

# Information Technology and Libraries

March 1986

## CONTENTS

- 5 Cataloging for the Local Online System *Judith Hudson*
- 28 What They Say and What They Do: Assessing Online Catalog Use Instruction through Transaction Monitoring *Brian Nielsen*
- 35 A New Direction for Online Catalog Instruction *Betsy Baker*
- 42 Videotapes, Computer Programs, and the Library *Debra J. Stanek*
- 55 Communications
- 55 Networking Using a Multiuser Microcomputer System *Sharon A. Keller and Susan E. Jones*
- 58 Microcomputer Use in a Mainframe Acquisitions Environment *Vivian Hay, Jeff Suttor, and Pat L. Walter*
- 63 News and Announcements
- 71 Recent Publications
- 71 Book Reviews
- 71 Boss, Richard W. *The Library Manager's Guide to Automation*, reviewed by Frederick C. Lynden
- 72 Corbin, John Boyd. *Managing the Library Automation Project*, reviewed by James A. Cogswell
- 73 Kinsella, Janet, ed. *Online Access to Library Files: Conference Proceedings*, reviewed by Karen Stabler
- 74 Matthews, Joseph R. *Public Access to Online Catalogs*, reviewed by Sandra K. Ready
- 75 Mitev, Nathalie Nadia, Gillian Venner, and Stephen Walker. *Designing an Online Public Access Catalogue: Okapi, a Catalogue on a Local Area Network*, reviewed by Karen Markey
- 79 Letters
- 80 Instructions to Authors
- 81 Index to Volume 4 (1985)
- 77 Index to Advertisers



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- 63 News and Announcements
- 71 Recent Publications
- 71 Book Reviews
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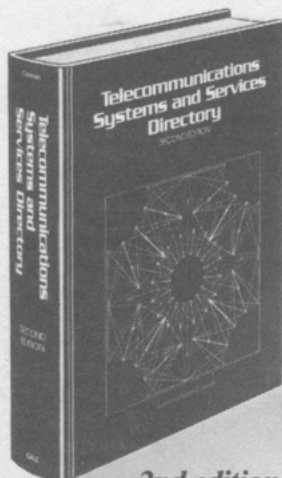
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# Cataloging for the Local Online System

Judith Hudson

*The cataloging operations at six university libraries that have implemented local automated systems were observed. Each automated system is described as it relates to the cataloging process. Authority control, catalog maintenance, decentralization of original cataloging and other technical services functions, enhanced public access to materials, and quality control are the areas that have been affected most. The article concludes with some suggestions for cataloging departments planning for an online system.*

Many libraries are planning for local online systems that will provide automated support for a variety of library functions. To anticipate the changes that an automated system will make in the cataloging operation of a library, it is useful for planners to be aware of the experiences of libraries already using an online system. The cataloging process is assumed to include precataloging searching, preparation and editing of cataloging records, and the addition and maintenance of bibliographic, holdings, and authority records in the online system.

In order to identify changes in the cataloging operation that might be expected, six university libraries were visited in March 1985, and their cataloging operations were observed. They were New York University, Pennsylvania State University, Virginia Polytechnic Institute and State University, The University of Illinois at Urbana-Champaign, Ohio State University, and Northwestern University.

This article briefly describes the automated system as it relates to the cataloging process at each of the six university libraries. Following the descriptions, the major changes that can be attributed to the

implementation of an automated system are discussed and suggestions for planners of online systems made by the staff of the six libraries are summarized.

After implementation, there are two stages in the life of an online catalog. The first is a period when the library must load cataloging records into the system and resolve conflicts and inconsistencies in bibliographic description and syndetic structure caused by variations in cataloging and classification policies and procedures over the years. The second period is one when cataloging records are integrated routinely into a system that is internally consistent. The six libraries described below are each at different phases of the two stages of the online catalog. The libraries whose online catalogs are in the earliest stages are presented first. Only the last two libraries—those at Ohio State and Northwestern—are in the second stage.

## BOBCAT AT NEW YORK UNIVERSITY

The Elmer Holmes Bobst Library of New York University (NYU) uses a turnkey system developed by the Geac Computer Corporation to provide an online catalog and a

circulation subsystem. The NYU online catalog (BOBCAT) currently contains approximately 416,000 full bibliographic records for materials in all formats. Included are records for materials held by the other members of the Research Library Association of South Manhattan, a consortium that includes NYU, Cooper Union, the New School for Social Research, and the Parsons School of Design.

A circulation subsystem was implemented in 1980 and contains brief records for about half of the materials owned by the NYU libraries. Records in the circulation subsystem and the online catalog are not yet linked. As a result, the circulation status of materials listed in BOBCAT can be determined only by querying the circulation subsystem. BOBCAT does, however, include location and holdings information in its bibliographic records.

NYU began to load machine-readable records into BOBCAT early in 1983 and introduced BOBCAT to the public in June of that year. By September 1983, all machine-readable records produced on OCLC or RLIN since 1973 had been loaded. Filing into the card catalog ceased in June 1984 for all currently cataloged titles in Roman alphabets. Cards for new materials in non-Roman alphabets continue to be filed into the card catalog.

The holdings of the NYU Law Library, the NYU Medical Library, and the Courant Institute are not represented in the circulation subsystem or the online catalog. Cards for materials in these libraries are filed into the union card catalog. Planning is in progress for loading the law library's machine-readable records, produced through RLIN, into BOBCAT. Planning has not yet begun for the integration into BOBCAT of the records of the medical library or the Courant Institute.

### **Planning Bodies**

An Automation Committee, which was representative of the library staff, aided in the planning and selection of the automated system for NYU. They educated themselves about library automation and online catalogs and, once Geac was selected, worked closely with Geac in developing the online catalog. Planning for the

online system is handled by the Technical and Automated Services Department, which is also responsible for the operation of the system. Suggestions and requests for new features for the system may be sent to the department by any member of the library staff.

### **Communications**

The Systems Unit of the Technical and Automated Services Department is responsible for maintaining communication with the rest of the library on matters concerning the online system. A telephone tree has been set up to disseminate information quickly about the status of the system. Two irregular series of bulletins have been established: the BOBCAT Staff Information Bulletin and the BOBCAT Bulletin, which is for library users. Representatives of Systems make an effort to attend other departments' meetings and to establish informal channels of communications to assess how the system is working and what improvements might be made.

A staff contest was held to name the online catalog. An amusing logo has been designed that is used on all materials related to the online catalog. The logo has been useful in popularizing and personalizing the online catalog with both staff and users.

### **Organization**

The Technical and Automated Services Department is responsible for the operation of the online system. The department is made up of the Acquisitions, Cataloging, and Systems Units. The creation of a new unit, Catalog Maintenance, is currently under consideration.

### **Staffing**

The level of staffing in the Cataloging Department has not changed significantly since the implementation of BOBCAT. When filing into the card catalog ceased in June 1984, clerical staff was transferred to retrospective-conversion projects and eventually will be trained for online catalog maintenance.

### **Cataloging Work Flow**

The implementation of BOBCAT has had relatively little effect on the cataloging



process at NYU. The RLIN acquisitions subsystem is used for ordering most materials. Plans are underway to transfer acquisitions records to RLIN archival tapes and load them into BOBCAT.

When material is checked in by the Acquisitions Department, RLIN is searched for acceptable cataloging copy before the material is forwarded to the Cataloging Department. Materials with acceptable copy are sent to copy catalogers for editing and input into RLIN. Monographs and scores lacking acceptable copy are flagged in RLIN for fuller record notification and stored until the more complete record appears. At that time, the material enters the regular work flow. If no copy appears within one year, the material is forwarded to the Cataloging Department for original cataloging. Nonbook formats (sound recordings, audiovisual materials, maps, manuscripts) are held and searched periodically for copy. Priority items are forwarded for immediate cataloging. Once RLIN acquisitions records can be loaded into BOBCAT, online access to materials waiting to be cataloged will be available.

Serials follow a different flow. They are ordered and received by the Acquisitions Unit and are then sent directly to the Serials Cataloger for precataloging searching and cataloging.

As cataloging records are prepared or edited, authority records for headings are constructed and filed into the paper authority file. No cross-references are produced for the card catalog with the exception of those for headings in non-Roman alphabets.

### Catalog Maintenance

As NYU records enter the RLIN database, they are transferred to an archival tape. The tapes are sent to NYU weekly and used to load bibliographic and holdings information into the online catalog and the circulation subsystem. Records from the archival tape are transferred first into an edit file in the MARC Records Management System (MRMS) where they are checked automatically against a set of MARC tables for missing or invalid indicators and values in fixed or variable fields. Records for which no errors are detected are then trans-

ferred to the MRMS master bibliographic file. The online catalog uses the master bibliographic record as the source of its display. Designated fields and subfields are selected and mapped to the appropriate fields in the online catalog display. Specified fields are then transferred to the Geac circulation subsystem to form the circulation record.

NYU continues to use RLIN for its catalog maintenance. All changes to bibliographic or holdings information are made to the RLIN record, transferred to MRMS and then to BOBCAT and, as necessary, to the circulation subsystem. NYU has begun a retrospective conversion project using the Carrollton Press REMARC database. REMARC records will be loaded directly into MRMS. Since these records will not be in RLIN, they will be maintained directly on MRMS.

Although the card catalog was closed in June 1984, NYU continues to maintain a paper shelflist. It has no plans at the present to close the shelflist.

### Authority Control

An automated authority control module is currently being tested by Geac, and NYU plans to implement it as soon as it is available. Until then the manual authority file will be maintained, and procedures for authority work will remain unchanged.

The Geac authority control module will contain authority records in the MARC Authorities format for name, title, and subject headings, but not for uniform title headings from the 240 field of the MARC record. Authority records may be obtained from external sources, created locally by staff, or generated from the bibliographic records in MRMS.<sup>1</sup>

External sources of authority records include machine-readable tapes of authority records from the Library of Congress or other vendors that may be loaded directly into the authority control subsystem or records loaded directly into the subsystem via a link between a bibliographic utility and the Geac system. Locally created records may be keyed directly into the authority control module or generated automatically from bibliographic records if the library so chooses. When a bibliographic record en-

ters the edit file, all headings are checked against the master file of authority records. If the heading is not found, a temporary authority record is generated that can be reviewed subsequently for accuracy. At this point, cross-references and any other information desired can be added and the record authorized as permanent.

The same index files are used for both bibliographic records and authority records. The indexes provide linkages between the authority and bibliographic records that allow for global change capability.

Authority records may be corrected by obtaining revised replacement records from the external sources described above or by keying the corrections directly into the record. Once an established heading is changed, the corresponding headings in the bibliographic records linked to the authority record may be changed accordingly by means of a global change command.

NYU plans to purchase machine-readable authority records for the name and series headings in its database. Purchase of authority records for topical subject headings will be deferred until the LC Subject Headings tapes are up-to-date.

### **Quality Control**

Quality control depends in part on the automatic error-checking routines described above and on error reports from staff and other users. NYU has developed two types of error-report forms, one for searching problems and one for errors in the database. These error forms must be filled out by a library staff member and are sent first to the Systems Unit for analysis to identify possible problems with the system and then to the Cataloging Department for correction. Other quality-control measures are catalogers' revision of all records input into RLIN and review of shelflist cards before they are filed.

### **Retrospective Conversion**

NYU plans to convert into machine-readable form catalog records for all its holdings. Currently they are converting records for monographs using the REMARC database. In addition, projects in music, art, architecture, and manuscripts are using RLIN for retrospective conversion and a project is underway to in-

put serials check-in records into the Geac serials control module.

The implementation of the circulation subsystem and BOBCAT has had minimal impact on the cataloging process. Automated authority control is still in the planning stage. Catalog maintenance is handled through RLIN rather than through MRMS, since there is a strong commitment to keeping the RLIN and MRMS databases synchronized. When retrospective conversion records are loaded directly into MRMS and the authority control subsystem is in place, cataloging procedures and work flow may be reorganized.

## **LIAS AT PENNSYLVANIA STATE UNIVERSITY**

The Library Information Access System (LIAS) was developed at Pennsylvania State University Libraries. It has been implemented in stages since 1977 when the Bibliographic Record Input subsystem became available. At that time Penn State began a full retrospective conversion of the libraries' shelflist into the MARC format. A circulation subsystem was implemented in 1979 and, early in 1981 the card catalog was closed, catalog-card production ceased, and production of a COM catalog began. Online cataloging of materials and online database maintenance became operational in May 1981. In 1983 the online catalog was made available to the public. The LIAS database contains more than one million unique records for materials in all formats except for series analytics, books bound together, and microforms containing multiple titles. It includes the holdings of the University Park campus libraries and nineteen of the Commonwealth campus libraries of the Pennsylvania State University system.<sup>2</sup>

### **Planning Bodies**

The LIAS system is being developed with staff input, but planning and design are done in the Systems Department. A systems design group, made up of the assistant dean for computer operations, the head of computer operations, and chief systems analyst, and the documentation librarian, reviews requests and determines the technical requirements for requested additions and changes to the system. Features

requiring system redesign are referred to the Dean's Council, made up of top library administrators, which sets priorities for the system. A LIAS implementation team, made up primarily of public-services staff, makes recommendations to the systems design group on access or system-use problems. A LIAS liaison group, made up of a senior staff member from LIAS Computer Operations and a representative from each Penn State library division—the Commonwealth Campuses, Bibliographic Resources and Services, and Reference and Instructional Services—is an informational group that deals mostly with operational issues. The liaison group circulates new information or user techniques supporting library operations and collects suggestions or questions from the staff.

### Communication

Although official channels of communication are available, a lack of communication with the LIAS Computer Operations staff is felt by the staff in the technical services areas. Requests for changes or new features in the system are submitted, and there is little feedback. New features come up suddenly with little or no notice and documentation. As a result, the operational staff feels it has little involvement in the planning or design of the system.

### Organization and Staffing

The implementation of online cataloging led to a complete reorganization of the Technical Processing Division. The division, renamed the Bibliographic Resources and Services Division, is now divided into four departments. The Acquisitions Department is responsible for ordering all materials. The Receiving Department is responsible for receiving materials and binding. The Bibliographic Support Services Department, made up of the Information Processing Unit and the Physical Processing Unit, is responsible for preorder searching and all online-processing control and copy-cataloging functions. The Cataloging Department is responsible for original cataloging of materials, the enhancement of selected OCLC member records, and authority control.<sup>3</sup>

Three levels of staff are responsible for the cataloging process. Routine tasks, such

as preorder searching, retrospective conversion, catalog maintenance, online copy cataloging of LC MARC records for monographs, input of minimal level records, searching for OCLC copy, input of records into LIAS, and marking of books are assigned to clerical units. Paraprofessionals in the Cataloging Department handle copy cataloging of more complex formats, including serials, cataloging of literary works lacking LC or OCLC member copy, enhancement of items with variant edition copy and with British or Canadian CIP and series authority work. Original cataloging, subject analysis, classification, and name and subject authority work are handled by the catalogers.

Original cataloging is decentralized at Penn State with the dispersion of catalogers into public services, where they combine original cataloging of materials in their subject specialties with public services, collection development and database searching activities.<sup>4</sup> They spend one-third of their time on cataloging and the remainder on other responsibilities. Four catalogers remain in the Cataloging Department. They spend one-third of their time cataloging. The rest of their time is spent acting as bibliographic experts, focusing on bibliographic problem solving, keeping the cataloging documentation up-to-date, monitoring the quality of the database, and participating in the training of support staff and the "distributed" catalogers. Each specializes in a particular aspect of cataloging, such as authority work or serials, and acts as a resource person for the support staff and other catalogers. The original catalogers' activities are coordinated by the principal cataloger.

The reorganization of the work flow and redeployment of staff has resulted in most staff learning to do more than one task. The transfer of the more routine copy cataloging to the clerical unit has allowed the paraprofessionals to take on more tasks that once were handled by the catalogers. Thus, catalogers now have more time for truly professional work.

### Productivity

Productivity has increased as a result of the implementation of the online system. Although the number of staff has decreased



over the years, processing has exceeded the acquisition rates. In addition, the time involved in processing an item has decreased sharply.<sup>5</sup>

### Cataloging Work Flow

At present, most acquisitions operations are not online, although a communications link with the Faxon LINX system facilitates serials check-in and control. Planning is underway for a more complete link with LINX. As materials are received they are checked in and, if there are new titles, they are sent to the Information Processing Unit for searching and online processing through LIAS.

Penn State uses locally mounted LC MARC tapes and OCLC as sources of cataloging information. Records created locally, either through original cataloging or derived from LC MARC, are sent on tape to OCLC to be loaded into its database.

LIAS includes, in separate but linked databases, records for the holdings of the Penn State libraries and the LC MARC tapes for the books format. MARC tapes for music and serials may be loaded in the future. When a monograph, score, or sound recording comes to Information Processing, the PSU database and MARC file are searched by Library of Congress card number. If a matching record is found, it becomes the basis for the LIAS record. Holdings and location information are input into the record and the call number is recorded on the order slip. The item is sent to Physical Processing where call-number labels and card pockets are generated automatically from the record. After marking, the item is forwarded to the collection for shelving.

If no LC card number match is found, a minimum-level processing (MLP) record is input that contains the LCCN, the title, author, ISBN/ISSN, added titles and authors, location, and holdings information. MLPs are searched against the databases by LC card number, ISBN, ISSN, titles, and authors in one operation, by keying in the COMPARE command. If a match or near match turns out to be correct, the MARC record is merged with the holdings and location information from the MLP record. The item then follows the work flow described above.

If no match is found, the bibliographic description is completed, and it is added to the database. The MLP record, which is immediately accessible to LIAS users, serves as a bibliographic-control record until the item is fully cataloged.

Items for which no LC MARC record is found are searched on OCLC. OCLC member records with LC classification and LC subject headings are printed out, and MLP records are edited to match. OCLC member copy lacking LC classification or subject headings or which the searchers deem problematic is sent to the catalogers for enhancement. Records for variant editions of materials for which LC cataloging is available, British and Canadian CIP, and records with call numbers that require Cutter numbers are referred to library assistants in the Cataloging Department for completion. Literary materials lacking cataloging copy also are referred to the library assistants for cataloging. The library assistants edit printouts, which are then returned to the Information Processing Unit for input.<sup>6</sup>

Items (other than literary materials) for which no cataloging is found are sorted by cataloging priority and either cataloged immediately by the original catalogers or sent to the main library or the departmental libraries. Each location decides whether to provide direct access to uncataloged materials or to store the items and retrieve them upon request. The main library shelves the uncataloged materials in closed stacks and retrieves them on demand for patrons. These items may circulate uncataloged. Their MLP records are placed in special queues that bring them up for searching after six months. If after one year no copy is found, they are flagged for original cataloging.

The original catalogers begin with an MLP record. Since the bibliographic description and access points are already in the record, they can spend their time on the more professional aspects of cataloging—establishing and verifying headings, subject analysis, and classification. Full authority records are constructed for all headings, typed and filed in the authority file.

Serials and audiovisual materials follow a different work flow. Serials are searched

through LIAS and OCLC and are forwarded to a paraprofessional in Cataloging. If acceptable copy is available, the paraprofessional completes the copy cataloging. If original cataloging is required the paraprofessional prepares the bibliographic record, which is then reviewed by a cataloger. Audiovisual materials currently are searched on LIAS and OCLC, MLP records are input, and the materials are forwarded to paraprofessionals or catalogers in the Cataloging Department. These materials are not queued for researching but are processed immediately.

Plans are underway to include all non-book materials in the regular copy processing work flow. Serials will continue to be cataloged by paraprofessionals.

### Catalog Maintenance

Online catalog maintenance is handled by the Information Processing staff. Added copies and volumes come to Information Processing along with uncataloged materials and are added routinely. Errors encountered in the database are usually corrected by the individual investigating the error.

### Authority Control

Automated authority control is in the planning stages for LIAS and is expected to be operational in 1986. Current authority procedures are all manual.

The LIAS Bibliographic Control subsystem has the capability to generate an "entry list" containing all headings from newly cataloged or updated records. These lists, produced in two parts—names and series in one and topical subjects in the other—contain all unique headings, arranged alphabetically. At one time these lists were checked against the manual authority file, the LC Authority microfiche, and reviewed by paraprofessionals (for personal names) or catalogers (for corporate names, series, and uniform titles). Authority records were constructed, typed, and filed into the manual authority file. The work load involved in maintaining this level of authority control was too great and, as a result, much of the authority work has been suspended until an automated authority control subsystem becomes operational. Authority control is currently limited to series authorities, authority for headings used

in original cataloging, and occasional problematic headings from LC or OCLC member records.<sup>7</sup>

The catalogers establish authority records for all headings on original cataloging records and for problematic headings referred to them by Information Processing staff. Series are checked in the authority file during preorder searching or, if the material has been received, before processing through LIAS. New series encountered on copy cataloging records are sent to library assistants in Cataloging for searching and establishing.

Automated authority control will involve the loading of LC MARC authority tapes into LIAS. The database will be run against the MARC tapes and an authority file created. Authority records will be able to be input and manipulated manually. Bibliographic and authority records will be linked. Incoming bibliographic records will be read against the authority file and matches linked. New headings that do not match or that conflict with existing authority records will be printed out and sent to the library assistants or catalogers for authority work. Global change capability will be available although the current plan is to have cross-references display transparently. Unauthorized forms of headings will not be changed to the authorized forms. A search for a heading will bring up all records for the heading and all its variants. Consequently a search for "Mark Twain" will bring up all records containing the headings for "Samuel Langhorne Clemens" as well as those containing the headings for "Mark Twain" if there is a cross-reference in the authority record from "Clemens" to "Twain."

### Quality Control

Penn State has incorporated a number of quality-control mechanisms into its cataloging procedures and into LIAS. Error prevention is the initial goal. Careful training, comprehensive documentation, and continuing review of newly input records are the primary means of preventing errors. A computer-based program has been developed to train cataloging staff in online processing procedures and the skills needed for copy cataloging.<sup>8</sup>

LIAS also includes a number of features

designed to facilitate the input of error-free records. As records are keyed into LIAS, prompts for frequent fields remind inputters to check for and enter the required information, if applicable. Automatic checks for invalid indicators, fields, or subfields are built into the work flow for inputting. A mechanism for minimizing the keying of repetitive data has been developed. It provides a variety of print constants that can be added to a record on demand. Examples of constants that might be used are the note "Includes bibliographical references" or the 533 or 593 note for microfilms from University Microfilms. A feature that helps to prevent duplication is the "shelplist" command, which searches newly input call numbers against the shelplist and displays duplicate call numbers, if any. The COMPARE command, which automatically matches access points in the MLP record with the LIAS and LC MARC databases, protects against the input of duplicate cataloging records. If questions arise during the input of a record it can be sent to a supervisor's queue or to a queue directed to a professional cataloger for attention. The 098 field has been defined for messages explaining the problem and requesting assistance.<sup>9</sup>

Error detection methods also include system-generated lists of duplicate call numbers, automatic call-number checking routines that occur as a part of the automatic labeling function, and the OOPS command.<sup>10</sup>

The OOPS command allows any user to enter on a bibliographic record a message pointing out a problem with the record. The user types in the word OOPS and a free-form message describing the problem or the request. There is no limit to the length of the message. Once the message is sent by the user, it no longer displays on the record. Periodically, OOPS messages are printed out and sent to technical services for action.<sup>11</sup>

The OOPS command can be used easily by the library patron without the intervention of a staff member. A minor drawback is that it lacks a means of feedback to the user. Because the messages usually do not indicate the identity of the sender, there is no way to respond to a request for additional information.

## Retrospective Conversion

Retrospective conversion has been completed except for the addition of analytic records. The next system redesign will allow for the input of analytics, and retrospective conversion of these materials will then begin. Detailed holdings are available for all materials except for periodicals and serials. Holdings for these materials are presented in summary form.

## Plans for the Future

A number of features are in production and will be available in 1986. They include a fully automated acquisitions subsystem, authority control capability, full integration of the bibliographic database with the circulation records, and MicroLIAS. MicroLIAS will provide the ability to use LIAS through microcomputers. Software interfaces will allow for the downloading of records into the microcomputers for manipulation, addition, and deletion of data. Among the uses planned for MicroLIAS are the structuring and managing of keyword and Boolean searches, manipulation of fund accounting records, database maintenance, and more sophisticated screen display. Another new feature planned is "outdial," the ability to access external databases such as OCLC, RLIN, or the online searching databases through LIAS terminals.

LIAS has changed the cataloging process at Penn State greatly. The organization of the technical processing operation was planned with the online system in mind. Many features of the system, such as the COMPARE command, the provision of print constants, and the OOPS command, were designed to replace time-consuming or cumbersome manual operations.

## VTLS AT VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

The Virginia Tech Library System (VTLS) at the Virginia Polytechnic Institute and State University Library (Virginia Tech) is an integrated online library system that consists of a circulation subsystem and an online catalog.<sup>12</sup> VTLS began in 1976 as



a circulation and finding system containing brief bibliographic records for monographs and serials. In 1980 the system was redesigned to allow for an online catalog that displayed full bibliographic records in the MARC format and provided searching capability for all major access points. Direct transfer of bibliographic and authority records from OCLC to VTLS was implemented and an authority control subsystem for personal and corporate names became operational in 1983.

At present, VTLS provides access to about two-thirds of the titles held by the Virginia Tech libraries. Approximately forty-five hundred thousand full bibliographic records for all materials added to the collection or circulated since 1979 and an additional two hundred thousand brief records are available in the database.

Although the online catalog has been available to the public since 1981, Virginia Tech has a limited number of public access terminals. As a result the library continues to file cards into the card catalog for all currently cataloged materials with the exception of serials. Card production for serials ceased in 1983.

### Planning Bodies

VTLS was designed and developed at Virginia Tech, but it is not owned by the library. VTLS, Inc., a subsidiary of the Virginia Tech Foundation, is responsible for its development and marketing. It has been purchased and installed at a number of other libraries.

The library has contracted with VTLS, Inc. for the maintenance and day-to-day operations of the system. Within the library, the VTLS Operations Group, which consists of representatives from each department and one representative from VTLS, Inc., discusses problems, reviews feature requests, monitors the system, and sets local priorities for VTLS.

### Organization and Staffing

The library's technical-services operations were reorganized in 1979 when Virginia Tech joined OCLC. At that time the Automated Cataloging Section was formed as a part of the Cataloging Department (currently called the Bibliographic Services

Department). It is responsible for all online searching of monographs, cataloging of materials for which LC cataloging records are available, online catalog maintenance, and online authority control.

Staffing has not changed much as a result of the online system. Although online cataloging has allowed for increased productivity in cataloging, the time and staff saved have been used to maintain both a manual and an online system. The staff has become more sophisticated as they develop experience with the MARC formats, online systems, and other matters relating to library automation.

### Training

All new staff are required to attend a workshop on the use of VTLS as part of their orientation program. They must successfully complete exercises requiring direct use of VTLS before they are allowed to work with the system.

### Cataloging Work Flow

The library has an automated acquisitions system that is not integrated with VTLS. OCLC records are used as the basis for generating order requests on Virginia Tech's IBM mainframe. The order information is then transferred to the acquisitions files on the IBM.

As material is received and processed by the Acquisitions Department, it is sent to Automated Cataloging for precataloging searching on OCLC. If an LC record is found, the record is matched to the book in hand and location information is added. As the OCLC record is produced and cards are ordered, the record is transferred to the data buffer, a storage file that is not a part of the live database.<sup>13</sup> Records in the buffer are accessible by OCLC number and updates are usually run every night to transfer them to the live database.

If OCLC member copy containing LC classification and subject headings is found the record is printed out and forwarded to paraprofessionals in the Monographic Cataloging Section, together with any appropriate name authority records. They edit the printout, verifying MARC coding and subject headings, reconciling the treatment of series with local practice and edit or cre-

ate name authority records for the online and manual catalogs. The records are returned to Automated Cataloging for input into OCLC and transfer to VTLS. Authority records from the OCLC Name Authority File are revised for local use and transferred into VTLS.

If unacceptable OCLC member copy or no copy is found for an item, the book is held for two months. During this time it is listed as "In Process" in the acquisitions system, and it is searched twice. If no acceptable copy is found within two months, a brief record containing main entry, title, a note indicating that the item is waiting for cataloging in the Bibliographic Services Department, and an identification number is input into VTLS. The item is then sent to a backlog until it is withdrawn for cataloging. Items in the backlog are periodically searched on OCLC for acceptable copy.

Before materials are sent to Monographic Cataloging, all headings are searched on OCLC, VTLS, and in the Virginia Tech authority file. The monographic catalogers provide full cataloging and classification for the materials, establish headings, and create authority records when necessary, and send work forms back to Automated Cataloging for input into OCLC and transfer to VTLS.

Series authority work is done manually. All series are checked during the cataloging process. When new series are encountered on LC records, the cataloging record and LC series authority record, if any, are printed out and sent to Monographic Cataloging to be established and added to the series authority file. The catalog record printout is then returned to Automated Cataloging for input into OCLC and transfer to VTLS.

Serials and nonbook materials are handled differently. Serials are sent to the Serials Cataloging Section where they are searched on VTLS and OCLC and cataloged by paraprofessional or professional serials catalogers. Serial records are input into OCLC and VTLS by the Automated Cataloging Section. One card is produced for each serial title and filed into the shelflist. Microforms for serial materials are also handled by the Serials Cataloging Section.

Most nonbook materials are sent directly

to the Monographic Cataloging Section. They are searched and cataloged by the music cataloger.

### Catalog Maintenance

Catalog maintenance is done in a number of sections. Online catalog maintenance for monographs is done by Automated Cataloging. Serials Cataloging handles the online catalog maintenance for serials. Filing, withdrawing, and correcting cards in the card catalog is responsibility of the Monographic Cataloging Section. Since cards for serials are no longer produced there is a minimum of card catalog maintenance involved. However, if a serial is recataloged on OCLC and transferred to VTLS, the old card set is withdrawn from the card catalog.

VTLS is now the official record for holdings for materials in machine-readable form. Holdings are maintained online only and the paper shelflist is retained solely as an indication of shelf location.

### Authority Control

Automated authority control is available for name headings and names used as subjects, and the system provides for global change capability for these headings. Authority records may be entered into VTLS by transferring them from the OCLC Name Authority File or by keying them in directly. The Automated Cataloging Section is in the process of keying the manual authority file into VTLS.

Each time the database is updated by material in the buffer, a listing of headings new to the database is produced. The name headings are searched in VTLS, OCLC, the LC authority file and the public catalog by paraprofessionals in Automated Cataloging. Authority records are found or constructed by catalogers and entered into the system.

Little authority work is done with topical subject headings. Subject headings are verified in the LC Subject Headings listing, but a subject authority file is not maintained for topical headings.

At present, VTLS is designed in such a way that blind references are not allowed.

Each authority record must be linked to at least one bibliographic record. Thus, it would be impossible to load the LC Name Authority or Subject Heading tapes into VTLS.

### Quality Control

When the data in the buffer file is transferred to VTLS, some automatic error-checking is done. Duplicate call numbers, duplicate LC card numbers, and conflicts in headings are listed in the buffer printout. These are checked by Automated Cataloging. New entry listings are reviewed for errors.

Some manual routines for quality control are followed. All offline cataloging is revised before being entered into OCLC and transferred to VTLS. Cards are compared with catalog record printouts at the point of card check-in, and errors are corrected prior to filing.

### Retrospective Conversion

Virginia Tech has two retrospective conversion efforts underway. When an item not represented in the database circulates, its cataloging record is converted into machine-readable form and added to VTLS. In addition, a cooperative serials retrospective conversion project is underway with the University of Virginia. Each institution is converting the serials in their respective Kardexes. The project is expected to be completed in 1986. After the current serials are converted, the systematic conversion of other materials will begin.

### Future Plans

Future plans for VTLS include the implementation of key-word searching in January 1986. Also in the planning stages are serials check-in, automated acquisitions, and a projected change in indexing design will allow for automated series authority. During the summer of 1985, additional public access terminals were added and planning for the closing of the card catalog has begun.

Although the online catalog has been available to the public since 1981, Virginia Tech still maintains a manual system. As a

result, procedural changes caused by automation had added to, rather than replaced, the cataloging processes already in place. The work flow is currently under study to eliminate inefficiencies in searching and catalog maintenance. When the manual system is eliminated work flows will change and staff will be redeployed.

### THE ONLINE CATALOGUE AT THE UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

The Online Catalogue of the Library of the University of Illinois at Urbana-Champaign (UIUC) consists of two separate but related systems called LCS and FBR. LCS, the Library Computer System, is a circulation system based on the Library Control System developed at Ohio State University, which was substantially modified by UIUC before being implemented. It uses as its database brief records containing main entry, title, call number, date and place of publication, locations, and circulation status for each item held by the library. It also contains circulation information for twenty-five other academic institutions throughout Illinois.<sup>14</sup> FBR is the Full Bibliographic Record component and contains full bibliographic records for most books cataloged since 1975, most serials cataloged since 1977, and most audiovisual materials cataloged since 1979. It uses Western Library Network (WLN) software and includes an authority control module as well as the capacity to store and display full bibliographic records. As of April 1, 1985, LCS contained almost three million brief records and FBR contained more than eighty-five hundred thousand MARC records. FBR records contain full bibliographic information with the exception of the call number.<sup>15</sup>

The two systems are linked so that users can move from a FBR record to the corresponding LCS record if call number, location, and circulation status are desired. At present there is no way to move from an LCS record to its FBR record.

LCS, the original component, was implemented in 1978 by UIUC and later adopted statewide at the recommendation of the Illinois Board of Higher Education. FBR was added later to the UIUC system in

order to provide an online catalog, enable the library to close the card catalog, and to support the decentralization of some library functions. Although it is currently not available to other Illinois libraries through the statewide system, UIUC currently is loading all the Illinet OCLC archival tapes into FBR and hopes to expand FBR to all the Illinois libraries that currently use LCS.

### Planning Bodies

Planning for LCS is done on the statewide level by two bodies. The LCS Policy Council, made up of six library directors elected from the Illinois LCS Organization (ILSCO), formulates policy and considers broad operational matters concerning LCS. The Operations Committee, comprising one representative from each member library, reviews changes to LCS, shares experiences with LCS, and monitors its performance.

Planning for FBR has been done on the local level by three committees. The FBR Steering Committee, made up of representatives from the library administration and the University's computing service, sets policy for FBR. Two committees make recommendations to the FBR Steering Committee. The FBR Policy and Implementation Committee is responsible for setting local priorities and objectives for FBR. It is made up of representatives from the various departments of the library. Proposals for new features for FBR are sent to this committee. The FBR Technical Committee evaluates the feasibility of proposed features, coordinates their development, and works with programming and computing staff.

### Communication

All change requests are sent to the Automated Systems Department, which is responsible for maintaining both LCS and FBR and for cataloging through OCLC. The head of Automated Systems distributes all information about changes to the Online Catalogue in the library and serves as the UIUC representative to the ILSCO Operations Committee. An Online Catalogue Contacts Group, made up of representatives from all departmental libraries at UIUC, assists in the communications process.

### Organization

Many of the changes in the organization of the cataloging process were made during a reorganization in 1979. At that time OCLC searching and cataloging and catalog maintenance were moved from the Cataloging Department to the Automated Systems Department. New job descriptions were written for data-entry machine operators at the clerical level and paraprofessional positions were defined with responsibility for copy editing, systems maintenance, and other semiprofessional activities.

In 1984, the University of Illinois at Urbana-Champaign decentralized its original cataloging operation. It did so because of the belief that all professional library activities are best done on the site where the clientele is to be found and by the staff that must deal with the clientele.<sup>16</sup> In order to achieve the decentralization of original cataloging, subject specialists in the departmental libraries were trained in the principles of cataloging and classification by the principal cataloger and the assistant to the principal cataloger. The subject specialists' cataloging is totally revised until they are making few errors and they are able to identify cataloging problems when encountered. After the revision period all work forms are reviewed before being entered into OCLC. In the future, subject specialists will train new colleagues in cataloging. The Online Catalogue, which provides access to all bibliographic and authority files for all the departmental libraries, makes the decentralization of original cataloging possible.

A small Original Cataloging Department staff remains, which handles the cataloging of serials.

### Staffing

With the exception of original cataloging, staffing of the cataloging process remains much the same, although some staff has been reallocated. For example, when the union card catalog was closed the card catalog maintenance staff was transferred to the Systems Maintenance Unit. The staff has, however, become more sophisticated since it must deal with a number of automated systems (OCLC, LCS, FBR, etc.).



## Productivity

Productivity has remained high throughout all the changes automation has brought. Large backlogs have been cataloged and, at present, only about five thousand backlogged titles in Asian languages remain in an official backlog, while materials awaiting original cataloging are stored in the departmental libraries. The effect of decentralized cataloging on production is currently under study.

## Cataloging Work Flow

When materials are ordered, a brief record is created on LCS for the material, and it is charged out to the vendor. When the item is received it is sent to the Automated Systems Department for precataloging searching on OCLC. Printouts of all OCLC records for the item are sent to the copy catalogers for editing. They also assign Dewey classification numbers and prepare authority records if needed. Revisions to the OCLC records are then input into OCLC. Authority records are forwarded to the Systems Maintenance Unit to be added to the online authority record that is created when a new heading is added to FBR. Serials follow a similar path through the department.

FBR currently does not have the capability to include records in the manuscript, map, scores or sound recording formats, for newspapers or for records in non-Roman alphabets. Cards for such materials are produced through OCLC and filed in card catalogs in the appropriate departmental libraries. The cataloging work flow for these materials is similar to that of monographs, serials, and audiovisual materials. Authority records are maintained online for headings from these records.

Monographs requiring original cataloging are sent to the departmental libraries where they will be cataloged or stored. Their LCS records are changed to reflect their location. As a result, UIUC has no large centralized backlog. Uncataloged materials reside, until they are cataloged, in the locations where they are most likely to be requested.

Serials cataloging has not been decentralized. Serials for which no OCLC records are found are sent to the serials cata-

logers in the Original Cataloging Department.

## Authority Control

The authority control database contains name headings from the 1981 LC Name Authorities tapes and subject headings from the tapes from the ninth edition of the *LC Subject Headings*.<sup>17</sup> It also includes all other name, series, subject, and uniform title headings that have been stripped from incoming OCLC records and loaded into the authority file.

Changes to authority records may be made at a terminal but are batch processed. The authority control system has global change capability. By changing the authorized form of the heading on the authority record, all occurrences of that heading in FBR will be changed.

Prior to loading FBR, UIUC contracted with Amigos Bibliographic Council to have all headings on the OCLC MARC bibliographic records from 1974 to 1984 converted to AACR2 and to eliminate all duplicate records. Nevertheless, the authority file still contains variant forms for many headings. Other major problems with the authority file are caused by typographical errors or by miscoded headings. These also remain to be cleaned up.

Copy and original catalogers prepare authority records that are sent to the Systems Maintenance Unit for input into the online authority record generated from incoming OCLC bibliographic records. A manual authority file of AACR2 headings was maintained until November 1984. UIUC plans to add all cross-references from the manual file into the online authority file.

## Catalog Maintenance

LCS records are created from OCLC archival tapes. The tapes are then loaded into FBR. Once the OCLC records have been loaded into both systems, the link between records for the same item is built by matching the call number in LCS with the call number field (092) on the MARC record. At this point the 092 is removed from the FBR record. Subsequent bibliographic record maintenance is handled by the Systems Maintenance Unit.

The main shelflist was closed in 1979, as were the union card catalog and authority

file. Filing ceased in November 1984, although card catalogs are still maintained for materials in formats not available on FBR. Currently only a temporary paper shelflist is maintained.

The FBR file contains the authoritative bibliographic records for current materials, and LCS is the authoritative record of locations and holdings. Changes to FBR and LCS records may be made at the terminal. The changes are processed overnight for FBR and once a week for LCS.

### Quality Control

Some quality-control mechanisms are built into the FBR system. Most records containing errors that are detected by the system (e.g., missing fields or subfields, incorrect indicators, etc.) are allowed to load into the system. However, if a record containing errors is called up to be changed, all errors must be corrected before the changes can be processed. A listing of headings new to the system is generated with every record load, but, at this time, the Systems Maintenance Unit cannot review them completely because of the volume of work.

### Retrospective Conversion

UIUC has no current plans for a full retrospective conversion project because it is such a huge undertaking—almost two million titles remain to be converted. However, a mathematics titles project has been completed, and there are some retrospective conversion projects underway involving law and map materials. The UIUC staff is converting series analytics, and planning has begun for the conversion of government documents on OCLC.

### Use of Microcomputers

One of the most exciting and innovative developments at UIUC is the way in which IBM Personal Computers are being used to supplement LCS and FBR. In public services, PCs, which are used as terminals to access the Online Catalogue, have in their memories a program that leads the user through LCS and FBR using natural language. The PC determines which component is to be searched and constructs the appropriate commands.<sup>18</sup> Automation of the

reserve function in the undergraduate library using PCs is currently under development.

In the technical services areas PCs are used to match unlinked records in FBR with the associated record in LCS. A program is currently being developed to search the bibliographic records in FBR for possible variations of established headings in the authority file. Automatic shelflisting is another use being considered for PCs. PC programs offer great potential because they can be developed locally to meet local needs, can be changed readily, and do not affect response time on the mainframe.

Although integrated systems are currently in vogue in libraries, UIUC has approached the problem in another way. They believe that the criteria for a successful system are that all information about an item be accessible through one terminal, and that changes need only be made once to a record. They have chosen to link component systems that provide for an online catalog, authority control and circulation, and download data into microcomputers for other functions rather than to design or purchase one complex system that will perform all the needed operations.

The Online Catalogue was developed at UIUC primarily because the card catalog was out of control. It was so large that it was extremely difficult to use and very expensive to maintain. The online system has solved that problem and the resulting dispersion of files has allowed for the decentralization of various cataloging functions. Authority control is automated but will not be complete until the manual authority file is keyed in, LC MARC authority update tapes are loaded, and variant forms of headings are combined.

### LCS AT OHIO STATE

The Library Control System (LCS) was developed at the Ohio State University Libraries in 1970 as a circulation system.<sup>19</sup> Brief records for the entire cataloged collection including main entry, title, edition, imprint date, call number, and holdings (except those for serials) were keyed to tape from the shelflist to create the LCS database. New records were added to the database manually at first and later by stripping

the appropriate fields from machine-readable records on OCLC archival tapes. Since 1975, LCS records have been accessible to patrons by means of terminals in public areas of the libraries.

In 1978, LCS began to function as an on-line catalog when the capability to display full bibliographic records was added. Since then, complete OCLC records have been transferred from the archival tapes into the LCS database. In addition, an index of subject headings was created and subject searching on LCS became possible. In 1980 full bibliographic records from OCLC archival tapes for 1974-1978 were added to the database. The public catalog was closed and filing of cards in the card catalog ceased in 1982.

A subject headings file was created in 1978 and expanded in 1981 to include all name, series, and uniform title headings found in records in the LCS database. All new headings that entered the database were indexed and added to the file. New headings that were unique to the database were printed out and evaluated for cross-references, which, if deemed necessary, were added manually. Along with the subject headings file came the capability to make global changes in the database by changing the verified heading in the headings file. A Headings Maintenance Unit consisting of .5 FTE librarian, 2 FTE paraprofessionals, and student assistants was created to handle the authority work. In 1983 OSU ran its headings file against the Library of Congress master tape of name authorities, which contained name authority records from 1977 through March 1981. Also added were the LC update tapes through September 1982. Authority records that matched LCS headings were verified and cross-references were added. LCS headings that matched *see* references were changed to the correct headings.<sup>20</sup>

Currently, plans are in progress for the loading of full bibliographic records from the 1971-1973 OCLC archival tapes. The LCS database now consists of brief records for materials cataloged before 1974 and full bibliographic records for materials cataloged thereafter.

LCS does not include an integrated acquisitions subsystem. OSU has purchased

the Innovacq acquisitions system, and an interface between Innovacq and LCS has been developed to allow order records to display on LCS. As material is received and moves through the various stages of processing in technical services, it is charged out on LCS to the appropriate library department. Because all location and status information is available to the public, patrons can access an item from the time it is ordered to the time it is withdrawn from the collection.

In addition to the on-order records available on LCS, OSU has developed an online serials holdings (volume-level) record. Serials issues are checked in manually both at the main library and at some of the larger branches. Innovacq is also used for ordering serials. Although there is no interface between LCS and Innovacq for serials, such a system is projected for future implementation.

### Organization

The Catalog Department has reorganized often over the LCS years to meet the changing demands of automation. In 1969, before LCS was implemented, the department was organized by function (labeling, card production and maintenance, search, Library of Congress editing, duplicates) and by format (monographs cataloging, serials cataloging).<sup>21</sup> Today all automated cataloging activities (searching, OCLC editing and input, and catalog maintenance) have been consolidated in the Automated Processing Department. Original cataloging activities remain in the Catalog Department (Non-Book Cataloging, General Cataloging, Serials Cataloging, Thesis Cataloging).

### Staffing

The staff has become more sophisticated in its work because they must understand the operations of the automated systems and the relationship between LCS and OCLC. They must also be familiar with MARC formats. At one time students handled much of the manual work. Now that this type of work is done by computer, students have been shifted to inputting records into OCLC, discharging and charging rec-

ords on LCS, and other machine-related tasks.

### **Productivity**

Productivity has increased over the years as a result of automation. For example, the closing of the card catalog and the elimination of the paper authority files resulted in a great savings in routine labor.

### **Cataloging Work Flow**

After new material is checked in by the Acquisitions Department, it is sent to the Automated Processing Department where it is searched for cataloging records on OCLC. Materials with Library of Congress cataloging or OCLC member cataloging with LC classification are handled by the OCLC Edit/Input Section. The records are reviewed, edited, and upgraded, if necessary, and a shelflist card is produced. Detailed holdings information is input into OCLC at the time of cataloging.

Materials lacking acceptable cataloging on OCLC are handled by the Catalog Department. Items designated for "priority cataloging" at the time of selection are expedited. The rest are sorted by the library to which they will be sent after cataloging and are stored to await original cataloging. In-process records in LCS provide author/title access to these materials.

Original cataloging follows traditional methods but the manner in which authority work is done has changed because of the authority control mechanisms in LCS. Original catalogers continue to construct authority records for headings that they formulate in the course of their cataloging activities, but LCS has become the first source searched during this operation. Once constructed, the authority records are forwarded to the Headings Maintenance Unit for input of cross-references into the headings file. Because bibliographic records are accessible by subject, and shelflist browsing is available, LCS is also used heavily in classification and subject analysis.

### **Catalog Maintenance**

The Catalog Maintenance Section, which includes the Headings Maintenance Unit, Bibliographic Maintenance Unit,

Duplicates Processing Unit, and Card Maintenance/Recataloging Unit, is responsible for maintaining the LCS database, the remaining card files, and the card shelflist. The Duplicates and Recataloging Units are involved with location changes, addition, enhancement and withdrawal of bibliographic and authority records as well as changes in call numbers and other bibliographic information. At present, online maintenance of LCS is not available. Changes and additions can be entered only through OCLC, by typing them on optical scanning forms that are entered offline, and, for the headings file, by online data collection on LCS. However plans are underway for the implementation of online bibliographic maintenance that will allow for more streamlining of the additions and changes procedures.

### **Authority Control**

Although original catalogers continue to do authority work during the cataloging process, most authority work for copy cataloging is handled after cataloging. Since all new headings are matched against the heading file and unmatched or unverified headings are printed out for review, it is possible to do the authority work after the cataloging records are loaded into LCS.

This system was adopted, but was temporarily suspended because the volume of work resulting from the loading of authority records from the LC Name Authority tapes was so great that the Headings Maintenance Unit could not keep up with the current headings as well. Consequently, searchers and copy editors were asked to check all headings on LCS and, if not verified there, on OCLC in order to share some of the burden of the Headings Maintenance Unit.

Currently, the backlog of authority work has been cleared up and the library has returned to post-cataloging authority work. Headings reported each week by LCS are verified against the OCLC Name Authority and bibliographic files, cross-references prepared, and the headings file updated accordingly. If not found on OCLC, headings are established according to AACR2 and cross-references are prepared and entered into the headings file.

Subject authority has been handled simi-



larly. In 1984 the LCS subject headings file was run against the 1981 LC Subject Authority tapes. As new subject headings enter the LCS database they are printed out. New subject headings from LC cataloging records cataloged under AACR2 rules are verified but cross-references are not added until they appear in the *Library of Congress Subject Headings* supplements. It is intended that these supplements be checked routinely for all unverified subject headings and for verified subject headings requiring cross-references.

A new procedure under consideration would search annually all new headings against the headings remaining on the LC Name and Subject Authority tapes that have not yet been used in LCS. Authority records found would be transferred to the headings file.

All series are checked against LCS during the cataloging process. New 440 and 8xx series are accepted by copy catalogers at the point of cataloging, and established forms and cross-references are determined by the Headings Maintenance Unit after the catalog records have been loaded into LCS. Untraced series are not verified.

### Quality Control

There are a number of quality controls in operation at OSU. LCS has some automatic error routines that may identify missing fields and subfields or incorrect or missing indicators or fixed fields. Some holdings information is not entered on OCLC during the cataloging process but added after the OCLC records have been transferred into LCS. At the time the holdings are input the LCS record is checked against the work form to insure against errors in input. Currently the Bibliographic Maintenance Unit is experimenting with the verification of all access points on incoming records by calling each up on LCS.

### Plans for the Future

Planning for the future continues at OSU. Many projects under consideration will affect the cataloging process. The library is considering closing the shelflist. Guidelines for identifying materials that might be appropriate for minimal level cataloging are being drawn up. The use of the OCLC M300 work station to download au-

thority records from the OCLC Name Authority File is under investigation. Retrospective conversion of nine hundred thousand brief records (sixty thousand of them serial records) and two hundred thousand serial analytic records is desired.

The cataloging process at OSU has changed as LCS has grown. LCS files are now the first place catalogers check rather than one of the last places. LCS is an automation of the card catalog with the addition of a patron file that can link with the bibliographic file and provide circulation status. Repetitive tasks, which were once done by humans, are now done more rapidly and efficiently by the machine. However, when new capabilities such as keyword and Boolean searching become operative it will become a system that is greater and more powerful than the card catalog.

### NOTIS AT NORTHWESTERN UNIVERSITY

NOTIS, the Northwestern Online Total Integrated System, is an integrated library system providing for circulation, acquisitions, serials control, cataloging and catalog maintenance, and public access.<sup>22</sup> Operation of NOTIS began at the Northwestern University Library in 1970 with a circulation system. During that year all serials were converted into machine-readable form. In 1971 a technical services component was added that supports acquisitions, serials control, cataloging and catalog maintenance. The system was planned to automate the circulation and technical services operations that lent themselves to computerization and to give improved access to the information needed to complete those operations. A library staff systems analyst observed the manual technical processes to determine what could and should be automated and consulted closely with Technical Services Division personnel in planning the automated system.

In 1977 a new index configuration was implemented that eliminated the need for search keys to retrieve records from NOTIS. As a result, public services staff began to appreciate the system's potential for an online public access catalog. Up to this time the public had access only to the circulation status of materials by call number.

An Alternatives to the Card Catalog Committee was formed at that time to determine how to deal with AACR2 and to make recommendations on the future format of the public catalog. The assumption was that the library would move directly to a public online catalog and that the online catalog would be an extension of what had previously been available only to the staff.

Catalogers, in consultation with public services staff, were responsible for planning how to close the card catalog and what connections should be made between it and the online catalog. Catalogers and reference staff worked together to determine what would be needed for public access. LUIS (Library User Information System, the online public access catalog display) was implemented in 1980 and on day one of AACR2, the author/title card catalog was closed. An add-on catalog was maintained for about one year. Card production and filing for the card catalog then ceased and the add-on catalog was discarded. Subject access was added to LUIS in 1981.

### Planning Bodies

Two planning bodies exist for the system: the NOTIS Review Group, made up of representatives from all divisions of the library, and the LUIS Design Group, made up largely of public services staff. The NOTIS Review Group was formed because there was a need for a decision-making body to evaluate and approve suggested changes and to set priorities for the further development of NOTIS. It is a planning group that reviews systemwide projects. The LUIS Design Group plans the display of information for the user. Membership of the two planning groups overlaps somewhat.

### Organization

The organization of the Catalog Department also has changed as a result of automation. At one time the Catalog Department included a Pre-Cataloging Search Unit. This unit was merged with a preorder search unit to form a Search Department. The Search Department later became a part of the Acquisitions Department but continues to do pre-catalog searching. At

the time NOTIS was implemented most data input functions were consolidated in one support unit. Since then the responsibility for inputting has gradually been dispersed back to the departments and units generating the data. Another change that was partially sparked by automation was the transfer of serials cataloging from the Catalog Department to the Serials Department.

Over the years, classification of the clerical staff in the Catalog Department have been upgraded and increased numbers of paraprofessional staff have been hired.

### Productivity

The estimated annual savings attributable to automation for the Technical Services Division as a whole is eighty-five thousand dollars.<sup>23</sup> The Acquisitions and Serials Departments now require fewer staff. On the other hand, when the online catalog was implemented, staffing for the Authority Control Unit was increased by one-half FTE professional, one FTE paraprofessional, and additional student help.

The implementation of the automated system had little immediate effect on the number of titles cataloged by the Catalog Department. Catalog record production decreased every time a new feature was added to the system and then returned to earlier levels. After fifteen years of operation the department is routinely producing a few more titles than it was in 1969 with fewer staff members, some of whom have different assignments than before NOTIS.

### Training

The level of training and sophistication required of all staff has increased because of automation. Staff must understand the search structure and the tagging of machine-readable records. Because the system is integrated, all departments of the library must understand many details of the functions and operations of other departments. Because a single record is used for an item from the time of order until the time of withdrawal, all staff must be aware of the status of the item in order to locate it. Some changes to records may be handled earlier in the work flow than before NOTIS. For

example, changes in periodicity discovered by the Serials Acquisitions Section can be entered into NOTIS immediately rather than waiting for catalogers to make the change.

### Cataloging Work Flow

Because acquisitions and cataloging are integrated, a provisional catalog record is created when an item is ordered. Acquisitions does all preorder searching on NOTIS, RLIN, and LC MARC tapes. Orders containing author, title, and LC card number or ISBN information are keyed into the system and are automatically searched nightly against the LC MARC tapes. If a match is found the full bibliographic record is immediately transferred into the NOTIS record. When material is received it is checked in and, if no LC record is available, the title is searched again on RLIN. If found, the record is printed out and keyed into NOTIS. Monographs for which cataloging records are found are sent to Copy Cataloging for editing, authority work, and further processing.

If no match is found, the search is continued automatically for up to five years or until canceled. Materials for which no cataloging records are found on the MARC tapes or on RLIN are organized according to special priority, location, or language and stored until they are scheduled for original cataloging.

As material moves through the various departments of Technical Service, its status is changed accordingly. Once it is cataloged and sent to the collection, all searching for LC MARC records ceases.

Serials are handled in a similar fashion but in a separate Serials Department. Its Serials Acquisitions Section orders, claims, and maintains receipt and payment records for serials. Its Serials Cataloging Section catalogs, processes added volumes and copies, and transfers and withdraws serials. It also creates or updates name and series authority records for materials handled.

### Authority Control

The authority control subsystem contains authority records for names and series in full MARC format. Main entries and se-

ries are searched against the NOTIS bibliographic and authority files during the pre-cataloging search process to determine whether they are new headings or whether they conflict in some way with current established headings. Conflicts and new headings are then searched on the RLIN authority file. Results obtained by searching are forwarded to the copy or original catalogers who search further to determine the need for authority and/or cross-references. They prepare worksheets for the name and series authority records, which are then manually input into the system. Changes to authority records must be made record by record. Global changes to bibliographic records are possible.

Subject authority work follows a different scheme. All new subject headings are printed out periodically and are checked against the LC Subject Headings for accuracy. Corrections are then made to bibliographic records in NOTIS. Northwestern plans eventually to put topical subject headings into the authority control system, preferably through purchase of a subject authority database from a commercial vendor such as the Library of Congress, Blackwell North America, or UTLAS.

Authority work is the cataloging procedure that has changed the most as a result of the online system. Because the computer is so unimaginative and provides only for a complete match with the search terms, authority work has become more demanding. Copy catalogers spend nearly one-third of their time on all aspects of authority work; original catalogers spend more than one-third of their time.

### Quality Control

Quality control continues to depend largely on the diligence of the catalogers. Emphasis, however, has shifted toward maintaining consistency in form of headings and away from detecting errors in bibliographic descriptions that do not affect access. Some quality-control mechanisms that were not available before automation are printouts of all headings affected by global changes with the old headings they changed from, automatic checking for missing fields and subfields or incorrect in-

dicators or fixed fields, and printouts of new subject headings. A planned revision of NOTIS will include automatic notification of conflicts between *see* references and verified headings, listing of blind cross-references, and listings of new headings.

### Plans for the Future

Northwestern's plans for the future include an index redesign that will provide a single index for all main and added entries and all cross-references from the authority file. Index entries will be longer to provide for more specific retrieval of entries. Subject access will also be enhanced. Discontinuation of the paper shelflist is under study. Because NOTIS has a call-number index and each record includes the holdings for that title, as retrospective conversion progresses the paper shelflist should become unnecessary. Other changes to NOTIS that are planned are the implementation of keyword and Boolean searching.

Retrospective conversion is not an immediate need because the card catalog has been weeded of all cards for records that are available online in full bibliographic form. As a result the card catalog is consistent within itself. Northwestern has identified some types of materials they would like to convert first (e.g., belles lettres of major authors, LC records from 1967-1971 for which machine-readable records are available), but have no definite plans at present for full-scale retrospective conversion.

Almost all phases of the cataloging process at Northwestern have changed as a result of NOTIS. Bibliographic control is publicly available for an item from the time it is ordered. Order records often contain full bibliographic descriptions. Authority control is maintained online for name and series headings in the database. Maintenance of the card catalog has ceased and online catalog maintenance has taken its place.

In assessing the changes in cataloging since NOTIS was implemented, Janet Swan Hill, head of the Catalog Department, believes that its greatest contribution to cataloging is the view that catalogers now take of their work. They now regard the catalog as a whole as a product of their

work rather than the individual cataloging record. Catalogers now meet Public Services staff on common ground and work together to create a better catalog. Hill also believes that productivity, efficiency, and effectiveness have increased because constant analysis and observation of procedures and work flow have allowed them to reorganize to maximize use of automation.<sup>24</sup>

### MAJOR CHANGES IN THE CATALOGING PROCESS

All of the university libraries described above have experienced some change in the cataloging process as a result of the implementation of an online system. Because the systems at Penn State and Northwestern provide for local online cataloging of materials, these libraries have been able to reorganize the entire cataloging work flow to maximize the efficiencies their online systems allow. The other libraries, which depend on bibliographic utilities for their online cataloging, have been able to change only certain stages of the cataloging processes. Those areas in which most change has occurred are authority control, catalog maintenance, decentralization of original cataloging and other technical services functions, enhanced public access to materials, and quality control.

In many cases, automated authority control has allowed for the streamlining of copy-cataloging procedures by removing authority checking from the work flow. New headings are established and authority records constructed from lists generated after bibliographic records have been loaded into the system. This allows for batching of work and eliminates the need to check those headings that have already been established and added to the system. Original catalogers continue to establish headings and construct authority records during the cataloging process. The Ohio State and Virginia Tech cataloging operations illustrate how the authority work flow can be reorganized and made more efficient.

Catalog maintenance has changed enormously where card catalogs have been closed. Online catalog maintenance is



much more efficient than card-catalog maintenance because the machine does the filing and because changes need be made only once, to the master record.<sup>25</sup> In addition, changes can be made by authorized personnel at any location where a terminal is available. Penn State and the UIUC provide interesting examples of online catalog maintenance arrangements.

Decentralization of original cataloging operations and some other technical services functions has become a possibility as a result of online systems. Because online files can be displayed and manipulated through terminals at remote locations, many technical services functions can be dispersed. Penn State and the UIUC have moved in the direction of decentralized cataloging. Distributed catalog maintenance and on-site check-in of serials at departmental libraries are other possibilities for decentralization.

Online systems allow for enhanced access to materials for the user because the status of an item from the time it is ordered until it is withdrawn can be determined with one search. Library patrons need not spend time searching the shelves for materials that are in circulation. Library staff can determine the status of material by looking in one file rather than many. Northwestern, with its integrated acquisition, cataloging, and circulation systems, and Ohio State and the UIUC, which enter a record into LCS when an item is ordered, provide examples of such control.

Quality control is another area that has changed as a result of the implementation of online systems. The systems have provided automatic routines for error checking and identification of conflicts in headings. However, because the records are reviewed by fewer staff members, errors that are not detected by the online system may go uncorrected. New York University and Penn State have instituted reporting mechanisms to attempt to deal with this problem.

#### PLANNING FOR CHANGE

During the course of the interviews at the various libraries, staff members were asked for advice for catalogers who are planning for an online system. The following is a

summary of some of their suggestions.

Within the technical services operation, work flow and procedures must be analyzed and reorganized with the online system in mind. Routines must be set up and exceptions to the routine identified. Each position in the department must be analyzed with the new procedures in mind and new or revised job descriptions written. New positions may be created. The organization of the technical services department may be changed, as it was at Penn State, to accommodate the new work flow. The new organization and work flow must be presented to the staff within the context of the online system so that they understand that changed routines and job responsibilities are necessary rather than arbitrary.

Documentation for the online system operations must be obtained and all new procedures thoroughly written up to facilitate training. Two-way channels of formal and informal communication must be established with those responsible for the operation of the system.

The online catalog represents the future, and it will receive an increasing amount of attention. The emphasis in the cataloging operation will shift from the card catalog to the online system. Card files may close. Cleaning up the database, retrospective conversion and other enhancements to the online system will become the major areas of interest and concern.

Implementing an online system can be an extremely positive experience for library staff members involved in the cataloging process. The system can bring them together with public services staff because of their mutual interest in and concern for the online catalog. Implementation can broaden their vision by exposing them to the operations of other units of the library and can raise their visibility within the library.

This article has attempted to provide a sense of how cataloging operations in six libraries have changed to meet the needs of an online system. It has described the cataloging process in libraries that are in the process of loading retrospective catalog records into an online system and resolving conflicts between the various records (stage

1) and libraries whose cataloging databases are internally consistent (stage 2). It is hoped that the experience of these libraries can provide aid to others in planning for the online catalog.

## ACKNOWLEDGMENT

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# What They Say They Do and What They Do: Assessing Online Catalog Use Instruction through Transaction Monitoring

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From the introduction of the first online catalogs in the U.S. and Canada in the late 1970s and early 1980s, American librarianship shared the enthusiasm of a significant segment of the library user community for that new technology. Whether the catalogs were easy to use, whether the coverage of the online file was clear, whether users were floundering at the terminals, the enthusiasm was sustained and powerful. As the early studies showed, particularly the major surveys undertaken by various researchers under the sponsorship of the Council on Library Resources in 1982-83,<sup>1</sup> those who used the online catalogs could hardly be happier about this new tool, and those who had not yet had the experience of use were optimistic about the prospect.

Today, online catalogs are more familiar to us and to our users. For many librarians in public services positions, the online catalog has presented new challenges not described in the early, glowing reports on this technology. Especially important to public services librarians is the question about the amount of mediation that online catalogs may require, through direct one-on-one user assistance and through user education. This is a question that the well-known CLR

online catalog studies did not directly address, as they assumed for the most part that online catalog user education might either be a rather simple service problem best left to individual public services units in the field or not be required at all.

Northwestern University Library public services staff, with considerable experience in assisting users with its NOTIS online catalog, felt that additional investigation into the matter of online catalog user education was warranted. With the aid of a grant from the Council on Library Resources titled "Educating the Online Catalog User: A Model for Instructional Development and Evaluation," Northwestern has explored a number of instructional issues surrounding the online catalog and come up with aspects of a model that other academic libraries may adopt as they face new online catalog implementations.

Though a portion of this paper reviews the overall findings of this project, our objective here is to focus more specifically on methods of data collection used in evaluating online catalog performance and user performance. Through a discussion of the rationale and methodology of transaction log monitoring used in the "Educating the

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Online Catalog User" project, we hope to arrive at a better understanding of the value of unobtrusive data collecting. We will also suggest some new direction for technical development, directed to problems that public services librarians face as online catalogs are introduced.

This paper is structured around four major points: First, the CLR "Educating the Online Catalog User" project, on which the author worked as principal investigator, is reviewed, with a brief description of the project's objectives, procedures, and findings. Next, the way transaction logging was used in the project will be described, explaining how the log works and what can and cannot be found out through a research methodology using transaction logs. Some software changes are then suggested that online integrated system designers could make to improve the systems from a user-education point of view. Finally, some more general comments are offered about what should be on the program agenda for user education librarians as they are faced with challenges posed by new technology. Throughout this presentation, the focus is on the user and technology first, and only secondarily on the role of instructors.

A brief summary of the objectives, research design, and overall findings of the "Educating the Online Catalog User" study provides useful context for the discussion of transaction logging that follows. The study had four objectives: (1) the establishment of a generalizable instructional model for online catalog user education, based on discussions among librarians at Northwestern, Washington University, and the University of Wisconsin-Madison and expressed through a formal statement of learning objectives; (2) the implementation of a program based on those learning objectives at the Northwestern site; (3) an evaluation of the implemented program, using transaction monitoring as one source of data for the evaluation; and (4) assessment of the viability of transaction logging data for instructional evaluation purposes.

The establishment of a set of learning objectives and an instructional program implementing them were well within the mainstream of established BI practice. A classroom-style presentation utilizing three

large video monitors connected to the catalog to teach the essentials of use of the NOTIS online catalog and use of *Library of Congress Subject Headings* was developed. Two printed brochures were created to teach much of the same material, but in a different medium. For the third and more difficult objective we devised a research design that measured performance of three groups of freshman students on a written test, one group receiving no instruction, the second group receiving the classroom presentation followed by exposure to the printed instructional material, and the third group receiving the printed brochures followed by a classroom presentation. The written test had as one of its elements a series of online catalog exercises, requiring each student to actually input searches and write down information gleaned from the searches; it was not revealed to the students that their searches were also being recorded by the catalog's transaction monitoring facility.

The results of the evaluation are more detailed than can be described here easily, though in a nutshell it was found that students performed best following exposure to the live presentation. The final report to the Council on Library Resources on the project<sup>3</sup> provides considerable detail on all aspects of the study.

What is an online transaction log? A transaction log or monitoring facility records onto a computer disk or tape various aspects of the interaction that occur between a computer system and the human being using it. Typically, the log simply records events as they happen, like a bar code-reading grocery cash register, which prints on the register tape every item and price as the groceries are slid off the belt and into bags. But instead of bread and eggs, the transaction log records keystrokes: usually commands, sometimes other information the user types on the terminal, sometimes information about what the system presents back to the user. Transaction monitoring usually also records the date and time the keystrokes are entered. When the information recorded on the disk or tape is printed out on paper, one may "read" the sequence of events like reading a grocery-store tape, finding out what users

did online just like going over what is in the grocery bag; the only difference is that the transaction log printout does not so easily total the bill, so to speak. Summary data from the transaction logs can be sparse indeed, and I will explore this further a bit later.

In essence, looking at an online catalog transaction log once it is printed out is a way of unobtrusively looking over a user's shoulder as he or she has used the catalog. Should we care about information on transaction logs? We already know that users are enthusiastic about the new technology, that they use the online catalog much more than they ever used the card file, that they are satisfied and need little help or instruction at the terminal. It is the view of this writer, however, that more knowledge is needed about online catalog use.

Why our present state of knowledge is inadequate has to do with epistemological problems stemming from two sources: first, the difficulties with obtaining question responses that are reliable and meaningful, which are inherent in survey questionnaires; and second, difficulties in interpretation we face as researchers because of our relationship to the library organization. The transaction logs have the potential to overcome these problems because they provide a totally unobtrusive observation of online catalog use. Though the logs present problems of their own, they have an advantage of "literalness" in reflecting user experience, giving us a clearer picture of user success with the technology than we otherwise would get.

As a technical occupation concerned with the design and use of particular technologies, we have a stake in the adoption of new technologies.<sup>3</sup> We are not neutral in assessing the values of an online catalog. We want online catalogs to *work*, and that value position influences the way we ask questions of users (whether the questions are on paper or asked in interviews) and how we interpret responses. Transaction logs provide data that are by nature unobtrusive measures, and thus may provide new insights into technical and human performance.<sup>4</sup> For those of us who are particularly concerned with user education, defining our teaching responsibility in relation to the online catalog depends critically

upon what we know of user success with the new tool. If success and satisfaction are widespread, clearly our responsibility is slight and we can go on to other, more important, things. On the other hand, if users are having trouble, we may need to take special steps to correct the sources of difficulty. Either way, it is important for us to know the true situation so as to know how to allocate our instructional resources.

The matter of making judgments based on questionnaire responses has recently received attention in our literature, in an article by James Kidston titled "The Validity of Questionnaire Responses."<sup>5</sup> Kidston's use of a rather ingenious small survey of two groups of M.B.A. students regarding their library use activity calls into serious question results of many of the library user surveys we have relied on in our field. The article has special relevance if we consider the quality of response data from questionnaires *about* the online catalogs as compared to data on actual *use* of the catalog.

Kidston's research objective was to determine how well questions designed to measure frequency of use of the library actually do so when posed with response categories such as *seldom*, *occasionally*, and *often*. He found not only that respondents may have widely differing interpretations of these response categories but that even a single individual may show significant variance in the way he or she defines these categories when applied to different objects such as use of a reserve book or use of an index. Moreover, there was enormous variation in how respondents even defined "use," whether in terms of using a book, a journal, or the library. Kidston concluded that interpreting results of any questionnaire seeking information on library use must be done with extreme caution, as librarians' interpretations of basic concepts like "use" appear quite different from our patrons' interpretations. Though the research did not seek information regarding card or online catalog use specifically, we may easily extend Kidston's conclusions to the by-now well known CLR online catalog surveys of 1982-83. Kidston is simply saying "Beware of survey data," as what one user means by *often* may be the same as *seldom* to another user.

Looking specifically at the overall con-

clusions of the several CLR studies that reported a high level of satisfaction with the catalogs, as librarians we are likely to view "high satisfaction" as indicative of "successful use," just as Kidston argues that librarians attach particular (and perhaps peculiar) meaning to the word *use*. Because this notion of successful use is so critical to anyone's evaluation of the tool, it is important to determine what types of outcomes might be defined as successful use, drawing from our practical experiences in public services.

A catalog search may be successful if it results in finding the call number for a desired book. It might also be successful, paradoxically, if it resulted in an accurate determination that the library did not hold the book. However, a user would judge his or her search successful even if a misspelling or the misformatting of an entry had occurred. There are other ways the online catalog can be misjudged as successful, reflecting in fact more our natural human fascination with computing rather than fair testing and comparison of various results. A subject search that retrieves two books when there are in fact fifty on the topic in the library may be "successful," just as a search with forty-eight false drops might, if the two books in which the user was interested also came up in the retrieval. As Patrick Wilson has carefully argued, these and many other pitfalls beset any catalog user, online or otherwise, though the user dazzled by the CRT has little sense of what its shortcomings may be.<sup>6</sup> Kidston's warnings about the inherent dangers in using survey questionnaires to determine library use are considerably more alarming when we're trying to find out about catalog use.

Another reason for us to be cautious in using survey findings as the principal component of online catalog evaluation studies is the field's overall bias toward "bottom-line" findings—that is, that the critical information from any survey boils down to "we like it" or "we don't like it," thus giving us little notion of how to improve it, but enough information to library decision makers to allow them to make a decision on whether to buy the technology—a classic case of "satisficing." This bias can pervade the library organization, for typically the goal is just to get something that "works,"

however vaguely that may be defined. The result is, of course, a lot of online catalogs that leave much to be desired in their clarity to many users, and that cause a lot of time to be spent by public services staff providing on-the-spot tutorials, explanations, and doing searches for users.

Because of these problems with the use of surveys, we at Northwestern, and other researchers elsewhere, are increasingly looking to transaction log data to provide us information about online catalog use. Transaction records have the distinct advantage of reflecting what users *do*, rather than what they say they do. We are especially fortunate that at Northwestern, with the NOTIS software, we are able to glean a substantial amount of information from the logs, if we make the effort. An important aspect of our recently completed CLR study on educating the online catalog user was to investigate the potential of transaction monitoring data for the evaluation of online catalog instruction.

The NOTIS transaction logs records essentially every keystroke at every terminal dedicated to searching the online catalog, including users who dial up or who access the online catalog on the campus academic computing terminal network. (No recording of terminals in staff areas is done.) Not only is all this user activity—what is called *input events*—recorded, but so are various elements of what the computer responds with, termed *output events*. Among the components of the input event records collected by the logging facility are the date, time, terminal ID, and the entire content of what was entered—say "a-twain mark" for author search or a single-letter command requesting help. This data allows us to see the progress of searches, the false starts, the dogged search for appropriate subject headings by trial and error, the no-expletives-deleted frustrations vented by users on the keyboard. The output event records tell us how many "hits" occur with each search, the type of display or help screen the user is viewing at every stage of the search, and whether a bibliographic record being displayed is for a monograph or serial. What we don't find in these data, of course, is any information about *whose* fingertips are typing away, and since our online catalog requires no initial sign-on or

sign-off, we can't really even tell whether two successive searches on the same terminal were from the same person. The design of this monitoring facility was done by Kenton Andersen and the author in 1982, supported by an earlier CLR grant.

Our educating the online catalog user project gave us the opportunity to work closely with these transaction logs and to experiment with a means of actually tying log data to individual online catalog searches, which is extremely difficult in a natural setting. The work we did with the transaction logs was novel and ambitious, and proved to be time-consuming and complicated, though we have felt rewarded both by what we have learned through the process and by what we see as a more clearly defined path for further work in transaction log research as it may be used in bibliographic instruction evaluation. What we did, in essence, was to use the training setting created in the early stage of the research project as a means to tie *user* data from our subjects to *use* data collected by the transaction logs. In a completely natural setting this tying of different kinds of data would raise not only logistical, but ethical problems as well; recording user searches in the catalog so that the user could be identified easily could be seen as a serious privacy invasion. In an instructional situation, however, with search problems not of the subjects' but of our choosing, we can avoid the privacy invasion problem and maintain the unobtrusiveness of the data collection at the same time. Such a tactic has potential benefit not only for the evaluation of online catalog instruction, but for the evaluation of other systems too.

Monitoring our online catalog users for this BI evaluation project required only that we reserve online catalog terminals for use only by our subjects during the hours that the experiment took place. What we did in fact was to set up sixteen terminals in a large room of the library, all connected to the online catalog so that we could seat groups of subjects together and thus more easily manage both the experiment administration and the extraction of the transaction log records at a later point. The written test, besides seeking demographic, attitudinal, and knowledge of online cata-

log information, asked each respondent to write down the ID number of the terminal at which he or she was sitting. Following administration of the experiment, we put results of the written test in machine-readable form and got a printout of all the ten thousand transaction records, sorted first by terminal ID, then by time. The printout thus allowed us to identify individual performance, and with the pencil-and-paper information we had collected, we were able to match up the transactions with other characteristics.

Our findings on the analysis of the transaction logging are up to this point quite limited, as the processing of the more than ten thousand transactions gathered by monitoring eighty-seven students was the formidable task. Much of the data-processing effort in the project involved analysis of the written test responses, which also included information on the subjects' backgrounds, amount of library use, and attitudes, so that fewer DP resources were available for work with the transaction records. We were able to actually match up each of the records with the responses on the written tests and to count the number of various types of errors made by each respondent. Among our findings was that students who had first had a live classroom presentation made fewer errors than those whose first instructional exposure was to the printed brochures. We also could see through examining the log printouts that boredom with the instructional setting and the test taking was a definite problem, that many students deviated from a strictly sequential approach to answering the test questions, and that many students were not motivated to "practice" their search skills, as was suggested by the written test, but rather concentrated strictly on filling in the blanks on the test. All of these findings have given us useful insights into how our user education can be improved.

In regard to our evaluation of the utility of transaction data analysis for instructional evaluation in general, we offer a number of observations. First and foremost, we view the log data as invaluable to grounding librarians in concrete knowledge about the behavior of users. We can look at user performance directly, not rely-



ing on users' reporting of their performance through the use of questionnaires. Because in our teaching role we typically don't have the sustained contact with students that allows extensive feedback such as the regular academic faculty receive, clear indicators of student performance are important.

Our work with the transaction logs has led us to offer recommendations in the area of systems design rather than bibliographic instruction per se, which I think is interesting in itself. We call for designers to provide a better means for the processing of transaction log data on an on-demand basis for both librarian instructors and end users themselves. It should be possible, in other words, for the type of experiment we conducted to become routine—a way for a librarian instructor to make a group presentation, allow the group to go online with whatever system is being taught, and subsequently receive a machine-generated report of the performance of the group. Going beyond this convenience for librarians, a user should, with a well-designed system, be able to sign onto an online catalog or other online system with a request that his or her performance be tracked in order to give useful feedback. Systems designed exclusively for learning purposes—computer-assisted instruction (CAI)—have already incorporated such feedback mechanisms, but we've not yet seen them designed around what are really "production" systems, such as online catalogs, microcomputer software tools, end-user bibliographic searching, and the like. Interestingly, the feedback that might be provided cannot only improve user performance but system performance as well.<sup>7</sup> As our online catalogs become more elaborated and begin to offer entries to a much wider array of information resources than the traditional catalog was designed to offer, we may come to see that such training feedback will be even more important for the success of those systems.

These comments on the need for systems design improvements lead me to make some more general concluding observations regarding our role as teachers vis à vis the new technologies at hand. It should be clear to all by now that the online catalog is *not* the culmination of the decades of effort made by library automation specialists. The online catalog is but the flow of one stream into a much larger river of change, whose banks and direction are not yet mapped, but whose force may well make much of the now existing terrain unrecognizable in a very few years. Our notions of information access, of print on paper, of the function of libraries in our society are all adrift in that churning water. A teacher as steersman cannot chart a simple and direct course and expect to succeed under these conditions. The currents are too powerful; they are bound to make the straight course impossible. And if teaching is oriented only to the present and not to the future, all is lost, for the map provided the student is meaninglessly out-of-date in a very short time.

What is to be done? I think two things: One, it is important that in our teaching we *not* fixate on the online catalog at all as the object of instruction. Two, expanding on a point suggested more specifically by our work with the transaction logs, we may want in the next few years to transfer some of the energies away from teaching to get more directly involved in systems design ourselves. We need to be better prepared to navigate that new river, and if we take a more active role in experimentation and research with the new technologies, we will be able to carve some channels, to influence the direction of change, so that our users will be better served.

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# A New Direction for Online Catalog Instruction

Betsy Baker

*This paper will explore some of the issues surrounding efforts to introduce the online catalog to users. The processes we have used seem, at least in part, to be motivated by attitudes and psychological perspectives grounded on our increasing interaction with technology. As a foundation for this, relevant research results from a project that was recently completed at Northwestern University will be presented. The project, which was funded by the Council on Library Resources, was entitled "Educating the Online Catalog User: A Model for Instructional Development and Evaluation." Within this context, some of the inherent difficulties and practical concerns in teaching online catalog use will be discussed. By exploring attitudes, examining practical concerns, and stressing the necessity of linking the use of computers in libraries with the use of computers in other facets of life, a new direction for online catalog instruction planning will be offered.*

## INTRODUCTION

Automation has been the instrument of major changes in library operations for many years. Typically, these changes have focused upon technical-service operations with the intention of making them less labor intensive. Although such innovations certainly enhanced library services, they have primarily represented "behind the scenes technology" invisible to most library users. In fact, it is likely that users are not only unaware of such improvements but also are actually uninterested in changes that do not affect them directly.

Library automation became more noticeable to the majority of users during the last decade, as computer-assisted reference services spread. In most libraries, however, it is only with the introduction of the online catalog that information technology at last

becomes directly accessible to the user. The online catalog is only the first in what will be a series of innovations in services for the user. At this point, it is simply the most visible sign of more fundamental changes. But it is exerting a powerful influence on the way libraries are used and information is sought.

With library technology now directly affecting user behavior, we face a new era of library use. We have a new way to search the library's collection, but do we have the vision to develop appropriate, innovative instructional services to accompany this change? We could continue to offer online catalog instruction using the traditional card-catalog analogy; but such an approach does not recognize the value of linking the use of computers within the library to computing applications beyond the library environment. By establishing this

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crucial link in our online catalog instructional programs, we can begin to identify and build on those skills that will become increasingly important in our society. With automation affecting a multitude of facets of our everyday lives, librarians are faced with the challenge of articulating the relevancy of these changes in the library setting.

This paper will explore some of the issues surrounding our efforts to introduce the online catalog to users. The processes we have used seem, at least in part, to be motivated by attitudes and psychological perspectives grounded on our increasing interaction with technology. As a foundation for this, relevant research results from a project that was recently completed at Northwestern University will be presented. The project, which was funded by the Council on Library Resources, was entitled "Educating the Online Catalog User: A Model for Instructional Development and Evaluation." Within this context, some of the inherent difficulties and practical concerns in teaching online catalog use will be discussed. By exploring attitudes, examining practical concerns, and stressing the necessity of linking the use of computers in libraries with the use of computers in other facets of life, a new direction for online catalog instruction planning will be offered.

#### ATTITUDES AND PRECONCEPTIONS ABOUT ONLINE CATALOGS

When libraries close card catalogs, the online catalog can no longer be considered a search option, but rather, an essential tool for basic library use. In most libraries, for the foreseeable future, users will have to be adept in at least two types of searching. They will find it necessary to continue searching the card catalog, with skills (or lack of skills) based on familiarity, experience and guesswork, using a logic sometimes unfitted to an admittedly complex and mysterious manual tool. They will also find it necessary to develop new skills and logical approaches to search the online catalog—an equally mysterious and complex tool, which sometimes embodies proof that what is different is not always better.

As more systems are added—online cata-

logs, OCLC terminals, separate circulation systems, end-user database search services—the mystery of libraries is increased and the variety of skills necessary to gain access to information is multiplied. Lee Jones suggests that users may not be interested in knowing how information is obtained when the searching is done for them.<sup>1</sup> But as direct users of information-access systems, they must now take a more active learning role to adequately fulfill their information needs. It is likely that the user's preconceptions about these new systems affect the way they use them. For example, the mere presence of an online catalog often creates a false sense of confidence concerning the comprehensiveness of its contents and the knowledge required to use it effectively.

At this time, public service librarians face a number of ethical and practical considerations concerning how they can accommodate new technology. Charles Bunge was among the first to discuss the difficulties that might be experienced by reference and instruction librarians in this respect. He pointed out that lack of familiarity or understanding of technological developments might result in loss of professional confidence, and could result in a feeling that one's own knowledge does not match the situations one faces. More specifically, he states, "Our expanded range of information resources, which should add to our ability to respond to the needs of our clients and hence to our joy as reference librarians, all too often, becomes a source of frustration, feelings of inadequacy or lack of competence, and a sense of loss of control over our practice."<sup>2</sup>

As a result, public service librarians are finding it necessary to devote considerable time and effort to technology-related activities as they struggle to master new concepts and develop new competencies.<sup>3</sup> Simultaneously they must attempt to anticipate the possible effects of technology on user behavior and design appropriate methods for educating others in its use.

#### RESEARCH ON ONLINE CATALOG USE

Within the past four years, considerable research on online catalogs was completed.



Much of it provides useful insight into user attitudes about online catalogs. I will not attempt to outline these works here, but virtually all of these studies have revealed that users and even nonusers have a positive feeling about the online catalog.<sup>4</sup> While this news is encouraging, it is not clear what motivates a user to express satisfaction with a particular system. It is not clear whether there is an association between positive attitude and searching performance. Also, it is not clear which criteria should be used to determine what "success" or "satisfaction" mean when discussing searching. While the overall objective of Northwestern University's CLR, "Educating the Online Catalog User" project was to measure the effect of formalized instruction on user performance, some insight into these questions was achieved as well.

Without reviewing in detail the research design or the full objectives of the project, the process used for obtaining data for the study will be described briefly. Since the primary objective of this study was to explore the affect of instruction on user performance, two types of instruction were presented to test groups: a brochure describing how to search the system; and a fifty-minute instructional session (workshop) covering the basics of searching. Two test groups were employed. Both groups received the two types of instruction, but the order in which they were received differed. A control group that received no instruction was used for comparison with the test groups. All subjects were first-year undergraduates attending Northwestern University.

Tests were administered to the groups following each instructional activity. The test questions for accomplishing the evaluation goals of the study were developed to measure the attainment of specific objectives, and were modeled in format after the type of question long used in catalog instruction. All three groups completed questionnaires and worked search problems at terminals. Both questionnaire data and an immense amount of computer-recorded data were gathered. An analysis of these data revealed evidence that teaching improved user performance on the written test, and in a more limited way on the test

requiring use of the online catalog itself. Specifically, it was found that subjects who had attended the instructional session performed better than the other test groups. While this may not be surprising, the fact that the control group performed better than the test group that was requested to read a brochure before answering test questions was interesting.

Since a set of attitudinal questions was included on the test forms, it was possible to analyze the data to see if an association existed between type of instruction and the subjects' attitudes toward the online catalog. It was found that the test group that received the workshop approach exhibited a more favorable attitude on several of the items (e.g., ease of author searches, the use of prompts). In addition, they had a more positive overall attitude toward the online catalog. However, on the whole, all participants held similarly favorable attitudes toward the online catalog. Even though we were able to identify varying levels of searching performance, we did not identify significant variance in the expression of satisfaction between groups.<sup>5</sup>

It is not sufficient to simply know that users are satisfied. And, as suggested by this study, satisfaction does not necessarily indicate that the user is proficient in searching the system. Future research designed to determine which variables contribute to a user's sense of satisfaction may provide further support for the planning of these instructional programs. An instructional session interspersed with known positive reinforcements about using online systems may serve as an ideal teaching method for sustaining interest in a learning activity.

### ATTITUDES ABOUT ONLINE CATALOG TEACHING

A discussion of attitudes, however, is not complete without exploring the attitudes and views of librarians toward teaching the use of the online catalog. Whether we face the prospect of altering or abandoning traditional library systems for new technologies with enthusiasm or skepticism, many of us recognize that the changes affect the foundation of library practice and the fundamentals of library use.

Since the programs developed reflect the personal attitudes of designers, it is important that these attitudes be examined closely. In a recent book, *The Second Self: Computers and the Human Spirit*, Sherry Turkle provided an interesting discussion concerning the relationship between individual attitudes toward technology and the larger social implication of these attitudes.<sup>6</sup> In her discussion with many different types of computer users, she illustrated how personal attributes may be reflected through style in using the computer. She suggests, for instance, that the attitudes of those individuals who are highly enamoured of computers may reflect a need for power and control. A preference of many of these individuals to program at a very basic machine level, she states, illustrates a need to control the computer's most vital functions. A better understanding of the perceptions and attitudes of patrons and librarians is important in order to deal effectively with technology. The primary concern is that a balance be maintained between human considerations and the technology of library automation.

Examining such underlying attitudes is a complicated endeavor, because such sentiments are abstract and difficult to define. In attempting to identify some widely held perceptions of technological developments in libraries and how they affect user education, it is soon apparent that technological accomplishments are interrelated with our attitudes. Attitudes toward technological developments are like the innovations themselves—they build on one another, with each assumption based on a prior conception. One example of this theory may be illustrated by librarians' mixed acceptance of online catalogs, and their belief that users are similarly ambivalent. Or conversely, the librarians' expectation that the enthusiasm they have surrounding the online catalog and accompanying instructional workshops will be received by users with the same degree of excitement associated with their development. It is inevitable that mixed emotions will exist about any major innovation. It is probably also inevitable that we will ascribe our own feelings to our users.

Perhaps the single most important condi-

tion that has influenced the way users have been introduced to the online catalog has been our own excitement and fascination with the online catalog.<sup>7</sup> Of course, a certain amount of curiosity or fascination is a natural response to technological developments. Fascination, however, does not always imply acceptance. Perhaps there is also an apprehensiveness about this change, as it suggests that the card catalog no longer represents the core of how library research is structured. Although it is debatable whether the prominence and importance of the card catalog should have ever been presented as the essence of library research, it cannot be denied that more than a century of work and effort have been invested in its upkeep. In an article titled "Catalog Dependency," Evan Farber informally traced this historical preoccupation, suggesting that many other useful library research techniques have been overlooked or have received secondary mention to the card catalog.<sup>8</sup> He recognizes the fascination librarians have for the online catalog, and cautions that over enthusiastic introductions might result in a parallel dependency on the part of users.

As librarians, we risk holding too much fascination with the online catalog. It is easy to become enamoured of the appeal of technology. However, such an attitude may result in programs that appear to be directed more to marketing efforts rather than teaching efforts. While it is important to present a positive image of the system, there is a danger that excessive enthusiasm may be interpreted by the user as wholesale promotion, resulting in a loss of educational contact and lack of confidence in the instructional endeavor. A preoccupation on our part with the online catalog could lead to atrophy of other services not only in scope but also in content. During the transition phase from a card catalog to an online catalog, it is desirable and even essential to treat the online catalog as a separate and special entity. But this concentration of attention should not necessarily lead to separate instructional programs teaching only online catalog use. A program that focuses exclusively on the online catalog will probably not be welcomed with the same element of enthusiasm that has been invested

in its development. More importantly, isolating instruction on the online catalog from other instructional services and from other information retrieval developments in other settings can have serious consequences. Such programs fail to provide the necessary link between the online catalog and other information retrieval methods, and may fail to capitalize on computing applications with which the user may be already familiar in other contexts.

Since the public does respond to the online catalog positively, librarians can take advantage of public interest by building user awareness of other library tools and services. However, making online catalog training the single goal of an instructional effort may not be sufficiently interesting to attract students. Users are basically pleased with the online catalog as a tool, but for them it is one tool among many and is perceived simply as a means of gaining access to a portion of the library's collection. As such, learning to use the online catalog is a necessity but may not be seen as an interesting endeavor in itself. Since most users express positive feelings about online catalogs we should avoid simple promotional efforts and instead develop a stronger educational stance that integrates online catalog instruction with other educational goals.

### SUGGESTIONS FOR ONLINE CATALOG TEACHING

With research indicating that users like the online catalog but can perform better after instruction, the challenge now faced is in developing programs that communicate the importance of acquiring searching skills. However, determining an appropriate way to do this is a complex task.

First of all, experience has shown us that we cannot expect an isolated program, such as a workshop, to elicit motivation for learning in the user. This has been the experience at Northwestern University and seems to be widely supported by others involved in online catalog instruction. At the 1985 LOEX workshop, which was devoted to the topic of educating online catalog users, many instruction coordinators reported similar experiences of low response to this method of instruction.<sup>9</sup> An instructional focus that centers on teaching the

new tool in terms of the old will not provide sufficient challenge to sustain user interest in the learning activity.

The LUIS Workshops developed in conjunction with the research project carried out at Northwestern University Library were poorly attended, we feel, because they were perceived to offer no more than card catalog instruction, albeit with a new tool. Librarians have always been concerned that users have a false sense of confidence in their card catalog searching skills. With the appearance of the online catalog terminals, we may be implying that library research is now easier than ever; therefore, why should someone voluntarily attend a workshop that is designed to teach something that is perceived to be already mastered?

It also is apparent that we do not need to focus our energies on a marketing venture for the online catalog. However, as a spokesperson for the library, the online catalog teacher often is faced with the dilemma of justifying the positive aspects of the library's choice of a particular system, yet representing its inconsistencies candidly. The challenge of teaching involves much more than simply marketing a product.

Yet the content of online catalog instruction remains an issue of contention. We must decide whether instruction should be organized around procedural matters or conceptual matters. Research in the field of cognitive psychology emphasizes the importance of teaching about the structural framework of an online system. Christine Borgman's work supports the theory that people build mental models of the internal workings of a system whether instruction has been organized around a model or not.<sup>10</sup> A person with a correct mental model has a conceptual understanding of the way the system works and should ultimately perform better. A person with only procedural knowledge has learned a set of rules to apply in interacting with the system but has not organized these rules into a related framework. While the card catalog seems to be the model with which we are most comfortable, it may not be the model that is most meaningful to our users. In fact, as we move forward in our own thinking about

online systems, this model also may no longer be relevant. New models are developing that seem more applicable. Librarians at Carnegie-Mellon are experimenting with designing instruction based on an index model. The online catalog could be described to users as an access index tool similar to standard printed indexes but providing additional access points such as key-word searching.<sup>11</sup> Those students who are familiar with computing concepts are able to associate the idea of an index more readily with the structure of the online catalog. Teaching based on conceptual models may fill the gap between that which the user needs to learn, and that which the system can convey. In no way does such an approach lessen the importance of procedural instructions, but procedures are best learned through using the system and its help screens or other online instructions. Of course, it is necessary to train users about the idiosyncratic features of a particular system. However, concentrating instruction at this level detracts from efforts to build a framework transferrable to other situations.

More importantly, with the variety of computing options available, both within and outside the library, we cannot afford to think of online catalog instruction in isolation from other programs. It is essential that we develop instructional programs that address other applications of technology. In order to do this we must understand more complex concepts about automation ourselves. Many of our uses are operating at a level of computer sophistication or literacy that surpasses that of the librarian.

### CONCEPT-BASED INTEGRATED INSTRUCTION

A more generalized approach to instruction might be better suited for integrating these approaches. Such an approach would likely include explanations of record structure and file organization as elemental building blocks for information retrieval systems. It could also describe the types of indexes to the file that are available and the commands necessary to gain access to the indexes. The online catalog toward which the teaching is directed could serve as an example of a particular implementation of

general principles but not the only possible implementation. Use of other examples such as general database management systems, which commonly are available for microcomputers, would enrich the instruction. Such an approach would likely be more challenging to students and have the great advantage of providing useful information within a broader context.

This approach does relegate to a secondary status many of the details and minutiae about the online catalog that we consider useful. But experience has taught us that much of the detail that we teach is lost anyway, if not changed through technological developments, by the time it is needed. In exchange, a broader approach may gain both better acceptance by students and better transferability to other systems.

### CONCLUSION

Within the library environment, we have found that users naturally gravitate to the terminals of the online catalog because of their novelty and because of the belief that a "computerized" online catalog provides a more efficient and reliable means of linking them to desired information than the card catalog. These gains are important in a society that places value on innovation, speed, comprehensiveness, and ease of use (user friendliness) for all services, whether they be in libraries or elsewhere.

With the adoption of new information technologies like the online catalog, the role of the librarian will, by necessity, change. Some of those changes are potentially undesirable. One possible scenario is the librarian in an information-rich environment with the librarian's role supplanted by that of information-resource manager, with little concern for the content of the information. Such a change signals the abandonment of the librarian as a "knowledge" facilitator. A second scenario finds the librarian emphasizing some tools at the expense of others, thus unintentionally preventing the user from exploring a broader range of information sources. If we consider the value of the educational role of the librarian, avoid the procedural approach to instruction, and retain the concept of "scholarly information," we may be able to avoid these extremes. Integrating



online catalog instruction into a full bibliographic instruction program and making the instruction more generalized prepare both librarians and a new generation of information users for the future.

User sophistication will grow through use of library and other systems. Expectations of ease of use also will increase. If we limit our focus to online catalog instruction, particularly to the mechanical aspects such as backspace keys and error messages, we may fail in our short-range goal of teaching online catalog use and defeat our

long-range goal of educating users in gaining access to information. We need to take responsibility for providing our users with a larger perspective. If we do not get past teaching mechanics or the excitement associated with the online catalog, our instructional efforts may be ineffective.

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# Videotapes, Computer Programs, and the Library

Debra J. Stanek

*As administrator of ALA's Office of Rights and Permissions, part of the Director of Publishing's office, I receive numerous queries regarding library use of copyrighted videotapes and computer programs. I felt that the subject was an urgent one and that ALA should provide some guidance. The lack of case law and the often baffling combination of intricacy and vagueness in the copyright law made consultation with ALA's attorney essential. I asked ALA attorney Mary Hutchings Reed, of the law firm Sidley & Austin, to prepare a paper addressing the issues that librarians had brought to my attention. Reed enlisted Debra Stanek's assistance and the result is the following article as well as a briefer work, "Library and Classroom Use of Copyrighted Videotapes and Computer Software," which appears as an insert in the February issue of American Libraries. These papers express the opinion of ALA's legal counsel. Individuals and institutions deeply involved in copyright matters should consult their own attorneys. —Donna Kitta, administrator, ALA office of Copyright, Rights and Permissions.*

## I. THE COPYRIGHT ACT

Copyright is a right in intellectual property provided for by Article I, Section 8, of the United States Constitution, which empowers Congress "to Promote the Progress of Science and Useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." Congress has exercised this power by creating the Copyright Revision Act of 1976, 17 U.S.C. Section 101 *et seq.* (1976). In effect, the Copyright Act gives the creator of a copyrighted work a monopoly on that work for a time. The primary purpose of this monopoly "lie[s] in the general benefits derived by the public [with] reward to the [copyright] owner a secondary consideration."<sup>1</sup>

The current Copyright Act, a comprehensive revision of the 1909 act, greatly expanded the application of copyright and

tried to provide for developing technology. In 1980, following a report to Congress by the National Commission on New Technological Uses of Copyrighted Works (CONTU), the act was amended by the Computer Software Copyright Act of 1980, 17 U.S.C. Sections 101 and 117, which defined "computer programs" and made the 1976 act applicable to them. Both the 1976 act and the 1980 amendments play important roles in developing policies governing library and classroom use<sup>2</sup> and lending of videotapes and computer software.

The Copyright Act creates and grants to copyright owners a bundle of overlapping rights. Only the copyright owner may exercise these rights or authorize others to do so. These rights are enumerated in Section 106; they are the rights of

1. Reproduction
2. Adaptation
3. Distribution

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4. Public Performance

5. Public Display

All of these rights are subject to "fair use." Briefly, the fair-use doctrine embodied in Section 107 looks at the purpose of the use, the nature of the work, the amount of the work used, and the effect the use has on the market for the copyrighted work. Other limitations on a copyright owner's exclusive rights are provided for in Sections 108-118 of the act.

While ownership of a copyright is a property right, the type of property involved is not tangible. An important distinction made by the Copyright Act is the separation of ownership of a copyright from ownership of the object in which it is embodied (17 U.S.C. §202). Owning a videotape of a copyrighted motion picture or a diskette containing a copyrighted computer program does not give its owner the exclusive rights enumerated in Section 106 (with certain exceptions under Section 109). Likewise, owning a copyright does not necessarily create rights in any tangible objects.

A copyright owner's exclusive rights may be described as follows:

1. Reproduction. Copyright owners have an exclusive right to reproduce or make copies of a work. A copy is an object from which the work can be perceived, or otherwise communicated, directly or with the aid of a machine (17 U.S.C. §101). This right is subject to three general exceptions. The first deals with the special circumstances under which libraries and archives may make copies of a work (17 U.S.C. §108); the second permits limited copying of computer programs (17 U.S.C. §117); and the third of course is fair use (17 U.S.C. §107).

2. Adaptation. Copyright owners also have the exclusive right to prepare derivative works. The adaptation right overlaps the reproduction and performance rights. A derivative work is one which, by definition, is based upon (and therefore may infringe) a preexisting work. (17 U.S.C. §101). One exception to this right is the limited right to make or authorize an adaptation of computer software (17 U.S.C. §117).

3. Distribution. The law also gives copy-

right owners the exclusive right to distribute the work to the public. An important exception to this right is the "first sale" doctrine, which permits owners of lawfully made copies to sell or otherwise dispose of them by rental, lease, or lending (17 U.S.C. §109).

Consequently, once computer software or a videotape is sold outright, the copyright owner has no control over its further distribution—the purchaser can resell, lend, or rent the work; however, such a sale has no effect on any other exclusive rights. It does not authorize reproduction, adaptation, or public performance (owners have some display rights). So while the sale of a videocassette does not permit public performances from the cassette, public performances do not infringe on the distribution right (any infringement would be of the performance right). The subsequent sale, rental, or loan of a copyrighted work by the purchaser is not, in and of itself, an infringing act.

4. Performance. Copyright owners have the exclusive right to perform a work publicly. *Perform* is defined as "to recite, render, play, dance or act it, directly or by means of any device or process or in the case of audiovisual works, to show its images in any sequence or to make the sounds accompanying it audible" (17 U.S.C. §101). Given this broad language, it is clear that the audiovisual component of computer software is capable of being performed. The unresolved issue is when does library or classroom use of videotapes or computer software constitute an infringing "public performance?"

5. Display. Copyright owners also have an exclusive right to publicly display the work; unlike performance, display means to show individual images out of sequence (17 U.S.C. §101). However, like the distribution right, it is subject to the first-sale doctrine. That is, an owner of a lawfully made copy may display that copy publicly.

Unless otherwise excepted, violation of any of a copyright owner's exclusive rights is an infringement (17 U.S.C. §501(a)). Copyright owners have a variety of statutory remedies available to them, including obtaining a court order to stop the actions constituting infringement; impounding the

infringing articles; awards of actual damages and infringers' profits; statutory damages up to ten thousand dollars (up to fifty thousand dollars for willful infringement); awards of costs and attorneys' fees; and criminal penalties for willful infringement (17 U.S.C. §505 and §506).

The existence of these rights and remedies raises a number of important issues for librarians and educators:

1. Do any current or proposed uses of videotapes or computer software by libraries or schools violate copyright laws or other legal obligations?

2. Should videotapes and computer software be treated differently than other library or classroom materials?

3. What steps must librarians and classroom instructors take to prevent infringement while making fullest use of copyrighted materials?

4. To what extent, if any, are librarians and classroom instructors liable for use of copyrighted materials by others—library patrons, students, or the general public?

## II. VIDEOTAPES

Use of audiovisual materials, specifically videotapes, has increased tremendously over the years.<sup>3</sup> Libraries and schools are among those seeking to take advantage of the many educational materials available in the new medium. There are a variety of ways in which libraries and schools make use of purchased videotapes; this paper will attempt to take into account as many of these uses as possible.

Some libraries and schools lend videotapes to patrons and students for outside use. While many provide this service at no charge, some libraries charge a fee for the service—generally it is a nominal amount (a dollar, perhaps) and quite frequently it is earmarked for a fund used to add more videotapes to the collection. Some may even charge a fee greater than a nominal amount while others require a deposit that is returned to the borrower on return of the tape. In addition, some libraries own videotape recorders or videotape players that also may be borrowed.

Other libraries and schools permit in-house viewing of the videotapes. This service too may be provided at no charge or

under one of the fee arrangements already mentioned. The type of supervision over viewing varies from almost none to complete control by library or classroom personnel. Arrangements for in-house viewing range from individual video carrels to private viewing rooms for a small number of people (in which only educational videotapes may be viewed) to large viewing rooms that have no limit on the type of videotapes that may be viewed (i.e., permitting theatrical, feature-length films).

Other arrangements include showing videotapes to large groups in classrooms or library meeting rooms. These groups may be made up of library or school-sponsored club members, students, or the general public. It is also possible that a community or other group might use a library meeting room in order to show a videotape on its own or library equipment.

Many of the above uses are more likely to be employed in the classroom setting or in private rather than public libraries; however, the issues raised by the various uses are essentially the same.

The positions in this paper with respect to videotapes are limited to those cases in which the library or school has purchased the videotapes (as opposed to licensing them). To the extent that a valid license agreement is in effect, the licensee library or school would, of course, be bound by the contractual terms of the license. Portions of the discussion in Part III of this paper might then be applicable.

### A. Library and Classroom Lending

Much of the concern and confusion among librarians and educators as to the legality of library lending and classroom use of copyrighted videotapes is a result of "Home Use Only" labeling and other information supplied by the Motion Picture Association of America (MPAA) and some of its members. Typical "Home Use Only" labels read as follows:

Licensed<sup>4</sup> for private home exhibition only. Any public performance, copying or other use is strictly prohibited. . . .<sup>5</sup>

or

This videocassette is for home use non-public performance exhibition in the United States of America or Canada only. Any other use is not authorized and is prohibited.<sup>6</sup>



Much of this labeling and information is misleading and inapplicable to libraries or schools.

Among the exclusive rights belonging to a copyright owner is the distribution right. One important exception to this right is the first-sale doctrine of Section 109. Under Section 109, anyone who owns a lawfully manufactured copy of a copyrighted work may distribute that copy by resale, rental, or loan. Once a particular copy has been the subject of a "first sale" or other transfer of title (such as by gift), the exclusive distribution right as to that particular copy ceases.

A library or school that resells, rents, or lends a copy of a copyrighted videotape that it *owns* is not infringing on the copyright owner's rights. The actions of the library or school are merely those of distribution—the act of lending does not implicate the copyright owner's other rights (adaptation, public performance, reproduction, public display). The fact that a fee is charged is irrelevant—the right to distribute a copy includes the right to rent it (for a fee, deposit, or otherwise).

Because the right of public display is also subject to the first-sale doctrine, this right is not infringed by displaying the videotapes and their packaging on library or school shelves. To display an audiovisual work is "to show individual images nonsequentially" (17 U.S.C. §101). (See Part II. B.2., Library Use.)

This view is consistent with both the language of the statute and, to some extent, the opinion of the MPAA. The MPAA view seems to be limited inasmuch as it states that "libraries which circulate cassettes *for use at home* do not infringe the Copyright Act."<sup>7</sup> However, libraries and classrooms do not ordinarily inquire where borrowed materials will be used, and such inquiries are not required under the act.

It is important to keep in mind that the copyright owner's exclusive rights include the right to *authorize* others to reproduce, adapt, publicly perform or display, or distribute the work. "For example, a person who lawfully acquires an authorized copy of a motion picture would be an infringer if he or she engages in the business of renting it to others for purposes of unauthorized

public performances."<sup>8</sup> Therefore, libraries and schools should refrain from *appearing* to authorize infringements apart from actually infringing. This can be done rather simply by insuring that the original "home use only" labels remain on the videotapes. Little else is required by the Copyright Act. If a borrower expresses his or her intention to use the borrowed videotape for an unauthorized public performance (an exhibition at a public place for a fee, to take the easiest example), the lender is under a duty to state that such a use may be prohibited by the copyright laws. Generally, liability for unauthorized public performances of copyrighted videotapes should not differ significantly from liability for the public performance of any other loaned materials: books, play scripts, sheet music, films, records, or audiocassettes. After informing the borrower, the lender is not necessarily required to refuse to lend the material.

For these reasons, a library or school that lends videotapes is not a direct infringer of the copyright owner's exclusive rights, nor will librarians and classroom instructors ordinarily be liable for direct copyright infringement when students or patrons use the materials at some place other than their own homes or private places.

It is possible for one to be vicariously liable or a contributory infringer under the Copyright Act.

A well-established principle of copyright law is that a person who violates any of the exclusive rights of the copyright owner is an infringer. . . . To be held a related or vicarious infringer in the case of performing rights, a defendant must either actively operate or supervise the operation of the place wherein the performances occur, or control the content of the infringing program, and expect commercial gain from the operation and either direct or indirect benefit from the infringing performance.<sup>9</sup>

A contributory infringer is one who "was in a position to control the use. . . and had authorized the use without permission."<sup>10</sup>

Ordinarily, libraries and classrooms that lend copyrighted videotapes to patrons and students will not be liable for two reasons. First, as long as the borrower takes the material out of the library or classroom, it will not be a place that the lender actively oper-

ates or supervises, nor will it control the use of the videotape. Second, except in cases where a lender was charging a fee (not a deposit) that was too great to be considered "nominal," the lender will not expect commercial gain from the loan, nor will it benefit from the performance.

This discussion has centered on liability for infringement of the public performance right. The same general principles apply to liability for copying by borrowers. In addition to the "home use only" language, most labels also contain prohibitions on copying. If the lender is asked if copying is permitted, or is informed of a borrower's intention to copy, there is a clear duty to state that it is not authorized. Like the situation described above in the context of unauthorized public performances, there is no clear duty to refuse to lend the material. This is no different than the situation librarians or teachers face concerning copying of any other materials.

A more significant problem arises when video equipment is loaned with videotapes; however, here too it is unlikely that the lender would be liable for the unsupervised use of the equipment. This situation is similar to that of unsupervised library copying machines. Section 108(f)(1) of the Copyright Act provides that a library is not liable for infringing use of unsupervised copiers on its premises as long as the equipment bears a notice that making such a copy may be subject to the copyright law. Nothing in Section 108(f)(1) limits its applicability to paper copiers (therefore video equipment capable of copying would be included), but the notice is only required for equipment on library premises. A notice on recording equipment to be used outside the library is not required (for example, many libraries lend audiocassette recorders with no notice concerning copyright laws); however, it would be a good idea to use them both to educate and warn patrons.

### **B. In-Library and In-Classroom Use**

In the context of in-house use of copyrighted videotapes by patrons and students, the first-sale doctrine loses its importance. The first-sale doctrine is only relevant to the distribution right, which is not involved in in-house use; the main concern is the performance right.

Unlike the lending situation, here the classroom is treated differently in the statutory scheme. This approach marks one of the more significant changes made to the 1909 Copyright Act by the 1976 revision. Under the 1909 act, nonprofit public performances of musical or nondramatic literary works were noninfringing. In contrast, the 1976 act "state[s] the public performance right in broad terms, and then . . . provide[s] specific exemptions for educational and other nonprofit uses."<sup>11</sup> However, the specific exemptions are not exclusive: "the same general standards of fair use are applicable to all kinds of uses. . . . [for example,] the fair use doctrine would be relevant to the use of excerpts from copyrighted works in educational broadcasting activities not exempted under [other provisions]."<sup>12</sup> Therefore library and classroom uses of copyrighted materials may constitute a fair use under Section 107 of the work despite the existence or nonexistence of a specific exemption for other uses.

#### *1. Classroom Use*

Section 110(1) specifically limits a copyright owner's exclusive performance and display rights. It states:

performance or display of a work by instructors or pupils in the course of face-to-face teaching activities of a nonprofit educational institution, in a classroom or similar place devoted to instruction, unless, in the case of a motion picture or other audiovisual work, the performance, or the display of individual images, is given by means of a copy that was not lawfully made . . . and that the person responsible for the performance knew or had reason to believe was not lawfully made [is not an infringement] (17 U.S.C. §110(1)).

All of these requirements must be met in order for the classroom exemption of Section 110(1) to apply.

First, the performance must be by instructors or pupils. This is to prevent performances of copyrighted works in the classroom by persons from outside the school, although "instructors" may include guest lecturers if their instructional activities are confined to classroom situations. "Pupils" generally refers to enrolled class members.

Second, the performance must be in connection with "face-to-face teaching activi-

ties." This requirement is designed to prohibit broadcasting and transmissions to the classroom from outside; therefore, while it is not necessary that the instructor and pupil be able to see each other, they should be in the same building or general area. "The 'teaching activities' exempted by the clause encompass *systematic* instruction of a very wide variety of subjects, but they do not include performances or displays, whatever their cultural value or intellectual appeal, that are given for the recreation or entertainment of any part of their audience."<sup>13</sup> The entire audience must be involved in the teaching activity, not just a substantial part.

Third, the teaching activities must be those of a nonprofit educational institution.

Fourth, the performance must be in a "classroom or similar place devoted to instruction." This clause includes classrooms and other places similarly used for systematic instructional activities; this may be a library, gym, auditorium, or workshop, provided it is used as a classroom.

Finally, the classroom exemption will not apply where the videotape was not lawfully made and the person responsible either knew it was not or had reason to believe that it was not.

Most educational classroom uses of videotapes fall under Section 110(1). As long as Section 110(1) applies, it is not necessary to purchase special classroom licenses to publicly perform copyrighted materials in this manner. To the extent that the exemption does not apply, the fair-use doctrine may permit some other classroom uses. (See Part II.B.2., Library Use.)

## 2. Library Use

Because a library may be "a similar place devoted to instruction" the classroom exemption also protects public performances in libraries that meet the requirements of Section 110(1) discussed above. Where such performances do not fall under Section 110(1), they may be infringing public performances. It is clear that a library's performance of a videotape to a large group of persons would, in fact, constitute a public performance as it is defined by the act. In addition, previewing, in which prospective borrowers are permitted to view portions of

the videotape prior to borrowing it, constitutes an infringing public performance when done in public areas. Previewing by an individual in a private room in a library is probably a fair use for the reasons to be discussed.

What about libraries that permit individuals or small groups of persons to watch videotapes in private viewing rooms? Such performances are public performances, but they may be a fair use of the materials and therefore not infringing.

In the case of a videotape, showing its images in any sequence or making its accompanying sounds audible constitutes a performance. Under the Section 101 definition of *publicly*, even performances in a private room in a library would be public because a library is a place open to the public.<sup>14</sup> Therefore, such performances are infringing unless they can be said to be fair uses of the copyrighted work (17 U.S.C. §107).

Section 107, which codified the law under the 1909 Copyright Act, lists four of the factors that are to be considered, among others, in determining whether a use is fair. These include the purpose and character of the use; the nature of the work; the amount and substantiality of the use compared to the whole work; and the effect the use would have on the market for the original work. None of these factors is by itself conclusive nor is it clear how much weight should be given to each. Applying these factors to in-library lending and viewing of videotapes indicates that under certain circumstances such uses will be fair.<sup>15</sup>

First, lending for in-library use is generally nonprofit. The only exception would be the unusual case in which the library charges more than a nominal fee for such a service. The purpose of many in-library uses will be educational, including use for comment, research, criticism, and independent study. Where they are not, such uses still benefit the public in that they convey information, promote public interest in literature, arts, and sciences, and promote intellectual freedom. The Supreme Court has rejected the argument that only "productive" or creative uses may be fair uses.<sup>16</sup> Most fair-use cases, though, have involved productive uses of the original work—the would-be infringer adds an original contri-

bution or has a scholarly purpose.

The second factor looks at the nature of the copyrighted work. The fact that a particular work is audiovisual in nature is important because the only way the public may perceive or get the benefit of the work is by performing it. On the other hand, one may perceive a printed work by reading it; performance requires something more (recitation, for example). One person watching a copyrighted videotape in a private room in a library is like a person reading a book in the library. It is only the nature of the work itself, which requires a showing of its images in order to be perceived (performances under Section 101), that turns the private viewing into a public performance. Anyone may take a book off a shelf and browse through it to determine whether it is appropriate personal reading or appropriate for another (a child, perhaps) before borrowing it. It is entirely reasonable to permit the same person to preview a videotape for similar reasons.

In this respect, it makes sense to treat videotapes like records and audiocassettes. Individuals may listen to them while in the library because Section 114 specifically limits the performance rights of an owner of copyright in sound recordings.

In addition, some libraries limit borrowing privileges to library-cardholders, while permitting unlimited in-library access to noncardholders. If in-library viewing is not a fair use, noncardholders, as well as those who do not have video recorders or players at home, are denied all access to videotapes.

This second factor has been aimed primarily at copying the original work, but some of the considerations that arise under it are relevant here. These include whether the work is available elsewhere; whether it is factual or creative; and whether its creation represents a substantial investment of time and labor. Most videotapes may be available for home rental from a video store—rentals for which the copyright owner receives no compensation due to the first-sale doctrine. Many library videotapes may be "creative" works, though a significant number are educational or instructional. On balance, this consideration is not helpful; even instructional videotapes have

creative elements of style and presentation. Admittedly, most, if not all, feature and instructional videotapes represent "a substantial investment of time and labor made in anticipation of a financial return."<sup>17</sup> However, this consideration must also be viewed in light of the first-sale doctrine. Once a particular copy of a copyrighted videotape is sold, no further financial return is anticipated from that copy.

The third factor is based upon the amount of the work that is used. By its nature, performance of a videotape will likely be a performance of the entire work.

Fourth, the effect of the use on the market for the copyright owner's original work must be considered. This factor is "widely considered to be the most important."<sup>18</sup> The Constitution clearly states that authors shall have exclusive rights to their writings secured in order to promote the arts and sciences. Uses that destroy or greatly harm the market for the copyright owner's original work would provide little incentive for authors to continue to create.

In-library viewing in private rooms by individuals has little effect, if any, on the market for the original work. There are several reasons why it is not reasonable to assume that someone viewing the videotape in a library would otherwise purchase a copy. First, it is just as likely as not that the person does not own a video recorder; therefore he or she would never purchase a videotape. Second, given the ready access to video rental stores, it is more likely that the person viewing the videotape in the library would either borrow or rent a copy to view at home before buying one. Third, the impact on the market is similar to that of libraries on book or magazine publishers. The magazine industry, for example, loses sales when people regularly read *Time* or *Newsweek* at the library, in the same way that other book publishers do. This again highlights the distinction between printed matter and audiovisual material—the only equivalent to silently reading a book or magazine in the library is a "performance" that, under the current interpretation of the copyright law, must be deemed a public one.

Finally, it may be that the copyright owners, when selling videotapes to libraries



and schools, directly or through their agents, are put on notice of ordinary library and classroom uses of the materials. They ought to be aware that ordinary use for these institutions includes use on the premises by patrons and students.

It is important to keep in mind the reason why most fair-use cases deal with reproduction rather than performance: the effect on the market is clearer. After fair-use copying, the person making the copy actually has a tangible copy of the work in which the copyright is embodied. In many cases the copy is of as good quality as the original. The user may then retain the copy, getting the benefits of ownership (limited of course to possession rather than rights of disposal), without the copyright owner receiving his or her reward. This is not the case in the limited type of performance under discussion. Given the widespread concern about unauthorized copying of copyrighted videotapes, as well as computer software, it would be anomalous if a library patron might freely borrow a videotape for use outside the library but might not watch the videotape in a supervised and controlled environment where copying would be much more difficult, if not impossible.

For these reasons, it is reasonable to assume that performance of a copyrighted videotape with no user fee in a private room in a nonprofit library or school, where it is viewed by a single person, is a fair use of the videotape.<sup>19</sup>

Libraries that have meeting rooms open to the public may also face questions of liability for public performances that take place in them. The library might be liable by appearing to authorize public performances (rather than actually doing the performing) under circumstances in which it might be in a position to control the use of the copyrighted works.

Several courts have held that a landlord is not a contributory infringer merely by virtue of the fact that he provides the premises whereon infringing works are publicly performed or sold. As mentioned earlier, active supervision of the place where the performances occur plus commercial gain from the operation and benefit from the actual performance make one an infringer. In

some cases libraries would be actively supervising meeting rooms and getting an indirect benefit from the infringing performance, although no commercial gain from the operation of the room would result.

Even in the absence of commercial gain, the most prudent course would be similar to that for lending videotapes. Upon being informed of or being asked about a potentially infringing use, there is a duty to state that the proposed use is not authorized. The case here seems slightly stronger for refusal to lend the materials or give access to the room, although the duty is still not clear (and may depend upon the individual library policies concerning such rooms). A safe course would be to require those using meeting rooms to secure all necessary licenses and to indemnify the library for any failure to do so.

Merely by providing the equipment—the video recorder or player—the library is not liable. In the recent *Sony* (Betamax) case, motion picture producers tried to argue that the producers of the video recorders were contributory infringers; however, the Court rejected an argument based upon the fact that people might use the equipment to make unauthorized copies of copyrighted material. When the library provides the place, the equipment, and the copyrighted work, the case is less clear, and the library may be under some duty to post a notice in the room or on its equipment apart from any “home use only” label on the particular videotape. Such a notice might state that many videotaped materials are protected by copyright and that unauthorized copying may be prohibited by law.

Library or school performances not discussed here will ordinarily require permission of the copyright holder and will probably require payment of a special fee for a public performance license. The procedures for obtaining such permission and license are similar to those for obtaining permission for public performances of motion pictures.

The fair-use provisions in the Copyright Act are among the most difficult to be found anywhere in the law. The act therefore provides that any employee of a nonprofit educational institution, library, or

archives, who "believed and had reasonable grounds for believing that his or her use of the copyrighted work was a fair use under Section 107" is exempted from statutory (but not actual) damages for *reproduction* only (17 U.S.C. §504(c)(2)(i)). However, any employee who tries to stay within the ALA guidelines should have an adequate good-faith defense in the case of an innocently committed infringement, and statutory damages may be reduced, at the discretion of the court, to one hundred dollars.

In addition, it is unlikely that libraries would face any liability for infringement by users. Indeed, the only way a library patron might infringe in the library would be by copying the videotape. One cannot ordinarily make a copy using only one machine; but a prudent course might be to post a notice similar to that posted on unsupervised copying machines pursuant to Section 108(f)(1).

In addition to the right to lend videotapes for in-house use and a limited right to authorize performance within the library, Section 108 gives libraries and archives limited rights to reproduce copyrighted audiovisual works.

Subsection (c) authorizes the reproduction of a published work duplicated in facsimile form solely for the purpose of replacement of a copy or phonorecord that is damaged, deteriorating, lost or stolen, if the library or archives has, after a reasonable effort, determined that an unused replacement cannot be obtained at a fair price. The scope or nature of a reasonable investigation to determine that an unused replacement cannot be obtained will vary according to the circumstances of a particular situation. It will always require recourse to commonly known trade sources . . . in the normal situation also to the publisher or other copyright owner. . . .<sup>20</sup>

Section 108(h) permits libraries to copy and distribute audiovisual news programs provided it includes a copyright notice, is not done for commercial advantage, and the library is either open to the public or open to members of the public doing research in a specialized field. With the exception of these circumstances, libraries generally may not copy copyrighted videotapes. It is unlikely that other types of copying would be a fair use.

### III. COMPUTER SOFTWARE

With the advent of the personal computer, use of and demand for computer software has skyrocketed. Computers have natural applications to classrooms and libraries.<sup>21</sup>

As with videotapes, the arrangements under which computer software (and hardware) is loaned to library patrons or students and used on premises varies greatly from institution to institution and raises essentially the same issues, with one important exception. Most computer software purports to be licensed rather than sold. Frequently the package containing the software is wrapped in clear plastic through which legends similar to the following appear:

You should carefully read the following terms and conditions before opening this diskette package. Opening this diskette package indicates your acceptance of these terms and conditions. If you do not agree with them you should promptly return the package unopened and your money will be refunded.<sup>22</sup>

or

Read this agreement carefully. Use of this product constitutes your acceptance of the terms and conditions of this agreement!<sup>23</sup>

or

\_\_\_\_\_ is licensed on the condition that you agree to the terms and conditions of this license agreement. If you do not agree to them, return the package with the diskette still sealed and your purchase price will be refunded. Opening this diskette package indicates your acceptance of these terms and conditions.<sup>24</sup>

In the absence of authority to the contrary, one must assume that such licenses (which are unilaterally imposed by producers) are in fact binding contracts.<sup>25</sup> Therefore by opening and using the software, the library or classroom may become contractually bound by the terms of the agreement wholly apart from the rights granted the copyright owner under the copyright laws.

Following the legend are the terms and conditions of the license agreement. The terms vary greatly between software producers and sometimes between programs produced by the same producer. Many explicitly prohibit rental or lending, some limit the program to use on one identified

computer or to one user's personal use.

Where software is licensed rather than sold, the first-sale doctrine of Section 109 is not applicable, therefore restrictions on lending and rental are contained in the license agreement control.

### A. Library and Classroom Lending

Generally, the terms and conditions of each software package's license agreement will control whether the software may be loaned to students or library patrons. The license agreement is a contract that should be carefully reviewed in order to determine whether the anticipated use of the software is permitted. If the use to which the library or school wants to put the software is not permitted, the producer or its agent should be contacted in order to amend the agreement. Many producers will readily agree to library lending of software—such agreements should be confirmed in writing shortly after they are reached.<sup>26</sup>

Some libraries and schools may insure that they will be able to lend or otherwise use the software by including a statement on purchase orders to the effect that the order should not be filled unless the computer software may be loaned to patrons for home use or used in the library. Just as opening the software packaging results in accepting the terms of the license agreement, filling the order results in accepting the terms of the purchase order. In case of a conflict between the two forms, the earlier one generally will control.

Libraries face liability for breach of contract for any violation of the terms of a valid license agreement, though the likelihood of suit is minimal and damages may be difficult to prove.

While a significant portion of computer software is licensed in the above manner, some is sold protected only by copyright. The Copyright Act gives significant protection to computer software. The copyright owner of software has the same exclusive rights granted by Section 106 as the copyright owner of any other work: reproduction, adaptation, distribution, public performance, and public display. From the copyright owner's point of view, the most important of these is the reproduction right.

The copyright owner has the exclusive right to copy or authorize the copying of the program except to the extent that it must be copied in order to be used. Because mere input of a copyrighted work into a computer results in making a copy (for example, software is loaded from a diskette into a computer's memory; the diskette containing the program may be removed, but a "copy" of the program remains in the computer), Section 117 of the act permits the owner of a computer program to make or authorize making a copy of a program provided that making the copy is an essential step in using the program.

A copy also may be made for archival purposes, provided that the archival copy is destroyed when possession of the original ceases or is transferred along with the original program. The purpose of an archival copy is to have a backup in case the original is damaged or destroyed. Some libraries or classrooms may copy the program and circulate the copy. As long as the original is stored (i.e., "archived") and only *one copy at a time* is in use, there is little likelihood of an infringement action.<sup>27</sup>

In addition, if the circulating copy is damaged or destroyed, the archival copy may then be copied in order to continue having one circulating copy and one archival copy. While this is not explicitly set out in the statute, it is implied by Section 117. Because the purpose of the archival copy is as a backup, once the original is damaged or destroyed, the archival copy may be used. The authority for making another archival copy may be found in the language of Section 117, which provides that the owner of a program may make "*another copy*" provided that it is for archival purposes. The owner of a program may always have one copy for use and one archival copy of the program. Further, Section 108(c) may permit copying of software under limited circumstances. (See Part II.B.2., Library Use.) Making any other copies is an infringement for which libraries or schools may be liable unless such copies can be said to be a fair use.

Section 117 also gives the owner of a program the right to adapt or to authorize an adaptation of the software as an essential step in using the program (for example,

adapting the program to the owner's hardware). Such an adaptation may, like a copy, be archived, (17 U.S.C. §117(2)), but the ownership of the adaptation and its archival copy may not be transferred without the permission of the copyright owner.

Unless a license agreement precludes it, the first-sale doctrine applies to software in the same way it applies to copyrighted videotapes. Therefore, libraries or classrooms may lend software to patrons and students. The first-sale doctrine also would permit display of the software in the library or the classroom—most licenses do not preclude this.

Finally, the copyright owner has public performance rights as well. The definition of perform includes "render[ing] . . . it . . . by means of any device or process or in the case of audiovisual works . . . show[ing] its images in any sequence or . . . mak[ing] the sounds accompanying it audible" (17 U.S.C. §101).

'Audiovisual works' are works that consist of a series of related images which are intrinsically intended to be shown by the use of machines . . . together with accompanying sounds, if any, regardless of the nature of the material objects, such as films or tapes, in which the works are embodied (17 U.S.C. §101).

From these definitions it is apparent that computer software may be an audiovisual work capable of performance. Courts have expressly recognized that computer program copyrights connected with video games are protectible apart from the audiovisual copyrights.<sup>28</sup> To the extent that every computer program is capable of performance the same issues of infringing public performances that exist with respect to videotapes exist here, though to a lesser extent. In most cases the performance component will be so minimal (in a word processing program, for example) as to be insignificant.

#### B. In-Library and In-Classroom Use

Where library patrons or classroom students are using copyrighted computer software in-house, the same public performance issues discussed in Part II are raised, although the problem is simpler in this context. First, the classroom exception may apply to any uses that meet the face-to-face

teaching requirements mentioned earlier. Second, to the extent that the classroom exception does not apply, such performances are more readily seen as fair uses—given the proportionately small portion of a program that the audiovisual component makes up. Third, even video games that rely heavily on the audiovisual component rely less on it than videotapes (where the audiovisual component is the entire copyrighted work). In any case, individual use in the classroom or library is a fair use in the same way that individual viewing of a videotape would be.

Generally, however, the license agreement will control how the software may be used in the library or classroom. Many licenses preclude use of the program on more than one machine *at the same time*. For example, a teacher ordinarily would not be able to take one copy of a program and load it into several machines for use at the same time by different students. Nor would it be permissible to load the program into one computer that may be accessed and used on several different terminals. In addition to being prohibited by almost all license agreements, such a use also violates copyright laws concerning reproduction rights. Section 117 permits the owner of a program to make a copy as an essential step in using the program. In the above examples, the use to which the program is put results in the creation of several copies.

It may be possible that some copying of computer software by libraries and schools will be fair uses, but is unlikely that copying an entire program, except as permitted under Section 117, will ever be fair use given the effect such a copy has on the market for the original work. Liability for infringements is also similar to liability for videotapes. If asked about, or aware of, unauthorized uses, the library or classroom personnel have a duty to state that such a use is not permitted. Under a license agreement this duty may be greater or more explicit; certainly any copies that are circulated must bear the appropriate copyright notices. This is especially true when the original software is being archived and a copy is being circulated.

Given the relative ease of copying software (contrasted to videotape copying,



which ordinarily requires two pieces of equipment), a prudent course would be to post notices on the hardware similar to those posted at unsupervised copying machines. Such notices may be required by Section 108 of the act, which refers to "unsupervised reproducing equipment," in order to avoid liability for patrons who use the equipment to copy software. If one can make a copy using the hardware it is probably "reproducing equipment," and "unsupervised" probably includes computer hardware that is not actually operated by library personnel, although they may either be involved in its operation (turning on the equipment, etc.) or in the same room with it.

Further, liability for breach of contract will exist where the terms of a license agreement have been violated.

#### IV. CONCLUSION

In conclusion, while the Copyright Act grants broad protection to copyrighted videotapes and computer programs, it also contains sufficient leeway to permit a variety of classroom and library uses. The key to making fullest possible use of any copyrighted material is an appreciation of the basic rights granted to authors by the act and an understanding of some of the exceptions to those rights.

#### ACKNOWLEDGMENT

The author gratefully acknowledges the contribution of Mary Hutchings Reed, a partner in the law firm of Sidley & Austin, Chicago, and counsel to the American Library Association.

#### REFERENCES AND NOTES

1. Sony Corp. v. Universal City Studios, Inc., \_\_\_\_\_ U.S. \_\_\_\_\_, 104 S. Ct. 774 (1984) (citing *United States v. Paramount Pictures*, 334 U.S. 131, 68 S. Ct. 915 [1948]).
2. For the purposes of this paper, *in library use*, *in classroom use*, and *in-house use* refer to use in the library, classroom, or other premises by the public, library patrons, or classroom students. This paper is not intended to address institutional use in a library, classroom or other setting by librarians, teachers, or other employees (for example, use of computer software for payroll or accounting purposes), although portions of it may, in fact, be applicable to such uses.
3. For the purposes of this paper, *videotapes* includes videocassettes and videodisks.
4. The use of the word *licensed* does not create a licensing agreement, which, as noted, might require permission of the licensor to engage in use outside the home. Generally this language is merely intended as a restatement of copyright law rather than a condition of sale. It is unlikely that these conditions are valid license restrictions where videotapes are sold to libraries by a manufacturer or its agent. See *RCA Mfg. Co. v. Whitman*, 114 F.2d 86 (2nd Cir. 1940) (legend "Not Licensed for Radio Broadcast" held invalid).
5. *Walt Disney Productions v. Walt Disney Home Video Label*, "American Heroes" (1983).
6. Letter from Burton H. Hanft to Jerome K. Miler (Aug. 12, 1983).
7. Letter from Burton H. Hanft to Jerome K. Miller (Aug. 12, 1983) (emphasis added).
8. H.R. 1476, 94th Cong., 2d Sess. 61 (1976).
9. H.R. 1476 at 159.
10. Sony, \_\_\_\_\_ U.S. \_\_\_\_\_, 104 S. Ct. at 786.
11. H.R. 1476 at 62.
12. H.R. 1476 at 65.
13. H.R. 1476 at 81.
14. One court has said "[t]he relevant 'place' within the meaning of Section 101 is each of [defendant's] two stores, not each individual booth within each store." *Columbia Pictures Industries v. Redd Horne, Inc.*, 749 F.2d 154, 159 (3rd Cir. 1984).
15. Before looking at each of these factors, it is important to note that fair-use cases and the portion of the House report discussing fair use generally deal with reproduction rather than performance. However Section 107 explicitly states that all of the exclusive rights enumerated in Section 106 are subject to fair use. The House report also suggests that the four criteria are applicable regardless of the use to which the work is put.
16. Sony, \_\_\_\_\_ U.S. \_\_\_\_\_, 104 S.Ct. at 795 n.40.
17. *MCA, Inc. v. Wilson*, 677 F.2d 180, 182 (2d Cir. 1981).
18. *Triangle Publications v. Knight-Ridder Newspapers*, 626 F.2d 1171, 1177 (5th Cir. 1980).
19. A single viewer is a minimum. A larger audience might constitute a fair use (i.e., a parent and child, several members of a film class,

etc.). However, charging a user fee or permitting more than one person to view the work increases the likelihood that the use would not be fair (the less like reading a book or magazine the activity becomes). Permitting a greater number would also put librarians in the position of inquiring and making judgments about the purposes of the use, which is not in keeping with other library policies concerning rights of access, privacy, and intellectual freedom.

20. H.R. 1476 at 75-76.
21. For the purposes of this paper, *computer software*, *computer program*, and *software* refer to computer programs as defined in Section 101 of the Copyright Act, "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result" in the form of floppy or hard disks, computer tapes, or any other form in which the program may be physically inputted into a computer (i.e., not including written statements).
22. International Business Machines Corporation, IBM Program License Agreement.
23. Software Arts, Inc., Software Arts License and Warranty Agreement, VisiCalc Advanced Version for the IBM PC/XT.
24. Micro Solutions, Inc., UniForm End User License Agreement.
25. This view is not inconsistent with the view expressed earlier that "licensed for home use only" language on videotapes is not binding for two reasons. First, the language on videotapes may be read as a restatement of the copyright law. Second, the software producer is more clearly making the software subject to the terms of the license by giving the licensee (purchaser) the option to accept the terms by opening the package or reject them by returning it for a full refund.
26. The real concern of software producers is unauthorized reproduction of computer software. Copying of software is cheap, relatively easy, and damaging to the market for the original software because a copy of a program is just as good as an original, unlike copies of videotapes and audiotapes or phono records, which deteriorate after a few generations of copies. As a result, many producers have no objection to lending if safeguards against unauthorized copying exist.
27. The language of Section 117(2), which permits archival copying, actually requires that the "new copy . . . [be] for archival purposes only."
28. *Midway Manufacturing Co. v. Strohon*, 564 F. Supp. 741 (N.D. Ill. 1983). ■■

# Communications

## Networking Using a Multiuser Microcomputer System

Sharon A. Keller and Susan E. Jones

### INTRODUCTION

The Health Sciences Library at the State University of New York at Buffalo is using a TRS-80 Model 16 microcomputer with XENIX, a UNIX operating system, to implement a networking project for the Library Consortium of Health Institutions in Buffalo. The consortium consists of the libraries of the eight teaching hospitals affiliated with the university's medical school. Goals of the project are to establish an online union catalog of monographs, serials, and audiovisuals capable of being searched and updated at remote locations; an electronic mailbox for transmission of interlibrary loan requests, computer searches, messages, and a newsletter; and to generate statistics for collection development and periodic listings of new journal, book, and audiovisual acquisitions. Each hospital library can access the system using a microcomputer and a modem. The system can presently accommodate three users simultaneously at 300 or 1200 baud.

When the Library Consortium of Health Institutions in Buffalo was formed in 1981, its stated purpose was to provide more effective library and information services to meet the educational and health-care needs of the eight member institutions. The institutions all serve as affiliated institutions of the School of Medicine of the State Univer-

sity of New York at Buffalo in their role as teaching hospitals for the university. A close relationship has existed between the libraries of these eight institutions and SUNY at Buffalo's Health Sciences Library, primarily because of the need for interlibrary loan networking. The urgent nature of their patient-care requests required the development of a faster and more efficient networking system. This was set as a high priority when goals were established for the consortium. To establish this network, it was determined that it would be necessary to create an online database of monograph, audiovisual, and serial holdings. Previously, the members had no access to the monograph and audiovisual holdings of the other institutions. The method for identifying monograph and audiovisual holdings was to telephone members randomly—a time-consuming duty for the borrower and the lender. The capability of searching a database online and for members to be able to add, delete, and alter their own holdings information was seen as highly desirable. A database of serials holdings would be beneficial also, although an outdated microfiche union list of serials was in existence, so the need for it was not as urgent.

The capability for generating periodic listings of new acquisitions for each member and listings of holdings by broad subject area were other requirements for the system. These listings would be used as a current awareness tool for the institutions.

An electronic mailbox system for transmitting interlibrary loan requests and other messages was necessary to replace the system of telephoning or mailing requests. Eventually, a program could be written to analyze the requests for collection development purposes.

Other capabilities that were desirable but not as urgent were compilation of statistics, serials management, production of catalog cards, a circulation system, and on-

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line bibliographic database searching.

To implement the goals, Radio Shack equipment was chosen because the Information Dissemination Service Office of Health Sciences Library where the microcomputer was to be housed was already using a TRS-80 Model II microcomputer, and it was felt that compatibility between the pieces of equipment would be beneficial to the office staff. At this time, Radio Shack was testing its new Model 16, a multiuser system that would allow simultaneous access by three terminals. The system seemed ideal for the consortium's needs, because it was small enough that it did not need the climatic and personnel requirements of a minicomputer system, and large enough to accommodate the eight members of the consortium, along with the three primary databases of monographs, serials, and audiovisuals.

To purchase a system that was not yet on the market and that was the only system of its kind was a risky endeavor. It soon became evident that developing the system required much more time than had been anticipated. Training classes at Radio Shack were helpful, and the staff at Radio Shack gave much-needed assistance with the implementation of the project. Eventually, however, a consultant was hired to help with specific problems, such as working with consortium members on compatibility of their microcomputers with the system, and installing a second hard disk when it became necessary.

The consortium decided that each member library would need to acquire a microcomputer to access this multiuser system. Microcomputers were recommended for purchase because of their capabilities beyond dumb terminals. However, once the Model 16 had been purchased, the consortium hospital administrators were reluctant to endorse the purchase of microcomputers for their hospital libraries until it could be proven that the system would work. Several institutions offered the assistance of their data-processing personnel. A Technical Advisory Committee was formed, consisting of members of four of the hospital data-processing departments. It was their charge to study the plan for the

project, assist with any technical problems, and make a recommendation to the board of directors of the consortium. The committee met and decided that they needed to see a demonstration of the system in operation. The committee was able to draft a favorable report to the board, despite problems that occurred during the demonstration (such as being cut off from the system due to switchboard-controlled telecommunications). But this did prove the need for the institutions involved to have a separate outside telephone line for telecommunications installed for the microcomputers, rather than use a telephone line that is connected to a central institutional switchboard. The added cost of having this type of telephone line installed is easily justified by the savings in frustration of being inadvertently disconnected from the host because of a switchboard-controlled telephone system. The librarians who attended the demonstration were also pleased with the results.

The equipment used for this project includes the TRS-80 Model 16 multiuser microcomputer with 512K internal memory, 2 floppy disk drives, a 12-megabyte external hard disk and a 15-megabyte secondary hard disk. The software packages purchased for the project were the XENIX operating system and development system, Profile 16 (a relational database management system), and a spreadsheet package, Multiplan. The software licensing policies for these software packages allow multiple users to access the databases set up with Profile and the spreadsheets set up with Multiplan. The microcomputers at the libraries of the consortium members would be emulating terminals to access predefined spreadsheets and information in the databases. Because the actual software packages were not being transmitted to other microcomputers, the software license was not being violated.

The three primary databases of consortium holdings contain 2,200 monographs, 1,100 serial titles, and 800 audiovisuals. Each record includes the basic bibliographic information necessary for identifying the item (author, title, publisher, date, edition, call number, and location) on a



second screen. Each institution has the ability to add records to the databases and to add or change its own holdings information. It cannot delete a record or change holdings information of other institutions. The XENIX development system has an electronic mailbox subsystem that stores interlibrary loan requests and other messages until they are called up by the destination institution. At this time, requests for interlibrary loans must be typed manually. A future enhancement of the system will be the ability to generate an interlibrary loan request once a record has been called up and a location has been identified.

The union lists of serials, monographs, and audiovisuals were input in four to five months using a part-time student assistant. It was during this period that a second hard disk was added to the system because the software and records took up much more space than was originally allocated. From the beginning of the project, unsuccessful attempts had been made in trying to communicate with an Apple IIe at the library of the Research Institute on Alcoholism, the only member of the consortium that already had acquired a microcomputer. The consultant recommended trying the communications software package Teleterm for the Model 16 system. The Research Institute purchased Softerm, so they can now send their interlibrary loans through the electronic mailbox and are able to search the three union lists online with no difficulty.

The goals of the project have been uneven in their rate of attainment. Some goals planned for the future were easily accomplished, and some are impossible with this particular system. Individual members must approach some of the goals separately and fulfill these needs within their own institutions.

A list of new acquisitions would take a fair amount of programming using this system but will be available soon. Because all of the members of the consortium are hospitals except for one, they don't often request materials published before 1979; therefore, no funding has been provided by the consortium for inputting pre-1979 records. Addition of new acquisitions information into

the databases for members who do not yet own microcomputers is done by the IDS staff as time is available. Within the next year, each member library should have its own microcomputer and be able to input records at their own site.

Newsletters can easily be typed on the system and sent to consortium members' mailboxes by using the electronic mail facility built into XENIX. The consortium has planned an online newsletter, but is waiting until all members have their microcomputers and equipment to begin its production.

Statistics are the main focus of the programming being done at this time. A special version of the Multiplan spreadsheet facility is installed on the hard disk. An individual user can call up the facility with a single command once they are logged on to the consortium's online network. Access to the bibliographic databases is very similar and just as easy. A user may have a large number of individual spreadsheets, with up to eight interrelated sheets. Currently, each member sends ILL statistics to the IDS office each month and the information is compiled by IDS staff, a very time-consuming and laborious process. Eventually, individuals may be able to input the required information into a predefined spreadsheet, and IDS will be able to compile quickly the information on the correct form using the microcomputer without ever looking at the individual members' data.

There has been far more programming involved with this system than was anticipated. It has been necessary to rely heavily on a consultant and on Radio Shack for guidance. Further programming should be done to make the system more "user-friendly" than it is at present. The difference between using the system now, and using the system as it could be, is comparable to the difference between searching the full BRS utility and searching BRS/After Dark. To help new users, an online training module should be developed. Eventually, the system can be improved to the point that it will be a network that is fast, easy, and pleasant to use. ■ ■

## Microcomputer Use in a Mainframe Acquisitions Environment

Vivian Hay, Jeff Suttor,  
and Pat L. Walter

The technical services staff of the UCLA Biomedical Library is striving for a synthesis of traditional mainframe and emergent microcomputer technologies for automated processing of library materials. Such a synthesis makes optimal use of mainframe speed and storage capacity, while utilizing the microcomputer's flexibility to enhance extant programs without the need for mainframe programming changes. One primary application we have explored is the use of the microcomputer as a communications link, a "translator" for both online and indirect interactions between vendor databases and the local mainframe. We have conducted highly successful experiments of data transfer with the F. W. Faxon company serials database and are now developing some of these interactions into ongoing processing routines. Biomedical Library staff are negotiating similar tests with other serials and monograph vendors. These uses of the microcomputer appear to be highly adaptable to a variety of hardware and software configurations in a variety of library settings.

### THE MICROCOMPUTER AS INTERFACE BETWEEN VENDOR AND INSTITUTION MAINFRAMES

The UCLA Biomedical Library utilizes the F. W. Faxon Co. as one of its major serials vendors. Faxon provides service on approximately two thousand of the Biomedical Library's seven thousand current journal subscriptions. Faxon has two mainframe-based serials services, DataLinx and Infoserve, accessible online to its customers. We were interested in how these services might interact with our ORION

processing environment,<sup>1</sup> and Faxon graciously arranged for a test period to try out various interactions.

Two functions have proved especially fruitful, namely "Data Capture" and "Floppy Disk Invoicing." In each function the microcomputer has added extra speed, convenience, and accuracy to serial processing tasks by establishing communications with both the Faxon and UCLA computers and translating from one data format to another with no rekeying needed. *Transferring* data rather than *entering* them has obvious advantages.

#### Data Capture

"Data Capture" is simply a catch phrase to express a combination of electronic communication and storage of data, which results in telescoping many separate steps by both library and vendor staff into a more efficient information transfer; it is akin to but not equivalent to downloading.

To order a new serial in the traditional way, the acquisitions staff key in at a terminal all available bibliographic data and processing codes to construct an "on-order" level record in ORION. The paper purchase order is printed in the next twice-weekly batch of paper products and is delivered to the Biomedical Library the following day. All purchase orders are grouped by vendor and mailed. After several days the order arrives at the vendor, for instance Faxon, where their staff member keys the subscription information into their database.

With Data Capture we avoid this repetitious keying and much wasted time. We log onto DataLinx, search for the specific title and, having located it, load our order information on Faxon's customer template. This much can be done by any DataLinx customer with a communications terminal. The microcomputer, however, also enables us (1) to negotiate the log-on sequence with one or two keystrokes; and, more important, (2) to copy to our microcomputer disk the relevant bibliographic information supplied by the Faxon database. When we log off DataLinx, we then log on to ORION and load our "captured" bibliographic data into one of ORION's "new record" templates without rekeying it. The same se-

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quence takes place when we enter a request for a sample issue on Faxon's Infoserve System and place a "sample" level record into ORION.

Data Capture is made possible through the use of the keyboard enhancement program, SuperKey's<sup>2</sup> "cut and paste" function, which allows any block of text appearing on the screen to be "marked" and then "cut" from the screen into a defined macro key for later use in ORION.

Data Capture works in reverse, also. We have, in one instance, "captured" the titles, ISSNs, and our holdings on a number of serials from ORION, in order to rewrite with Faxon the subscriptions from a publisher whose service had deteriorated. Using a standard word-processing program to compose a letter about the rewrites, we incorporated the captured journal data into the letter after substituting in it words for MARC tags with standard character string "search-and-replace" reformatting commands (i.e., "TITLE:" for ">245"). The micro accomplished the entire task with very little typing needed.

### Floppy Disk Invoicing

"Floppy Disk Invoicing" is undoubtedly our most exciting microcomputer development to date. We cannot say "discovery," because its components are unexceptional; but simply by using common software and some ingenuity, coupled with F. W. Faxon Company's cooperation, we have been able to tame a task whose size and tedium daunted our acquisitions staff at subscription renewal time each year.

Traditional invoice posting on our mainframe system requires a staff member to search each title in ORION, confirm the hit, and archive the previous year's payment statement by moving the information to a history field in the record, thus leaving the invoice field free to key in the fund code, current invoice number, invoice date, period covered by the current sub-

scription, and price. A second staff member then proofreads the work and keys in a payment release date. There is an ORION "dynamic modify" command, which helps with the repetitious elements, but the subscription period covered and the price—especially the price—are extremely vulnerable to typographical errors. In all, the task of invoice posting is one of the most labor-intensive and error-sensitive jobs in our system.

At first we had hoped to have invoice information from Faxon transferred electronically, to be captured and loaded into the appropriate ORION records. Alternatively, Faxon offered to supply the information on magnetic tape, as they do for some other customers. Both of these options would have required programming alterations, either at UCLA or Faxon. Faxon's technical staff suggested an alternative that has proven to be effective and efficient; namely, the floppy disk.

As a test, Faxon loaded the invoices for subscription renewals of 499 titles (for which they had already supplied the traditional paper invoices) on a floppy disk. The data filled 141K of the 360K available on the disk, and Faxon was able to load this information onto the disk by procedures very similar to their ordinary routines for producing paper invoices. This disk was easily suited for processing on our end. Each "paper invoice line" was represented on the disk by three 80-character lines in a text file (see figure 1). A map was provided that specified the location of pertinent information within the three lines; for example, the ISSN may be found on line 2, beginning at column 7, and occupies the next eight characters.

We first spent about an hour mapping each data element from Faxon's floppy disk to its matching position for ORION records. One of the authors with some programming experience spent one-and-one-half hours conceptualizing the process and

0045660VASCULAR SURGERY  
0456600422835 001001000000185128500060001B-M  
004566388-000

R009608814770001061  
070584009608814770001062  
009608814770001063

Fig. 1.

approximately eight hours writing a program in TurboPASCAL. This program reads in three lines at a time from the floppy disk, breaking them up by data element according to line number and character position. The program then generates an output file understandable to ORION by adding MARC field tags and mnemonics to these data. This output file, used in conjunction with SuperKey, establishes a searchable link between a Faxon record and the corresponding ORION record, automatically identifies each element of invoice data on the floppy disk, adds the appropriate ORION data mnemonics, and automatically transfers the invoice data plus mnemonics into the matched ORION record.

The task was divided into two operational steps: (1) linking a Faxon record to the corresponding ORION record via the Faxon record number; and (2) loading the invoice information from the Faxon record to the appropriate ORION record field, having first moved outdated invoice data on the ORION record to a history field.

Step 1, linking Faxon and ORION record numbers, is a one-time operation, needing no repetition once the linkage has been established. The SuperKey program allows one single keystroke to access the "address" on the TurboPASCAL output file from the Faxon disk for each successive ISSN and to perform a search for that number in the appropriate MARC field of the ORION database:

```
FIS 0042-2835 < transmit >
—entered by pressing the "Control" and the
"F5" keys simultaneously
```

If the ISSN matches at this point, the program advances to the next operation. If no match on ISSN occurs, the program next searches ORION by Faxon's bibliographic title, again seeking its "address" in sequence on the floppy disk:

```
FNT VASCULAR SURGERY < transmit >
—entered by pressing the "Shift" and the
"F5" keys simultaneously
```

Whenever a record match is confirmed, whether on ISSN or on title, a single keystroke loads Faxon's title number into a searchable field in the ORION record:

```
FAX#004566 < transmit >
—entered by pressing the "Alternate" and the
"F5" keys simultaneously
```

The Faxon identification number, unique for every title, establishes the link between Faxon and ORION records; this number will constitute the search key lifted from the Faxon floppy disk to be searched automatically in the ORION database.

In Step 2, loading invoice information, a single keystroke searches for the ORION record by the newly added Faxon number. When the record is found and displayed, another single keystroke moves the previous payment information to the history field, loads the new charge, period covered, invoice number, invoice date, ORION fund code, and payment release date:

```
> MOV 907 > 900FD/LBB01,SB1,ZVFAX,IN-
VD840705,INV#881477,PR/60.00,PRD/01.85-
12.85,INRD850215 < transmit >
—entered by pressing the "Shift" and "F6"
keys simultaneously
```

When verification confirms that the data have loaded successfully, a third keystroke "OK"s that ORION record. At this point the sequence starts over again with a search for the next Faxon number.

In this step the posting task has been reduced from an average of 110–140 keystrokes per title to 3 keystrokes per title. Thus, the routine is remarkably fast, and we have confidence in the quality of the data because we are *transferring* rather than *keying* information.

## DISCUSSION AND CONCLUSION

Direct online library-to-vendor acquisition processing has the drawback of adding telecommunications costs to the other costs of acquiring materials. Although the transfer of information from vendor to library



via magnetic tape provides a less expensive option, programming and tape handling resources are required for implementation. By contrast, the floppy disk can provide an immediate and viable improvement in serials or monograph tasks with minimal added costs for either vendor or library. The same procedures described in this paper can obviously be adapted to deal with invoicing from a large number of vendors. Even very small vendors, for whom a single microcomputer may constitute "automation," should be able to supply invoicing in this manner. The disks are cheap and reusable, and it does not matter exactly *how* the data are organized, but simply that they *be* organized.

The outcome of this experiment in serials processing stimulates additional ideas for using the microcomputer in a mainframe environment for both monographs and serials. Data can flow in the other direction, with the library conveying information to vendors via floppy disks. An example would be running a batch job for monograph orders, or a claims run for either monographs or serials, and loading the product onto a floppy disk instead of printing paper purchase orders or claim letters. This possibility should help to reduce mailing costs and lessen the impact on overburdened printers. The vendor, with a very small initial investment in time for "mapping" the customer's format to make it conform to his own database, could then have his own staff loading rather than keying. This should help the vendor hold the line on costs and have positive benefits for customers.

In conclusion, the goals of this experiment were to make serials processing more efficient in terms of staff time, accuracy, and cost effectiveness, and we feel these goals have been met. The procedures de-

scribed above are becoming processing routines rather than experiments in the Biomedical Library, even as we continue to experiment with further microcomputer applications in the mainframe environment. At the same time, the Biomedical Library is serving as a test site for the whole UCLA library, with the expectation that many of these applications will prove useful to acquisitions and serials processing staff who perform their tasks in the other eighteen libraries of the UCLA Library System.

#### ACKNOWLEDGMENTS

UCLA Biomedical Library Acquisitions Division staff involved with microcomputer-to-vendor developments included Robert Skinner and Martha Riemer. F. W. Faxon Company staff who have assisted in these experiments have included Diane Davis-Francis, Cheryl Murphy, Jamie Harrison, Amira Lefkowitz, Jim Sokoloski, and Mary Ellen Clapper.

#### REFERENCES AND NOTES

1. ORION, the UCLA Library's online information system, includes sophisticated serials processing, book acquisition, online catalog, and linked authority control modules. The serials processing and book acquisition modules provide automated fund accounting, claiming, and bindery options as well as order, receipt, and other functions. Staff throughout the UCLA Library system access ORION from two hundred CRT terminals. The automated system operates on the UCLA Office of Academic Computing IBM 3033 mainframe computer under MVS and TSO.
2. We have experimented with various commercially available software products: Spellbinder, Volkswriter, TurboPASCAL, Prokey, and SuperKey. ■■

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The Editor-in-Chief, Ching-chih Chen, is Professor and Associate Dean of the Graduate School of Library and Information Science at Simmons College in Boston, and is a well-recognized author, editor and teacher in the areas of information management and technology. In addition to her numerous research and consulting activities related to new technology applications, she is active in many areas of microcomputer applications, including publications, development of the MicroUse database, and organization of conferences and user groups. She also directs and teaches numerous microcomputer-related institutes and courses.

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## News and Announcements

### NASIG

A new organization, the North American Serials Interest Group (NASIG)—dedicated to discussing, resolving, and communicating contemporary issues relating to all phases of serials management—has been formed and is seeking new members.

Established in response to the need for cross-communication and education among all people working with information in serials form, NASIG will strive to offer an open and equal forum for the discussion of mutual problems and interests.

NASIG invites educators, librarians, serials publishers, subscription agents, bibliographers, and any other serials-oriented parties to become members. Because of its breadth of membership, NASIG will avoid formal governing ties with existing related organizations; however, members of groups such as the American Library Association, the Special Library Association, the American Society for Information Science, the Library Binding Institute, and the American Bookman's Association are welcome to join. NASIG will communicate with all relevant special interest groups through informal liaison and, as appropriate, will refer to these organizations, for official consideration and potential endorsement, drafted codes of ethics, statements of principle, and new serials standards as they are developed.

The first planning session for NASIG was held during the American Library Association's Midwinter Meeting, January 1985, in Washington, D.C. At that time, the organization was conceived as a group with a simple set of bylaws and four to six administrative officers. Plans call for a two- to three-day annual conference to be held in a different regional location every year. The conference would include formal papers and panels, workshops, and tours, with an

emphasis on the dialogue of all participants.

For more information, please contact either Rebecca Lenzini, Co-Chairperson, NASIG, The Faxon Company, Inc., 15 Southwest Park, Westwood, MA 02090; or John F. Riddick, Co-Chairperson, NASIG, Park Library, Central Michigan University, Mount Pleasant, MI 48859. ■■

### CLR Issues Report on Videodisc, Optical Digital Disk Technologies

The Council on Library Resources has issued *Videodisc and Optical Digital Disk Technologies and Their Applications in Libraries*, a report by Information Systems Consultants, Inc. Commissioned to provide an overview of the potential of optical media for libraries, the report includes special emphasis on their use for preservation purposes. The study also explains the underlying principles of the technologies, the various forms in which they are marketed, production methods and costs, and the capabilities of each medium.

The promise of optical technologies for libraries and information centers has been widely publicized. However, the authors found that products and systems to support the applications are only beginning to emerge. Currently, only reflective optical videodiscs and compact audio disks are available. Sources of supply and markets for optical digital disks, which have been promoted as computer mass storage devices, are being established.

Videodiscs, optical disks, and compact audio disks employ optically sensitive materials to store information. Most use light, generally in the form of lasers, for both recording and reading purposes. Differences among the technologies have emerged as they are developed and marketed for various applications.

Videodiscs and optical disks can help

preserve and improve access to materials. Information published in other formats can be recorded on videodiscs and compact audio disks for long-term storage. These reproductions can be substituted for direct use of rare or fragile items. Since disks are easily replicated, materials can be made available in many locations, and for multiple users.

An introductory chapter describes the forms of optical media and their potential applications in libraries. The bulk of the report addresses specific products and projects. Those aimed at the library market are discussed in the final two chapters, and a technical appendix details procedures involved in converting text, graphics, and audio to digital form.

The report is available from the Council for \$6 (prepaid only). Please address orders to: Videodisc Report, Council on Library Resources, 1785 Massachusetts Ave., NW Washington, DC 20036. ■■

### **RLG Gets Grant from NEH for Retrospective Conversion of Archival Records**

The Research Libraries Group (RLG) has been given a grant of \$162,222 in matching funds from the National Endowment for the Humanities for an archives and manuscripts retrospective conversion project within its membership. The grant is the second NEH has made to RLG in support of the development of a national database for archival and manuscript materials; an initial planning grant was provided in 1981.

The project will involve the use of the Archival and Manuscripts Control (AMC) enhancements made to RLIN—RLG's automated library information network—early last year. The RLIN bibliographic database currently contains about 11,000 AMC records. ■■

### **California Talking Terminal**

A "talking terminal," developed by the University of California's Division of Library Automation (DLA), will enable blind and other visually impaired students

at UC to use a UC library catalog without assistance.

The terminal unit incorporates a keyboard labeled with large letters and braille, a screen display that magnifies print, and a digital speech synthesizer. It is connected to UC's MELVYL Online Catalog, a computerized master catalog consisting of two million book titles and more than half a million periodical titles of UC library holdings throughout the state.

"The prototype was developed to help our students at UC but obviously could benefit many other visually impaired library patrons," DLA Project Manager Bennett Price said. Approximately 120 students at UC's nine campuses are blind or near blind, he adds.

The terminal responds to this special users in two ways, according to Price. To the totally blind, the unit speaks by means of digital speech synthesis. A built-in cassette tape recorder can record the output for the user. For those with partial vision, a large-print adapter enlarges the screen display up to sixteen times its normal size.

The prototype was developed with a grant from federal Library Services and Construction Act funds and administered by the California State Library. One talking terminal is being routed to UC campuses for evaluation; another remains at the DLA office in Berkeley for further testing and development.

"The goal is to identify funding so we can install at least one talking terminal at each UC campus," Price said. Each terminal costs approximately \$10,000, with additional cost for a braille printer if further evaluation recommends it. ■■

### **LS/2000 Terminal Compatible with 3M Library Security Systems Now Available**

OCLC has announced the availability of a Very Low Emission (VLE) LS/2000 Terminal that may be placed within three feet of 3M Corporation's most recent version of its Tattle Tape Security (gate) System without interfering with the gate's book theft detection performance.

The FCC-approved VLE LS/2000 ter-



minimal was developed by Lear Siegler Corporation's Data Products Division with the cooperation of OCLC's Local Systems Division, 3M's Security Systems Division, and Hall-Mark Electronics.

Older Tattle Tape Security Systems may additionally require a moderately priced filter, available from 3M.

Most libraries have been using security gates—primarily 3M Tattle Tape Security Systems—since the early 1970s. A sensitized marker concealed within the book triggers an alarm if a book passing through the gate's interrogation field is not legitimately checked out by library staff.

Until the development of the VLE LS/2000 Terminal, most conventional terminals could not be placed closer than eight feet from a gate because the electromagnetic field it emitted neutralized the gate's interrogation field.

Further performance, pricing, and delivery information about the VLE LS/2000 is available from OCLC Local Systems, (614) 764-6403. ■■

### The Library of Congress and the Research Libraries Group Get Linked Systems Project Up and Running

The Library of Congress and the Research Libraries Group have announced the completion of the first phase of the Authorities Implementation (AI) of the Linked Systems Project (LSP).

Through LSP's communications protocols, the Library of Congress can now send authority records to RLG directly, computer-to-computer, rather than by mailing tapes weekly. The result is that users of the Research Libraries Information Network (RLIN) will now have access to authorized name headings on the RLIN system from the Library of Congress Name Authority File current to within twenty-four hours.

A Library of Congress tape of more than forty-three thousand authority records was loaded at the beginning of September to bring the RLIN file and that of the Library of Congress into sync. Now, through the LSP authorities project, records are being added to RLIN at the rate of some two

thousand a day, including updates.

The Authorities Implementation is the first use of the LSP communication protocols, which are based on the International Standards Organization's Open Systems Interconnection Reference Model. This model provides a common framework for standards development that allows for communication between different types of computer hardware and systems. The LSP project is a cooperative venture involving the Library of Congress, RLG, the Western Library Network (WLN), and, more recently, the Online Computer Library Center (OCLC). It has been funded principally by the Council on Library Resources.

At RLG, phase two of the LSP authorities project, currently in the development stage, will permit the creation and maintenance at RLG and contribution online via the link to the Library of Congress of authority records initiated by RLG libraries that participate in the Library of Congress Name Authority Cooperative Project (NACO).

The Library of Congress also has completed the LSP software that will allow it to take contributions of authority records over the link, add them to the NACO file, and redistribute them online as well as through the present MARC Distribution Service. ■■

### Singapore Purchases WLN Computer System Software

The Western Library Network (WLN) has announced that the Republic of Singapore has purchased the WLN Computer System. The Southeast Asian city-state will use the system to support a national library network. WLN staff, working with personnel from several Singapore government agencies, will install the WLN bibliographic subsystem and database on computer equipment of the Singapore Department of Finance.

The system will first be used to bring cataloging and catalog maintenance of the National Library online. The library now operates a batch system for cataloging and authorities. Later the new system will be extended to other libraries, including aca-

demic and special, creating in the process an online Singapore union catalog. The network will be known as SILAS, for Singapore Library Automation System.

Singapore joins the national libraries of Australia and New Zealand in the use of the WLN software in the Pacific region. On the other side of the world, WLN recently installed the system for the British Library. It is also in use at several sites within North America, in addition to WLN's own network operation in the Pacific Northwest. Singapore will be the fourteenth organization to use the software in one of its several versions.

The WLN Computer System is an integrated library system for use on IBM, IBM-compatible or Burroughs mainframes. It features powerful cataloging, catalog maintenance, and searching facilities, with linked authority control. Optional facilities are Acquisitions and Retrospective Conversion subsystems. Other subsystems currently are in development. Enhancements to the system made by the various sites where it is installed may be shared, a process coordinated by WLN. New features are thus being added at an increasing rate. ■■

### **Information Access Company Adds Enhanced InfoTrac Optical Disk System to Product Line**

Information Access Company (IAC) has introduced an enhanced version of its InfoTrac system designed for use in corporate and academic libraries. The new option adds downloading, word processing, and dial out access to remote online databases to the electronic search and retrieval capabilities of the InfoTrac system.

Introduced in January 1985 as the first commercial product to combine optical disk storage with access by microcomputer, the InfoTrac system provides a disk playback unit with especially designed controller and software to support up to five retrieval stations equipped with microcomputers and virtually silent printers.

The system offers information retrieval speed and searching versatility usually associated with online data gathering while

providing greater access ease and economy. At a fixed annual subscription price, users have unlimited use of databases selected from a growing library of optical disk information files. The databases are updated with the delivery of a new disk containing the fully cumulated file either monthly or quarterly, depending on the time value of the information.

The original InfoTrac database offered by IAC contains indexes to approximately one thousand business, technical, and general interest magazines and newspapers. The second IAC optical disk database, called LegalTrac and introduced in June 1985, covers indexes to more than seven hundred law journals, magazines, and newspapers. Using the IAC-developed search software, a researcher can type in a topic and immediately read on the computer screen a list of articles that have been published on the subject over the past several years. The user can elect to print out the entire list or selected references. In addition, simply by pressing a button the user can view other related references listed under *see* and *see also* headings.

The new InfoTrac system enhancements will allow the searcher to press a key to download the selected references (or the full text of some material) onto a soft (floppy) disk in order to edit the material before print-out or incorporate it in other documents. The downloading feature is compatible with standard word-processing software.

In addition, the enhanced InfoTrac system provides the user at a keystroke with the capability to dial out, via a modem, to remote online databases to gather additional or more current information. For instance, a topic search of one of the IAC optical disk databases could be conducted. Then the material could be downloaded onto a soft disk or printed out. Using the same controlled vocabulary search terms to save valuable online time, the user at the press of a key could dial out to one of the major electronic information delivery services—DIALOG, Mead Data Central, or BRS—to reach NEWSEARCH, the daily index update to more than twenty-five hundred newspapers, magazines, and journals. The most recent references found in

NEWSEARCH could be downloaded at the press of another key to the same floppy disk to create a comprehensive, up-to-date file of citations on the subject.

The dial-out feature is not limited to IAC online databases or any specific information service. The more than three thousand public databases now available can be accessed from the InfoTrac station.

IAC will continue to offer the basic InfoTrac system to users who do not have a need to incorporate InfoTrac data into other documents or to gather additional information from remote online databases. The enhancements can be added on later if the need arises for the additional capabilities.

Information Access Company, a division of Ziff-Davis Publishing Company, is the world's leading publisher of reference aids for periodical literature. More than ten million people annually use IAC products in libraries and from offices and homes via computers. ■■

### New Pro-Search Version 1.03 from Menlo Corporation

Menlo Corporation, developers of the Pro-Search gateway software for online searching and telecommunications, has announced Pro-Search Version 1.03. The new version offers significant enhancements to already existing Pro-Search features, and adds several new capabilities to the program.

#### *Version 1.03 Enhancements*

Pro-Search now lets searchers store strategies created offline in native (command-driven) mode to a disk file. Without reentering the strategy, a saved search can be uploaded for repeated use. Or the same search can be executed in multiple databases without rekeying. Native mode searches can be saved and uploaded in BRS, DIALOG, or other online services with a consistent system prompt.

Expanded accounting report capabilities let the searcher store the accounting reports of DIALOG and BRS usage created by the Pro-Search program for later editing with most word processors. Searchers can customize their accounting files to change or reformat existing accounting information,

incorporate charges from other online services into their report, or add service charges to invoices.

A new Pro-Search feature prints mailing labels from downloaded DIALOG records. This option can be used with any database containing a name-and-address format.

Other version 1.03 enhancements include support of DIALOG's special print formats (such as LABELS, PORTRAIT, and SIMPLEX) in the high-level search mode, and a start-up shortcut that lets searchers select an online service, upload a saved search, and go on to the service, all from the same line that starts the Pro-Search program. Another useful feature allows users to deinstall Pro-Search from a fixed disk system, either to move the program to another computer or to perform hard-disk maintenance.

#### *IBM Voice Communications Option Compatibility*

Pro-Search now supports the newly-released IBM Voice Communications Option. Using the option's speech synthesis capabilities, information retrieved from any online service can now be "spoken" with the Pro-Search "Speak" command. The new IBM multifunction adapter card can be installed in the IMB PC, XT, and AT and can be used with Pro-Search as a 300 or 1200 baud modem.

#### *Automatic Update to Version 1.03*

Pro-Search update service subscribers automatically receive Version 1.03 of the software. For one hundred dollars per year, the update service provides new category disks every two months, reflecting the latest DIALOG and BRS database changes and enhancements to the Pro-Search system software. An update to Version 1.03 also is available on a one-time-only basis for twenty-five dollars. ■■

#### **\$1.2 Million Computer Enhancement for UTLAS**

UTLAS has expanded its system by adding four Tandem TNS II computers at a cost of \$1.2 million. This addition augments its Catalogue Support System (CATSS) and supports its ongoing research

and development activities. The new equipment ensures that the company keeps pace with the needs of its current customers and anticipates its continuing rapid corporate growth. The four new TNS II Tandem computers are being added to UTLAS' existing Tandem computer hardware.

UTLAS is a computer service organization for libraries and information centers. As a bibliographic and information utility, UTLAS has been supplying online database services and related products in English and French to customers since 1973. Since January 1985 UTLAS has been a wholly owned subsidiary of International Thomson Organization. More than 475 institutions, members of consortia and government agencies, maintain individual user-owned databases through UTLAS' facilities. More than two thousand libraries of all types and sizes receive products and services from the company. ■■

### **Brown University Acquires BLIS for Integrated Library System**

Brown University has acquired Biblio-Techniques Library and Information System (BLIS) to serve as its online public access catalog and integrated library system for the university and its affiliated institutions. The BLIS Software will serve as a central component of the Brown Network of Scholar's Workstations Project, a widely publicized effort to meld computer technology with liberal learning.

In July 1985 Biblio-Techniques staff installed the BLIS Online Catalog, Catalog Management and Acquisitions/Accounting Components on the Brown University IBM 3081 mainframe computer. The BLIS Circulation Control Component is to be installed in early 1987 to replace an existing stand-alone system. Data conversion analysis and on-site training are underway in preparation for making the system public on a library mainframe in June 1986. Biblio-Techniques will provide custom data conversion services to load Brown's RLIN database of some 250,000 records and to establish authority-controlled headings using the WLN Authorities Database.

Brown University joins a growing number of large research libraries that have

opted for the sophisticated library technology that is represented in BLIS. Other BLIS customers include Columbia University, University of California at San Diego, University of Cincinnati, Metro Toronto Library, and Indiana University. The WLN Software, on which BLIS is based, is also installed at the University of Illinois; University of Missouri; SOLINET; the National Libraries of Australia, New Zealand, and Singapore; and the British Library. ■■

### **UMI Announces Plan to Distribute Optical-Disk Databases**

University Microfilms International (UMI) is planning to produce and distribute microcomputer databases of indexed articles on optical disk.

UMI demonstrated a prototype workstation and two early prototypes of optical-disk databases at the IIA and ONLINE '85 meetings November 4-6: one on twelve-inch (860-megabyte) disks and the other on compact (550-megabyte) disks. The prototypes were originally unveiled in August at the International Federation of Library Associations and Institutions (IFLA) conference in Chicago.

The prototype workstation consists of an OCLC M300 (or IBM PC) plus UMI's Information Delivery Module (IDM), which is designed to support local and remote database retrieval. Made up primarily of off-the-shelf hardware, the IDM has two subsystems: one for receiving, forwarding, and printing digitally-transmitted images; and the other for retrieving, displaying, and prints documents and data stored on optical disk.

### *Transactional Billing and Royalty System Built into IDM*

An important feature UMI has designed into the IDM is the ability to track billing and royalty data in connection with the printing of copyrighted documents and data. The company plans to charge users each time an article is printed from disk. UMI will be able to electronically poll IDM work stations once a month for transactional data on article printouts.

The billing feature turns the IDM workstation into an "information vending ma-



chine," which the company believes will become an increasingly important distribution channel for its information products in the future.

UMI expects its pricing of article printouts to be competitive with the cost of library photocopying services. The company believes that the economic and other advantages of its point-of-purchase delivery service will attract library and office business, thereby promoting copyright compliance as well as additional income for publishers. ■■

#### **Information Access Company to Offer Full Text of *Wall Street Journal* on Optical Disk and Microfilm**

Information Access Company (IAC) has announced that it has been granted rights by Dow Jones & Company to republish the full editorial contents of the *Wall Street Journal* on optical disk and in 16mm microfilm cartridges. The contract covers all issues of the Eastern edition and Pacific Coast editions back to January 1, 1985.

IAC has provided indexing to the *Wall Street Journal* for more than several years in online databases, which provide references as current as yesterday's issue, and in computer-output microfilm, which contains coverage of issues published as recently as two weeks earlier.

The full text of the two editions of the *Wall Street Journal* on optical disk will be offered as part of IAC's optical disk reference library. IAC introduced the first commercial product to combine optical disk storage with microcomputer retrieval, called InfoTrac, in January 1985. The systems are used in public, legal, corporate, and academic libraries throughout the country.

The InfoTrac system provides an optical disk playback unit with especially designed controller and software to support up to five retrieval stations equipped with microcomputers and virtually silent printers. The system provides information retrieval speed and searching versatility usually associated with online data gathering, while offering greater access ease and economy. At a fixed annual subscription price, users have unlimited use of databases selected

from a growing library of optical disk information files. The databases are updated with the delivery of a new disk containing the fully cumulated file either monthly or quarterly depending on the time value of the information. ■■

#### **National Library of Canada to Test Telefacsimile Transmission in Pilot Project**

From October 1 to December 31, 1985, the National Library of Canada planned to test telefacsimile transmission of information in a pilot project with the Nova Scotia Provincial Library and the University of Alberta Library. Participants will use telefacsimile transmission for interlibrary loan messaging as well as document delivery.

During the three-month trial period the telefacsimile project will allow the National Library to assess quality of service with and without the telefacsimile equipment, to gather comparative turnaround time figures for various types of document delivery services and to assess the use of telefacsimile transmission for ILL activities.

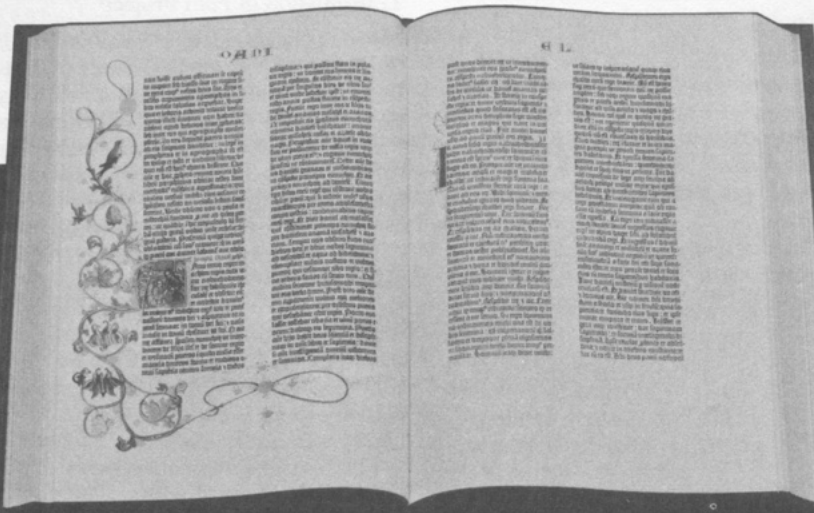
For further information, contact Havenin Anand, Chief, Lending Division, National Library of Canada, 395 Wellington Street, Ottawa, Canada K1A 0N4; (613) 996-7426. ■■

#### **University of Washington Awards \$2,000,000 Contract to Geac**

Geac Computers International of Markham, Ontario, announced that it recently signed a contract with the University of Washington in Seattle for the automation of the institution's twenty library facilities. With an initial term of five years, the contract value is approximately \$2 million.

Phase one of the installation will take place in the initial two years of the contract with two Geac 8000 systems providing online catalog and circulation functions to a database of one million titles. Over the balance of the term, incremental additions to the system will support the full twenty-branch circulations load with more than four hundred terminals accessing a catalogue of two million titles. ■■

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# Recent Publications

## Book Reviews

Boss, Richard W. *The Library Manager's Guide to Automation*. 2d ed. Professional Librarian Series. White Plains, N.Y., and London: Knowledge Industry, 1984. 169p. ISBN: 0-86729-052-8, hardcover, \$36.50; 0-86729-051-X, softcover, \$27.50.

Although Boss has substantially revised and expanded his 1979 edition, his book is still too ambitious a work. In one book he covers hardware basics, software, data communication, the database, options for automating, planning and implementation, and future trends. Inevitably his work lacks in-depth coverage of the topics. For example, he has only two paragraphs on computer-to-computer communications in the chapter "Future Trends," and he does not describe the LC Linked Systems Project. He devotes only a page and a half to remote database searching. The title of his work might be more aptly *Library Manager's Introduction to Automation* or *Library Manager's Survey of Automation*. Many of the criticisms of the first edition still apply, e.g., the treatment is superficial, and the book covers material library managers should have already mastered.

Despite these drawbacks, the book contains some sections of great value. In his chapters on hardware basics, software, and data communications, Boss provides a very readable and detailed discussion of computer basics that would be of value to the library school student or the beginning librarian. The glossary of computer and library related terms has been expanded from five pages in the 1979 edition to sixteen pages in the 1984 edition, and it is useful as a basic vocabulary of terminology for a librarian using computers. The chapter on databases also contains basic information on retrospective conversion and use of records in a local system, especially loading and keying of data. In his chapter on "Op-

tions for Automating," Boss concentrates on the turnkey systems. He comments that for turnkey systems "those that include in the price all hardware, software, installation, training, and ongoing support . . . have been by far the most popular." His advice on hardware expandability and transportability is worth noting.

The section on future trends makes three very interesting prognostications that are worth remembering. First, he suggests that "all the utilities could be adversely affected if a commercial organization were to offer libraries machine-readable bibliographic records in MARC format for loading into stand-alone systems. Such a service could use the economical video-disc or optical digital disc as storage and distribution media." This is already happening, but hasn't yet posed a problem. The reviewer presumes the utilities could sell them. Second, Boss predicts a growing use of telefacsimile and recommends steps for libraries to take advantage of the technology. Finally, he foresees a use for optical scanning devices for conversion of nonbook materials, special indexes, and community information files.

Overall, there is more text in this latest edition and surprisingly few errors and omissions. The reviewer wishes there were more recommendations on implementation, e.g., what about a discussion of numbers of terminals for public use, documentation for database loads, and development of user interfaces? There are many anachronisms inevitable in a book on computers, e.g., WLN is now Western Library Network; AVATAR is now LS 2000; and CTI is no longer an alternative. He should try to stick to guidelines and be less specific. As an earlier reviewer said, "information about current vendors and services will become outdated quickly, given the rapid pace of development." Boss should also correct two glaring mistakes: The Faxon *LINCS* system is actually *LINX* and *Karen Horney* is *Ka-*

ren Horny. The latter mistake survived the first edition despite a review pointing it out.

In summary, the book is an excellent work to read as an introduction to the field and should be of interest to library school students and novice professionals. It is not valuable to librarians already automating their libraries. In attempting to inform public as well as academic librarians and cover such diverse topics as public databases and automating offices (with only one short paragraph on the latter), the book tries to do too much for too many.—*Frederick C. Lynden, Brown University Library, Providence, Rhode Island.*

**Corbin, John Boyd, *Managing the Library Automation Project*. Phoenix, Ariz.: Oryx, 1985. 274p. ISBN: 0-89774-151-X, hardcover, \$35.**

The purpose of this book is to provide a practical handbook for the librarian untrained in systems development, and perhaps even unfamiliar with computers, who is nonetheless responsible for developing an automated library system.

So states the author in the preface to *Managing the Library Automation Project*, a completely revised edition of his *Developing Computer-Based Library Systems* (Oryx, 1981). As a handbook—that is, as a tool for quick reference to specific questions—his new book serves its purpose rather well. Both the veteran and the novice manager of library automation projects will find it worth consulting as a reference tool. However, the book's focus may, at times, unintentionally mislead the inexperienced manager consulting the work for brief introductions to specific automation issues.

The book is well organized and written in a very basic, almost simplistic style that will not intimidate even the most computer-shy librarian. The author assumes that his audience has an acquaintance with OCLC, which is mentioned several times throughout the text, but hardly any mention is made of other bibliographic utilities or networks. I found no mention of any commercially available library system or service vendor of any size or reputation,

even though such a mention could have enhanced some sections of the text. Nevertheless, the book succeeds quite well in setting forth the specific steps for managers to follow in implementing a system, even to the point of providing general job descriptions for key personnel and sample texts for project goals and system specifications. The chapter on the request for proposal, when taken with the appendix, which features a sample RFP document, is extremely well presented and could alone justify the purchase of the book for many project-manager reference collections.

The text is divided into four parts designed to lead the library manager through the major phases of an automation project. Part 1, "Introductory Concepts," briefly discusses computer technology as well as basic approaches to automation. Part 2, "Project Organization and Management," sets forth the manager's staffing, planning, and control concerns. Part 3, "System Procurement," addresses issues of system specifications, the RFP, the bidding process, system evaluation, and selection. Finally, Part 4, entitled "System Installation and Operation," discusses site preparation, database conversion, staff training/user education, and system installation and operation. Four appendixes outline sample project tasks, job descriptions, equipment requirements, and an RFP document. A glossary (the best I have yet encountered in an introductory text) and a selected bibliography complete the work.

The author never loses sight of his intended audience—the "beginning project manager"—and the true beginner will be relieved to find such a clearly written and remarkably jargon-free text. However, as stated, in the interest of providing a balanced, systematic, and nonthreatening approach to automation, the author may, at times, mislead inexperienced managers. For example, the book never provides any insights into the relative importance of the varied tasks involved in a library automation project. As any experienced library manager knows, nothing is more critical to the success of such a project than the database, which typically endures well beyond any given system and largely dictates the configuration of future systems. Despite



devoting a full chapter to database conversion, the author fails to adequately impress the reader with the paramount importance of planning, building, maintaining, and securing the database.

Similarly, the chapter dealing with staff training does not go far enough in emphasizing the library's role in this vital function. Although the discussion of training goals, formats, and content is straightforward enough, it is never clear where the ultimate responsibility for training and education lies. The inexperienced reader may well assume that it should rest with the vendor receiving the final contract (especially with training such a prominent feature of the sample RFP document). It should be understood that the library cannot and must not avoid its obligation to providing the bulk of the training and orientation for its own staff, since the individual staff members using the automated system will ultimately spell success or failure for the system.

There are other ways that the book may entrap the unwary reader. Many of the figures and charts can be downright confusing for the novice manager. Is a doubling of circulation transactions in five years (as indicated in one figure) typical? If so, of what type and for what size library? Another chart gives representative annual maintenance costs for hypothetical systems, but simple reference points such as the overall system configurations or even the total costs of hardware are missing in the illustration. Without such bench marks, many of the author's illustrations are not at all useful. Meanwhile, the inexperienced manager may browse through the book and find an enticing heading, such as "Effects of Using an Automated Library System." This is a worthy topic for discussion in any book targeted to the library manager, but not when less than two pages is devoted to the subject.

Up to now, the most widely used single-volume guide for library automation managers has been Joseph R. Matthews' *Choosing an Automated Library System: A Planning Guide* (Chicago: American Library Assn., 1980, \$12.70). The considerable price differential alone is likely to continue to put the Matthews book on more

managers' bookshelves, but Corbin's new work should still be seriously considered for purchase, especially on the strength of its detailed treatment of the system procurement process.—James A. Cogswell, Princeton University, Princeton, New Jersey.

**Kinsella, Janet**, ed. *Online Access to Library Files: Conference Proceedings*. Oxford: Elsevier, 1985. 202p. ISBN: 0-946395-18-7, softcover. Proceedings of a conference held at the University of Bath, 3-5 September 1984.

These proceedings contain eleven information papers for the practicing librarian who is about to implement an online public access catalog. The papers, written by experts in the field, are descriptive and practical. Topics range from describing currently available systems in the United Kingdom, to writing specifications, signing a contract, and testing a system, to future applications and developments. Most of the papers include bibliographies. Together, the papers provide a good overview of the developments and directions of the online catalog.

The first two papers review existing online systems. Pat Manson describes mini-computer systems. He traces their development through three different origins: circulation-based systems such as Geac, cooperative based systems such as OCLC, and database systems such as LS/2000. Paul Burton describes microcomputer hardware and software available for online systems. He envisages users calling up library files to check holdings or transmitting messages from their work station or home computer.

The next two papers provide practical assistance in choosing a system. In both cases, the authors stress the need for good communication. Guided by his experience at the Hillingdon Public Library, Graham Morris recommends careful planning by staff members. He also recommends writing specifications for the ideal system, providing careful attention in evaluating bids and interpreting bidders' contracts. Bill Ainsworth presents a professional approach on testing the system. He recommends a comprehensive listing of basic items to be evaluated by a rating scale. He

also presents a twenty-item list of implementation activities.

T. N. Teskey describes three different ways library files are organized as well as the limitations set by the computer hardware. Even with technological advances, real improvement for public access will not take place until the dialogue between user and librarian can be put into computer language.

According to Margaret Beckman, the trend in North America is away from the centralized database. In the future, local databases will have the highest priority because the costs of maintaining standards for centralized databases are too high. Librarians should concentrate on linking local databases as seen by the iNET gateway experiment in Canada, in which five different systems, four different computers, and six different formats were successfully linked. Emphasis should focus on what the role of the library should be in the changing environment where scholars have access to many databases.

Pauline Cochrane discusses the ingredients of the ideal catalog. She believes the relationship between subject headings and class numbers must be exploited. However, for this to be done properly, better help and information screens will have to be developed.

Jean Plaister demonstrates through example expanded library services by interlinking new technologies. By electronic messaging and gateways, users can have access to library policies and services and can make reference inquiries.

Charles Hildreth focuses his thoughts on the user-systems interface in an online public access catalog. Essential is the dialogue between man and machine. Today's systems use a combination of menu screens and command language, which he believes is becoming more natural. Hildreth sees a need for standardizing a retrieval language. In addition, more research is necessary in the area of format display, improved help screens, and highlighted subject headings to help users find additional records.

Alan Seal compares the research methods supported by the Council of Library Resources and the British Library Research

and Development Department. He points out two problems with current research. First, research should be more evaluative and less descriptive. Second, current research examines opinions about an existing system rather than an experimental online catalog.

Chris Leamy views the future library as a total information center. Users with computers in their workplace can browse the library catalog and have access to remote databases such as DIALOG and BRS.

Somewhat distracting are the typographical errors found throughout the work: for example, on page 19 *misspellings*, page 32 *usrs* for *users*, page 80 *be* for *we*, page 93 *corss* for *cross*, page 121 *wth* for *with*, and page 127 "a new development worth of our attention. . . ."

In the appendixes there is a list of suppliers of minicomputer systems and users of the system in the United Kingdom. There are also useful product reviews of systems and software.—Karen Stabler, *Tulane University, New Orleans, Louisiana.*

**Matthews, Joseph R.** *Public Access to Online Catalogs*. 2d ed. Library Automation Planning Guides Series. New York and London: Neal-Schuman, 1985. 497p. ISBN: 0-918212-89-8, softcover, \$35.

In the early 1980s, Joseph R. Matthews' consulting firm received a research grant from the Council on Library Resources to study public online catalogs in libraries. Shortly after completing the study, Matthews published the first edition of *Public Access to Online Catalogs* in 1982. Its intent, as stated in the preface, was "to present a basic primer on public access online catalogs." Content of the first edition included a basic introduction to online catalogs, information on choosing and implementing a system, advice on selection of terminals and placement of equipment, and a forecast of the future of the technology. More than half the book's three hundred pages were devoted to descriptions of existing systems.

Now, a brief three years later, the second edition is available. Like its predecessor, it claims to be a primer on public access on-

line catalogs. The volume contains information about individual and turnkey systems. Part I includes chapters on choosing a catalog design, hardware and software components, the catalog in operation, and effects of the catalog on staff and patrons. As in the first edition, more than three-fourths of the volume is devoted to sample screens and information on existing systems. It is in the second portion of the book that one is able to find differences between the first and second editions. The first edition contains profiles of thirty-four systems; the second contains forty-eight. However, it appears that data about the original thirty-four systems has not been updated or corrected to reflect any changes that may have occurred.

A close examination of the two volumes reveals some striking similarities of content. Few, if any, substantive differences can be identified. There appears to have been no attempt to update any data, particularly in Part I.

However, this lack of change does not diminish the value of the second edition. It is an excellent source of information about public access online catalogs. Designed as a "primer," it takes the novice carefully through all facets of planning, selecting, and implementing an online system. It points out all areas needing consideration and suggests appropriate positive solutions to possible problems.

The book is enhanced by an eighteen-page glossary that will aid the novice to "speak computer" with comfort and contains a sixteen-page bibliography for further information. It is also thoroughly indexed. It contains a wealth of valuable primary and secondary information for the beginner and can be truly considered a primer.

Some advice about acquiring this book—if your library already contains the first edition of *Public Access to Online Catalogs*, and you are not shopping for a system, you may not need to add the thirty-five-dollar second edition. However, if you do not own the first edition, or if you do and are shopping for a system, this book belongs in your library. It is an excellent source of information—everything you need to know—and should be made available as a

resource.—*Sandra K. Ready, Mankato State University, Mankato, Minnesota.*

Mitev, Nathalie Nadia, Gillian Venner, and Stephen Walker. *Designing an Online Public Access Catalogue: Okapi, a Catalogue on a Local Area Network*. Library and Information Science Research Report, 39. London: British Library, 1985; dist. in the U.S. by Longwood Publishing Group, Dover, New Hampshire. 254p. ISBN: 0-7123-3058-5, softcover, \$30.

This research report describes a two-year research project entitled "Microprocessor Networking in Libraries," which was supported by the British Library and the Department of Trade and Industry and based at the Polytechnic of Central London. After the authors' preliminary investigations into the application of microcomputer networks to library automation, they focused on the development of an online public access catalog (OPAC) on a local area network (LAN). The chief objective of the research project was "to produce an OPAC on a LAN, that would be readily usable without training or experience, without sacrificing effectiveness or being tedious for experienced users." The research report describes the design, development, and evaluation of the OPAC named Okapi (Online keyword access to public information).

In chapter 1 of the research report, the background, history, and objectives of the project are clearly stated. Chapter 2 reviews recent published works pertinent to the design and development of online catalogs. A discussion of local area networks is the focus of chapter 3.

Chapters 4 through 7 highlight the design and development of Okapi from MARC/UK format records of the Polytechnic of Central London (PCL). In chapter 4, the authors describe the selection of data fields and subfields in MARC/UK format records for indexing and display in Okapi and the record format of Okapi records. The project team did not retain MARC/UK format records in Okapi because the objective of the research project was the design and development of an *online catalog*. Had the project team designed and developed

an online catalog as a subsystem of an integrated library system or online cataloging system, the team probably would have retained MARC/UK format records in the system, but they still would have had to select a subset of the data fields and subfields in MARC/UK records for indexing and display in the online catalog component of the system.

The indexing of and indexes for the selected data fields and subfields of MARC/UK records are covered in chapter 5. The importance of this chapter is that Okapi indexes the individual words in author fields, title fields, and subject heading fields, and entire author (and corporate author) names, titles, and subject headings as phrases. Word indexing allows users to perform keyword searches for known-items or subjects and obtain records containing their entered terms; phrase indexing allows users to perform alphabetical searches for known items or subjects, browse alphabetically arranged lists for author names, titles, or subject headings, and obtain records for a selected author name, title, or subject heading in the alphabetical list.

The process of searching Okapi is presented in chapter 6. Okapi features alphabetical searching (called string comparison in the report), keyword searching using an implicit Boolean AND, and hyper-OR searching. "In the hyper-OR the postings for several terms are merged, i.e., they are OR-ed, and a weight is calculated for each posting. The value of this weight is the sum of the weights assigned to the terms to which the posting relates. Records can then be displayed to the user in weight order, which it is hoped will have some correspondence with their degree of relevance to the user's request." When the user enters a word or phrase, Okapi employs a "search tree" to determine whether to submit the user-entered word or phrase to an alphabetical search, keyword search, or hyper-OR search. The hyper-OR search and the search tree are online-catalog searching capabilities unique to Okapi.

In chapter 7, the project team describes its efforts to create an interface for Okapi that would enable novice users of an online catalog to effectively search the system and find library material pertinent to their top-

ics of interest. Chapter 8 and appendixes 5 through 8 feature the results of a user evaluation of Okapi using three different methods: (1) a structured interview with seventy individual PCL students; (2) a computer-produced compilation of summary statistics for 3,912 online catalog searches that were automatically recorded on a transaction log; and (3) a manual compilation of summary statistics for ninety-six user sessions that were identified by an observer stationed near Okapi terminals and matched with the transaction log. According to the project team, this user evaluation demonstrated that Okapi was readily usable without training or experience and without sacrificing effectiveness or being tedious for experienced users. The concluding chapter highlights the project team's recommendations for enhancing Okapi. Features suggested for future implementation are relevance feedback and ranked output, enhanced subject access to bibliographic records using abstracts or terms from the back-of-the-book index, and automatic correction of misspelled user-entered terms.

The authors are commended for their description of the design and development of an experimental online catalog in which technical material is presented in an understandable and easy-to-read fashion. *Designing an Online Public Access Catalogue* is essential reading for library staff involved in the design and development of an online catalog and system designers and technical staff involved in both systems analysis and programming for an online catalog. Whether library staff or technical staff are building an online catalog or acquiring a turnkey system, they will find this research report an invaluable source of information on selection of MARC/UK format record fields for indexing and display in an online catalog, system capabilities for known-item and subject searching, the process of known-item and subject searching, and user-system interface characteristics.

The user evaluation of Okapi takes a backseat to system design and development. Interesting findings about the users and uses of Okapi have been exiled to appendixes; however, the authors rely upon these findings and their knowledge and ex-



perience to recommend improvements to Okapi.

When designing Okapi, the project team aspired to the third generation of online catalog development defined by Charles R. Hildreth ("Pursuing the Ideal: Generations of Online Catalogs" in *Online Catalogs/Online Reference*, Chicago: American Library Assn., 1984: 40-45). The result of their design efforts was the development of a state-of-the-art online catalog with unique searching capabilities and user interface characteristics that make this experimental online catalog a serious contender for third-generation status.—Karen Markey, *OCLC, Dublin, Ohio*.

## Other Recent Receipts

Listed here are books and other publications of potential interest to members of LITA, received for review. Some of these materials may be reviewed in later issues of *ITAL*.

Clark, Philip M. *Microcomputer Spreadsheet Models for Libraries: Preparing Documents, Budgets, and Statistical Reports*. Chicago: American Library Assn., 1985. 118p. ISBN: 0-8389-0403-3, softcover, \$24.95.

Connors, Martin, ed. *Telecommunications Systems and Services Directory*. 2d ed. Detroit: Gale, 1985. 975p. ISBN: 0-8103-1697-8, hard-

cover, \$240. ISSN: 0738-3045. "Descriptive information on some 2000 telecommunications organizations, systems, and services."

Dodd, Sue A., and Ann M. Sandberg-Fox. *Cataloging Microcomputer Files: A Manual of Interpretation for AACR2*. Chicago and London: American Library Assn., 1985. 228p. ISBN: 0-8389-0401-7, hardcover, \$37.50.

Melin, Nancy Jean. *Essential Guide to the Library IBM PC. Volume 1, The Hardware: Set-Up and Expansion*. Westport, Conn., and London: Meckler, 1985. 275p. ISBN: 0-88736-033-5, spiral-bound, \$19.95.

Mount, Ellis, and Wilda B. Newman. *Top Secret/Trade Secret: Accessing and Safeguarding Restricted Information*. New York and London: Neal-Schuman, 1985. 214p. ISBN: 0-918212-90-1, softcover, \$39.95.

*Optical Disk Technology and the Library*. Canadian Network Papers, 9. Ottawa: National Library of Canada, 1985. 51, 55p. ISBN: 0-662-53811-0, softcover. Text in English and French with French text on inverted pages.

Spreitzer, Francis, ed. *Microforms in Libraries: A Manual for Evaluation and Management*. Chicago: American Library Assn., 1985. 63p. ISBN: 0-8389-3310-6, softcover, \$8.95.

Spyers-Duran, Peter, and Thomas W. Mann, Jr., eds. *Financing Information Services: Problems, Changing Approaches, and New Opportunities for Academic and Research Libraries*. New Directions in Librarianship, no. 6. Westport, Conn., and London: Greenwood, 1985. 197p. ISBN: 0-313-24644-0, hardcover, \$29.95.

Tallman, Johanna E. *Check Out a Librarian*. Metuchen, N.J., and London: Scarecrow, 1985. 180p. ISBN: 0-8108-1823-X, hardcover, \$15.

### INDEX TO ADVERTISERS

Ablex Publishing	page 62
Biosciences Information Service	page 79
Blackwell Library Systems	3d cover
Blackwell North America	2d cover
Faxon	page 78
Gale	page 4
Gaylord	page 3
General Research	4th cover
UTLAS	page 88

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## Letters

To the Editor:

The January 1986 issue of *Program*, which contains the review of volume 3 of *Information Technology and Libraries*, landed on my desk this morning. I enclose a copy of the review—which, as you will see, we persuaded Graham Mackenzie to write.

It was good to see *ITAL*'s review of volume 18 (and some of volume 19) of *Program* in your September 1985 issue. The *Program* editorial board was pleased with the generally favourable tone of what Michael Gorman had to say—and we hope that it will help to sell a few more copies of *Program* in the United States! I was asked, however, to point out a couple of factual errors to you:

- *Program* has undergone only two ma-

ior changes in format: in 1968, on the completion of volume 1, and at the end of 1984, on the completion of volume 18. Mr. Gorman is wrong about our subtitle too: it has always been present, though in the early days it did shrink twice.

- The editorial board (rumly or otherwise) are not all men: Lucy Tedd, Pat Manson, and Jane Wainwright all wondered just where Mr. Gorman got his information!

But these points are trivial. Overall, I'm gratified that the idea of reciprocal reviews, which we hatched up so long ago has at last become reality.—*Dr. R. C. Young, reviews editor, Program, University of Sussex Library, Brighton, England.*

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*Information Technology and Libraries* welcomes manuscripts related to all aspects of library and 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.

Manuscripts must be typewritten and the original submitted with one duplicate. Do not use onion skin. All text must be double-spaced, *including footnotes and references*. Manuscripts should conform to *The Chicago Manual of Style*, 13th ed., rev. (Chicago: Univ. of Chicago Pr., 1982). Illustrations should be prepared carefully as camera-ready copy, neatly drawn in a professional manner on separate sheets of paper. Manuscript pages, bibliographic references, tables, and figures should all be numbered consecutively.

*Feature Articles* consist of original research, state-of-the-art reviews, or comprehensive and in-depth analyses. An abstract of one hundred words or less should accompany the article on a separate sheet. Headings should be used to identify major sections. Authors are encouraged to relate their work to other research in the field and to the larger context of economic, organizational, or management issues surrounding the development, implementation, and use of particular technologies.

*Communications* consist of brief research reports, technical findings, and application notes. An abstract need not be included.

*Letters to the Editor* may offer corrections, clarifications, and additions to previously published material, or may be independent expressions of opinion or fact related to current matters of concern in the interest area of the journal. A letter commenting on an article in the journal is shared with the author, and a response from the author may appear with the letter.

*News and Announcement* items may announce publications, conferences, meetings, products, services, or other items of note.

*Book Reviews* are assigned by the book review editor. Readers wishing to review books for the journal are invited to contact the book review editor, indicating their special areas of interest and expertise.

Names and addresses of the journal editors may be found in paragraph three on the masthead page. In all correspondence please include your own name, institutional affiliation, mailing address, and phone number.



# Information Technology and Libraries

## Index to Volume 4 (1985)

Compiled by Kieth C. Wright

- Access to Media: A Guide to Integrating and Computerizing Catalogs*, (Review), 76-77
- Accessible Storage of Nonbook Materials*, (Review), Weihs, Jean, 73-74
- Acquisitions Systems.  
OCLC to Offer Micro-based Acquisitions System, (N&A), 276
- ADLIB.  
*Libraries Choose ADLIB*, (N&A), 68
- AMIGOS.  
AMIGOS and SOLINET Boards Explore Cooperation, (N&A), 66  
AMIGOS Announces Microcomputer Program, (N&A), 180
- Andre, Pamela Q. J. *Evaluating Laser Videodisc Technology for the Dissemination of Agricultural Information*, 139-47
- Applications of Local Area Networks of Microcomputers in Libraries*, Levert, Virginia M., 9-18
- Archives & Manuscripts: Machine-Readable Records*, (Review), Hedstrom, Margaret L., 279-80
- ASLIB.  
Gorman, Michael. *Program*, (Special Review), 277-79
- Asteroff, Janet F. *On Technical Writing and Technical Reading*, 3-8
- Authority Control.  
Tillett, Barbara B. *1984 Automated Authority Control Opinion Poll: A Preliminary Analysis*, (R&WP), 171-78
- Automated Periodical Reference Service*, (Communication), Ellefsen, David, 353-55
- Automation as a Socio-Organizational Agent of Change: A Evaluative Literature Review*, Olsgaard, John, N., 19-28
- Automation for Archivists and Records Managers: Planning and Implementation Strategies*, (Review), 78-80
- The Automation of Reserve Processing*, Self, James, 215-19
- Baker & Taylor Approval Program Records Available to Innovacq Users*, (N&A), 368
- Blackwell Library Systems, Inc.  
*Blackwell Unveils Version 4*, (N&A), 275
- BLS, Inc. Introduces Perline/Bookline Software for IBM PC*, (N&A), 365-66
- Borovansky, Vladimir T. and Machovec, George S. *Microcomputer-Based Faculty Profile*, 300-5
- British Library Establishes Transatlantic Link*, (N&A), 365
- British Library Installs WLN Software*, (N&A), 273
- Bronars, Lori. *Computer-Readable Databases: A Directory and Data Sourcebook. [V.1] Science, Technology, Medicine. [V.2] Business, Law, Humanities, Social Sciences*, (Review), American Society for Information Science, 369-70
- \_\_\_\_\_. *Online Database Search Services Directory: A Reference and Referral Guide to Libraries, Information Firms, and Other Sources Providing Computerized Information Retrieval and Associated Services Using Publicly-Available Online Databases*, (Review), Schmittroth, Jr., John and Maxfield, Doris Morris, 370
- Brown, William E. *Archives & Manuscripts: Machine-Readable Records*, (Review), Hedstrom, Margaret L., 279-80
- Brownrigg, Edwin B. and Lynch, Clifford A. *Electrons, Electronic Publishing, and Electronic Display*, 201-7
- Browsing with Sound: Sound-Based Codes and Automated Authority Control*, Roughton, Karen G. and Tyckoson, David. A., 130-36
- BRS Information Technologies.  
*Subset of OCLC Database to be Available on BRS for Subject Searching*, (N&A), 275
- Brunning, Dennis and Stewart, Doug. *Prosearch*, (Nonprint review), 374-83
- Cable for Information Delivery: A Guide for Librarians, Educators and Cable Professionals*, (Review), Kenney, Brigitte, L., (ed.), 77-78
- CAI Program Teaches OCLC Searching*, (N&A), 274
- Carney, Richard. *Information Access Company's InfoTrac*, 149-53
- Chan, Winnie and Clark, Sharon E. *Mainte-*

- nance of an Online Catalogue, 324-38
- Cheatham, David. *The Systems Development Life Cycle as a Planning Methodology for Library Automation*, 208-14
- Cheng, Chin-Chuan. *Microcomputer-Based User Interface*, 346-51
- Circulation Systems.  
*New Circulation Module Online at Northwestern*, (N&A), 276
- Clark, Sharon E. and Chan, Winnie. *Maintenance of an Online Catalogue*, 324-38
- CLR Publishes Online Catalog Design Report. (N&A), 65
- CLSI.  
 CLSI Releases Professional Workstation, (N&A), 66-67  
 Multi-Vendor Library Systems Datalinked in Massachusetts, (N&A), 68  
 CLSI Sunrise, (N&A), 366
- Collection Management.  
 Payson, Evelyn and Moore, Barbara. *Statistical Collection Management Analysis of OCLC-MARC Tape Records*, 220-32
- Computer-Readable Databases: A Directory and Data Sourcebook. [V.1] Science, Technology, Medicine. [V.2] Business, Law, Humanities, Social Sciences, (Review), American Society for Information Science, 369-70
- Consulting Services.  
*The Information Works*, (N&A), 65
- Copyright Law.  
 Brownrigg, Edwin B. and Lynch, Clifford A. *Electrons, Electronic Publishing, and Electronic Display*, 201-7
- Council on Library Resources.  
 CLR Publishes Online Catalog Design Report. (N&A), 65  
*Issues in Retrospective Conversion: Report of a Study Conducted for the Council on Library Resources*, (Review), Reed-Scott, Jutta, 85-86  
*Retrospective Conversion: Report of a Meeting Sponsored by the Council on Library Resources, July 16-18, 1984, Wayzata, Minnesota*, (Review), Gregor, Dorothy, (ed.), 85-86
- Coyle, Karen. *Record Matching: A Discussion*, (Communication), 57-59
- Crawford, Walt. (Letter) concerning errors in VDT Checklist: Another Look at Terminals, (December, 1984), 195  
 \_\_\_\_\_ (Letter) concerning RLN Command Analysis System, 283  
 \_\_\_\_\_ *Microcomputer Applications in Libraries: A Management Tool for the 1980s and Beyond*. (Review), Kesner, Richard M. and Jones, Clifton H., 80-82  
 \_\_\_\_\_ *The RLIN Command Analysis System: Measuring Use and Performance of an Online System*, 29-51
- Database Management Systems.  
 Borovansky, Vladimir T. and Machovec, George S. *Microcomputer-Based Faculty Profile*, 300-5  
 Koenig, M. E. D. *Data Relationships: Bibliographic Information Retrieval Systems and Database Management Systems*, (Special Tutorial), 247-72
- Databases.  
 Bronars, Lori. *Computer-Readable Databases: A Directory and Data Sourcebook*. [V.1] Science, Technology, Medicine. [V.2] Business, Law, Humanities, Social Sciences, (Review), American Society for Information Science, 369-70  
 \_\_\_\_\_ *Online Database Search Services Directory: A Reference and Referral Guide to Libraries, Information Firms, and Other Sources Providing Computerized Information Retrieval and Associated Services Using Publicly-Available Online Databases*, (Review), Schmittroth, Jr., John and Maxfield, Doris Morris, 370  
 Data Relationships: Bibliographic Information Retrieval Systems and Database Management Systems, (Special Tutorial), Koenig, M. E. D., 247-72
- Documentation.  
*On Technical Writing and Technical Reading*, Asteroff, Janet F. 3-8
- DYNIX.  
 Three Libraries Sign with DYNIX for Turnkey Systems, (N&A), 69  
*The Effect of the Online Catalogue on Reference: Uses, Services, and Personnel*, Woodard, Beth S. and Golden, Gary A., 338-45
- Electronic Publishing.  
 Brownrigg, Edwin B. and Lynch, Clifford A. *Electrons, Electronic Publishing, and Electronic Display*, 201-7  
 Hannemyr, Gisle and Flood, Even. *Scholarly References to Machine-Readable Documents*, (Communication), 61-64  
*Information Access Company Announces Electronic Journal*, (N&A), 67  
 Ellefsen, David. *Automated Periodical Reference Service*, (Communication), 353-55  
*Encoding Databases on Optical Disks*, Lewis, Bryan C., 147-49  
*Evaluating Laser Videodisc Technology for the Dissemination of Agricultural Information*, Andre, Pamela Q. J. 139-47
- Faculty Profiles.  
 Borovansky, Vladimir T. and Machovec, George S. *Microcomputer-Based Faculty Profile*, 300-5
- Fee-Based Services.  
*Fee-Based Services in Sci-Tech Libraries*, (Re-

- view), Mount, Ellis, (ed.), 192-93.
- File Transfer Pilot Project Operational*, (N&A), 366
- Flood, Even and Hannemyr, Gisle. *Scholarly References to Machine-Readable Documents*, (Communication), 61-64
- Florance, Valarie. *Media and Microcomputers in the Library: A Selected, Annotated Resource Guide*, (Review), Daniel, Evelyn H., and Notowitz, Carol I., 73-74
- \_\_\_\_\_. *Accessible Storage of Nonbook Materials*, (Review), Weihs, Jean, 73-74
- Gale, John C. *The Information Workstation: A Confluence of Technologies Including the CD-ROM*, 137-39
- GEAC.
- GEAC Develops Optical Disk Link for Micros*, (N&A), 275
- GEAC Signs Contracts with Georgetown and Lehigh Universities*, (N&A), 68-69
- Goldberg, Kay and Hammell, Kathryn A. *The Evolution of an Online Union Catalog: Impact of User Feedback*, 162-68
- Gorman, Michael. *Program*, (Special Review), 277-79
- \_\_\_\_\_. *The Online Catalogue at the University of Illinois at Urbana-Champaign: A History and Overview*, 306-11
- Gould, Martha. *To Free the Mind: Libraries, Technology, and Intellectual Freedom*, (Review), Oboler, Eli M., 82-84
- Hammell, Kathryn A. and Goldberg, Kay. *The Evolution of an Online Union Catalog: Impact of User Feedback*, 162-68
- Hannemyr, Gisle and Flood, Even. *Scholarly References to Machine-Readable Documents*, (Communication), 61-64
- Hardiman, Paul V. and Lowrey, James R. *Using a Text-Processing Language for Serial Record Conversion*, (Communication), 356-58
- Health Hazards of VDTs<sup>P</sup>* (Review), Pearce, B. G., (ed.), 84-85
- Heyman, Berna L. *Library Technical Services: Operations and Management*, (Review), Godden, Irene P., (ed.), 186-89
- Iannuzzi, Patricia. *Micrographics*, (Review), Saffady, William, 370-72
- Implementation of UTOC: An Online Catalog*, (Communication), Wikholm, Nancy. 59-61
- Information Access Company.
- Carney, Richard. *Information Access Company's InfoTrac*, 149-53
- Information Access Company Announces Electronic Journal*, (N&A), 67
- Information Access Company Introduces Videodisc System*, (N&A), 70-71
- Information Access Company's InfoTrac*, Carney, Richard. 149-53
- Information Access Company Introduces Videodisc System*, (N&A), 70-71
- The Information Works*, (N&A), 65
- The Information Workstation: A Confluence of Technologies Including the CD-ROM*, Gale, John C. 137-39
- Initial Funding Completed for RLG Recon Program*, (N&A), 181
- Intellectual Freedom.
- To Free the Mind: Libraries, Technology, and Intellectual Freedom*, (Review), Oboler, Eli M., 82-84
- Issues in Retrospective Conversion: Report of a Study Conducted for the Council on Library Resources*, (Review), Reed-Scott, Jutta, 85-86
- Jacob, M. E. L. *Networking Priorities for Standards Development*, (R&WP), 361-62
- Katz, Bob. *Cable for Information Delivery: A Guide for Librarians, Educators and Cable Professionals*, (Review), Kenney, Brigitte, L., (ed.), 77-78
- Koenig, M. E. D. *Data Relationships: Bibliographic Information Retrieval Systems and Database Management Systems*, (Special Tutorial), 247-72
- Kluegel, Kathleen. *Professional Bibliographic System*, (Nonprint Review), 372-74
- Kruger, Kathleen J. *MARC Tapes and Retrospective Conversion: The Editing Process*, (Communication), 53-57
- Lewis, Bryan G. *Encoding Databases on Optical Disks*, 147-49
- Lever, Virginia M. *Applications of Local Area Networks of Microcomputers in Libraries*, 9-18
- Libraries Choose ADLIB*, (N&A), 68
- Library and Information Technology Association (LITA).
- Crossroads: Proceedings of the First National Conference of the Library and Information Technology Association, September 17-21, 1983, Baltimore, Maryland*, (Review), Gorman, Michael, (ed.), 189-90
- Library Automation.
- Automation as a Socio-Organizational Agent of Change: A Evaluative Literature Review*, Olsgaard, John, N., 19-28
- Library Technical Services: Operations and Management*, (Review), Godden, Irene P., (ed.), 186-89
- LIBS 100 to Speak Chinese, Japanese, and Korean*, (N&A), 367
- Linking LCS and FBR: The Library's Perspective*, Potter, William Gray, 311-15
- Linking LCS and FBR: Technical Perspective*,

- Salika, Catherine, 315-23
- LITA. SEE Library and Information Technology Association.
- Local Area Networks.  
*Applications of Local Area Networks of Microcomputers in Libraries*, Levert, Virginia M., 9-18
- The Library of Congress Non-Print Optical Disk Pilot Program*, Parker, Elisabeth Betz, 289-99
- Lowrey, James R. and Hardiman, Paul V. *Using a Text-Processing Language for Serial Record Conversion*, (Communication), 356-58
- Ludy, Lorene E. *OSU Libraries' Use of Library of Congress Subject Authority Files*, (Communication), 155-60
- Lynch, Clifford A. and Brownrigg, Edwin B., *Electrons, Electronic Publishing, and Electronic Display*, 201-7
- McPherson, Dorothy S. *MARC Compatability: A TESLA Survey of Vendors*, (R&WP), 241-46
- Mandel, Carol A. *Issues in Retrospective Conversion: Report of a Study Conducted for the Council on Library Resources*, (Review), Reed-Scott, Jutta, 85-86
- \_\_\_\_\_. *Retrospective Conversion: Report of a Meeting Sponsored by the Council on Library Resources, July 16-18, 1984, Wayzata, Minnesota*, (Review), Gregor, Dorothy, (ed.), 85-86
- MARC.  
*MARC Tapes and Retrospective Conversion: The Editing Process*. (Communication), Kruger, Kathleen J., 53-57
- McPherson, Dorothy S. *MARC Compatability: A TESLA Survey of Vendors*, (R&WP), 241-46
- Payson, Evelyn and Moore, Barbara. *Statistical Collection Management Analysis of OCLC-MARC Tape Records*, 220-32
- MARC Compatability: A TESLA Survey of Vendors, (R&WP), McPherson, Dorothy S., 241-46
- MARC Tapes and Retrospective Conversion: The Editing Process. (Communication), Kruger, Kathleen J., 53-57
- Machovec, George S. and Borovansky, Vladimir T. *Microcomputer-Based Faculty Profile*, 300-5
- Media and Microcomputers in the Library: A Selected, Annotated Resource Guide*, (Review) 73-74
- Microcomputer-Based User Interface*, Cheng, Chin-Chuan, 346-51
- Microcomputer Applications.  
*AMIGOS Announces Microcomputer Program*, (N&A), 180
- BLS, Inc. Introduces Perline/Bookline Software for IBM PC*, (N&A), 365-66
- Borovansky, Vladimir T. and Machovec, George S. *Microcomputer-Based Faculty Profile*, 300-5
- Cheng, Chin-Chuan. *Microcomputer-Based User Interface*, 346-51
- Florance, Valarie. *Media and Microcomputers in the Library: A Selected, Annotated Resource Guide*, (Review), Daniel, Evelyn H., and Notowitz, Carol I., 73-74
- Microcomputer Applications in Libraries: A Management Tool for the 1980s and Beyond*, (Review), Kesner, Richard M. and Jones, Clifton H., 80-82
- University of Michigan Library Acquires Microcomputers*, (N&A), 183
- OCLC Introduces Micro-Based Services*, (N&A), 69-70
- OCLC to Offer Micro-based Acquisitions System*, (N&A), 276
- WLN Software Downloads Bibliographic Records to Microcomputers*, (N&A), 366-67
- Microcomputer Applications in Libraries: A Management Tool for the 1980s and Beyond*, (Review), Kesner, Richard M. and Jones, Clifton H., 80-82
- Micrographics*, (Review), Saffady, William, 370-72
- Miller, R. Bruce. *Health Hazards of VDTs?* (Review), Pearce, B. G., (ed.), 84-85
- \_\_\_\_\_. *Video Display Terminal Workstation Ergonomics*, (Review), Tijerina, Louis, 84-85
- Minds Meet on "Maggie III": Eyring Research Institute, Inc. Wins Library Contract*, (N&A), 274
- Mischo, William H. *Subject Searching in Library Catalogs: Before and After the Introduction of Online Catalogs*, (Review), Markey, Karen, 190-92
- Moore, Barbara and Payson, Evelyn. *Statistical Collection Management Analysis of OCLC-MARC Tape Records*, 220-32
- Multi-Vendor Library Systems Datalinked in Massachusetts*, (N&A), 68
- National Information Standards Organization, Z39.  
 Jacob, M. E. L. *Networking Priorities for Standards Development*, (R&WP), 361-62
- Networking Priorities for Standards Development*, (R&WP), Jacob, M. E. L., 361-62
- 1984 Automated Authority Control Opinion Poll: A Preliminary Analysis*, (R&WP), Tillet, Barbara B., 171-78
- New Circulation Module Online at Northwestern*, (N&A), 276
- Nonprint Media.



- Access to Media: A Guide to Integrating and Computerizing Catalogs*, (Review), 76-77
- Accessible Storage of Nonbook Materials*, (Review), Weihs, Jean, 73-74
- Nonprint Reviews.
- Professional Bibliographic System*, (Nonprint Review), 372-74
- Prosearch*, (Nonprint review), 374-83
- OCLC.
- CAI Program Teaches OCLC Searching*, (N&A), 274
- OCLC Introduces Micro-Based Services*, (N&A), 69-70
- OCLC Microcomputer Exchange Begins*, (N&A), 65-66
- OCLC Publishes Microcomputer Magazine*, (N&A), 179
- OCLC to Acquire Advanced Telecommunications Equipment and Software*, (N&A), 67-68
- OCLC to Acquire Computer Equipment for Linked Systems Project*, (N&A), 69
- OCLC to Offer Micro-based Acquisitions System*, (N&A), 276
- Payson, Evelyn and Moore, Barbara. *Statistical Collection Management Analysis of OCLC-MARC Tape Records*, 220-32
- Subset of OCLC Database to be Available on BRS for Subject Searching*, (N&A), 275
- On Technical Writing and Technical Reading*, Asteroff, Janet F., 3-8
- Online Catalog Systems.
- Cheng, Chin-Chuan. *Microcomputer-Based User Interface*, 346-51
- Clark, Sharon E. and Chan, Winnie. *Maintenance of an Online Catalogue*, 324-38
- CLR Publishes Online Catalog Design Report*, (N&A), 65
- GEAC Signs Contracts with Georgetown and Lehigh Universities*, (N&A), 68-69
- Gorman, Michael. *The Online Catalogue at the University of Illinois at Urbana-Champaign: A History and Overview*, 306-11
- Hammell, Kathryn A. and Goldberg, Kay. *The Evolution of an Online Union Catalog: Impact of User Feedback*, 162-68
- Implementation of UTOC: An Online Catalog*, (Communication), Wikholm, Nancy, 59-61
- Integrated Online Library Systems: Principles, Planning and Implementation*, (Review), Genaway, David C., 185-86
- Libraries Choose ADLIB*, (N&A), 68
- Online Catalog at the University of Illinois at Urbana-Champaign*, (N&A), 182
- Potter, William Gray. *Linking LCS and FBR: The Library's Perspective*, 311-15
- Record Matching: A Discussion*, (Communication), Coyle, Karen, 57-59
- The RLIN Command Analysis System: Measuring Use and Performance of an Online System*, Crawford, Walt, 29-51
- Special Section: In Depth—The Online Catalogue of the University of Illinois at Urbana-Champaign*, 306-58
- Salika, Catherine. *Linking LCS and FBR: Technical Perspective*, 315-23
- Woodard, Beth S. and Golden, Gary A. *The Effect of the Online Catalogue on Reference: Uses, Services, and Personnel*, 338-45
- Organizational Change.
- Automation as a Socio-Organizational Agent of Change: A Evaluative Literature Review*, Olsgaard, John, N., 19-28
- OSU Libraries' Use of Library of Congress Subject Authority Files*, (Communication), Ludy, Lorene E., 155-60
- Other Recent Publications, 86-87, 194, 283, 383
- Packet Radio.
- UC Plans Prototype Packet Radio Network*, (N&A), 367
- Parker, Elisabeth Betz. *The Library of Congress Non-Print Optical Disk Pilot Program*, 289-99
- Payson, Evelyn and Moore, Barbara. *Statistical Collection Management Analysis of OCLC-MARC Tape Records*, 220-32
- Peters, Paul Evan. *Integrated Online Library Systems: Principles, Planning and Implementation*, (Review), Genaway, David C., 185-86
- Pikes Peak Library District.
- Minds Meet on "Maggie III": Eyring Research Institute, Inc. Wins Library Contract*, (N&A), 274
- Planning.
- Cheatham, David. *The Systems Development Life Cycle As a Planning Methodology for Library Automation*, 208-14
- Potter, William Gray. *Linking LCS and FBR: The Library's Perspective*, 311-15
- Processing and Data Distribution within the Research Libraries Information Network*, (N&A), 181-82
- Professional Bibliographic System*, (Nonprint Review), 372-74
- Program*, (Aslib's journal of automated library and information systems), (Special Review), 277-79
- Prosearch*, (Nonprint review), 374-83
- Record Matching: A Discussion*, (Communication), Coyle, Karen, 57-59
- Reference Services.
- Ellefsen, David. *Automated Periodical Refer-*

- ence Service, (Communication), 353-55
- Woodard, Beth S. and Golden, Gary A. *The Effect of the Online Catalogue on Reference: Uses, Services, and Personnel*, 338-45
- Research Libraries Group.
- Initial Funding Completed for RLG Recon Program*, (N&A), 181
- RLG Study on Distributed Processing*, (N&A), 181-82
- RLG Announces IBM PC Version of RLIN Terminal*, (N&A), 273-74
- Research Libraries Information Network (RLIN).
- The RLIN Command Analysis System: Measuring Use and Performance of an Online System*, Crawford, Walt, 29-51 (See also letter p. 283, September 1985)
- RLG Study on Distributed Processing*, (N&A), 181-82
- Reserve Book Systems.
- Self, James. *The Automation of Reserve Processing*, 215-19
- Retrospective Conversion.
- Initial Funding Completed for RLG Recon Program*, (N&A), 181
- MARC Tapes and Retrospective Conversion: The Editing Process*. (Communication), Kruger, Kathleen J., 53-57
- Issues in Retrospective Conversion: Report of a Study Conducted for the Council on Library Resources*, (Review), Reed-Scott, Jutta, 85-86
- Retrospective Conversion: Report of a Meeting Sponsored by the Council on Library Resources, July 16-18, 1984, Wayzata, Minnesota*, (Review), Gregor, Dorothy, (ed.), 85-86
- WLN Introduces Micro-Recon*, (N&A), 179-80
- The RLIN Command Analysis System: Measuring Use and Performance of an Online System*, Crawford, Walt, 29-51
- Roughton, Karen G. and Tyckoson, David A. *Browsing with Sound: Sound-Based Codes and Automated Authority Control*, 130-36
- Russell, Keith W. *Crossroads; Proceedings of the First National Conference of the Library and Information Technology Association, September 17-21, 1983, Baltimore, Maryland*, (Review), Gorman, Michael, (ed.), 189-90
- Salika, Catherine, *Linking LCS and FBR: Technical Perspective*, 315-23
- Scholarly References to Machine-Readable Documents*, (Communication), Hannemyr, Gisle and Flood, Even. 61-64
- Self, James. *The Automation of Reserve Processing*, 215-19
- Smith, Tom. *Fee-Based Services in Sci-Tech Libraries*, (Review), Mount, Ellis, (ed.), 192-93.
- Software Reviews. SEE Nonprint Reviews
- SOLINET.
- AMIGOS and SOLINET Boards Explore Cooperation*, (N&A), 66
- Sound Based Systems.
- Roughton, Karen G. and Tyckoson, David A., *Browsing with Sound: Sound-Based Codes and Automated Authority Control*, 130-36
- Talking Terminal for the MELVYL Catalog*, (N&A), 179
- Special Section: In Depth—The Online Catalogue of the University of Illinois at Urbana-Champaign*, 306-58
- Special Tutorial.
- Koenig, M. E. D. *Data Relationships: Bibliographic Information Retrieval Systems and Database Management Systems*, (Special Tutorial), 247-72
- Statistical Collection Management Analysis of OCLC-MARC Tape Records*, Payson, Evelyn and Moore, Barbara, 220-32
- Stewart, Doug and Brunning, Dennis. *Prosearch*, (Nonprint review), 374-83
- Subject Access.
- Mischo, William H. *Subject Searching in Library Catalogs: Before and After the Introduction of Online Catalogs*, (Review), Markey, Karen, 190-92
- Subject Searching in Library Catalogs: Before and After the Introduction of Online Catalogs*, (Review), Markey, Karen, 190-92
- The Systems Development Life Cycle as a Planning Methodology for Library Automation*, Cheatham, David, 208-14
- Talking Terminal for the MELVYL Catalog*, (N&A), 179
- Technical Services in Libraries.
- Library Technical Services; Operations and Management*, (Review), Godden, Irene P., (ed.), 186-89
- Text Processing Languages.
- Lowrey, James R. and Hardiman, Paul V. *Using a Text-Processing Language for Serial Record Conversion*, (Communication), 356-58
- Three Libraries Sign with DYNIX for Turnkey Systems*, (N&A), 69
- Tillett, Barbara B. *1984 Automated Authority Control Opinion Poll: A Preliminary Analysis*, (R&WP), 171-78
- To Free the Mind: Libraries, Technology, and Intellectual Freedom*, (Review), Oboler, Eli M., 82-84
- Tyckoson, David. A. and Roughton, Karen G. *Browsing with Sound: Sound-Based Codes and Automated Authority Control*, 130-36

- UC Plans Prototype Packet Radio Network, (N&A), 367
- University of Michigan Library Acquires Microcomputers, (N&A), 183
- University of Toronto Sells the UTLAS Library Information System to International Thomson, (N&A), 180
- User Studies.
- Hammell, Kathryn A. and Goldberg, Kay. *The Evolution of an Online Union Catalog: Impact of User Feedback*, 162-68
- A User's Guide to Computer Contracting: Forms, Techniques and Strategies, (Review), 75-76
- Using a Text-Processing Language for Serial Record Conversion, (Communication), Lowrey, James R. and Hardiman, Paul V., 356-58
- UTLAS Library Information System.
- UTLAS Acquires Dataphase ALIS III, (N&A), 275
- University of Toronto Sells the UTLAS Library Information System to International Thomson, (N&A), 180
- Video Display Terminal Workstation Ergonomics, (Review), 84-85
- Videodisc Systems.
- Andre, Pamela Q. J. *Evaluating Laser Videodisc Technology for the Dissemination of Agricultural Information*, 139-47
- Carney, Richard. *Information Access Company's Infotrac*, 149-53
- GEAC Develops Optical Disk Link for Micros, (N&A), 275
- Information Access Company Introduces Videodisc System, (N&A), 70-71
- Gale, John C. *The Information Workstation: A Confluence of Technologies Including the CD-ROM*, 137-39
- Lewis, Bryan G. *Encoding Databases on Optical Disks*, 147-49
- Parker, Elisabeth Betz. *The Library of Congress Non-Print Optical Disk Pilot Program*, 289-99
- Wajenberg, Arnold S. *Access to Media: A Guide to Integrating and Computerizing Catalogs*, (Review), 76-77
- Washington Library Network.
- British Library Installs WLN Software, (N&A), 273
- Special Section: In Depth—The Online Catalogue of the University of Illinois at Urbana-Champaign, 306-58
- Washington Library Network Goes Western, (N&A), 366
- WLN Introduces Micro-Recon, (N&A), 179
- WLN Software Downloads Bibliographic Records to Microcomputers, (N&A), 366-67
- Wikholm, Nancy. *Implementation of UTOC: An Online Catalog*, (Communication), 59-61
- Wilson, Lofton. *Automation for Archivists and Records Managers: Planning and Implementation Strategies*, (Review), 78-80
- Woodard, Beth S. and Golden, Gary A. *The Effect of the Online Catalogue on Reference: Uses, Services, and Personnel*, 338-45
- Yavarkovsky, Jerome. *A User's Guide to Computer Contracting: Forms, Techniques and Strategies*, (Review), 75-76

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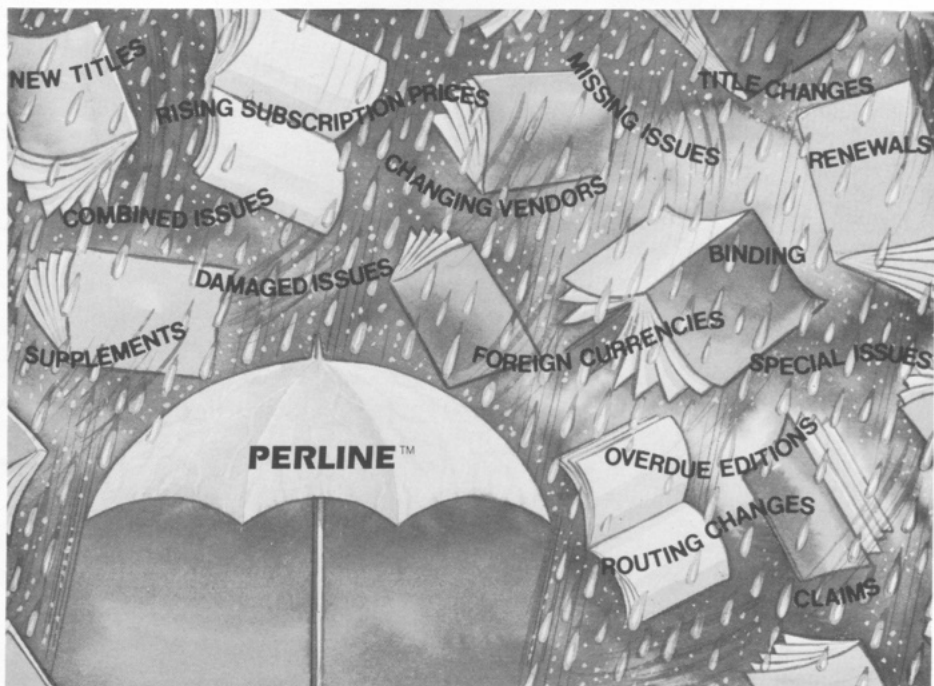
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