diane Vizine-Goetz. New York: Academic, 1994. 365p. $55 (ISBN 0-12-221570-2).

Few writings on library technical services today can lay claim to completeness without dealing with the changes still to come. In this excellent contribution to the literature on subject headings and subject searching in online catalogs, Drabenstott and Vizine-Goetz explain existing systems lucidly, show forcefully their current shortcomings in utility to the end-user, and finally offer detailed proposals for system enhancements aimed at a more efficient subject search.

The authors provide a brief history of the development of Library of Congress subject headings and their principles, and an explanation of the machine-readable subject heading authority file. They discuss the machine-readable bibliographic record, with attention to subject-rich elements, and show the inherent shortcomings of these databases for subject access in the online catalog, i.e., the paucity of cross-references in the authority file and of subject headings in general on the bibliographic record. Clearly, since machine retrieval by the end user was not part of the original design, there are deficiencies in the "raw material" that we must now address.

After this focus on theory, the authors move to the practical level—to the results of actual subject searching in online catalogs. From previous user-search studies, they derive twenty characteristics of subject searches that either impede or aid success in the search.

They then turn to their own empirical research, which extracted about 80,000 subject queries from three different academic library catalogs: SULIRS (Syracuse University Library Information Retrieval System) at Syracuse University, ORION at the University of California at Los Angeles, and LS/2000 at the University of Kentucky. Discouragingly, they find that users now are experiencing many of the same difficulties in subject searching as in the earliest online catalogs. A full 57.5 percent of searches are unsuccessful in matching LC subject headings or normalized LC subject headings, even when the keyword approach is included.

Next the study results are further analyzed for clues about the practical determinants of success. These chapters incorporate discussions of searches for personal, corporate, and geographic names, and comments on responses which result in zero retrievals, unmanageable retrievals of hundreds or thousands of records, or retrievals irrelevant to what the user is seeking.

Finally, Drabenstott and Vizine-Goetz suggest solutions. Their recommendations are built around the present LCSH (Library of Congress Subject Heading) system, and they spell out reasons why this approach is better than abandoning the system. They make a plea for a long-range complete editorial review of the LCSH system and suggest the outlines of a plan. They also make

recommendations for immediate practicable measures to increase success in subject searching. These are of two kinds. On one hand, they advocate editorial review—for instance, identification of broad categories of subdivisions and pattern headings for more specific tagging. On the other hand, they propose systems improvements to automatically channel user queries to the most effective retrieval responses. They present six search trees constructed to respond to different types of queries. The emphasis here, and one of the most important messages of the book, is to enable the system to guide user queries to the best search strategy. Unfortunately, the percentage of increased success these search trees would have is not indicated, although it is clear they would be a definite improvement.

The authors analyze major problems in online subject searching lucidly and make compelling arguments for their recommendations. While this study shows, once again, that the task at hand is enormous, the specificity and feasibility of their proposals are welcome. This book can serve as a basic text on subject searching in online catalogs. It will also be indispensable reading for librarians and systems planners hoping to make their online catalogs more effective.—*Laurel Franklin, City College of New York*

Other Recent Receipts

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Software Reviews

George S. Machovec, Editor

BookWorm Electronic Book Reader

Version 1.1. Price: $79.95.

After the Fire: American Literature in the Age of Expansion, 1865–1914

Making the Modern: 19th Century Poetry in English

Compact Disc Anthology for BookWorm Electronic Book Reader. Price: $59.95 each. Communication and Information Technologies, Inc. 11020 Solway School Rd., Knoxville, TN 37931; (615) 927-4908. System Requirements: Apple Macintosh, CD Drive, Color Monitor, System 7.0 or higher, 5MB available RAM.

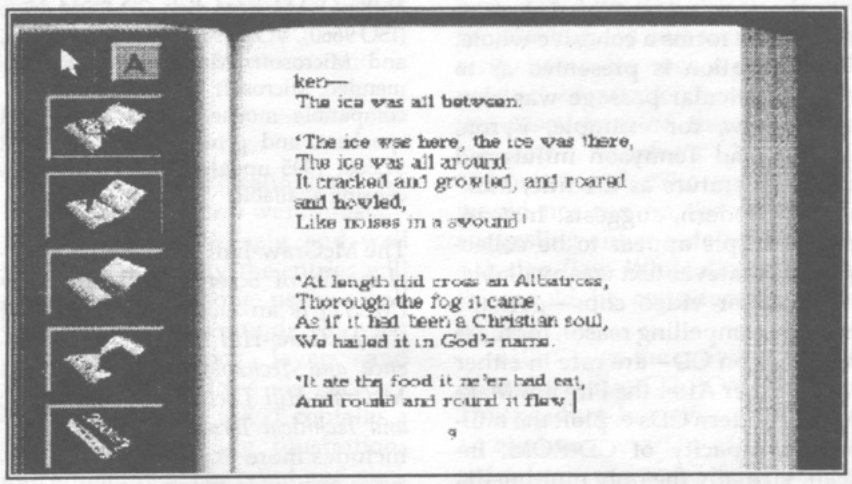

Figure 1
The text display of the BookWorm Reader.

Because of its capacity to store and quickly search huge amounts of data, compact disc has found a niche in trade catalogs, bibliographic databases, and, more recently, encyclopedias. With its ability to link disparate information and multimedia capacity, CD producers now hope to revolutionize traditional book publishing. But this segment of the industry is still in its infancy and the "electronic book" has yet to be proven. Nonetheless, several companies, including the Voyager Company, Sony, Harper & Row, and Communications and Information Technologies (CIT), are releasing books on CD.

CIT has released two new electronic books on CD for its BookWorm Reader software. Both titles are annotated anthologies of 19th century literature targeting high school and introductory college freshman English classes. After the Fire collects excerpts of the fiction of such American authors as Stephen Crane, Frederick Douglass, Mark Twain, and Henry James. Making the Modern selects poems of nearly a dozen English romantics such as John Clare, John Keats, and Alfred Lord Tennyson.

CIT's product consists of two separately purchased components: the BookWorm Reader software and the electronic book on CD. With the BookWorm Reader and CD, the user can read text from the screen, display annotations, view video and sound clips, and search unfamiliar words in a dictionary. Currently, CIT's catalog lists about a dozen CDs comprising copyright-free English and American literature titles.

The Reader displays text as a page in a book. Colorful graphics support that metaphor and pages are turned by clicking on page corners similar to those on Apple's Note Pad. With only about 175 words displayed per page, text is pleasantly easy to read from the screen. Text can be printed or copied to the Macintosh clipboard, but only one page at time. This is further aggravated because standard commands such as cut and copy deviate from the familiar Macintosh routines.

Where BookWorm differs from other CD book products, however, is that it allows users to create their own annotations, margin notes, and video or sound files. These files are saved on the user's hard drive, but are displayed as annotations when text on the CD is selected. Educators can use this feature to add annotations, notes, or tests specific to their students' needs to either of the CDs. But as an authoring tool, BookWorm is frustratingly primitive and clumsy. Tasks often require three or four redundant steps to complete. The text editor offers little more than font options. This is more of a problem than might appear. The memory-hungry Reader (5MB) prevents an 8MB RAM Macintosh from simultaneously running System 7, BookWorm, and a word processor. Consequently, anything but the briefest text is painfully difficult to enter in the Reader's editor.

The essence of any annotated anthology is its intellectual content. According to the CIT, no editing was performed on the author's works, and the text is reproduced as it appeared in the original editions. Annotations that focus on theme, language, character, and plot have been added by CIT staff. Given the intended audience—high school students and college freshmen—the annotations are probably adequate. While brief biographies and photographs accompany each author's text, very little period analysis or

critical essays are provided. In fact, neither disc forms a cohesive whole. No explanation is presented as to why a particular passage was chosen or how, for example, Byron, Rossetti, and Tennyson influenced modern literature as the title, Making the Modern, suggests. Instead, these excerpts appear to be collections of whatever text was available.

Sound or video clips—perhaps the most compelling reason for making books on CD—are rare in either disc. Neither After the Fire nor Making the Modern CDs exploit the multimedia capacity of CD-ROM. Instead, virtually the only multimedia are author photographs and the hypertext links to annotations.

Certainly the strength of this product is its ability to allow users to link annotations of text, sound, graphics, or video to the CD's text. Not only does this provide an instructor the ability to tailor annotations for a particular class, but it also provides students the ability to save their notes and papers electronically. The weaknesses of this product are more apparent than its strengths. The clumsy and memory-hungry BookWorm Reader software is frustrating to operate. The choices of text seem haphazard, and the annotations lack any compelling reason for needing CD-ROM technology. In the end, one has to wonder what advantage such CDs offer over traditional print anthologies.—*Scott Seaman, University of Colorado, Boulder*

McGraw-Hill Multimedia Encyclopedia of Science & Technology

1004, Beta Version. McGraw-Hill, Inc., Blue Ridge Summit, PA 17214-9988; (800) 233-1128. Minimum system requirements: IBM or compatible, 386 processor, 4MB of RAM, hard disk, CD-ROM drive (ISO 9660), VGA or SVGA color monitor, and Microsoft Windows 3.1. Recommended: Microsoft Video 1.1, Microsoft-compatible mouse, sound board and speakers, and printer. Purchase price: $1,300. 1995 update: $325. Network licensing available.

The McGraw-Hill Multimedia Encyclopedia of Science & Technology (MEST) is an electronic version of the *McGraw-Hill Encyclopedia of Science and Technology* (7th ed.) and *McGraw-Hill Dictionary of Scientific and Technical Terms* (5th ed.). MEST includes more than 7,000 signed articles on a wide range of science and technology topics and provides definitions for more than 122,000 scientific and technical terms. MEST also provides hundreds of illustrations, thirty-nine animation sequences, maps, selected biographies, and "study guides."

Searches on MEST may be conducted by key word or phrase and by various system indexes. Indexing is provided through basic and advanced indexes, and the basic index may be used to search for a single word or phrase. The advanced index can search up to four words or phrases with Boolean operators and opens access to topical indexing and proximity searching. MEST provides several layers of information for articles, including article outlines and the availability of hypertext links that allow access to related entries. Because search results may retrieve a substantial number of entries, the user is given the option of changing the parameters of each set. In turn, each set may be listed alphabetically or by occurrence. Search results may either be printed or downloaded to disk.

One CD was provided in the package studied for the review, which included the MEST product, installation software, and Microsoft Video 1.1. Other material provided in the review package included printed installation instructions, "Beta Release Notes," which describe recent changes in the beta version, one user guide, and promotional material.

Installation

The installation of MEST was tested on an IBM PS/1, 486SX (25MHz) computer with a double-speed CD-ROM drive, SVGA color monitor, sound card, and stereo speakers. The installation process, which included both the installation of MEST and Microsoft Video 1.1, took less than ten minutes. Installation was completed by responding to a series of onscreen questions and prompts. The MEST software requires less than 1.4 megabytes of hard disk space and is distributed among seven directories.

Operation

Once MEST has cycled through the initial loading process, it uses an onscreen, outer space illustration to attract potential users. The initial screen prompts users to select one of several choices to begin a search. Menu choices are easily understood and help screens are readily accessible. Search commands and menu choices may be made with the use of the keyboard or mouse. However, the use of a mouse is recommended for a smooth operation.

As expected in a Windows environment, MEST is a user-friendly program. Although a printed user's guide is available with the product, many users will find that the well-designed menus and help screens are adequate for navigating the system. When running the program on the hardware used for the review, MEST was fast and exceptionally responsive. The Windows environment also serves as a powerful tool for enlarging and scrolling through the illustrations, as well as for plac-

ing the text and relevant graphics side by side. In addition to the text, captions may also be retrieved with the illustrations.

MEST includes a powerful set of layered indexes. In the advanced index, users are given an opportunity to limit their searches with the AND and NOT operators. Surprisingly, however, the OR operator is not provided as an option in the advanced Boolean search menu. Searches may be limited to words in titles, text, same paragraph or section, as found in up to ten major subject categories, or from between one and ninety-nine words apart. An index of key words is also provided as a searchable option. Once an entry has been retrieved from one of the indexes, users may fine tune queries by searching for specific words within an article, surveying article outlines, and retrieving related articles.

Summary

The articles and definitions retrieved for the review were substantive, informative, timely, and well balanced. Generally, the entries will spark interest among users of all educational backgrounds. Moving through the many layers and authoritative articles is accomplished with ease. MEST contains a variety of intriguing illustrations and animations. The point-and-click option on the polar "sky maps," which provides a more detailed view of a particular constellation, is particularly exceptional. The animations are also engaging, and are accompanied by clear, crisp sound effects and narration. While most of the illustrations and animations are well chosen for such a multimedia product, a few lack contrast and clarity. Also, four of the animations ("Heart," "Kepler's 2nd Law," "Planets," and "Shock Absorber") would not run on the review CD, suggesting either a defective CD or a design flaw. While disappointing, this could be considered a minor problem.

MEST joins the growing number of multimedia, CD-ROM products. This product, however, is unique as an electronic version of two standard science and technology print titles. MEST will captivate users of all ages, and is recommended for school libraries, public libraries, and academic institutions.—*Gary L. Cheatham, Northeastern State University, Tahlequah, Oklahoma*

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News and Announcements

OCLC Promotes Liz Bishoff to Vice-President, Member Services

K. Wayne Smith, OCLC president and chief executive officer, announces the promotion of Liz Bishoff to vice-president, Member Services.

In her new position, Ms. Bishoff will be responsible for relations with OCLC users and OCLC's major constituencies, including Users Council, user advisory committees, the Library of Congress and other national libraries, and the American Library Association. She also assumes responsibility for the OCLC Pacific division, legislative monitoring activities, and the OCLC Corporate Information Center.

Bishoff joined OCLC in 1987 as manager of the cataloging and database services department and most recently held the position of director of member relations. She is active in ALA, having served on numerous committees, and as president of the Association for Library Collections and Technical Services (ALCTS) in 1992-1993. She is now a member of the ALA Council.

She has worked at the Pasadena (California) Public Library, the Ela Area Public Library in Lake Zurich, Illinois, the Waukegan (Illinois) Public Library, the library of Grant Community High School, and the Northbrook (Illinois) Public Library. Bishoff is an adjunct faculty member at Emporia State University School of Library and Information Management, and has taught graduate library courses at Rosary College.

She is a graduate of Western Illinois University, holds a master of library science degree from Rosary College, and has completed coursework for a master's degree in public administration from Roosevelt University, Chicago.

OCLC Invites Applications for Research Fellow Program

The OCLC Office of Research has immediate openings in the 1995-1996 OCLC Research Fellow program.

The OCLC Research Fellow program brings scientists, educators, and administrators with demonstrated research capabilities to OCLC to conduct research with OCLC staff, facilities, and data resources.

An OCLC research fellow is expected to conduct research that focuses on problems of significance to the library and information science community; the research need not be specific to OCLC's development and production activities.

Successful candidates must have doctoral degrees or equivalent training in library, information, or computer science; applied mathematics; statistics; psychology; or human factors. Experienced researchers will be expected to perform independent research at OCLC, while those at the start of their careers will generally be assigned to one of OCLC's ongoing research projects under the direction of a research scientist.

OCLC expects research fellows to publish research results in the open literature. Publications stemming from research conducted while at OCLC are attributed to the OCLC research fellow; acknowledgment of OCLC's support is required, and coauthorship is expected when OCLC staff make significant contributions to the research effort.

The length of appointment for an OCLC research fellow is variable, traditionally six months to one year. OCLC offers a competitive salary and benefits, and relocation assistance is available.

Candidates should submit a letter of interest, including a curriculum vitae, date of availability, and specific research interests to Dr. Terry Noreault, Director, Research and Special Projects, OCLC Online Computer Library Center, Inc., 6565 Frantz Rd., Dublin, Ohio 43017-3395.

The OCLC Office of Research conducts mission-oriented research to provide the library and information science community with theoretical findings and practical applications.

Lydia Ievins Is LITA/GEAC Scholarship Winner

Lydia Ievins is the winner of the 1994 LITA/Geac Scholarship in Library and Information Technology. (This was formerly the LITA/CLSI Scholarship.) Ms. Ievins is enrolled in the School of Library and Information Studies at the University of Michigan in Ann Arbor. The scholarship consists of a $2,500 stipend provided by Geac Computers, Inc., of Newtonville, Massachusetts.

Ms. Ievins has a B.A. and M.A. in English, and a B.A. in Latvian Studies. She has earned several academic awards, including election to Phi Beta Kappa. Lydia's master's thesis was a hypertextual exploration of electronic language on the Internet. As part of the Library School's selective University Library Associates program, Lydia has accepted a half-time appointment in the National Science Library in preparation for a career in academic library reference. She is "especially interested in the use of new information systems to accommodate the needs of a textual environment increasingly centered in electronic information resources."

The scholarship jury for 1994 was chaired by Elizabeth Lane Lawley, of Internet Training and Consulting Services. The LITA/Geac Scholarship is one of two scholarships given by LITA in 1994. For further information contact Linda J. Knutson, Executive Director, 50 E. Huron St., Chicago, IL 60611, 312/280-4270, Internet linda.knutson@ala.org.

Nancy Roderer New LITA President

Nancy Roderer, director of the Cushing/Whitney Medical Library at Yale University in New Haven, Connecticut, is the new President of the Library and Information Technology Association (LITA), a division of the American Library Association (ALA). She assumed this office at the conclusion of the ALA Annual Conference in Miami Beach.

Roderer will focus on the creation of a network of librarians ready to speak and write on libraries and the National Information Infrastructure (NII).

"Technology is a driving force in many of the changes that are occurring and LITA can and should play a significant role in defining the future of libraries," she said. "As the critical debate over the NII continues, it is important that librarians speak out on the role of libraries and on issues of equitable access."

Roderer is involved in the Yale University Integrated Advanced Information Management Systems (IAIMS) project. She works closely with computing and medical informatics units throughout the Yale New Haven Medical Center. Roderer is a member of the university's Committee on Scholarly Information that involves library and computer units working together on the delivery of electronic information from a variety of sources. Her research interests include user needs and organizational schema in the electronic environment.

She has held several positions at the Columbia University Health Sciences Library, including IAIMS coordinator. Roderer served as a library and information services consultant for several Washington, D.C., firms for twelve years, including Westat, Inc., and King Research, Inc. Her consulting work emphasized the design and evaluation of all types of information systems, including the use of systems analysis, economic modeling, and survey research.

Roderer is a member of the American Medical Informatics Association, the American Society for Information Science (ASIS), the Association of Computing Machinery, and the Medical Library Association.

Her most recent publications include "Database Access Systems, to be published in the fall in the *Annual Review of Information Science and Technology*, Volume 29, and "Navigating the Internet," to be published in the *Medical Library Association's Bulletin*.

Roderer has a bachelor's degree in mathematics and computer science from the University of Dayton in Ohio and a master's degree in library science from the University of Maryland, College Park.

RLG Receives $600,000 Grant From Mellon Foundation

The Research Libraries Group (RLG) has received an unrestricted grant of $600,000 from The Andrew W. Mellon Foundation to be spent over the next two years to improve RLG's operating infrastructure and broaden its services.

Part of the grant will support the one-time expense of bringing in-house some administrative services currently contracted for, as well as other institutional changes geared toward long-term efficiency and economy. At the same time, the grant will allow RLG to modernize its access technology and expand its service to users.

The Mellon Foundation has been a long-time supporter of RLG and has played an instrumental role in its creation, direction, and success. Most recently, Foundation funds enabled RLG to launch a major, three-year transition during which it consolidated its programmatic activities, reduced its fees, and broadened its membership. In 1991, RLG had 108 members; in September 1994, it had 145 members, including 11 overseas and 6 in Canada.

Archivists Honor RLG

The Society Archivists (SAA) presented its Distinguished Service Award to the Research Libraries Group (RLG) in September 1994 at the SAA Annual Meeting in Indianapolis.

The Distinguished Service Award was founded in 1964, according to SAA sources, to "recognize a North American archival institution, organization, or education program that has given outstanding service to its public and has made an exemplary contribution to the archival profession."

This is the highest accolade that the SAA can confer on an institution; the award is not presented every year. That RLG is itself not an archives makes the distinction even more unusual. "During the past ten years," explained Donn C. Neal, director of external affairs at the National Archives and chairman of the SAA's Distinguished Service Award

subcommittee, "RLG has done more than any other institution in the world to achieve a working system for archival information exchange on a truly national and international scale."

This year marks the tenth anniversary of RLG's development of the Machine-Readable Cataloging Archival and Manuscripts Control format (MARC-AMC). In presenting the award, Neal singled out MARC-AMC for praise. "MARC-AMC has been a lasting achievement that has already brought profound change to archival institutions, the archival profession, and the research community," he observed. Quoting one of the archivists who had nominated RLG for the award, Neal said that "the successful integration of archival records into a national network of research information has made possible the fulfillment of the dream of many archivists and scholars, the creation of a national network of archival sources."

RLG's work on MARC-AMC and the related RLIN-AMC implementation was not the sole reason for the award, however, as Neal made clear: "Reciting the many archival issues in which RLG has played a role during the past ten years illustrates the broad range of its impact: improved archival description, standardization of archival descriptive practice, preservation microfilming, appraisal strategies, interinstitutional cooperation in appraising and describing government records, and database conversion."

"In fact," added one of the SAA members who nominated RLG, "it is difficult to imagine any area of archival enterprise today that has not been significant[ly] affected directly or indirectly by RLG's work."

Reacting to the announcement, RLG's president, Jim Michalko said, "We're very proud that the contributions RLG and RLG staff have made to the archival profession have been acknowledged by the Distinguished Service Award."

PICA Libraries Test Z39.50 Interface to OCLC FirstSearch Databases

End users in six libraries in the Netherlands have begun an evaluation of a Z39.50 interface link to OCLC's FirstSearch service. The Z39.50 interface has been adapted by PICA (Project for Integrated Catalogue Automation), the Dutch Centre for Library Automation, in association with OCLC.

The client software on the central PICA system will function as a gateway for PICA users' central and local systems to the OCLC Z39.50 server. End users will be able to search the FirstSearch databases using the online public access catalog interface to which they are accustomed. Library staff will access FirstSearch at their cataloging workstations.

The six libraries participating in the evaluation are the University of Amsterdam; Brabant University, Tilburg; Twente University, Enschede; State University of Groningen; Erasmus University, Rotterdam; and State University Leiden.

"Through Internet, we now offer our users access to the richness of OCLC's FirstSearch service through the same PICA interface as the one used for our own databases; this is what I call real integration," said Look Costers, director of PICA. "Moreover, this forms a breakthrough for the cooperation of U.S. and European library organizations."

"The PICA evaluation will not simply enable the PICA library community to access the rich array of FirstSearch databases online," said David Buckle, managing director, OCLC Europe, "but also demonstrate the value of the seamless connection of the Z39.50-based server with the PICA Z39.50 client, a first for such a connection between the OCLC FirstSearch database host and the user community in Europe."

The FirstSearch service, designed for library patrons, allows users to move easily through the online search process in just a few simple steps, without training or online searching experience. The service now provides 48 databases and a variety of document delivery options.

The nonprofit Dutch Centre for Library Automation, PICA, interconnects nearly 1,000 libraries in the Netherlands and Germany and offers them central, regional, and local library network services.

U.S. Department of Education Provides Grant for Catalog of Internet Resources

The U.S. Department of Education has awarded a $62,000 College Library Technology and Cooperation grant to support the OCLC project, "Building a Catalog of Internet Resources."

The project initiates a nationwide, coordinated effort among libraries and institutions of higher education to create, implement, test, and evaluate a searchable database of USMARC format bibliographic records, complete with electronic location and access information, for Internet-accessible materials.

The grant funds 58 percent of the $107,327 project; OCLC is contributing the balance of the costs. The eighteen-month project is funded from October 1, 1994, to March 31, 1996, through the Federal Higher Education Act of 1965, Title II-A.

"We are pleased to be able to build upon the earlier efforts of the OCLC office of research and to continue extending the value of the nation's libraries, library systems, and catalogs to include the rapidly grow-

ing world of networked information," said Martin Dillon, director, OCLC library Resources Management Division, who will serve as project director. "It is essential that libraries and OCLC gain experience using library catalogs, methods, and practices to include Internet materials."

In a volunteer effort, libraries participating in this project, in cooperation with representatives from their host institutions, will identify, select, and catalog computer files available via the Internet.

OCLC will provide participants with cataloging guidelines and help-desk support, and facilitate the creation, searching, and retrieval of bibliographic records through OCLC systems.

In addition to bibliographic description, records created in this effort will contain location and access information, and will be accessible through the OCLC PRISM service and the FirstSearch WorldCat database. The collection of records also will be made available experimentally for general Internet access, and OCLC will test the technical feasibility of providing direct user access to remote materials based on encoded location and access information.

At the conclusion of the project, OCLC will host a colloquium and publish results in print and electronic format.

OCLC is a nonprofit computer library service and research organization whose computer network and services link more than 18,000 libraries in sixty-one countries and territories.

Letters

To the Editor:

Just got my copy of volume 13, number 3, and it's hard to imagine how a lead article evaluating OPACs could be published in late 1994 and not include INNOPAC as one of the twelve systems evaluated, unless one is writing an article on ancient history. I also find it somewhat interesting that the system evaluated as "best" just happens to be the one used by the author's institution!

I know you have heard of INNOPAC, as have some other members of the editorial board. There are INNOPAC systems in Canada (Concordia University, University of Lethbridge, University of Saskatchewan, to name three, and soon at Simon Fraser University). So what's the excuse? Internet access?

If you look at the Hytelnet database (maintained at the University of Saskatchewan in Canada), one can find over 150 INNOPACs on the Internet, including many in Canada beyond the four mentioned here. Have your researchers heard of Hytelnet? (telnet to access.usask.ca and login as hytelnet). The Hytelnet database shows at least twice as many INNOPACs on the Internet as any other system. There are so few DOBIS/PALS systems on the Internet as to be a joke. And this week there will be one less PALS system as the one at the University of Wollongong replaces its with INNOPAC. So one has to be pretty prejudiced or ignorant to leave out INNOPAC.

And what about the systems included? Two of the systems evaluated are "home grown," so no one knows what they are, and no one cares. Two more (DOBIS and PALS) are practically extinct animals. And I think it is fair to say that the GEAC system will be extinct within a year (indeed, one of them evaluated in this study, the University of Saskatchewan, is already gone, replaced by INNOPAC, following in the footsteps of at least fifteen other GEACs). The other soon-to-be extinct system evaluated is NOTIS (three NOTIS systems in the United States have already been replaced with INNOPAC systems).

What I am suggesting is that editor or peer review procedure should have caught this and sent the article back to the writers with the message: evaluate something our readers might be interested in. Especially when the author's claim that it is "In an effort to continue the investigation of the state-of-the-art features of PRESENT-DAY OPACs with respect to . . . " that they have done their research and written this article.

How can home-grown, or DOBIS, PALS, and GEAC systems be considered "present-day OPACs"? How can the biggest seller of systems into academic libraries (INNOPAC) be excluded, even in Canada? (Don't they know that in 1993, six ARL libraries went to the market to buy systems, and five of those six selected INNOPAC? Can anyone name just one library that in 1993 or 1994 selected the NOTIS, GEAC, PALS, DOBIS, or home-grown system?)

I would argue that articles like this, that systematically exclude INNOPAC, are extremely hard to justify, unless everyone has their head in the sand.

May I suggest that you ask the writers of this article to login to Hytelnet, choose the option that lists OPACs by "type of system," and count how many are listed under PALS, how many under DOBIS, how many under GEAC, how many under NOTIS, how many under DRA, and how many under INNOPAC, and then publish the result.—*Steve Silberstein, Innovative Interfaces Inc., Berkeley, California*

Index to Advertisers

Instructions to Authors

Information Technology and Libraries welcomes manuscripts related to all aspects of library information technology. Some specific topics of interest are mentioned on the masthead page. Feature articles, communications, letters to the editor, and news items are all considered for inclusion in the journal. Feature articles are refereed; other items generally are not. All material is edited as necessary for clarity and length.

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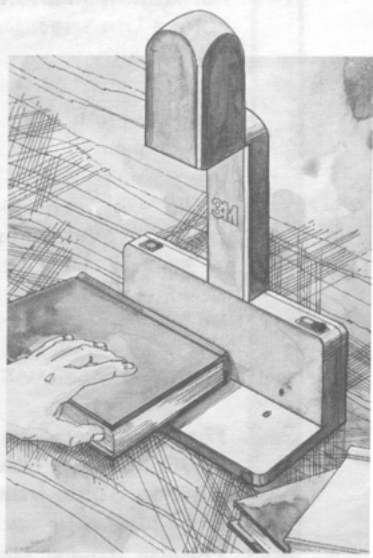

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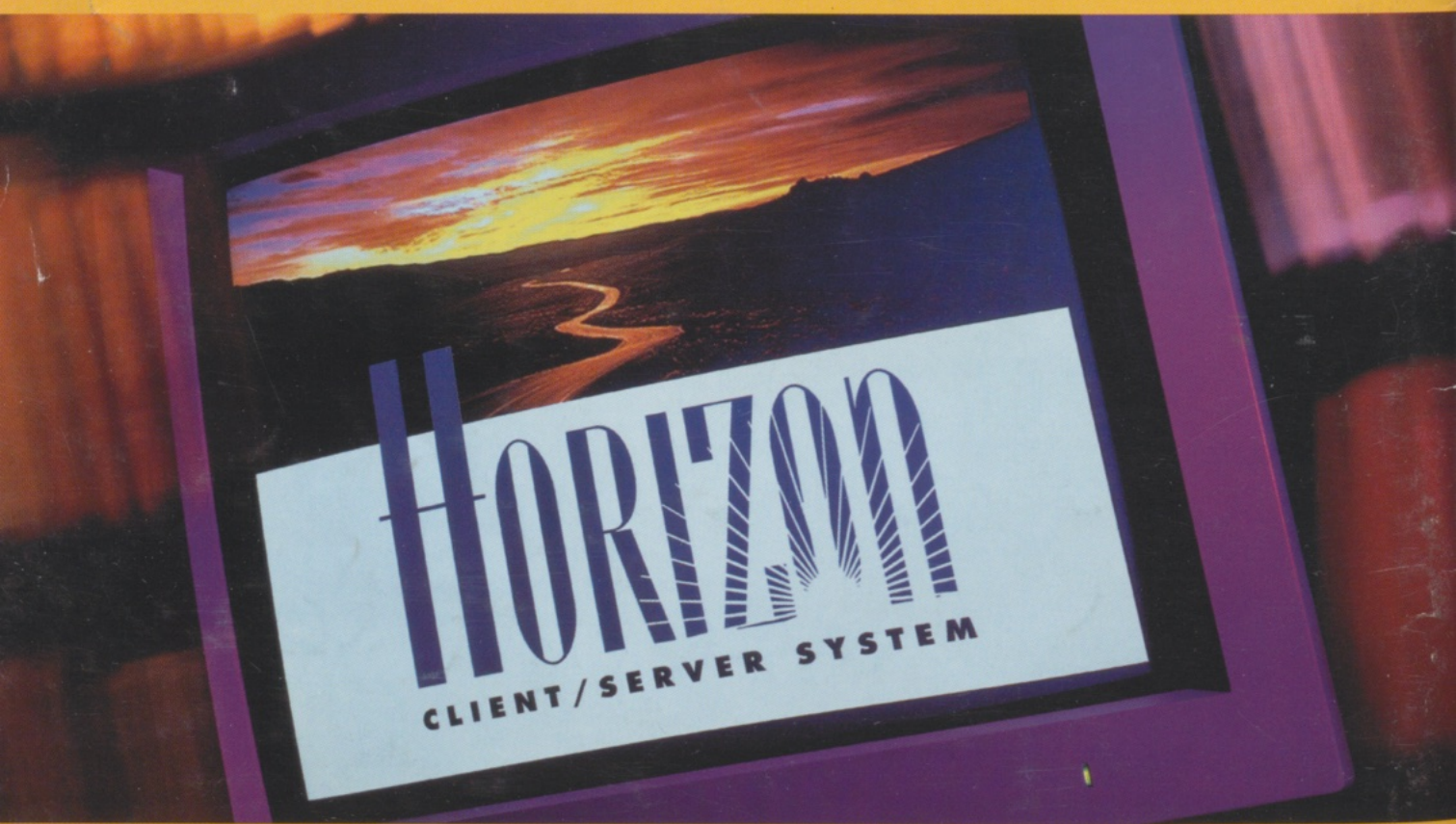

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