# Information Technology and Libraries

## June 1991

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# Information Technology and Libraries

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# Techniques to Improve Subject Retrieval in Online Catalogs: Flexible Access to Elements in the Bibliographic Record

## Tschera Harkness Connell

*A paragraph description of "what the book is about" taken from* Book Review Digest *is used to evaluate information on the bibliographic record. It is first determined to what extent book descriptions match either subject headings or keywords in the title. Segments of the bibliographic record are then examined to determine their potential for retrieving the book described. The combination of approaches used to simulate manipulation of the data in the record increased recall in the sample by 20%. Keyword matching in the personal name and corporate name subject fields is a way to increase both precision and recall.*

Providing adequate subject access is one of the most important challenges facing librarians today. Online catalog use studies have shown that users search by subject at least as frequently as they do by title or author.[1] However, the difficulties of providing good subject access are numerous. There is a great deal of subjectivity involved in determining what a book is about. The problem is compounded when predicting how a patron will ask for the book. Variances in language, terminology, semantics, and point of view may cause the same book to be described differently by indexer and user.

There are at least three approaches to solving the problem of subject access in an online environment: (1) to enhance the content of the bibliographic record by augmenting it with additional information, (2) to educate the user about the strengths and the limitations of the system, and (3) to develop the interface between the content and users so that the chances of a user's input matching the content of the system will be increased. These approaches are not mutually exclusive but are a convenient way of isolating various facets of system design for further study. This study is concerned primarily with the third approach.

Interface design can include systems features for manipulating user input such as automatic right truncation, spelling checkers, and simultaneous singular/plural retrieval. Interface design also can include features that manipulate the grammar and punctuation of designated fields in the record, or that search parts of records that have not traditionally been used for direct access.

Studies have shown that the match rate between user terms and catalog subject headings ranges widely from a low of 14% to a high of 58%.[2] However, user terms are frequently brief and may not represent topics within the scope of the database. In this study, a paragraph description of "what the book is about" is taken from Book Review Digest and used to evaluate the information on the bibliographic record. The degree to which book descriptions match assigned subject headings indicates the chances that a user will be able to find the book if the user makes a request for "what the book is about."

The study proceeds in two phases. The first phase determines to what extent book descriptions match either subject headings or

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keywords in the title. The second phase examines segments of the bibliographic record that presently are not widely used in subject retrieval in order to determine their potential for retrieving the book described. This second phase is performed only on those books that did not match in the first phase. The analyses concentrate on permutations and/or segmentations of the Library of Congress (LC) subject headings as found on Library of Congress records in the Online Computer Library Center (OCLC) database.

## STATEMENT OF THE PROBLEM

Manual catalogs constrain users by the linear, alphabetic arrangement of subject headings filed in the catalog. It is possible in manual catalogs to provide multiple entries and thus have multiword access, but the size of most library collections precludes an exhaustive listing of potential access points. Computers make it easier both to increase the quantity of information in the record and to access more points in the record. However, it is important to understand the ramifications of this computer potential before massive modifications to online catalogs are made. Past experience with major changes in systems of bibliographic organization in libraries (new cataloging codes, new shelf classification schemes) have raised questions as to whether the "improvements" have warranted the costs involved. The library faces the costs of time and resources to make the changes. The user has to grapple with using multiple systems existing side by side.

Therefore, before we increase access points to the catalogs of our collections it is important to know which enhancements are most likely to increase retrieval of relevant information. More access is not necessarily better access. Some modifications may not warrant the expense of time and personnel to effect the change; others may increase recall, meaning the number of items retrieved, but at the same time decrease the precision ratio, that is, the proportion of items that are relevant to the request.

Grammar and syntax in the *Library of Congress Subject Headings* (*LCSH*) are often seen as a further hindrance to user access. It may be possible to work around this access problem by using the flexibility of the computer for multiple access without having to make the corresponding changes in card or book catalogs. This study looks at the results of some of these more flexible means of access.

## LITERATURE REVIEW

### Enhancing the Content through Augmentation

Enhancing the content of the record can be accomplished by adding information to the record and by using the information already available to better advantage. Several researchers have suggested adding more information to the catalog record. The most extensive study of this approach was the Subject Access Project (SAP) performed under the direction of Atherton.[3] A monographic database was created by augmenting the subject headings of 2400 MARC (MAchine Readable Cataloging) records with words and phrases from the book's index and/or table of contents. Searches were then performed in the augmented database, BOOKS, and compared with the same searches performed on records that had not been augmented. Online searches in BOOKS took less time and retrieved more relevant items than the same searches in the MARC database. Although the precision ratio for BOOKS was poor, it was no worse than for searches in the unaugmented MARC database: both systems produced two to three nonrelevant items for every one relevant item retrieved. Despite the problems of precision, SAP demonstrated that improvement in subject recall could be obtained by adding selected content and index information to the bibliographic record. The costs of adding and storing the additional information were relatively low when compared to traditional subject analysis costs.

Adding a greater variety of authorized terms to the subject headings list is an indirect way of augmenting the database. LC's policy of literary warrant means that a subject heading term is created only if the Library processes a book that requires it. Therefore, libraries with specialized collections may find *LCSH* inadequate for their needs. The Library of Congress recognizes this problem. One of the purposes of the publication of the Library of Congress' *Subject Cataloging Manual* is to aid "practicing subject catalogers wishing to assign subject headings in the spirit

of LC's own policies and practices."[4] The Library of Congress has encouraged individuals wishing to submit headings for *LCSH* to write for instructions and blank subject authority worksheets.[5]

Another way of adding information to the record is to use classification to enhance subject retrieval. Using the OCLC MARC records as a research base, Markey and Demeyer have tested the retrieval potential of the Dewey Decimal Classification (DDC).[6] Subject terms in the *DDC Schedules and Relative Index*, hierarchical arrays of related terms in the schedules, and class numbers in the schedules and index were all used as searchers' tools for subject access and browsing. DDC numbers on the bibliographic record were indexed to provide potential access points. Markey and Demeyer demonstrated that, used in combination with *LCSH* and title keywords, DDC could increase recall and bring up relevant items that would not be retrieved by any of the other fields on the record.

Chan has examined the theoretical issues related to whether the Library of Congress Classification (LCC) can be used to enhance subject retrieval in an online catalog while Williamson is working on a project to test the potential of using LCC for subject retrieval.[7,8] Huestis has reviewed strategies for overcoming the major problems involved in the use of LCC as an access point in online catalogs.[9]

### Enhancing Access through Improvement of *LCSH*

Improving access to the bibliographic record can also be accomplished by using the information already available to better advantage. Although the MARC record provides the means for using several sources for subject headings, including headings that are locally assigned, the primary source for subject headings in the United States is the *Library of Congress Subject Headings* list (*LCSH*). Improving *LCSH* is a way to improve the bibliographic record.

The *Library of Congress Subject Headings* list has been extensively criticized during the seventy-plus years of its existence.[10] Outside the scope of this study, but of major concern, have been issues of terminology. One criticism has been the inability of the system to keep up with current terminology, especially in rapidly evolving fields of knowledge. Another has been the Male- /Anglo- /Western-/ Judeo-Christian bias of the terminology used. The structure and grammar of *LCSH* have also been major areas of concern. The *LCSH* reference structure consists of *see* references from terms not used, to the headings that are used and *see also* references from a broader heading to a narrower term, or between any two headings that are related other than hierarchically. The 1983 Library of Congress entry vocabulary project was one experimental effort to increase the coverage of *see* references in the *Library of Congress Subject Headings* list.[11]

The immense size and rapid growth of the Library of Congress collections have meant that inconsistencies and anomalies have developed in the list. In 1970, Harris showed that some of the headings which cause problems in terminology are leftovers from earlier lists, and *LCSH* cross-references were shown to be inconsistent and incomplete.[12]

In 1972, a study conducted by Sinkankas pointed out the need for an improvement in the entire reference structure of *LCSH*. Sinkankas tested the *see also* references of *LCSH* to determine if the hierarchy of references would guide the user through a subject until all aspects of the subject had been exposed. He concluded that "[t]he syndetic structure does not perform any guiding function at all. It connects terms, but the connection may not be considered a classification."[13] In light of this study, the recent decision of the Library of Congress to adopt the very precisely defined terminology of thesaurus construction to show relationships in the LC subject headings list is misleading. Dykstra, in particular, criticizes the new terminology of *LCSH*.[14] "Broader term," "narrower term," and "related term" are precisely defined to show very specific hierarchical relationships in tightly structured vocabularies. The Sinkankas study shows that the syndetic reference structure of *LCSH* is not tightly controlled.

There have been many studies that have dealt with the structure and grammar of Library of Congress subject headings. Steinweg studied headings in order to determine how common marks of punctuation (comma, parentheses, hyphen, apostrophe, and period)

are used and if their usage was consistent and predictable.[15]

Wepsiec considered the grammar of the headings from a different point of view. By grouping existing headings into twenty-two syntactic types, he found that some semantic types were expressed by more than one syntactic type. For example, the headings "Religion and sociology" and "Hospitals—Sociological aspects" both present the sociological perspective of the focal noun (religion in the first case, hospitals in the second). Wepsiec suggests that the user would be better served if the two headings were formulated using the same syntax—the noun qualified by a subdivision. He concluded that seven syntactic types could be eliminated without loss of specificity of the headings.[16]

Dailey also performed an extensive evaluation of the grammar of Library of Congress subject headings.[17] He developed fifteen syntactical rules for heading formation in which he advocated using punctuation consistently and uniquely in formulating headings.

Understanding the structure and grammar of *LCSH* is important in order to make effective improvements in the list itself and to use computer systems to access the existing headings effectively in different ways. Both can be considered enhancements to the content of the bibliographic record.

## Enhancing Access through Computer Design

Mischo, in two studies performed at Iowa State University, took the approach of using a computer to simulate changes in the headings. He explored the possibility of increasing access to the bibliographic record through the use of computer-assisted indexing.[18] He later experimented with the same techniques using the Online Union Catalog of OCLC. Because of the tremendous requirements for machine space to invert files needed for Boolean searching, an algorithm was developed for the rotation of significant words in a subject heading as a way of increasing subject access points. Mischo simulated "Boolean search capability over subject heading words by building precoordinated term combinations into the derived or phrase index keys."[19] The ability to search title keywords was judged to be an important integral component of the project. The fact that these approaches provided

improved subject retrieval over unmodified *LCSH* is not surprising in view of the fact that a greater number of access points (an estimated fifteen per title) is provided. Increasing the potential access by adding access points was the purpose of the experiments.

Lester, in her doctoral research on improving subject access in online catalogs, used the approach of developing the interface to increase the chances of a user's input matching the content of the system. User terms collected from transaction logs at Northwestern University were compared with *LCSH* headings to determine the degree of match success. Then twenty-two systems features for manipulating user input were applied to the "match failures" (those terms that did not exactly match *LCSH* headings) to determine how well modifications improved the rate of match success.[20]

In many ways the present study is patterned after the methodology used by Lester. However, there are two important differences in approach between the two studies. Lester's research approaches the problem of improving subject access primarily by modifying user input. The present study approaches the problem by simulating modifications of the content in the bibliographic record. There are infinite ways a user can ask for information. The studies into the structure and grammar of *LCSH* indicate that there is a finite number of syntactic patterns for Library of Congress subject headings. This project examines the potential benefits of manipulating four of those patterns with and without using keywords in the title. Therefore, the focus is not on user success but on potential user success. The use of an independent description of "what the book is about" addresses the issue of whether the indexing reflects the content of the book.

## METHODOLOGY

The *Book Review Digest* (*BRD*) was selected as the source of independent summaries of each book's content. The *BRD* "provides excerpts of and citations to reviews of current fiction and nonfiction in the English language."[21] It also includes a summary paragraph for each entry on "what the book is about."

Because juvenile and young adult materials are not a collection priority of LC, the termi-

nology of *LCSH* is often inadequate for these materials. Since this study examines the effect of modifying traditional access to Library of Congress subject headings, juvenile and young adult titles are eliminated.

The books listed in the 1987 *Book Review Digest* (excluding juvenile and young adult titles) provide the population for the study. A preliminary examination of 20 randomly chosen pages of the *BRD* produced descriptions of 66 books. The purpose of this preliminary sample was to gather information that would help determine the size of the sample required for the final study. Twenty-one percent of the entries were juvenile or young adult titles and therefore were eliminated. The remaining books were then examined to determine the proportion of entries whose *BRD* descriptions match main headings of subject headings, or keywords in the title proper. Seventy percent produced a match.

Considering this initial match of 70% in a preliminary examination of *BRD*, the expected proportion of the population that would fail to match on main headings of the subject and on keywords in the title, but succeed on any one of the final tests, is estimated to be 20% or less. The 20% figure is based on an assumption that some but not all of the 30% that failed to match on the main heading of the subject and on keywords in the title will match on one of the final tests, and that 20% is at the upper end of the percentage range that might be expected to match. To achieve a statistical precision of 2.5% in the estimated proportion (at the 95% confidence level), the required sample size is: $n = (1.96/.025)^2 (.2)(.8) = 983$.

Twelve hundred entries were randomly selected from the 1987 *BRD* to ensure that after juvenile and young adult titles books were eliminated, at least 983 other titles would remain (983 is approximately .79 × 1,200).

To obtain the random sample, 430 pages were photocopied. The 1987 *BRD* is 2,064 pages long which means that the sample size is approximately 21% (430/2064) of the entire population. The sample was chosen by dividing the *BRD* into 6 equal sections and then photocopying the first 71 pages of 2 sections, and the first 72 pages of each of the remaining 4 sections. The 430 pages produced 1,297 full *BRD* entries. Of those 1,297 entries, 266 (21%) were eliminated because they are juve-

nile or young adult titles. Eight additional entries were eliminated because the descriptions for what the books were about appeared in an earlier volume of the *BRD*. The 1,297 entries yielded a sample of 1,023 book descriptions that are used in this study.

After the 1,023 books were identified, each title was searched for Library of Congress cataloging in OCLC. As each of the 1023 titles was found, a paper print was made of the OCLC control number, author, title, and all Library of Congress subject headings.

## Phase 1: Match by Subject or Keywords in the Title Proper

In manual catalogs, a user will find the main subject heading and then distinguish between aspects of the topic by using the subdivisions assigned. Computer catalogs can be designed to search either the entire field or just the first element (main heading). Most online catalogs also have the capacity for searching keywords in the title. The first phase of this study determines a match rate between the *BRD* book description and the combined elements of the main heading (subfield ǂ a) of Library of Congress subject headings or *LCSH* recommended cross-references, and keywords in the title proper (245 field, subfield ǂ a). ("Title proper" is defined as the main title including alternative title, but excluding parallel titles and other title information.) A subject heading match occurs when a term or phrase in the book description is exactly the same when compared from left to right, letter for letter, (excluding capitalization, punctuation, and birth/death dates of persons) as the term or phrase in the subject heading. A keyword match occurs when a term in the book description is exactly the same when compared from left to right, letter for letter, (excluding capitalization, punctuation, and birth/death dates of persons) as the term in the title. For keyword matches, the order of terms in the book description and in the bibliographic record do not need to be the same. Fourteen words—stop words—are excluded from comparison: a, an, and, at, by, for, from, how, in, of, on, the, to, with.

This first phase of the project is accomplished in three steps. The book descriptions, excluding stop words, are initially compared against the first element of each subject field (subfield ǂ a). In MARC records, subject

headings appear in the 600 (6XX) numbered fields. All types of subject headings—personal name (600), corporate name (610), conference or meeting name (611), uniform title (630), topical (650), and geographic (651)—are compared.

The second step compares the book descriptions with the 10th edition of the *Library of Congress Subject Headings* (1986). A match on a reference from terminology not used to a heading that had been assigned to the book under consideration is counted as a subject match. It is not uncommon to find libraries making the recommended *see* references prescribed in *LCSH*, even when no other kinds of references are made. It is for this reason that evaluating matches on *see* references is included. It was also the desire of this researcher to determine the degree to which the use of the recommended *see* references increases the match rate, before comparisons on keywords in the title are made. However, it is recognized that many libraries do not make any references in their catalogs. For this reason the results of subject matches achieved through *see* references are kept separate from the results of direct subject matches. All books which have a subject match were removed from further consideration.

The third step compares the remaining book descriptions (those that had not matched on subject) with the keywords in the title proper (≠ a) (see table 1).

## Phase 2: Match on a Simulated Manipulation of the Bibliographic Record

The second phase of the project involves a series of five tests on the 337 unmatched items from the first phase. All five tests are performed on each of the 337 titles. The tests measure the improvement in access to the existing MARC record obtained by modifying the way information in the record is accessed. All of the five methods of access can be achieved through interface design; three of

the tests simulate modifying the grammar and syntax of the subject headings themselves. The purpose of this phase of the study is to determine to what extent these additional access points will increase the chances that books that did not match by subject or keywords in the title will now produce a match.

Four tests compare the descriptions of what the book is about with the Library of Congress subject headings as they appear in current MARC records. The fifth test compares the description against keywords in any portion of the title other than the title proper. The same stop words used in phase 1 are used also for this phase of the study. The results of these tests show the amount of improvement in match results for each modification made. The tests performed are comparisons between descriptions of what each book is about and:

1. subdivisions of the main subject fields.

*Example:* The phrase "data processing" will produce a match with the heading, EDUCATION—DATA PROCESSING.

2. inverted subject headings changed to direct order. This test was divided into a comparison of name headings (inversions, name) and topical headings (inversions, nonname).

*Examples:* The phrase "sociology of knowledge" will produce a match with the subject heading, KNOWLEDGE, SOCIOLOGY OF. The name "Anthony Eden" will match with the subject heading: EDEN, ANTHONY.

3. the principal term or phrase in a subject heading involving a parenthetical qualifier. Words or phrases in the book description were compared with the principal element of the subject heading; that is, up to the first parenthesis. In a manual catalog, the parenthetical qualifier helps the user to distinguish between two headings that would appear the same without the qualifier. This test simulates the manual environment in that it makes the initial comparison on the unqualified heading.

*Examples:* "Alabama" will match with the subject heading, ALABAMA (MUSICAL

*Table 1. Matches between Description of Book Content and LC Subject Headings and Keywords in the Title (sample size = 1,023 books)*

| Subject (≠ a) | Subject (x–ref) | Title (keyword) | Total Matches | No–Match |
|---|---|---|---|---|
| 365 | 37 | 284 | 686 | 337 |
| (35.7%) | (3.6%) | (27.8%) | (67%) | (33%) |

GROUP). "Power" will match with the subject heading, POWER (SOCIAL SCIENCES).

4. keywords in the subject headings. This test was divided into a comparison of keywords involving proper names (keywords, name), and keywords not involving names (keywords, nonname).

*Examples:* "Bowie" and "Kuhn" will both match the subject heading KUHN, BOWIE, 1926- . "1926" will not match because birth and death rates are excluded from the matching process. "Power," "social," and "sciences" will all match the subject heading POWER (SOCIAL SCIENCES).

5. keywords in parallel titles, and/or other title information (field 245 ǂ b).

*Example:* The words "funny," "pro," "business," and "football" will each match with the other title information of *First down and a billion: the funny business of pro football.*

A match is defined the same as for phase 1: the term or phrase in the book description must be exactly the same when compared from left to right, letter for letter, (excluding capitalization, punctuation, and birth/death dates for persons) as the term on the record. For tests involving keyword matching, individual terms do not have to be in the same order in the book description as in the bibliographic record.

Data for each of the five tests are recorded from three points of view. First, the total number of match occurrences for each test is

recorded. For example, if a term in the book description produces a match in three of the five tests, then three matches are recorded: one match for each test. Considering only questions of recall, these data help answer the question: If we can only add one of the tested methods of access, which one? The 337 book descriptions, when compared with all five modifications to the record (the five tests), produce a total of 405 hits. Table 2 gives a summary of these data.

The second approach records unique matches. That is, a match is recorded for a test if it is the only test which produces a match. For example, if one book description matches in three of the five tests, no match is recorded. However, if a match occurs on the fourth test only, then the match is recorded for the fourth test. Considering only recall, this approach answers the question: Given all five methods of access, which one can we eliminate with the least harm? Table 3 represents this approach.

The third approach to the data is a variation on the second. The difference between the two is that the fifth test, determining the number of matches on keywords in the subfield ǂ b of the title, was not used in the analysis. Therefore, a book description that was not recorded for the second approach because it matched on tests 3 and 5, would be recorded for the third approach, because it matched only on test 3. This point of view answers the question: Which of the four mod-

Table 2. Total Number of Matches for Each Test (Presented in rank order)(n = 405 [total no. matches for 337 book descriptions]) ($\pi$ = population proportion)

| | No. Matches | Confidence Interval* | | |
|---|---|---|---|---|
| Keywords | 169 | .3704 | $\leq \pi \leq$ | .4659 |
| Keyword (nonname) | 127 | .2703 | $\leq \pi \leq$ | .3603 |
| Keyword (name) | 42 | .0776 | $\leq \pi \leq$ | .1372 |
| Title (245 \| b) | 136 | .2915 | $\leq \pi \leq$ | .3832 |
| 6XX subfields | 67 | .1324 | $\leq \pi \leq$ | .2047 |
| Inversions | 17 | .0264 | $\leq \pi \leq$ | .0662 |
| Inversions (name) | 14 | .0207 | $\leq \pi \leq$ | .0572 |
| Inversions (nonname) | 3 | .0025 | $\leq \pi \leq$ | .0215 |
| Parenthetical Qualifier | 16 | .0245 | $\leq \pi \leq$ | .0632 |
| No-Match | 130 | | | |

*Formula for determining confidence interval taken from Glass and Hipkins, *Statistical Methods in Education and Psychology*, 2d ed. (Englewood Cliffs, N.J.: Prentice-Hall) p.280.

*Table 3. Tests that Produced Unique Matches: Title Subfield ≠ b Included (Presented in rank order)*
*(Sample size = 1,023) (π = population proportion)*

| | No. Matches | Confidence Interval | | |
|---|---|---|---|---|
| Title (245 ≠ b) | 40 | .0288 | ≤ π ≤ | .0528 |
| Total Keywords | 34 | .0239 | ≤ π ≤ | .0461 |
| Keyword (name) | 8 | .0040 | ≤ π ≤ | .0154 |
| Keyword (nonname) | 26 | .0174 | ≤ π ≤ | .0370 |
| 6XX subfield | 19 | .0119 | ≤ π ≤ | .0288 |
| Parenthetical Qualifier | 3 | .0010 | ≤ π ≤ | .0086 |
| Total Inversions | 1 | .0002 | ≤ π ≤ | .0055 |
| Inversions (name) | 1 | .0002 | ≤ π ≤ | .0055 |
| Inversions (nonname) | 0 | .0000 | ≤ π ≤ | .0037 |
| No-Match | 130 | .1080 | ≤ π ≤ | .1489 |
| No-Match (Fiction) | 57 | .0433 | ≤ π ≤ | .0715 |

ifications to subject headings has the least (or most) potential to produce matches with books that are not matched by any of the other methods tried? Table 4 is a summary of this approach.

## Data Analysis and Discussion

### Phase 1

In the first phase of the project, exact matches on subfield ‡ a of the subject heading account for approximately 36% (365/1023) of the total sample. Combined with matches resulting from the use of cross references the figure is 39% (402/1023). These figures are within range of the results reported in studies

that have matched user terms and Library of Congress subject headings.

Two benchmark figures for studies that evaluated Library of Congress terms are the match rate of 58% in the University of Michigan card catalog study and the match rate of 40% in Lester's analysis of user terms taken from online transaction logs.[22] It is not surprising that the figure for this study is less than the University of Michigan study because in a manual catalog there is opportunity for browsing. The human eye is much more flexible than the binary design of a computer. Therefore, in a manual catalog, user success does not depend upon an exact match. It might be reasonable to expect that this study, which made a comparison of Library of Con-

*Table 4. Tests that Produced Unique Matches: Title Subfield ≠ b Excluded (Presented in rank order)*
*(Sample size = 1,023) (π = population proportion)*

| | No. Matches | Confidence Interval | | |
|---|---|---|---|---|
| Total Keywords | 91 | .0730 | ≤ π ≤ | .1080 |
| Keyword (name) | 24 | .0158 | ≤ π ≤ | .0347 |
| Keyword (nonname) | 67 | .0519 | ≤ π ≤ | .0823 |
| 6XX subfield | 39 | .0280 | ≤ π ≤ | .0517 |
| Total Inversions | 8 | .0040 | ≤ π ≤ | .0154 |
| Inversions (name) | 6 | .0027 | ≤ π ≤ | .0127 |
| Inversions (nonname) | 2 | .0005 | ≤ π ≤ | .0071 |
| Parenthetical Qualifier | 4 | .0015 | ≤ π ≤ | .0100 |
| No-Match | 170 | .1446 | ≤ π ≤ | .1902 |
| No-Match (Fiction) | 70 | .0545 | ≤ π ≤ | .0856 |

gress subject headings with summary paragraphs, should produce a higher match rate than Lester's comparison with user terms. However, studies that look at user terms compared with subject terms used in a database are not looking at the indexing of particular books. In Lester's study a user term could match with any bibliographic record in the LC MARC database that had a matching subject assigned. The present study, by looking at the potential for finding each particular title in the sample, examines only the indexing assigned to that particular title. The population of adult titles found in *BRD* includes many fiction titles. Since it is Library of Congress policy not to provide subject headings for single works of fiction or collections of fiction by one author, there will be no match for these items.

Another factor that might contribute to the fact that the results from this phase of the study are not higher is that there were a number of instances where the summary paragraph was very vague. The following is an example:

This volume presents abstracts from 600 journal articles. These are presented in a regional arrangement, followed by author and subject indexes and a chronology of events related to the topic. [Book title: *Global Terrorism*]

It would be very difficult to find a meaningful subject heading that would match this description.

The match rate of less than 4% for the comparison of book descriptions with the *LCSH* recommended *see* references was surprisingly low. A common assumption in the library field is that providing the LC prescribed *see* references will greatly increase the chances that users will find subject material on their topic. This study does not support that assumption. The result does not mean necessarily that *see* references are unimportant, but only that the quantity of *see* references suggested by LC is not large enough to make much difference in recall.

## Phase 2

This phase of the study uses the 337 book descriptions that did not match with main subject headings or the title proper during the first phase of the study.

The data (see table 2) suggest that the greatest number of matches will occur between descriptions of what the book is about and keywords in the subject fields. At a 95% confidence level, keywords in the subject fields account for between 37% and 47% of the access points. Data are fairly conclusive that keywords-subject account for more matches than keywords-title subfield; the confidence intervals are almost disjointed. (Because of the slight overlap in confidence intervals, there is a chance that keywords-title could account for more matches that keywords-subject.) Keywords in subfield ǂ b of the title will produce between 29% and 38% of all the access points. With respect to all other tests, however, the data indicate that matching keywords in the subject fields potentially will result in the greatest recall.

The usefulness of 6XX subfields for retrieval has been questioned on the basis that many 6XX subfields are form subdivisions (e.g., CONGRESSES, HISTORY) and therefore too general for retrieval in large databases. Because of this, the matches for the 6XX subfields were analyzed in order to determine what proportion are form subdivisions. The matches on title subfields were similarly analyzed, because in the process of data collection it became apparent that many of the title subfields indicated form. It was determined that 47.76% (32/67) of the matches in the 6XX subfields are with terms that represent form. In the title subfield the percentage is lower: 26.70% (36/136).

When considering ways to improve precision, searching for keywords in the personal and corporate name fields only, rather than all the subject fields, is an option to be considered. Approximately 25% (42/169) of the matches on keywords in the subject fields are on names (see table 2). Keyword name subject searching is the fourth highest group in terms of recall of the nine recorded. However, the groups that rank second (title subfield ǂ b) and third (6XX subfields) have a large component of matches due to form headings. Nearly 50% of the matches with the 6XX subfields are matches with form subdivisions. Although the potential increase in access through the use of keywords in the personal and corporate name subject headings is only between 8% and 14%, the benefits in increased (or at least not decreased) precision make this option worth considering.

Table 3 records those book descriptions that matched on one test and one test only. The data show that comparisons of the description of "what the book is about" with subfield ǂ b of the title will match between 3% and 5% of the book descriptions in the sample once all other techniques have failed. The potential for total recall is increased by 3-5%. Inverted subject headings and headings with parenthetical qualifiers are the least likely to increase total recall. For books that do not match by any other means, the potential success rate using these two methods in less than 1% each. Using keyword name comparisons, the potential for unique hits is less than 1.5%.

It can be expected that even by using all methods, phases 1 and 2, 11-15% of the books compared will not match. Looking at this another way, we can be 95% confident that by using all the methods of access in the study, between 85% and 89% of the book descriptions in *BRD* will produce a match. If the capability for matching on keywords in subfield ǂ b of the title is removed, then the total number of potential matches is decreased by 3-5%.

Table 4 presents the results of the book descriptions that match on only one test, but only the first four tests are included. Results of comparisons of keywords in the subtitle are excluded. These data give an indication of the relative merit of each of the modifications to Library of Congress subject headings. Of the last four methods, keywords (name and nonname) comparisons are clearly the most effective method for matching books that matched

by no other means. At a 95% confidence level, comparisons of summary paragraphs with keywords have the potential to match an additional 7-11% of the titles. This 7-11% is over and above any other matches made using subject headings. The next highest group is the 6XX subfield matches which range from 3 to 5%. Again, considering only recall, inversions and headings with parenthetical qualifiers are the potentially least useful modifications to be made.

This study shows that the potential match rate for descriptions of "what the book is about" with subjects and titles is between 85% and 89%. Ideally one would want the potential to be 100%. With that in mind, an analysis was performed on the books that did not match in order to determine if there were other modifications that might be made to the existing record that would increase the potential for recall. Table 5 is a summary of that analysis.

Given the Library of Congress' policy of not providing access to most works of fiction, it is not surprising that fiction accounted for the largest percentage (44%) of the nonmatches. The 11% of the nonmatches in category 3 could be retrieved by techniques of truncation. These techniques could be applied to either the bibliographic record or to user input. Categories 2, 4, and 5 are a little more difficult.

Traditional subject heading practice directs the cataloger not to assign general headings to an item that is specific. Considering category 2, this means that the heading BASEBALL PLAYERS would not be assigned to a biogra-

*Table 5. Items That Did Not Match on any Test (Number of no-matches = 130)*

| Categories of Possible Reasons for No-Match | No. | % |
|---|---|---|
| 1. Fiction titles (including collections of poems or collections of novellas | 57 | (43.85) |
| 2. Works about a person or corporate body (including autobiography) where the name of the person or body was not mentioned in the book description | 23 | (17.69) |
| 3. Differences in grammar (possessive form of name in description, singular/plurals, nouns/adjectives) | 14 | (10.77) |
| 4. Book description more specific than subjects assigned | 15 | (11.54) |
| 5. Book description more general than subjects assigned | 13 | (10.00) |
| 6. Other differences in terminology | 8 | (6.15) |
| Totals | 130 | (100.00) |

phy of Ozzie Smith. Many of the 18% of the items did not match because the name of the person about whom the book is written was not mentioned in the *BRD* description. These items would match if general (broader) headings were assigned. In the 1970s the Library of Congress began to assign general and specific headings to certain categories of works. However, the results have not been satisfactory and the policy is being reconsidered. Users who come to the catalog looking for a general work on baseball players should be able to find what they need at the specificity they desire without having to wade through hundreds of biographies of individual players.

Categories 4 and 5 are more elusive. These cases include instances where the book summary describes just one facet of the book, or where the description is so general that it says little. Category 6 includes all other nonmatches in the sample.

## SUMMARY AND CONCLUSIONS

This study is concerned primarily with improving subject access in an online catalog by using the information in the bibliographic record to better advantage than can be done in a manual catalog. It has examined ways to increase subject recall by manipulating the grammar of headings and by accessing parts of fields not ordinarily accessed.

Due to the many ways that the subject content of a book can be described, it is important to provide a variety of approaches to the item. The combination of approaches used in this study increased the recall in the sample by 20% (from 67% to 87%). If recall is the only consideration, keywords in the subject fields will produce the best results. One way to increase *both* precision and recall is to provide keyword matching in the personal name and corporate name subject fields. Inverted headings and headings with parenthetical qualifiers occur infrequently. However, when they do occur, matches on these kinds of headings are likely to be precise.

Interfaces between the users and the content of a system can be designed to search in order of defined priorities. When no match occurs by using the techniques in the first phase of this study, the system can be designed to search additional fields in a specified order. Those fields that can be defined as subject-rich, such as the inverted subject headings or the headings with parenthetical qualifiers, can be searched first, before the more general fields such as the 6XX subfields are searched.

In a sense, Carol Mandel presented the charge for this study when she cautioned that "it is important that we do *not* increase the effort and expense of record creation unless we are gaining enhancements that cannot otherwise be achieved through good online catalog design."[23] The techniques presented in this study are among those that can be used to improve subject access in online catalogs.

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# Special Section:
# Report from the OCLC/RLG Seminar

## Local Systems and Bibliographic Utilities: Data Exchange Options

### Kathleen Bales, RLG

Nearly 100 invited participants gathered on January 10, 1991, to attend a seminar sponsored by the Online Computer Library Center, Inc. (OCLC) and the Research Libraries Group, Inc. (RLG). The participants were staff from RLG member libraries and from the OCLC Research Libraries Advisory Council (RLAC). The seminar grew out of questions OCLC and RLIN users ask, as well as concerns from research libraries and OCLC and RLG staff about the problem of returning bibliographic data from local systems to a central database.

The keynote speaker, Gerald Lowell, presented some of the outstanding problems facing academic libraries; subsequent speakers outlined present and future methodologies of data exchange, workflow concerns, and policy issues. The participants then broke up into small discussion groups to consider the points covered earlier and to raise further questions. One of the most startling facts coming out of the small group meetings was the realization that there is no predominant model for the use of a local system with a utility, which presents difficulties in solving technical and procedural problems associated with data exchange. The results of these sessions were summarized for the larger group; both the large and small groups engaged in lively discussion. The papers presented at the seminar vary in voice and tone; for the most part, they are transcriptions of the presentations and are somewhat informal. OCLC and RLG staff felt that timely publication was preferable to more formal papers.

Although the purpose of the seminar was that of information exchange and not of creating an action agenda, some of the issues raised will be pursued by RLG and OCLC staff in order to provide greater flexibility and better service for their users. ■■

## Local Systems and Bibliographic Utilities: Data Exchange Options: Keynote Address

### Gerald R. Lowell

With the increased growth of local automation efforts in the 1980s, major research li-

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braries in the United States have been developing numerous new scenarios for achieving local bibliographic control. Many of these libraries have embarked on unique combinations of local- and utility-based automation activities, with one obvious result being that more and more bibliographic control data are now being stored only at the local site and more and more cataloging is done locally. The spread of local systems, coupled with the existence of more than one bibliographic utility, now inhibit successful data exchange and national-level resource sharing.

Why do libraries need a successful data exchange program? The question of "why" is easy to answer. Librarians need such a capability to continue the national resource sharing programs that were successfully automated in the 1970s using, as a foundation, the bibliographic utilities. The resources shared through these programs include actual physical items, such as books and journals, and cataloging records for these materials. No research library is able to acquire all of the various resources required to support the needs of their research communities. Therefore, the end users served by libraries need national level resource sharing programs which in turn require effective exchange of bibliographic and other kinds of data. If no data exchange occurs, then the resulting isolation of libraries jeopardizes national resource sharing programs and, consequently, effective library services.

Several of our colleagues raised voices of alarm in the late 1980s, expressing concern over the future of resource sharing if the trend toward isolation were to continue. RLIN (Research Libraries Information Network) libraries first noticed the potential consequences when several major record contributors successfully moved to local cataloging using NOTIS before the NOTIS tape output product was available. During the period that the tape output program was being developed, many unique bibliographic records were no longer available on RLIN. This lack of records at the utility level was especially painful for those special, esoteric disciplines in which these several institutions specialized.

The impact that local systems are having on the utilities and our national resource sharing program can also be deduced from data gathered in the 1989 survey of technical services directors. Respondents were asked to estimate the number of records that would be in their local systems compared to the number of records that would be in their respective utility. These record estimates clearly reflected the dilemma facing the utilities and their members. For example, the total estimated number of less-than-full cataloging records on the twenty-five local systems would total 3,418,000 by 1992. The number of less-than-full records on the utilities associated with these twenty-five respondents was estimated to be 1,040,000. In other words, over 2 million less-than-full cataloging records will not be able to be used for resource sharing because they will not appear in a bibliographic utility.

As acquisitions budgets continue to reel under the constraints of publisher price increases, inflation, and dollar devaluation, as preservation needs continue to challenge libraries, and as the amount of research-value information continues to increase, the need to rely on resource sharing will also continue to increase. It is ironic that as libraries move to independent local systems, coordinated collection development activities, interlibrary loan programs, and full-text document delivery programs will be even more important in the coming decade.

Granted, it is possible to argue that we no longer need bibliographic utilities to support shared processing and information access through interlibrary loan or document delivery. Instead, new mini-networks, consisting of several carefully selected sister institutions whose online catalogs are accessible to each other, can serve as effective alternatives, if these mini-networks are buttressed by special interlibrary loan and document delivery systems. Certainly more and more of our librarians are finding the online catalogs of other institutions available on the Internet to be a valuable asset. However, to the extent that such access tends to foster a sense of "owned" information rather than "shared" information, it becomes restrictive and cannot substitute for comprehensive resource sharing programs.

Against the background of these considerations, one can safely predict that the decade of the 1990s will be one of consolidation. As bibliographic control infrastructures are restructured, the issue of data exchange must be paramount. Libraries cannot afford to return to the era of the early 1960s with their card-based cataloging fiefdoms, isolated from one another, and not structured to accommodate effective resource sharing.

Various factors impede successful data exchange programs. The first factor is the variety of ways that libraries have implemented local systems. There is little commonality from one library to another in the methodologies adopted for implementing local systems or in the policy and workflow environments surrounding the use of the local system. Some libraries have installed integrated systems in

which all of the component parts have been implemented. Others have installed only some parts of an integrated package. Some have separate application-based systems that may or may not be linked to each other. Because of this variation in implementation and operational methodology, libraries no longer have an understandable common base on which to build interdependent bibliographic control programs.

Local systems come from a variety of sources. Some libraries have purchased vendor-supplied systems and have attempted to install them with as little modification as is possible. Others have purchased vendor-supplied systems and extensively overhauled these systems. Some libraries have developed their own systems. Some have gone through several generations of systems; others are on their first generation. Some libraries have more than one local system from different vendors.

Various applications are covered by the term "local system": cataloging, acquisitions, circulation, serials control, binding, database maintenance, searching remote databases, and searching in-house databases. Therefore, the term "local system" must be used with care, since there is a range of applications offered by various local system vendors along with degrees of choice that exist for each institution regarding how these specific applications are introduced. For example, one NOTIS library may perform cataloging on OCLC, while another NOTIS library may perform cataloging on the local system. All too often the term "local system" is used without an appreciation of its imprecision.

All of this variation poses a challenge when attempting to design a successful data exchange program. How sophisticated do these programs need to be? Whose set of functional requirements needs to be met if local system implementation methodology varies from library to library?

A second factor that inhibits successful data exchange is the variety that exists in the design and use of our bibliographic utilities. We do not have a single nationally funded and managed network, as other countries do and that usually emanates from the national library. Instead, we have a number of bibliographic utilities: WLN, OCLC, RLIN, joined by other key entities that play a role in meeting national information needs, such as the Library of Congress (LC) and the large numbers of regional networks.

Relationships among these utilities, LC, and the various regional networks are complex and at times difficult. Relationships between OCLC and RLIN are at times competitive and combative. The fact that intersystem searching and record retrieval such as that promised by LSP is not yet a reality should surprise no one. Why should one utility let libraries in another easily extract records from its database?

Another set of relationships that has been complex and difficult is the one that exists between LC and our utilities, especially OCLC. The most notable area of disagreement centers on roles. LC wants to be the national database generator, working with other national libraries on record exchange issues; OCLC sees itself as also having a legitimate role in arranging such record exchanges, given that it views itself as having the preeminent database in the country.

OCLC and RLIN have radically different philosophies governing database and record structures. OCLC relies on the single-record concept that excludes, for the most part, institution-level data. RLIN, through clustering methodology, stores and displays institution-specific versions of bibliographic records. The challenge of integrating local information varies considerably between these two networks. RLIN faces difficulties because of its institution-specific record storage and display philosophies; OCLC must perform time-consuming duplication detection processes when accepting data from local systems because of its master record construct.

We are also experiencing greater variety in our use of utilities. In a 1989 survey of the technical services directors of large research libraries, only five institutions indicated that they would be using a single bibliographic utility in 1992; eighteen institutions anticipated using, at a minimum, both OCLC and RLIN. Nine different configurations were listed to describe the use of bibliographic utilities by the respondents.

Local workflow procedures constitute the third challenge to successful data exchange. Cataloging routines vary from library to library. Some would perform all cataloging on the utility; some perform all cataloging on a

local system. Some catalog certain categories of material on a utility but other categories on the local system. Still other libraries catalog some categories on one utility and other categories on another utility.

The point in the cataloging workflow at which data exchange occurs can vary. Some institutions retrieve cataloging records from the utility, download them unaltered into local systems, and then upgrade them to reflect local requirements. Some download records from the utilities only after the cataloging process has been completed on the utility. Still others extract cataloging copy from more than one utility, download the data into a local system, and then complete the cataloging process locally.

Unfortunately, the issue of cataloging workflow has also taken on an emotional tone. For example, the largest RLIN research libraries have split between those that continue to perform their cataloging on the utility and those that have moved to local systems. Recent discussions on this topic have become heated and passionate, with each camp attempting to disprove the assumptions of the other.

Another factor associated with our discussions about data exchange is the issue of "database of record." Is it the local system or the bibliographic utility that contains the most authoritative version of the record reflecting our specific holdings? For some libraries, the answer is not "either/or" but "both." For example, at Yale, the local system is the database of record for the majority of bibliographic data except for vernacular cataloging, the ARC portion of the AMC record, and cataloging done by the Law Library, for which the database of record is RLIN. Of the libraries that define their local system as the database of record, many make updates to records held locally without changing the corresponding records in the bibliographic utility, while others try to transmit all local changes to the utility.

The "database of record" issue takes on another level of complexity when we attempt to define "data" more specifically. What "data" should the utilities contain? Surely all would agree that bibliographic data should be included, but what about holdings information for serials, for multi-volume sets, or for monographic series that are cataloged seri-ally? What about institution-specific location information? Or on-order or in-process information? What about preservation information? For the most part, the current data being exchanged from the local system to the utility are for cataloged bibliographic records representing items that have been acquired and cataloged by our libraries. A few institutions are reporting "acquisitions-level" information or "less-than-full" level records to their utility from their local system.

Issues surrounding database maintenance do not impact each of the bibliographic utilities in the same fashion. The consequences of changes in database maintenance practices are greater for those institutions whose utilities display institution-level cataloging data and holdings such as exist on RLIN. These changes may affect public services, collection development, and interlibrary loan programs more than they affect technical services. Several examples can be cited. As the large research libraries that are currently members of RLIN continue their shift to the adoption of the local system as the database of record, it appears that the level of detail in the RLIN database for the holdings of the various school, departmental, or branch libraries for each of these RLIN members will diminish. How will this affect interlibrary loan? The CONSER program, with its database on OCLC, deems ongoing maintenance to be one of the critical objectives of the program. Will the large research libraries that participate in CONSER continue to be willing to perform this maintenance if their local system is their database of record?

Another issue impeding successful data exchange centers on technology matters. Our primary methodology for exchanging large numbers of catalog records is magnetic tape. This exchange methodology is easily understood by library administrators, its costs are known, it is reliable, it works, and it is currently available. On the negative side, it is not timely and it is batch intensive.

Other types of transfer methodologies exist. The Linked Systems Project (LSP) is now successfully used to report authority records to LC via the utility. Some institutions have an LSP connection between their local system and the utility for the exchange of bibliographic records. Experiments have begun as part of the National Coordinated Cataloging

Program (NCCP), using the Internet as a communication channel between the local system and the utilities for bibliographic record exchange.

According to the 1989 survey of technical services directors of large research libraries, LSP will not play an important role in 1992 for transferring bibliographic records. Many would expect to use LSP for bibliographic record transfer if it were available, but uncertainty over the availability of LSP and its potential costs caused respondents to cite tape transfer as the anticipated transfer medium for bibliographic records in 1992. Obviously, libraries are not the only entities relying on national network structures for data exchange, even in the academic arena. Unfortunately, the other networks in existence today, such as Internet, rely on the TCP/IP as a telecommunications "standard." We find ourselves, at least temporarily, with one set of dedicated networks supporting bibliographic record exchange and another set employed by higher education and associated research.

When transfer methodologies are discussed, the need for two-directional transfer is often overlooked. Yes, records need to be moved from the local system to the utility. But records also need to be moved from the utility to the local system. Record-by-record transfer from the utility to the library currently occurs through downloading techniques relying on micros within libraries. Such transfer mechanisms may or may not include additional local, system-specific processing, such as creation of additional local records to support other types of activities using the bibliographic record as a base. Record-by-record transfer of records from utilities to the local system is not easily accomplished by some libraries.

Other factors impeding successful data exchange programs can be found in our larger institutional environments. A most discouraging pall hangs over all of us in academe—the gloomy economic forecast for the 1990s. Retrenchment, scaling back, layoffs, and a tighter belt around library operations are factors that many of us are now encountering.

Automation costs in general are "big ticket" items that are facing increased scrutiny. Every facet of this automation component is now being reviewed by many librarians throughout the country. Every dollar saved is an important step. For those libraries utilizing large-scale local systems, it will become even more difficult to defend large dollar costs for the bibliographic utility if local needs can be satisfactorily met by manipulating the local system or if monies formerly allocated to the utility are now needed to fund the local system.

At the same time that belts are being tightened because of budget constraints, technological advances continue, further widening the gap between what is technologically possible and what is actually achievable in the nation's not-for-profit environment. The continued proliferation of electronic information, better access methodologies, and the need for continued integration of automation in libraries—these and other technological challenges must be addressed. All too often, support for adequate information exchange between libraries and utilities dwindles as the pressure to apply limited financial resources to other critical requirements reduces the resources available to be devoted to such exchanges.

Given all of the various factors that we have discussed thus far—differing methods of implementing local systems, variety in the design and use of the bibliographic utilities, different ways of designing workflow, technology challenges, and the differences in the institutional environments—what can be done to assure successful data exchange in order to promote and continue effective national resource sharing activities?

I would identify several key attributes of a successful program: flexibility, cost effectiveness, and workflow efficiency. Through consolidation of some of the components of our national bibliographic control structures, it is possible to assure an even more successful data exchange program.

Considering the range of factors that have already been discussed, it is obvious that "flexibility" must be a requirement for any data exchange mechanism. Few "right ways" can be identified that serve as hard and fast models for structuring data exchange processes. For example, data exchange methodologies must be able to: handle all formats, translate levels of detail used in local systems into broader, more general record structures that are appropriate for the utility, and cope with a wide variety of local data and conventions.

Two specific actions can foster greater flexibility. First of all, utility staff must promote well-defined and published interfaces. Sec-

ondly, librarians should focus only on general data for record exchange. Data exchange mechanisms should be as generic as possible; institution-level processing and adaptation should be done at the local site. More effective data exchange in a more timely fashion can be accomplished if librarians stop expecting that all institution-specific data appear on the utility.

Data exchange processes must be cost effective. Libraries and utilities cannot expect to adopt data exchange processes that are so expensive that they are then forfeited because their costs cannot be justified or covered. The costs for data exchange should be sufficiently low to encourage such exchange rather than discourage it and should not carry troublesome overhead charges aimed at penalizing the library performing cataloging on the local system while rewarding the library performing cataloging on the utility.

Data exchange options must be workflow efficient. Library technical processing workflows cannot be burdened with any more complexity. Data exchange operations should be able to be designed so that they are transparent to the cataloger.

And finally, consolidation. The bibliographic control infrastructures should be consolidated and a new national utility created. Through consolidation, data exchange problems will be greatly simplified and streamlined. As a first step, the bibliographic utilities should merge and their record structures be consolidated. RLIN should be disbanded, with the appropriate data moved to OCLC. The strengths of the RLG programs should be continued in some fashion, perhaps with RLG reconstituted as one of OCLC's affiliated networks. The multiple institution-level record concept on which the RLIN database was constituted should be abandoned and the single bibliographic record concept, as exemplified currently by OCLC and WLN, restored as the standard. Redundant bibliographic records should be eliminated.

Secondly, LC should move forward even more rapidly with its use of this new utility as a source for cataloging data. LC should move its MARC Distribution Service to this new structure through some type of contractual arrangement, with the MARC product lines

revised to reflect the new partnership, thereby removing a continuing source of friction between OCLC and LC. The goals of this new utility should be constructed on the principles of sharing, not competing. Bibliographic data would be available for all enterprises, whether public or private, not-for-profit or for-profit. This database should be viewed as a public resource and managed accordingly; it should operate on principles of openness rather than competitiveness and profit taking.

And finally, libraries and utilities should abandon the concept that LSP is the only methodology for bibliographic data exchange. Is it not possible to use already-existing telecommunications protocols to move records back and forth between local sites and/or this new merged utility, based on the OCLC model? Librarians certainly aspire to the data exchange principles embodied in LSP. However, is it necessary to have all of the LSP layers in place to be able to promote effective data exchange?

Librarians also need to debate vigorously whether separate utility-based networks are necessary for data exchange. Are these duplicate networks necessary? Can the important benefits of the packet-switched networks be achieved in the broadcast-style TCP/IP networks so that we need not foster the continuation of divergent networks dedicated to education and research?

Much of the discussion surrounding local systems and bibliographic utilities has tended to pit one activity, the local system, against the other, the bibliographic utility. Libraries and utilities need to devote more energy to viewing local systems and bibliographic utilities as equally important parts of an even more important whole—that of the national information network so critically important to all of us. The partnerships that have existed between the bibliographic utilities and the nation's libraries have successfully met information resource needs for the past two decades. With the institution of successful data exchange and the consolidation of the utilities, we can reasonably expect an effective, equitable resource sharing program for the year 2000 and beyond. ■■

# Local System and Bibliographic Utility Data Exchange: Current Approaches

## Liz Bishoff, OCLC

Before we can look to the future of data exchange between local systems and bibliographic utilities, we need an understanding of the past. As part of the review of the current data exchange environment, I will (1) look at how we got to where we are, (2) review current implementation, and (3) identify future needs. This review will lead into the discussion of the future by Kathleen Bales. While most of the statements we will make today apply to OCLC and RLG, there may be exceptions which we will note as appropriate.

Libraries have been transferring bibliographic information from providers of bibliographic records since the 1960s. The early local system databases were built through tapeloading or online input of bibliographic information. Developed by major university libraries, most of these early systems were mainframe based. In 1973, CLSI introduced its LIBS 100 system, a mini-computer based system, designed to support circulation functions, with limited storage space. With the application confined to circulation and constrained by storage space, CLSI devised the non-MARC formatted short record. Libraries were told that full MARC records were unnecessary. They required high storage overhead, which was costly, were too complex for staff and users, and weren't necessary for circulation functions. The short records were manually keyed into the system, were mnemonically based—no tags, no indicators—and those MARC records on archive tapes that had been so carefully created could not be used.

Manual input of bibliographic and patron records quickly became staff intensive and made for lengthy system implementation. Libraries with OCLC were faced with editing records on OCLC and then rekeying the brief

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record into the CLSI system. Clearly, a more efficient means of transferring data from one system to the other was required. The solution to this data transfer problem was developed by the staff at the University of California-Berkeley with their black box interface. This microcomputer-based device converted OCLC screen displays to the CLSI record format. Libraries were now able to convert and transfer the bibliographic information from OCLC MARC to the CLSI short format, create the unique identifier, and input the barcode and holdings information into the CLSI system.

As more local systems were introduced, different approaches were developed for transferring information from the bibliographic utility to the local system. Most local system vendors introduced tapeloading capabilities to facilitate the initial load process. MARC format and full records became more acceptable as the cost of storage dropped and as libraries expanded local system requirements to include OPACS, acquisition systems, and authority control. Tapeloading, while efficient for loading large retrospective files, did not make bibliographic information available in a timely fashion for current acquisitions. Libraries were faced with holding materials until the bibliographic records could be tapeloaded, varying from once a week to quarterly or semi-annually. Libraries needed a facility for the real-time transfer of bibliographic information from the bibliographic utility, as well as a tapeload facility.

Today we find a variety of approaches to online transfer. Most local system vendors have developed proprietary interface software rather than utilizing third party software. The majority of these data transfer applications are based on the transfer of a screen image from the source of bibliographic information through the printer port to the local system. The local system software converts the screen image to the MARC format used by the library. The transfer can be accomplished on a record-by-record basis to a file on the local system or to an intermediate device. Depending on system functionality, the records are available immediately or the next day, after an overnight batch conversion process. Other options include converting screen displays to ASCII files for subsequent loading. In the case of OCLC libraries, some

vendors support records transfer from the Cataloging Microenhancer.

While these interface facilities served their purpose, they had a number of shortcomings. The interface relied on the bibliographic utility to maintain a consistent screen image. Changes to the MARC format, which occur two to three times a year, could cause a modification to the utility's screen display. The local system vendor had to modify the interface to assure transfer of data. Because the implications of the screen modifications weren't always obvious to the bibliographic utility, the impact wasn't recognized until the bibliographic utility displayed the new screens, and the library's interface didn't function. Analyzing the problems could be difficult. Libraries needed a remedy to the problem, while vendors and bibliographic utilities pointed fingers at one another.

Other problems with the screen interface approach include record size limitations or inaccurate data transfer. Records have to be edited to fit the constraints of the interface, sometimes eliminating important information. On occasion, two records would be merged into one. In some cases the transfer mechanisms weren't reliable enough to eliminate checking the local system to assure the transfer was effected. Clearly, a method that guaranteed reliable, quality record transfer that wasn't staff intensive was needed.

From the perspective of the bibliographic utility, changes to screen design and possibly functionality were constrained due to the impact on the local system interface. Bibliographic utilities required standardization in order to develop products and services. This standardization wasn't possible with the screen-based transfer because libraries used so many different local systems with different interface functionality. The first step in solving this problem was the implementation of the MARC record export capability. RLIN and OCLC have implemented such an export facility that provides the necessary standardization. OCLC has implemented the same capability on CAT CD450 and the PRISM service Cataloging Microenhancer. Exporting full MARC records in the same format as MARC tapes improves record quality, reduces the risk of error in data transmission, and provides the bibliographic utility the flexibility it

needs to change screen displays and enhance the products.

These means of transferring bibliographic data have served libraries well for over a decade. As we move into the 1990s, the local system and technical service environment is changing. Jerry Lowell identifies some of these changes in his study of the twenty-five largest academic research libraries on the use of bibliographic utilities and local systems in 1992. One of the biggest changes is the use of multiple bibliographic sources to get the highest hit rate and lower cost of cataloging. Libraries that no longer rely on cards can use multiple sources. Second, records are going to be transferred from these sources during the acquisition phase, rather than the cataloging phase. Third, original cataloging is shifting to local systems because the acquisition record is already present in the local system and the local system's authority control system supports the creation of the original record. Fourth, libraries are continuing to look for ways to obtain the highest quality cataloging copy, improve productivity, and move cataloging tasks to lower and lower levels of staff. Fifth, tapeloading is not seen as a timely method of exchanging data.

New capabilities are being requested of the local system vendor and the bibliographic utility. The ability to transfer records created and/or edited in the local system electronically, as well as set holdings, is needed. As libraries shift their record transfer from the cataloging phase to the acquisition phase, the ability to update the bibliographic utility without returning to the online system is needed. Returning to the utility affects productivity. More and more staff require access to both the library's local system and the bibliographic utilities. To provide this expanded access, libraries want access to multiple databases, including the bibliographic utilities, from terminals connected to their local system, reducing the duplication of terminals while increasing access to a different database.

How will these changes affect the library's data transfer needs? Libraries will be using multiple sources of information—bibliographic records from a utility, possibly from a book jobber, possibly from a second utility. Records will need to be transferred online as well as in a batch mode. Local systems will need to support tapeloading and export. The

local system tapeload and interface applications will need to accommodate different implementations of the MARC format—LC MARC, OCLC or RLIN/MARC, possibly UKMARC.

Staff searching multiple systems will need to cope with multiple user interfaces and multiple search strategies. Managers must consider training, staff efficiency and hardware requirements. The ability to transfer records from the local system to the bibliographic utility will need to be standardized. For libraries whose local systems only support tapeload, daily electronic file transfer of MARC subscription needs to be considered. Tape output will need to be in MARC format and electronic file transfers must use one of the standard file transfer utilities—Kermit, X Modem. How will the linking of systems in the future solve these problems without negatively affecting productivity? Are standards available now that can be implemented to assure some consistency and minimize the local development of these linking mechanisms? How do local system vendors and bibliographic utilities efficiently and effectively support these implementations? How do we avoid the problems of the past?

A host-to-host connection using the Open System Interface and Z39.50 standards may be the solution. For nearly a decade we have talked about linked systems or a host-to-host connection. Originally it was conceived of as a means of developing a single, logical national database rather than a single, physical national database. Today, libraries are interested in linking local system with local system or local system with bibliographic utility. After eleven years of work, how close are we to this goal? OCLC, RLG and LC have implemented a linked facility in support of the NACO activity. Thousands of records are transferred to and from LC, the bibliographic utilities and NACO LSP libraries. RLIN and New York University have implemented a record transfer facility based on the Information Retrieval Protocol. High-level specifications have been completed on linking local systems and bibliographic utilities and bibliographic utilities and the Library of Congress using Z39.50 and the OSI. However, real progress on implementation is still way off. Only in the last year has the OSI protocol been implemented by commercial hardware

vendors. The library community has just begun investigating implementation of the OSI and Z39.50 intersite search and retrieval application. If we look at the long-term goals of full OSI/Z39.50 implementation for cataloging, we are looking at three to five years for implementation. Local system vendors are currently focusing on implementation of intersite search and retrieval in support of reference service and resource sharing. Developing the capabilities to support the cataloging functions, including return of holdings and original cataloging, is not on their agenda because libraries are not requesting these applications. While everyone agrees that the host-to-host connection is desirable, getting there for cataloging may be years away.

Can we wait three to five years to solve the identified cataloging needs? Probably not. What problems can be resolved? First, standardizing transfer facility has been accomplished with the movement to a MARC format based export facility.

The MARC format will allow libraries to transfer full bibliographic and authority records reliably. As libraries look to alternative bibliographic sources, reliable record transfer must continue to be a critical component.

Use of a colleague's catalog as a source of cataloging must be carefully considered. While searching a colleague's database via Internet may be free, the facilities for transferring the records are not available. Once again, the library is facing the problems of manual keying or development of screen dump transfers.

While the library community is best served by online entry of original cataloging, a means of timely batch return of original records may be necessary for some libraries. Utilization of the electronic file transfer facilities may solve the problems of timely transfer of records. RLG has developed electronic file transfer and is working with a library on implementation, while OCLC is pursuing an electronic file transfer pilot project.

Libraries that wish to use their local system terminal to access the bibliographic utility and the local system database can accomplish this by loading the bibliographic utilities' communication software on a microcomputer connected to the local system. Movement between the two systems without disconnecting from one can be accomplished by using a

multi-session utility. In order to achieve this, the bibliographic utility software must support the local system's terminal emulation. For local systems that utilize dumb terminals rather than microcomputers, a gateway to the bibliographic utility can be provided through the local system. In this case, the local system software would perform the bibliographic utility's terminal emulation. Successful implementation of the latter application requires close coordination between the local system and the utility.

What needs remain? With the use of multiple sources of catalog information, library staff are faced with multiple search strategies and user interfaces. While staff have become accustomed to multiple search strategies and interfaces, libraries have had to provide training and monitoring. Search efficiency and effectiveness may be affected. To lessen the impact, libraries have organized workflow and staff assignments so that staff members would

concentrate on one system. Implementation on both the local system and the bibliographic utilities of the OSI/Z39.50 is necessary to reach this goal of a single interface. Libraries in that environment will be able to search the utility using their systems search protocol, transfer the record, edit on the local system with the local system user interface, and contribute local copy or set holdings to the utility. Both RLG and OCLC have started work on or have implemented part of the OSI/Z39.50 standards. Clearly, effective implementation will require close working relationships with the local system vendors.

I hope that this review of the history of data exchange, identification of needs, and some possible near-term solutions will provide food for thought for this afternoon's discussions. We look forward to hearing your perspectives on linking systems for cataloging purposes.  ■■

# Local System And Bibliographic Utility Data Exchange: Future Methodologies

## Kathleen Bales, RLG

This is not meant to be an exercise in crystal ball gazing. I am limiting myself to extensions of methodologies that are already in the pipeline and that will be available for the next three to five years. I have made an assumption that funds will continue to shrink for the next few years and that, for the most part, staffing will be more affected than acquisitions budgets. I am addressing the data exchange from utilities to local system and then that of local system to utilities. I will also review the purpose of data exchanges and the kinds of data used for those exchanges.

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## UTILITIES TO LOCAL SYSTEM

Libraries will continue to need sources of records for copy cataloging as well as flexibility in choosing methods for transferring records to their local systems. Three methods will be used: offline, terminal transfer, and computer-to-computer.

### Offline Methods

Utilities will provide tapes for some years to come. Some libraries will not have the resources to change this approach, in spite of the drawbacks. As Bischoff has pointed out, very large files are easier to deal with using tapes.

### Terminal Transfer

The use of screen dumps will be phased out, so that getting MARC records to a local system is straightforward and minimizes conversion steps. Terminal transfer of MARC records will continue to be used until a cost-effective way of replacing the functionality is available. This is a fairly cheap way to get a copy of a record, whether it is a copy of the record belonging to the library, one with the

holdings symbol attached, or simply a record to use locally for copy cataloging. The problem with this method, as Lowell pointed out, is that you deal with one record at a time.

## Computer-to-Computer Transfer

### OSI and TCP/IP

I am using Open Systems Interconnection (OSI), as shorthand for the suite of International Standards Organization (ISO) standards that provide for computer-to-computer communications, regardless of manufacture. The OSI reference model has seven layers, from physical up through the application; this is frequently referred to as an OSI stack. The current LSP protocols are an early version of a partial stack and will be migrated to the OSI standards. In the future, some library systems and utilities may have a vendor-supplied OSI stack, purchased by the parent institution, or, less likely, by the library itself. The library may be the driving force behind a university OSI purchase, although the university might use it for other purposes; not many have it now. A "roll your own " OSI implementation does not seem like a valid option for a library. The standards are complex and require careful study before any programming is done.

Another possibility is to implement a combination of OSI and other protocols, such as Transmission Control Protocol/Internet Protocol (TCP/IP). TCP is the transport protocol for connection-oriented full duplex streams and IP is the network layer.

OSI is a series of standards and there are established ways of recording information about an implementation so that interworking is more straightforward. (These records of implementation are called profiles.)

The big problem here is money. Currently, the OSI stack available from a large unnamed vendor is very expensive, even with educational discounts. Even the standards themselves are expensive to buy from ISO. In the future, this situation will change as more vendors provide the set of programs supporting an OSI stack. Competition will drive the price down, but OSI may not be easily affordable for another five years.

## File Transfer

Two of the mainstream protocols for transferring records are FTAM and FTP. FTAM,

the File Transfer, Access and Management remote file service and protocol, is used with OSI. File Transport Protocol (FTP) is an Internet protocol and program used to transfer files between host computers. This program is available electronically through the Internet.

They differ from the current LSP record transfer implementation in that both FTAM and FTP allow either pushing or pulling of files. (In LSP the files are pulled.) For example, a utility would pull or read a waiting file from a local system or the local system could push or write the file to the utility.

In planning for NCCP (National Cooperative Cataloging Program), Z39.50 will be used for searching, but the transfer protocol is still somewhat uncertain. We want to use FTAM instead of retaining LSP record transfer; a lot depends on the implementation schedule. The LSP record transfer RLG is using with New York University will also have to be changed.

FTP is very cheap (i.e., free), at least for the present. As the Internet migrates to or is replaced by the National Research and Education Network (NREN), this situation may change. Of course, a parent institution may charge a library for procuring and installing FTP, but it is part and parcel of Internet participation.

FTAM has recovery mechanisms that use facilities from the OSI session layer. It also has the capability of reading and writing partial files. However, with FTP, if something happens in the middle of transfer, you have to start over. You do not know what error condition occurred and you cannot pick up where you left off. This would be a real problem with large files. There are also security issues, which lead universities to differ in the extent that they allow generic access to the system.

Reliability is another issue. Internet reliability is only as good as the regional or local implementation, which may vary across the country. In addition, there is no single point of control. Who are you going to call when something goes wrong? Not ghostbusters or OCLC or RLIN network operations centers.

Other file transfer methods include Kermit and X Modem, mentioned by Bishoff. RLG uses Kermit to transfer files of search keys for retrospective conversion.

## Electronic Data Interchange (EDI)

This method of exchanging data is the subject of heavy standards work in the business community. Libraries and utilities are not involved directly yet, but may find that acquisitions system vendors must use the emerging ANSI Accredited Standards Committee X12 standards to convey orders to wholesale book or serials jobbers. Nothing may actually change in the user interface, but the costs of translating data elements and communications formats of NISO standards to X12 transaction sets will undoubtedly be partially borne by the customer.

## Proprietary Software

This kind of data transfer software is provided by vendors of a local system or by a hardware/software vendor—for example, DEC or Tandem. The transmission of data using proprietary software has some of the same advantages of buying OSI off the shelf. It is not really plug and play, but it may be pretty close. The problem here is that you can only communicate with a system from the same vendor. Utilities are not included in this loop unless they use the same hardware/software.

## LOCAL SYSTEM TO UTILITIES

### Offline Methods

In the future, more local system vendors will provide a way, whether by tape or diskette, to output records from the local system. After the initial conversion and testing, tape loading at the utility is routine. This is an established method and continuing costs are not great. However, the process is not automatic; someone at the local system must make an effort to produce the tape or diskette. Diskettes are only practical for small files. Tape is not a perfectly stable medium and diskettes are even less so. In addition, there is lag time between the time the tape is produced and when it is loaded into the utility database, due to shipping, getting the tape mounted, and so on.

### Terminal Transfer

It seems unlikely that this technology can be applied to sending records back to the utility. From the utility point of view, it is much better to replace this mechanism with one that works in both directions.

## Computer-to-Computer Transfer

The technical issues were covered earlier, since by its nature this exchange method is bidirectional. The cost issues of this exchang method are different for local systems than for utilities, but this was also discussed above. The most important implementation strategy is to be flexible; the goal should be a transfer of records in a continuum. If we use FTP now to accomplish our goals, we need to remember that a more robust technical environment should be the next step.

## DATA EXCHANGES

I am returning for a moment to the various reasons for exchanging data, since they affect how we plan using the methods discussed above.

## Why Do We Search Other Systems?

Reasons for searching other systems include: acquisitions and cataloging support (verification, copy, authority information); both staff and patron reference; interlibrary loan; and collection management purposes.

There is widespread commitment to using Z39.50, but there is no getting around the fact that it is much easier to provide a simple gateway to another system. If that system's native syntax is the same or similar to yours, staff and patrons can cope very nicely. Allowing your patrons to search for records in another system may not be such a large chore, but getting the records back to your computer is more complicated. Specifically, getting the records back in such a way that you have complete control over where the record goes in your system and which pieces of it go where are not trivial tasks. It does not seem feasible to have this flexibility unless you are using standards to direct your implementation. Eventually our patrons will demand a common search interface to all of the systems we make available to them; the standards to make that possible are nearly in place.

## Why Do We Send Records Back and Forth?

Most of the functions that searching supports also require bringing a record back to the system. In addition, libraries share data,

and once shared, it should be maintained. If that doesn't happen, the reliability of the shared catalog is degraded. To quote Annalisa Van Avery, "Whether using RLIN or OCLC, workers doing serials conversion will face more choices and require more training and supervision than those doing monographs. The task is made more difficult by the fact than many records are not kept up to date on the utilities as the publications change. What is needed is a more interactive relationship between the utilities and the libraries' individual automated systems."[1]

## What Data Are We Exchanging?

The purpose of the data exchange affects the kinds of data we send and how we send it. Do all search results need to return full MARC records? Is it easier always to return full records and leave the task of selecting the correct data for the applicable function to the receiving system? What if the system being searched doesn't directly retrieve full records?

Copy cataloging requires a full record, but getting holdings information back to the utility or shared catalog may be accomplished with less data. What is the format of the holdings information? How can we share the

## Evaluating Your Options

### Lennie Stovel, RLG

I know, you are looking for an option that is free, that does not have any impact on workflows or services, and that gets the data back and forth immediately with no human intervention. Well, let me tell you, there ain't no free lunch.

I will try to summarize some details about workflows and dataflows, and to identify some of the variables or decision factors that need to be taken into account during your evaluations of the techniques we have been discussing.

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Lennie Stovel is Manager of Intersystem Applications Development, Research Libraries Group.

publication pattern data present in a MARC holdings record? Do we use established standards for minimal records? If so, will acquisitions records match these standards?

In the future, will the utilities be able to cope with a file from a local system containing original cataloging, acquisitions records, authority records, ILL requests, catalog maintenance, and holdings? And what data will local systems be able to accept? The LSP Application Committee considered many of these questions in planning for NCCP. Their conclusions need to be verified and expanded in the larger arena of general local system/utility exchange.

## CONCLUSION

I have ended with a list of questions, but no answers. Stovel will pursue some of these issues, as will the group sessions this afternoon. We look forward to hearing about your picture of our joint futures.

### REFERENCES

1. Annalisa R. Van Avery, "Recat vs. Recon of Serials: A Problem for Shared Cataloging," *Cataloging & Classification Quarterly* 10, no. 4:67. ■■

## CURRENT WORKFLOWS: TWO PREDOMINATE

It will not be news to you that there are just about as many workflows as there are institutions doing the work. We are in good company here: Carol Mandel and Paul Kantor, in their work on copy cataloging practices for the Council on Library Resources (CLR) Bibliographic Services Study Committee, found it very difficult to discern patterns among the libraries they surveyed. They also found that patterns of use of local systems and utilities varied widely.

In terms of machine-readable data exchange between local systems and utilities, however, there are currently two predominant workflows. In the first, which is the longer-standing, the institution uses the utility for cataloging, whether copy cataloging or original cataloging, and gets copies of its re-

cords on magnetic tape for loading into its local system. (Libraries began doing this even before they had local systems, storing their tapes in anticipation of being able to load them sometime, somewhere. In some cases this planning has come to fruition; however, the ability to get an archive or snapshot tape from a utility has diminished the need for this practice.) At some institutions, further maintenance of the local records takes place on the local system; in others, maintenance is also done on the utility, and the tape records overlay records in the local system.

What impact does this method have? This dataflow implies workflows with significant use of both utility and local system terminals, which is likely to be less efficient than concentrated use of one or the other. The time that passes while waiting for the tape to be shipped and loaded can affect the handling of the materials themselves. How quickly the materials can be put into circulation may be a function of how quickly the records can be loaded. Alternatively, an item can be circulated without the corresponding bibliographic record, but eventually the two records have to be linked up by some process.

In the second predominant workflow, the institution transfers copy to the local system using a connection between the utility's terminal and the local system. This could happen at the point of order, or at the time of receipt or cataloging. Further processing takes place on the local system; this could be acquisition or cataloging processing. When the cataloging of the item is completed, a copy of the record is transmitted back to the utility, typically on tape. Original cataloging takes place on the local system; the records are contributed to the utility. Record maintenance is done on the local system, with updates contributed back to the utility.

This method gets the information from the utility into the local system more quickly, and avoids the problems with elapsed time that tape loading creates. Processing on the local system, however, removes the context of the large utility databases that can be useful to the cataloger. The biggest drawback of this method from the utilities' point of view is the potential for the records to get trapped in the local systems if institutions lack the capability or are not conscientious about seeing that the records get back to the utility. I feel sure you have all witnessed the effects on the utility databases of records getting caught in local systems.

Variations on these two basic patterns abound. Some institutions catalog on the utility but use terminal transfer to move their own records to the local system, as opposed to moving the copy and processing it locally. Other institutions have locally mounted resource files that serve as sources for bibliographic or authority records. The other speakers have already described the alternatives to tape transfer; each alternative has an impact on workflow. The faster the transfer of completed records from the utility to the local system, the faster the item can be smoothly moved into circulation. The faster the transfer of completed records from the local system to the utility, the less likely it is that more than one institution will have to catalog originally any given item.

Still other institutions use a mix of techniques. For example, non-Roman data entry may be done on the utility and the records downloaded, while Roman-only processing is done on the local system. If the non-Roman records are subsequently loaded into a local system that does not support the vernacular scripts, then maintenance transactions cannot be contributed back to the utility because the vernacular data will be lost.

## VARIABLES/DECISION FACTORS

How do libraries pick among these alternatives? There are many decision factors; the fact that there are so many variables and that so many of them operate locally accounts for the fact that there are so many possible workflows.

One of the most important variables is the local system itself. What capabilities does the vendor offer? Of those offered, which has the library purchased? Of those purchased, which have been implemented, and to what extent? For example, if the vendor does not support terminal transfer from the utility, that mechanism will not be an option. In actual fact, though, most vendors do provide such a capability. However, most local systems do not yet support non-Roman data, leaving that to the utilities.

In this age of change, the vendors (and the utilities, for that matter) are constantly altering and upgrading their offerings. Library

management has to stay aware of the changes—I hope by coming to seminars like this one, as well as by other means—select among the new options, keep up the pressure on the local implementation, and incorporate new features into workflows. But the vendors have limited capacity to develop new features. They respond to user needs. An example of the library community taking the lead in pushing for needed new functions is the NOTIS Tape Output Product, which facilitates data exchange by providing records on tape in a format suitable for loading into RLIN. Now that this product is available, however, we are in an interim period as libraries go through the process of purchasing, installing, testing, and preparing to use the new offering in a production environment.

Another group of variables has to do with the local technical environment. What transfer techniques can the local computer system support? Is there internal or external staff expertise available to advise the library? For example, if people are already familiar with personal computers and local area networks, they are more likely to devise workflows involving those technologies. If the capability for managing large databases exists, an institution is more likely to decide to mount its own resource files. If an Internet connection is available, those protocols will look more attractive than others. The local environment is also subject to change; the rate and direction or focus of change are local variables.

There are more mundane variables like the number of utility and local system terminals in the library and hence the availability of each kind of terminal for each kind of technical processing work. For example, utility terminals might be dedicated for original cataloging, while local system terminals are used for copy cataloging and maintenance. Similarly, the availability of more local system terminals in other parts of the library is likely to increase the pressure on the technical services functions to move data into the local system quickly. Most likely the proportion of local system and utility terminals will change over time, and the workflow will change along with it. I won't try to establish which is the chicken and which is the egg here.

Other variables have to do with how data are handled locally. For example, if data are

transferred from the utility at the point of order, order staff have to be trained to select the appropriate records. The potential conflict of headings in member copy downloaded from the utility prior to cataloging might pose difficulties in searching the local database. The availability of online authority files either locally or in the utilities is another variable.

Another data issue that might affect workflows is the handling of record control numbers or IDs. Care must be taken in dealing with both local system and utility numbers, so that when records are exchanged, the right updates get made. I guarantee that this seemingly small item will occupy a good deal of your time in planning data exchanges.

Other data issues include how to handle holdings and what kinds of changes are contributed to the utility and when. There is also variability among the utilities in their terminal transfer formats, in their ability to accept and load records in the various bibliographic formats, in the amount of local data they maintain online, and in their capacity to schedule dataloads.

Some problems will arise regardless of the method selected, due to changes in implementation decisions over time. To take a very specific example, some institutions have more than one Library Identifier (LI) in RLIN, for historic workflow or money flow reasons. In implementing their local system, they may have set up processing units that do not correspond to RLIN LIs. Frequently this can be handled by an automatic mapping from one to the other without an impact on workflow.

A variable that has an unmeasurable effect on data exchange between local systems and utilities might be termed peer pressure. You are all here by virtue of your participation in cooperative relationships, that is, we invited RLG and RLAC members, not hand-picked individuals or institutions. Your decisions about moving data affect your fellow members in these groups. This has been a topic of much discussion and some action. You are all performing a balancing act between local priorities and organizational commitments.

Finally, a variable that is the same for all of us is money: we all have less of it these

days. However, how we choose to spend it is up to each institution. What we have to spend it on might vary locally, too. One example I'm thinking of is communications; networking alternatives are not yet evenly distributed. Some decisions might shift costs from one part of the library to another, or from one library to another. For example, if an institution's records or holdings are not contributed to a utility database in order to save some steps or costs in technical services, a reference or ILL staff member in that institution or another might have to spend a corresponding amount of time—which is money—perusing local catalogs on the Internet to locate the title. What is the relative worth of productivity compared to saving dollars on system costs?

## FUTURE WORKFLOWS

In the ideal future, the library worker's desk will have one computer on it. Or perhaps the computer will be the desk. The location of the data will be immaterial to the work that needs to be accomplished, whether in technical processing or any other part of the library, and whether the worker is a library staff person or a user of the online public access catalog. Exchange of data, when necessary, will be seamless and invisible. The system will direct searches, using a Z39.50-style protocol or a successor, to whatever databases look most promising for the function, immediately incorporating and indexing whatever copy is relevant in the local database. The system will move data created locally into regional and national databases without further action by the library staff member. Issues of fair charging and equal access will be resolved. (Now I know I am dreaming.)

I would say this future is at least ten years away, as far as making it available to the day-to-day work in Technical Services is concerned. What we are going to continue to do, as Bishoff and Bales have indicated, is to take incremental steps to build the pieces, both for bulk record or file transfer, and for searching and downloading individual records or search results. We have already talked about using various kinds of electronic file transfer to speed up the movement of records. Efforts are under way to ensure that access to more than one system from a single terminal or personal computer is possible. The implementation of Z39.50 will enable access to more than one system through a single user interface. Today, however, you have to deal with nearly as many interfaces as OPACs you want to search. In addition, just because you can search some other library's OPAC does not necessarily mean you can download the record for cataloging copy. For the time being, the increasing access to OPACs on the Internet might add steps to your workflow, rather than decrease them. When access to the Internet becomes available on a campus, it might be more widely available to library workers than access to the utility terminals. One reason library staff use Internet access is because they can see more detailed holdings information in an OPAC than on a utility. This leads to changes in workflows, for example, to bibliographers doing more preorder verification because they can get to the utility or to other databases more easily than they might have in the past. This will have an impact on the preorder activities of acquisitions staff.

To date, the traffic on the Internet by off-campus users accessing OPACs has reportedly been anywhere from unnoticeable to 8 percent of total system use. This is not enough to worry about. The point at which this "foreign" use will interfere with core institution use and with your workflow will differ for each system, depending on system capacities and on the perceived desirability of the information in the OPAC. What will you do when this point arrives for your system?

## SUMMARY

I will finish up by summarizing quickly the decision factors I have mentioned:

• the local system and its current and future offerings

• the local implementation of the current system, and its evolution over time

• the technical environment

• the number of terminals and personal computers of various sorts

• the communications choices that are available

• issues of data control and data content

• the capabilities of the bibliographic utilities

• the availability and usefulness of standard protocols

• local and organizational priorities and commitments

• the related issues of costs and productivity

It would be wonderful if we could moosh all these factors into a spreadsheet and come out with The One Best Answer. But wait! We are not done yet. This afternoon, Kate Nevins will add some more issues to this list. I wish you luck as you try to create your mental spreadsheets for your institutions, and as you work with your vendors—and your utilities—to get what you and your users need.  ■■

## Linked Systems: Issues and Opportunities (or Confronting a Brave New World)

### Kate Nevins and Larry L. Learn, OCLC

Technical advances in the areas of telecommunications and computer systems in the recent past have been nothing short of breathtaking. But even this change is likely to be dwarfed by what appears to be coming just over the horizon. The advances in computer hardware and software, combined with those within the telecommunications domain, will make possible powerful distributed systems at affordable costs. The old model of terminals connected to large central systems is already beginning to evolve and change. Linked systems using specialized networks are now beginning to debut in increasing numbers and would appear to be the emerging library and information system automation model of the 1990s and beyond.[1]

This changing automation landscape brings with it not only significant opportunity, but also a new domain of issues and challenges. These include not only technical issues but also issues related to policy, infrastructure, and relationships. In this paper we attempt to highlight some of these issues; to focus on emerging areas that will need to be addressed to preserve the outstanding record that the library community has already established in the areas of cooperation and service to patrons.

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### STANDARDS

Standards, both de facto and de jure, have often been viewed as the panacea of linking automated systems. Although various standards, and the standards process itself, have made a very positive contribution to resolving many of the problems associated with the transfer of information between systems, they are clearly not the final answer in and of themselves.

### Interoperability

Standards simply do not guarantee interoperability of systems. Standards may facilitate the transfer of information between systems, but as we will see, this is only a necessary, and not sufficient condition for effective interoperation between these systems. To use an analogy, this can be akin to a transatlantic telephone call between the United States and France. Although the telephone infrastructure (i.e., standard) may function perfectly well in transmitting and receiving the voices of the participants (i.e., the information), the participants (i.e., systems) will not be able to understand each other (i.e., interoperate) unless, or until, both participants can effectively communicate using a common language. If one participant does not understand French, and the other does not understand English, then regardless of how flawlessly the telecommunication system functions, no useful communication will take place.

### Flexibility

It must also be realized that standards, by their very nature, reduce the flexibility of the individual systems. The flexibility to make independent decisions can be hampered. For example, if provision has not been made within a database standard to accommodate a

certain data element or structure, a local application designer is faced with a draconian dilemma: (1) abandon the prospect of implementing such a data element or structure, even though it might contribute integrally to the functionality or efficiency of the planned application; (2) embark on a lengthy effort to change or enhance the standard—an endeavor without a high likelihood of ultimate success; or (3) figure out some way to "bend" the standard to meet, at least partially, the need at hand—an approach that will likely compromise both the application and the standard.

## Lowest Common Denominator

The standards process itself can be, and often is, flawed. Too frequently there are vested interests involved. There may be commercial products in the marketplace, or under development, that could be positively or negatively impacted by the final form a proposed standard might take. The emergence and adoption of such a standard might erode the captive market of a provider—a market that was previously secured, for example, by a proprietary protocol or interface. There are frequently different "camps" that find themselves at odds over a proposed standard, often on philosophical grounds. Whatever the reasons, the standards process itself is, for better or for worse, geared to negotiation and compromise. The final result is seldom reflective of the "best" possible outcome, but rather is by definition, a compromise—the best result that could be agreed upon, given the views and political/economic power of the involved parties. Standards too often represent the lowest common denominator.

## Subject to Interpretation

Since the standards process frequently represents a compromise between competing approaches or commercial technologies, it is not uncommon for the resulting standards to contain various implementation options—frequently reflective of one or another approach. In addition, elective options also occur in standards, representing the varying degrees of functionality required by different applications. Whatever the origin, the inevitable result of standards that allow implementation options is that compliant implementations by different systems may not interoperate. This problem is examplified by the Government Open System Interconnection Profile (GOSIP), the NISO Z39.50 Implementers Group, and the Library of Congress Rule Interpretations—all with the goal of bringing consistency to inconsistent standards environments.

## Coordination

Mutual compliance of various linked systems with a standard can provide other problems as well. Standards evolve and change, and groups of users may decide to change the various options that had been previously elected—usually for good reasons. The problems arise in coordinating these changes across multiple implementations. Returning to the transatlantic telephone call analogy, if a new word is added to either the English or French language, or if a new or different meaning is given to an existing word, communication can break down unless both parties are somehow simultaneously made aware of the change. The inability of one or more of several systems to implement an agreed upon change can prohibit all systems from effecting the change, or exclude these systems from the group.

## Standards Are Necessary, but Not Sufficient

All of these problems should not, and do not, impugn either standards or the standards process. Standards are both necessary and serve an important and irreplaceable function in linking and interoperation. They are the best solution that has been found. The point is that standards are not the end all. As stated above, they are a necessary, but not sufficient condition of linking and interoperability.

## PROPRIETARY RIGHTS

### Ownership and Copyright

Ownership and copyright are examples of proprietary rights, rights that are not changed by linking. Information providers still retain all proprietary rights existing on their own systems in relation to their respective databases. Related aspects such as monitoring and protecting any such rights, policy issues related to usage, etc., remain, for the most part, unaffected by linking, and must be addressed regardless of linking. Linking may, however, provide some additional threats due to the

technology involved, particularly the potential bandpass (i.e., rate of information interchange) of computer-to-computer links as compared to terminals, but this is also rapidly changing with the advent of more powerful microcomputers and their popularity as workstations.

## Technological Enablers

History has repeatedly taught us that the advent of new technologies often provides new means to threaten proprietary rights. For example, when the only alternative for redistribution of printed materials was to copy them laboriously by hand, such redistribution was not much of an issue. However, the advent of the Xerox machine facilitated such copying and redistribution, and librarians have been struggling with the related copyright issues from that time hence. Such issues have only been magnified by the advent of electronic access and transfer.

## Vested Interests

Vested interests clearly exist, and a little reflection upon these situations will likely lead most thoughtful individuals to the conclusion that they are not necessarily all bad. There is an economic and intellectual basis upon which creation and distribution of data are based. Loss or reduction of proprietary rights can erode the ultimate production and distribution of information—a result that is detrimental to information consumers and providers alike. Policies need to be devised that ensure the rights of both producers and consumers of information.

## INFRASTRUCTURE

### Prices and Price Structures

Prices and price structures are another extremely important aspect of linking. Pricing includes charges by a given host system to its users, to users of another linked system, and payments by the host system to other linked systems. Economic issues relate not only to revenue generation and the overall ability to recover costs, but also can relate to incentives toward usage patterns, premiums for greater levels of service, or incentives toward product and service discrimination (e.g., away from certain products or services). Accounting and billing information in support of pricing func-

tions are also important. Audit trail information and procedures are essential—particularly where linked systems are involved. For example, pricing incentives can promote a leveling of system demand, hence mitigating the need to purchase and implement expensive reserve capacity necessary to support short peak periods of demand that might otherwise arise. Load management issues can be significantly exacerbated by linking—particularly when extensive networks are involved. These necessary functions must not be precluded in any way and must be facilitated by a link.

### Security

Databases must be secured from attacks on their integrity. This is especially important with regard to external sources. Criteria for identifying such violations, particularly as this relates to clandestine links, must be established. Classification of data, access levels, facilities for honoring "right-to-know" queries, and privacy of patron files and activities are all issues of importance accentuated by the process of linking. Policy decisions and technical implementation factors are both considerations in deciding who will have access, to what files and applications they will have access, and what functions they will be allowed to perform.

### Authorization

The authorization and logon procedures associated with linking should not create a significant added burden for users. Ideally, the entire logon process should be handled by "the system" and not require entry of large amounts of data by the user. Defaults should be used wherever possible. Authorization itself should be handled between systems, with the system itself being responsible for the "authority" of its own users and their access to other systems. Stated differently, it should be the system and not its individual users that is given authority on the link, although the system may at its discretion delegate the responsibility—but not the accountability. It may be necessary to encompass several levels or layers of authorization to support the required functionality appropriately.

### Navigation

In the past, users of information were faced

with scarcity. The task was to locate and retrieve pertinent information. Today, users are frequently faced with a problem of quite a different nature. The task of the information user has shifted to the selection process. Today's user must seek out directories and infrastructures necessary to select among vast quantities of information—to navigate upon these information seas.

Networks of systems and databases, while potentially making many more valuable information resources available to users, also can significantly compound and complicate the navigation problem. There is an expanded need to train and support these users to be able to access a wide variety of diverse systems. Returning again to the transatlantic telephone-call analogy, U.S. callers may have to be taught French, and possibly many other languages as well, should they choose to call additional countries made accessible to them by the international telephone network. The question is,"Who will train these users?" As the individual workstation becomes the information equivalent of "the center of the universe," who will assume this responsibility?

## PERFORMANCE

### Interrelationships

System performance and performance expectations are not directly related to linking. However, performance-related elements of one system can have significant effects on another linked system (e.g., unexpectedly poor response from another system can cause serious problems due to such things as queue buildup, queuing delays, etc.) unless these considerations are inherent in the linked-systems design and implementation.

### Accountability

When only a single system is involved, accountability to fulfill user expectations falls clearly upon the system provider. But when systems are networked, mixed expectations can result. When system performance is variable, or other user expectations fail to be met, perceptions of accountability can be divergent. The system provider may believe that the problem lies within the network or with another linked system—and it may—but this can make little difference if the user's perception is that of poor performance related to the local system. The situation can only be exacerbated if the providing system is dependent upon the user's usage as a source of revenue (i.e., the link is the major "highway" upon which the providers' products and services must travel).

Issues of who is responsible (and accountable) for variability of performance, technical support of users, and diagnostic and maintenance activities are all of considerable importance. Also of importance are operation of the network or link and related policies and procedures, coordination of availability (e.g., during what hours will the various systems be available—particularly where there might be time-zone differences), and capacity planning. Operation of a network, of which a link may be an integral part, can be of the utmost importance financially, operationally, and strategically to the systems and institutions it serves, and issues of responsibility and accountability for its performance must be clearly delineated.

## ECONOMICS

### "Free" May Not Be Free

It is exceptionally rare that anything is really "free." Whenever anything is purported to be free, chances are overwhelming that someone is paying—and frequently it turns out to be the recipient of the service. Free might be better described as "tolerable." Someone is willing to underwrite the cost of the free service, at a certain level, in return for some benefit derived. Too frequently, when activity levels of free services increase, attention is drawn to the service, and free becomes subject to close scrutiny. Lennie Stovel has pointed this fact out very eloquently:

To date, the traffic on the Internet by off-campus users accessing OPACs has reportedly been anywhere from unnoticeable to 8 percent of total system use. This is not enough to worry about. The point at which this "foreign" use will interfere with core institution use and with your work flow will differ for each system, depending on system capacities and on the perceived desirability of the information in the OPAC. What will you do when this point arrives for your system?[2]

### Cost Recovery

Automated systems can deliver tremendous value, but unfortunately, they cost

money. The fact that these costs must be recovered is an economic necessity. This is simply a fact of life—someone must pay. The question is "How will the costs be met?" They may be recovered directly from users— possibly on the basis of usage, or on the basis of perceived value obtained. The cost burden may be shouldered, or at least subsidized, by government, grants, or by a parent organization or institution. The realities are: (1) the costs must be met; and (2) whoever foots the bill must be satisfied that value is being received in return for payment. If a time arrives when either a benefactor cannot meet the expense, or the value received is perceived to be out of proportion to the cost incurred, then the resources will dwindle or disappear. Linking can significantly complicate this delicate equation.

## Viability

Financial viability of information providers in the evolving environment will depend on their ability to implement new pricing and marketing strategies. Information providers are now developing new and largely experimental pricing schemes for networked or locally mounted databases. For OCLC, this means restructuring prices through contribution pricing—an important change for both OCLC and its participating libraries. Meanwhile, libraries face increasing demand for attendant services (e.g., interlibrary loan). In a similar manner, libraries will have to develop innovative means to deal with these increasing demands.

## Maintenance Costs and Trends

System maintenance costs will multiply with the diversity of partner systems. The more systems and systems implementations there are, the more these costs escalate. OCLC is currently working with about seventy local systems vendors, and about fifty "home-grown" local systems or modified commercial systems in conjunction with PRISM, OCLC's new online system. Further, maintenance costs reflect not only ongoing hardware maintenance, but also modifications and enhancements to software. In addition to changes in application software, computer manufacturers frequently change the underlying operating systems, which inevitably necessitates adaptation of the library ap-

plications to these operating-systems changes. Of course, a library or local system vendor can choose not to implement a manufacturer's upgraded operating system, but the end result—even if the changes are not required by the library application—is too often that the system is left dependent upon an operating-system version no longer supported by the computer manufacturer. Finally, the underlying communications and linking modules are frequently integrated with the manufacturer-provided operating system. If upgraded protocol software is needed (e.g., necessitated by a change to the protocol standard), it may only be available for the most current version of the operating system.

Linking can magnify maintenance costs manyfold. For example, when a new or upgraded communications protocol software package is implemented by a linking partner, or any other change is made that may affect the link, it is incumbent upon the linked systems to test and verify the changes. This takes time and costly resources. In addition, changes made by any linked system carry with them the potentiality—however slight—of precipitating problems within other of the linked systems. In essence, the system becomes the network. Although a given system may not be burdened with maintaining all the systems on the network, all of the systems carry the potential to create problems on the given system. This, if not carefully controlled, can result in increased diagnostic, maintenance, and testing costs. It can also result in decreased levels of service and resulting productivity.

## ORGANIZATION

### Policy and Procedure

Policies and procedures become increasingly important as more and more parties of interest are involved. At the same time, complexity is greatly multiplied. Increasing complexity is seen in all areas (e.g., standards, performance, ongoing operations, maintenance, and support). Decentralization of computing power results in decentralization of functions and responsibilities. The shift from the uniform use of OCLC Model 100 terminals to access OCLC in the past, to a seemingly infinite variety of terminals, workstations, LANs, and other diverse hardware

and software configurations currently in use, is exemplary of this trend. Yet the very fact that the systems and structures become increasingly decentralized makes effective policy making and the development and implementation of effective procedures across and between systems considerably more difficult to achieve.

## Communication and Coordination

It follows that communication and coordination also become increasingly important as systems are linked or networked. However, ensuring that this communication occurs effectively becomes more difficult and problematic with linking. Policies and procedures can become more difficult to implement and coordinate at the very time when the need for these elements is rapidly increasing. For example, a seemingly simple undertaking such as maintaining synchronization of files among systems can suddenly become an operational nightmare.

## Support

Linking and networking tend to extend system access beyond the technically initiated, which frequently increases training and support requirements. These needs also tend to increase due to the diversity of systems and databases that become accessible on a network. Local support staff as well as users may require additional training. Support burden also tends to increase significantly.

Users may also gain access to remote systems through links from a local system. Often the location of the target system becomes obscure—at least in the mind of the user. The user may be accustomed to calling the local system for support, and will likely continue to do so, even when accessing—or attempting to access—a remote system.

To complicate matters further, the user may gain access to a remote system via a more-or-less circuitous route (e.g., via one or more gateways on various systems, or via the so-called Internet). When problems arise, they may occur anywhere along the access route, and it becomes necessary for someone to determine where the problem is and notify the appropriate party. This can be no small undertaking, and can require not only in-creased resources, but also increased sophistication on the part of the related support structure (i.e., personnel and systems). As Kathy Bales has so aptly put it: "Who are you going to call when something goes wrong? Not ghostbusters or OCLC or RLIN network operations centers."[3]

## CONCLUSION

Often, the first topics to arise, when linking and networking are discussed, are those of a technical nature. Yet, the more problematic areas are not technology related. Policy and procedure, cooperation and coordination, pricing and costs, operation and support, proprietary rights and vested interests all take on dimensions that tend to overshadow technology. As distributed applications evolve, the role of relationships between cooperating entities will be just as important, and probably more problematic, than the technical issues.

The library community has built a strong cooperative environment. Professional organizations, membership organizations such as OCLC and RLG, library consortia, and networks all play important roles within this environment. Fortunately, these organizations are already in place and well suited to address the issues and problems brought about by linking and networking. The challenge will be to lever the current structures to address these emerging issues—to develop a new infrastructure that will bring us into agreement with William Shakespeare, who—had he lived in contemporary times—might well have written, "Oh brave new world, That has such systems in it!"[4]

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4. The actual quote is, "Oh, brave new world, That has such people in 't!" It appears in Shakespeare's *The Tempest*, act V, scene 1. ■■

# Communications

## Publishing an Annual Faculty Bibliography at the University of Miami

### Lyn MacCorkle

*Scholarly inquiry is a social process. One way for a university library to encourage the research culture at an institution is to develop services that stimulate intramural communication. Faculty research referral databases and faculty publication bibliographies are ways to disseminate institutional research interests. The Otto G. Richter Library at the University of Miami has prepared an annual bibliography using ProCite and WordPerfect for the last four years. A use survey indicates that the bibliography covered an estimated 87 percent of the books and journal articles published by authors associated with the university, and that over one-fourth of the respondents contacted another faculty member as a result of research they identified in the report.*

David Riesman has observed that learning to find one's "true colleagues" within the university is the teacher's real problem, and that the most sympathetic mind may very well be in another discipline.[1] Little research exists on scholarly communication among university faculty employed at the same institution, especially communication with scholars outside one's own department. In 1985, the American Council of Learned Societies surveyed individuals belonging to member organizations associated with these seven disciplines: classics, history, political science, sociology, philosophy, and English and American literature.[2] The survey found that only 30 percent of the faculty in research universities had anyone in their departments to comment on their manuscripts; one-fourth of all respon-

dents to the questionnaire reported that no one in their present organization shared their research interests.

The university library can support intramural communication by developing services that collect and disseminate information on the professional activities and interests of faculty. Several libraries have designed computerized faculty research databases. Depending on the purpose, these databases have information on classes taught, publications, funded and unfunded research, dissertations and theses chaired, consulting interests, and language proficiency. Some of these projects are described in the literature, such as the microcomputer-based faculty profile established at the Science Engineering Library at the University of Arizona and the "Faculty Research Interest File" at Zimmerman Library, University of New Mexico.[3,4] Examples such as the "Faculty Research Interest Roster" at the Scott Memorial Library, Thomas Jefferson University, are found in the medical librarian's professional literature.[5] Other colleges and universities have published printed faculty bibliographies that can be distributed within the university or to the public.[6]

At the University of Miami there are several ways the research and scholarly activities of faculty are shared within the community. The vice-provost for research sponsors seminars to which faculty are invited to share their research with colleagues. *Veritas* is a faculty newsletter published monthly. Public relations publishes *Miami*, a quarterly journal, and the Otto G. Richter Library prepares *Faculty Publications: University of Miami.* An annual faculty bibliography is time-consuming to prepare, but with good software and proper planning, it can be efficiently and cost effectively done.

### RATIONALE

The University of Miami, established in 1926, is the largest private, independent university in the Southeast, with 12,743 students

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attending twelve schools and two colleges, and offering approximately 130 undergraduate and 175 graduate programs. The university is ranked among the top sixty institutions receiving federal funds, and in 1988/1989 awards for sponsored projects totaled $488 million. There are 1,706 full-time faculty.

In 1985, the assistant director of collection development and the psychology bibliographer at the Otto G. Richter Library, University of Miami, decided to initiate an annual compilation of faculty publications. The objectives were to:

1. support library collection development,

2. provide a measure of institutional research performance,

3. encourage communication among faculty in diverse fields,

4. furnish a public relations tool for the library and the university,

5. assist in determining the amount of interdepartmental research, and

6. provide a comprehensive and permanent record of the intellectual history of the university.

## ARRANGEMENT AND COVERAGE

The first report, published in 1986 by the Otto G. Richter Library, covered 1984 and 1985; subsequent issues have covered only one year. The latest publication, covering 1988, is 169 pages long, has more than 1,850 unique citations, and is arranged alphabetically by school/college/administrative unit and then by department/division/institute (a sample page from the 1988 report is shown in figure 1). Within the department, citations are arranged alphabetically by the name of the first author. An author index lists the full name of the 1,044 contributors and the reference numbers of the citations in the bibliography that correspond to their works. Although the title is *Faculty Publications*, authors include students, research assistants, administrators, and nonfaculty academic staff in such areas as the computer center.

The report is not evaluative. Refereed works are not distinguished from nonrefereed works. The purpose is to profile the scholarly and research interests of faculty as expressed in their books, articles in books and journals, published conference proceedings, and technical reports. Chairpersons were asked to approximate the percentage of their department's publications that were covered in the latest report. The averaged responses indicate that 87 percent of the books, book chapters, journal articles, technical reports, and published conference proceedings published by authors associated with the university are included in the report.

## DATABASE SOFTWARE

The database of *Faculty Publications* was prepared using ProCite version 4.1, a software package designed to produce professional bibliographies, WordPerfect 5.0, a Leading Edge microcomputer (30 mb hard drive/7 mhz), and an AST/TurboLaser printer. ProCite has many features necessary to prepare a professional report. For example, it is able to customize a punctuation/style template; merge databases; index and sort on the author, title, and index fields; search for references in the database using Boolean operators and truncation; and control margins, pagination, and indentation. WordPerfect is a popular and powerful wordprocessing package that is used to edit and print files downloaded from ProCite.

## PROJECT DURATION AND SOURCES OF INFORMATION

It takes about nine months to gather, input, edit, and distribute the reports. The annual project begins in December of the year that the issue will cover. The initial database is built using citations from a current awareness bibliography sent by the Institute for Scientific Information (ISI). During early spring a letter, along with a blank publications entry form, is mailed to all full-time faculty requesting that they send the library a list of their publications for the previous year. Faculty may also send that part of their vita that lists publications. To make it even more convenient to respond, a self-addressed envelope is included. The data received from faculty are checked against what has already been entered into the database from the ISI citation lists and missing works are added. During the summer the report is edited, sent to the printer, and if there are no unusual delays, the completed *Faculty Publications* is mailed from the library in early fall the following year.

For several years the library experimented with building the database by searching through various commercial online vendors

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*Figure 1. Sample Page from* Faculty Publications: University of Miami 1988.

and then combining the results with input sent by faculty. Early on, the decision was made not to rely exclusively on faculty contributions; it was believed that faculty cooperation would not be forthcoming until the publication became "established." For the first two issues, commercial online databases were searched to prepare a preliminary bibliography. This was sent to faculty requesting them to supply any omitted information. It was hoped that this initial effort would validate the library's intent, encourage faculty participation, and create a basis for continued cooperation with the project. The library wished to encourage a reply from faculty without sending out a preliminary list.

With the 1987 issue the expensive online searches were dropped. For less than $200 a

year, ISI sends a weekly current awareness list of citations by authors affiliated with the University of Miami. The ISI list is generated from the merged science, social science, and humanities databases. The citations in the 1988 issue of *Faculty Publications* come from two main sources. Seven hundred items came from ISI, but well over half of the 1,850 items were taken from lists submitted by faculty and departments. Another 100 or so were derived from searches of commercial online databases, OCLC, and various printed sources.

## INPUTING THE DATA

Biblio-Links, software that reformats citations from Dialog, BRS, and OCLC into a format compatible with ProCite, was experimentally employed until it became apparent that manually entering data was faster than adapting the downloaded references to our bibliographic style. The following are some of the conventions that have been adopted in the report: a colon is used to separate the main and the subtitle; a semicolon is used to separate the names of multiple authors; the first letter of each substantive word is capitalized only for serial titles; and the full title is given for all journals.

The ISI current awareness bibliography abbreviates journal titles and truncates long surnames, whereas Dialog and BRS load the ISI files so that the full name of the author and the full journal title appear. Using the ProCite Journal Authority List feature, an easy method was created to input the full journal title. First, the databases covering the annual reports from 1984 through 1987 were merged into a comprehensive ProCite file. An alphabetically arranged list of journal titles was then generated from the merged database by indexing the Journal Title Field using the "one record per title" indexing feature in ProCite. This ASCII file was converted to a WordPerfect 5.0 text file, where it was edited. Then, using a macro, brackets were placed before and after each journal title. Next, the ISI abbreviations were placed before each corresponding bracketed full title. Lastly, using WordPerfect, the journal title list was converted back to an ASCII file that could be used and sorted by ProCite.

As citations from the current awareness bibliography are being entered into ProCite, the full title can be transferred into the Jour-

nal Title Field without rekeying. This is accomplished in the data editing/input mode by calling up the Journal Authority List, scrolling or keying to the journal abbreviation, and then pressing the appropriate function keys to automatically transfer the unabbreviated title to the Journal Title Field within the current record. New titles can be added to the Journal Authority List as necessary from within the ProCite editing/input mode. This ProCite authority list/indexing capability has been adapted and modified by the assistant director for collection development to create a list of journals in which faculty have published and the number of times articles have appeared in each. The list is sent to academic administrators, departmental book chairpersons, librarians at the medical and law libraries, and the bibliographers within our library to use in collection management decisions.

After all the citations have been entered in the database, the individual items are coded in the index field with a department-author designator for each University of Miami author who contributed to the work. The following is an example of a department-name code found in the index field:

### soc-Wiggins, L.T./lpsy-Blaney, P.

Names are separated with slashes. This citation would be found in *Faculty Publications* under both the sociology and psychology departments. Cross-departmental research projects are not uncommon, especially in the medical school. Two hundred forty-seven of the citations in the 1988 issue are listed under more than one department. Individuals from as many as five different departments/schools have worked and published together. After the codes are assigned to each record, "chapters" corresponding to individual departments are created as ASCII files that can then be converted to WordPerfect 5.0 text files for the final editing.

## EDITING

While the department-author codes are being assigned to the ProCite records, a print copy of the references in alphabetical order by author is distributed in sections to various librarians for a preliminary editing. After the coding and editing are completed, a draft copy of each department's contribution is

mailed to the department chairperson. Chairpersons are asked to underline the names of their faculty, to edit in any way they think necessary, and, if they choose, to add missing items. The majority of the eighty-five departmental chairpersons responded to this request. These responses are used to correct the computerized database. A ProCite feature is then utilized to check for duplicate citations before copies of each department's publications with record numbers is produced for a final editing.

The final editing is done in WordPerfect. The "chapters" corresponding to the works of individual departments are edited utilizing the spelling module, easy to construct macros (e.g., for automatically establishing margins, font style and size, centering, and the location of page numbers), and a "search and replace" feature to change spacing and characters. WordPerfect's spell check program is surprisingly good with medical and scientific terms, and words can be added. A customized spelling module that is "familiar" with research at our institution has been created over the past several years, and this enhanced version considerably speeds up the editing process.

After the record numbers for all the citations in *Faculty Publications* have been established, an author index is prepared. The first step is to create an alphabetized list of department-name codes by indexing the Index Field of the ProCite records. The resulting ASCII file of alphabetized codes is then converted to a WordPerfect file, and record numbers are assigned to the codes. Next, using a macro, the department is stripped from code, leaving only the author's name and the record numbers that locate their works in the bibliography. This list is then sorted alphabetically. The last step is to add the full first name of the author and edit the index. The table of contents, preface, and introduction are prepared next. After these sections are completed, a camera-ready copy can be generated.

### FORMAT AND DISTRIBUTION

*Faculty Publications: University of Miami 1988* is handsome to look at. The report is printed on sixty-pound white stock and is perfect bound in an eighty-pound cover in color. The camera-ready text was generated on an AST TurboLaser/PS printer using an elegant and easy-to-read font called Palatino.

This year 750 copies were printed. Copies were distributed to the board of trustees, top administrators, deans, department chairpersons, division heads, and selected individuals and organizations outside the university. For the last two years, the dean of the School of Arts and Sciences has purchased copies to be sent to individual full-time faculty within that school. The provost has encouraged the deans to have chairpersons cooperate with the library in collecting data.

### USE SURVEY

Prompted by budgetary belt-tightening, the library enclosed a "Use Survey" in the 450 copies distributed to faculty in arts and sciences, all department chairpersons, division heads, and administrators. The survey was completed by 167 respondents for a 37% response rate. There were no follow-ups. The first question was: "The library has many demands on its resources. The cost to prepare, print, and distribute this publication is $9,000. How important do you feel it is for the library to continue to publish this annual bibliography?" A five-item Likert-like scale was employed: extremely important, highly important, important, moderately important, not important. Sixty percent of the respondents felt that it was moderately to extremely important to continue publishing the report, and 40% thought that it was not important. However, 78% of the department chairpersons responded that it was moderately to extremely important to continue the *Faculty Publications*. The faculty were almost evenly divided between assigning the report moderate to extreme importance and no importance.

Why did 40% of the respondents have such an unfavorable attitude toward continuing what the library considers a worthwhile and appropriate service? It appears from the comments made on the returned questionnaires that many respondents did not carefully read the first question and thought the $9,000 only covered printing costs. A department chairperson in the social sciences suggested that we publish the document electronically and save "about $8,900."

In fact, over two-thirds of the cost was the labor involved in preparing and distributing the document (representing about 5 to 10% of the librarian's time and about 20% of a library staff member's time over the course of

the nine months it takes to prepare the report). In addition, the attitude of faculty who did not appear in the publication may be biased unfavorably toward the report. As at other universities, many faculty at the University of Miami rarely publish. Studies have found that in research universities, "one-fourth have never published a journal article of any kind, and one-half have never published a book, manual, or monograph . . . an estimated 10% of all scientists produce 90% of all published works."[7,8] Over 50% of the arts and sciences faculty were not included in the report in the 1988 faculty bibliography. Since an estimated 87% of the books and journals published by faculty were included, many or most of the respondents published nothing during the year covered by the report.

Communication/networking questions were included to discover if the publication was used to find out what research was being done in other departments, and, if so, if another faculty member was contacted because of a research interest that was learned of in the *Faculty Publications*. Fifty-three percent of the respondents used the publication to find out what research was being done in departments other than their own. There was a positive association between interest indicated in research outside one's own department and the importance given to continuing the publication. Eighty percent of the group that used the report to find out what colleagues in other disciplines were publishing rated the publication important to extremely important.

The lack of interest shown by a large number of University of Miami faculty (47%) in research outside their departments is explained, in part, by studies finding little intramural communication among scholars outside their discipline. For example, John Deethardt examined "synergistic" linkages among faculty in sixty-seven departments and schools in a large Southwestern university.[9] Faculty were asked to name regular, full-time faculty with whom they communicated and to estimate the importance and frequency of the contact. This research determined that the majority of faculty "are not interested in the communication structure of the university at large, outside of their own departmental cultures . . . are ignorant or suspicious of it," and

were, in some cases, hostile towards the investigation, regarding it as an invasion of privacy.

The good news is that more than one-fourth (28%) of all survey respondents actually initiated contact with another faculty member because of a research interest they identified through this report. This is an important networking function and accomplishes one of the main objectives envisioned for the publication. Lastly, an inquiry was made about what other types of publications should be added to the bibliography. Opinions were directly sought about whether book reviews and dissertations should be included, and a space was provided where other types of literature could be suggested. Twenty-six percent of all respondents thought book reviews should be added, and 40% felt that dissertations should be covered. Other recommendations included art works in collections, published meeting abstracts, scientific abstracts, and correspondence in journals.

## FACULTY COMMENTS

The library has stable but limited resources; the acquisitions budget will probably never be great enough to satisfy librarians or faculty. In light of Richter Library's collection needs, some faculty were disturbed that money was spent on a publication such as this and not on books or journals. One academic administrator commented that with "Medline and all the other databases," this type of document is unnecessary. On the other hand, one department chairperson commented that the publication should become "a standard operating procedure," and another wrote that "the provost should make it mandatory for every faculty to list its publications" in the report. Several faculty suggested that it be published electronically, either on an electronic bulletin board or distributed on disk.

## CONCLUSION

The comments of the survey respondents were valuable. Other ways to collect and disseminate information on the professional interests and research activities of faculty are being examined. An electronic version of the merged *Faculty Publications* databases will be loaded on the university mainframe and publicly searchable. The assistant director for collection development has proposed a com-

puterized faculty interests roster that could be searched by patrons as well as librarians.

The objectives that were established for the publication have been met. It has supported the work of bibliographers in the library by documenting faculty research interests and the journals in which they regularly publish. *Faculty Publications* has been used by Governmental Relations, Public Affairs, and other offices on campus as a public relations tool. An estimated 87% coverage of books and journals is inclusive enough to consider the report comprehensive and to use it as one measure of institutional research performance. It can also be used as an aid in determining the degree of interdisciplinary research activity among faculty within the University of Miami, and our survey indicated that it has been used to network.

One of the keys to "strengthening the culture of research at any institution" is to develop organizational mechanisms that "encourage internal and external communication and contact with other researchers on research-related issues."[10] Many opportunities exist for any library to sponsor projects that stimulate professional networking and research performance among researchers on their campuses. The Otto G. Richter Library will support collegial communication among faculty by continuing to prepare this report.

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# Automation in Hungarian Libraries

## Suzanne D. Gyeszly

*The environment for developing automation in special and university libraries in Hungary was favorable in the mid-1970s. Hardware and software had to be acquired from foreign countries. Currently the National Library, the National Technical Information Center, and university libraries have the leading role in automation.*

Hungary was part of the socialist system in the form of a People's Republic until November 1989. Executive power was vested in a one-chamber national parliament whose members were elected every five years. However, the one-party system was eliminated in late November and a multiparty system introduced during spring 1990. The socialist library system was based on Library Acts established in 1949, 1956, and 1970. The early Library Acts were significant for two reasons. They codified the library networks as a system and assigned responsibility for documentation work for research and special libraries. The Library Act of 1970 recommended an increase in the division of labor and integration, cooperation, and standardization among libraries. Standardization provided a basis for future automation, and Hungarian libraries therefore adopted the ISBN and ISSN systems in 1974.

Library and information services in Hungary are under the jurisdiction of the Hungarian Ministry of Education. Currently the country has approximately 8,500 professional librarians and 14,500 libraries. Based on their tasks and functions, the libraries are divided by statute into four major categories: the national library, higher education and school libraries, special libraries, and public libraries.

The National Szechenyi Library (Orszagos Szechenyi Konyvtar) in Budapest collects the

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so-called Hungarica materials, consisting of all print and nonprint materials published in Hungary, foreign-language literature either translated from Hungarian or pertaining to Hungary, and Hungarian-language works published abroad. In addition, the library collects literature related to other people of the Finno-Ugrian language group.

University libraries provide materials to support the educational and research missions of their institutions and to meet the information needs of nonacademic researchers and experts. University libraries have also become the document depositories of their respective geographical regions.

Kindergarten–12th-grade school libraries support the daily curriculum and provide some leisure materials for students and teachers. Each elementary school library has 9.4 volumes per student, while the secondary schools have a minimum of 26.9 volumes per student.

Special libraries in the fields of research, education, production, health, and other fields meet collection and information needs as determined by their respective supporting bodies. The number of special libraries and their users increased during the past decade due to newly established scientific fields.

Public libraries follow the International Federation of Library Associations and Institutions (IFLA) guidelines in order to provide citizens an opportunity for free access to information and other services for self-instruction, information, and recreation.

## HISTORY OF HUNGARIAN LIBRARY AUTOMATION

The environment for developing library automation was favorable in the mid-1970s in special and university libraries because of the high demand from the researchers and newly established scientific fields. However, the lack of sufficient Hungarian-made hardware and Hungarian-language software made the widespread use of automation among libraries difficult. Most of the hardware and software had to be acquired from Western Europe or the United States because the quality of Eastern European products was not satisfactory. Due to the demands and needs of the Hungarian chemical and heavy industries, the first online automated services were introduced in the libraries of the University of Chemical

Industries (Vegyipari Egyetem) in Veszprem and the University of Heavy Industries (Nehezipari Muszaki Egyetem) in Miskolc. A computer-generated catalog was printed, and Selected Dissemination of Informaton (SDI) retrieval software was developed in 1978 based on the MARC format. SDI services were also offered at the Hungarian Academy of Sciences Library (Magyar Tudomanyos Akademia Konyvtara). The National Technical Information Center (Orszagos Technikai es Informacios Kozpont) established its own database in 1979 and had connections with the INSPEC, COMPENDEX, and INIS databases. The National Szechenyi Library (Orszagos Szechenyi Konyvtar) produced the Hungarian National Bibliography based on the MARC format beginning in 1978.

Although Eastern European computer products were significantly less expensive than their Western counterparts, they were not compatible with Western products. Some software was developed domestically in the late 1970s; first among them was the World Politics Information Service of the Hungarian Parliament Library. Public and school libraries were unable to automate their library services or to use any online products due to high costs.

## CURRENT AUTOMATION ACTIVITIES

National Szechenyi Library, the Hungarian Academy of Sciences Library, the National Technical Information Center, and university libraries have the leading roles in automation. Cooperation and networking among these libraries are influencing other major libraries in Hungary. Figure 1 illustrates the current automated networking among the Hungarian libraries.

The information network is based on a high-capacity IBM mainframe owned by the Hungarian Academy of Sciences Center for Computing Services. Additional VAX computers are connected to the Hungarian Academy of Sciences Library, the National Szechenyi Library, and major university libraries. Individual libraries are connected to the mainframe via IBM personal computers.

The purpose of networking is to provide:

• online information retrieval services to the participating libraries,

• direct dial-up services for researchers to access major databases,

• information and data exchange with foreign countries, and
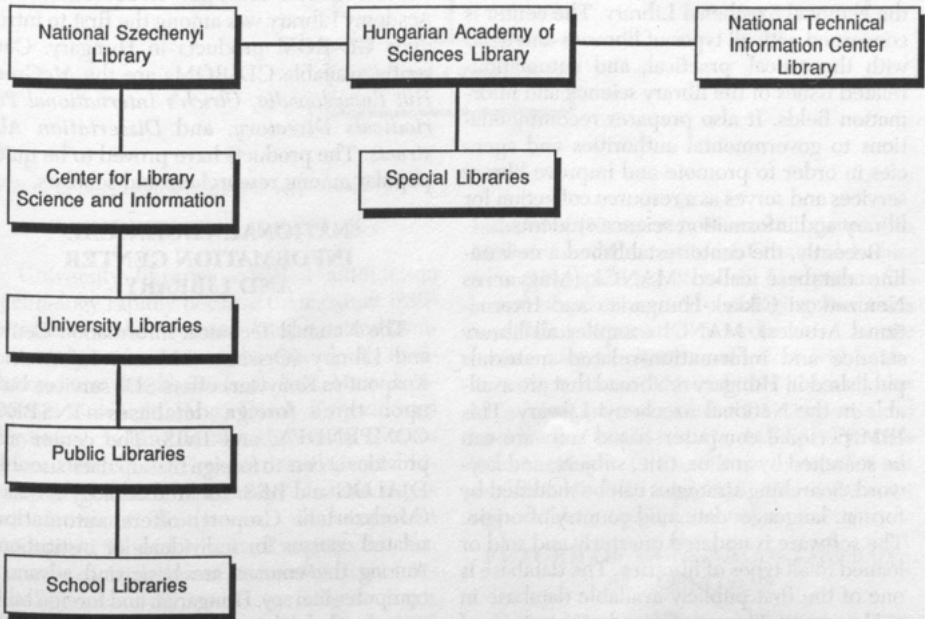
• document delivery via telefax in Hungary.



*Figure 1. Current Library Networks.*

## NATIONAL SZECHENYI LIBRARY

The National Szechenyi Library (Orszagos Szechenyi Konyvtar) plays a major role in Hungarian library automation. The library moved to its new building in 1986 and created a separate division related to automation. Presently, acquisitions and cataloging are partially automated. The following databases are already available on online:

Hungarian National Bibliography 1978–
   (Magyar Nemzeti Bibliografia)
Hungarian National Periodical List 1986–
   (Magyar Nemzeti Folyoiratok Listaja)
Hungarian Information Center 1985–
   (Magyar Informacios Kozpont)
International Serials Data Systems 1983–
   (Nemzetkozi     Folyoiratok     Adat
Rendszere)

More databases will be established in the future and will include information on librarianship and the availability of foreign books in Hungary.

## CENTER FOR LIBRARY SCIENCE AND METHODOLOGY

The Center for Library Science and Methodology (Konyvtartudomanyi es Modszertani Kozpont) was established in 1959 as part of the National Szechenyi Library. The center is concerned with all types of libraries and deals with theoretical, practical, and automation-related issues of the library science and information fields. It also prepares recommendations to governmental authorities and agencies in order to promote and improve library services and serves as a resource collection for library and information science students.

Recently, the center established a new on-line database called MANCI (Magyar es Nemzetkozi Cikkek-Hungarian and International Articles). MANCI compiles all library science and information-related materials published in Hungary or abroad that are available in the National Szechenyi Library. This IBM personal computer–based software can be searched by author, title, subject, and keyword. Searching strategies can be modified by format, language, date, and country of origin. The software is updated quarterly and sold or loaned to all types of libraries. The database is one of the first publicly available database in a Hungarian library. The administration of the Center for Library Science and Method-

ology Library uses this database as a teaching tool for the public. They hope that users of the system will learn more about basic aspects of computers and automation activities.

The center also publishes a series entitled Library Software. It consists of software programs for personal computers. The early programs in the series were prepared for Commodore 64-type computers, which are still popular in smaller libraries. Recent software is written for IBM-type hardware.

## HUNGARIAN ACADEMY OF SCIENCES LIBRARY

The Hungarian Academy of Sciences Library (Magyar Tudomanyos Akademia Konyvtara) information work was originally based on magnetic tapes of the Institute for Scientific Information of Philadelphia. The library also participates in the work of the International Information System in Social Sciences among the Eastern European countries. Additionally, the Hungarian Academy of Sciences Library is active in the European Cooperation of Social Sciences Information and Documentation Association (Tarsadalom Tudomanyok Informacios es Dokumentacios Szovetsegenek Europai Kozossege). The Academy Library was among the first to introduce CD-ROM products in Hungary. Currently available CD-ROMs are the *McGraw Hill Encyclopedia, Ulrich's International Periodicals Directory,* and *Dissertation Abstracts.* The products have proved to be quite popular among researchers and scholars.

## NATIONAL TECHNICAL INFORMATION CENTER AND LIBRARY

The National Technical Information Center and Library (Orszagos Muszaki Informacios Kozpont es Konyvtar) offers SDI services built upon three foreign databases—INSPEC, COMPENDEX, and INIS. The center also provides access to foreign dial-up databases like DIALOG and BRS. Its Methodology Division (Modszertani Csoport) offers automation-related courses for individuals or institutions. Among the courses are basic and advanced computer literacy, Hungarian and foreign bibliographical databases, online searching methods, and office automation.

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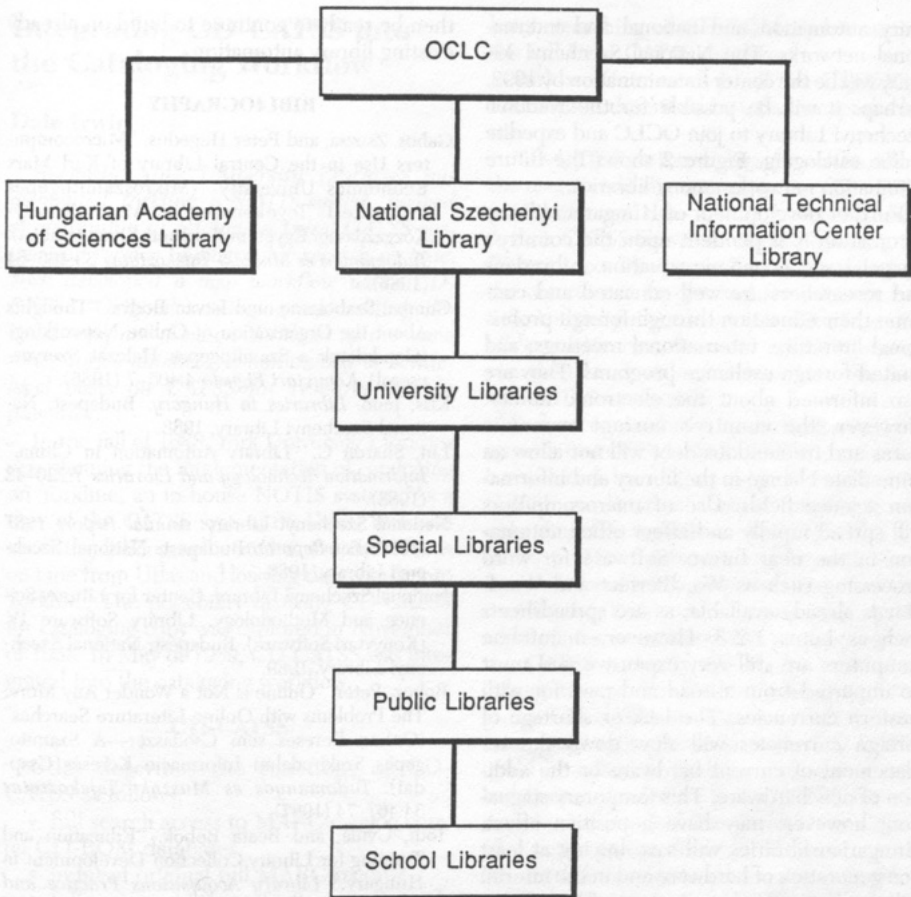
*Figure 2. Suggested Future Library Networks.*

## UNIVERSITY LIBRARIES

University libraries adopted automation technology rapidly because their parent institutions have the necessary hardware and computer expertise. Among these academic institutions are the libraries of Karl Marx Economics University (Marx Karoly Kozgazdasagi Egyetem), Lorand Eotvos University (Eotvos Lorand Tudomany Egyetem), and Central Library of Technical University (Muszaki Egyetem Kozponti Konyvtara), all located in Budapest. Elsewhere in Hungary are the libraries of Attila Jozsef University (Jozsef Attila Tudomany Egyetem) in Szeged, Lajos Kossuth University (Kossuth Lajos Tudomany Egyetem) in Debrecen, University of Heavy Industries (Nehezipari Muszaki Egyetem) in Miskolc, and University of Chemical Industries (Vegyipari Egyetem) in Veszprem. Selected acquisitions and cataloging functions have been automated in order to eliminate unnecessary duplication of effort within the same institution. Most of the libraries also have computer-assisted SDI services and have access to CAS, CIN, METADEX and-WAA databases. Online database searches are available via BRS and DIALOG. Users are responsible for paying for online services.

## FUTURE OF HUNGARIAN LIBRARY AUTOMATION

Hungary's open borders and political independence will have a significant impact on li-

brary automation and national and international networks. The National Szechenyi Library will be the center for automation by 1992. Perhaps it will be possible for the National Szechenyi Library to join OCLC and expedite online cataloging. Figure 2 shows the future automation networks among libraries.

Further development of Hungarian library automation is dependent upon the country's financial and economic situation. Librarians and researchers are well educated and continue their education through foreign professional literature, international meetings, and limited foreign exchange programs. They are also informed about the electronic library. However, the country's current economic status and tremendous debt will not allow an immediate change in the library and information science fields. Use of microcomputers will spread rapidly and affect office automation in the near future. Software for word processing such as WordPerfect and WordStar is already available, as are spreadsheets such as Lotus 1-2-3. However, mainframe computers are still very expensive and must be imported from abroad and paid for with western currencies. The lack or shortage of foreign currencies will slow down the replacement of current hardware or the addition of new hardware. This temporary stagnation, however, may have a positive effect. Hungarian libraries will save buying at least one generation of hardware and in the interim will gain a tremendous amount of knowledge about automated library services. They will then be ready to continue to build on already existing library automation.

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# Integrating CD-CATSS into the Cataloging Workflow

## Dale Irwin

*Recently, York University Libraries implemented Yorkline, a NOTIS system. Instead of continuing to catalog on Utlas' CATSS system and receive bibliographic records on tape, York developed a new workflow using CD-CATSS. Original cataloging and editing derived copy are done on Yorkline. At the same time, York's database is maintained at a title-level basis on CATSS for resource-sharing purposes.*

In the fall of 1988, York University Libraries was planning the implementation of cataloging on Yorkline, an in-house NOTIS system. As a user of the CATSS system on Utlas, York was receiving bibliographic and authority records on tape from Utlas and loading the records into Yorkline. The possibility of using CD-CATSS for cataloging copy was explored in November of 1988. In May of 1989, CD-CATSS was integrated into the cataloging workflow.

## CD-CATSS

Utlas describes the functions of CD-CATSS as follows:

• full search access to MARC catalog copy on CD-ROM databases

• input of original full MARC records

• full-screen editing of all records, with extensive support for fixed-field editing

• input and display of the full ALA character set

• exporting of records in USMARC format from CD-CATSS to a local system

• direct, online access to CATSS to search for records not on the CD-CATSS database

• loading of CD-CATSS records into a CATSS user database

• uploading of edited, brief, and full bibliographic records to Utlas CATSS for full authority control and/or batch searching

• downloading of authority-controlled records from CATSS to the CD-CATSS workstation

• creation of brief search key records for

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batch searching of CD-ROM no-hits against the full Utlas CATSS database.[1]

York was interested in all the CD-CATSS functions as described by Utlas except the last one.

CD-CATSS, as it is designed by Utlas, allows the user to edit the records in the CD-CATSS workstation and then upload them to be added to their CATSS file where the records are given RSNs (Record Sequence Numbers) and where the records can be checked for authority control. Authority records are issued on tape. The bibliographic records under authority control can then be downloaded back into the local CD-CATSS workstation.

York recognized that by deriving cataloging records from CD-CATSS, CATSS costs could be reduced by editing records in the CD-CATSS workstation instead of online. By uploading the records to York's CATSS file, York's CATSS database could be maintained for resource-sharing purposes—interloan and contributing York's original cataloging copy. In addition, the records could be validated against the CATSS authority file at the same time. Taking this one step further, instead of editing at the CD-CATSS workstation, York felt that cataloging copy obtained from CD-CATSS could be edited in Yorkline after the records had been uploaded to York's CATSS file and downloaded into Yorkline through CD-CATSS after authorities verification. If this was possible, then doing original cataloging in Yorkline and uploading it to York's CATSS file should also be possible by reversing the process. This would further reduce CATSS costs as well as allow the flexibility to utilize the cataloging functions of Yorkline fully.

On May 15, 1989, York started cataloging on Yorkline. Two CD-CATSS workstations for searching cataloging copy, uploading bibliographic records to York's CATSS file, and downloading the records under authority control are now being used in the Bibliographic Services Department. The workstations that York configured have a Zenith PC (model no. ZMM-149-P), a Hitachi CD-ROM drive (model no. CDR1503S), and an IBM Proprinter II.

## FILE STRUCTURE ON CD-CATSS

A knowledge of the file structure is important to understanding the functions of CD-CATSS. "There are three types of workfiles in

CD-CATSS: the Save file, the Tempsave file, and the Data file. Records in the Save and Tempsave files are stored by the user, while the Data file is used exclusively for files downloaded from Utlas."[2]

When searching on CD-CATSS and finding a record that is needed, a "save" command is given by the searcher. The record is then added to the Save file. When searching directly on CATSS, the "import" command is given by the searcher when a record is found that is needed. The record is then added to the Tempsave file. "The Tempsave file is most often used for incomplete records, or for the temporary storage of edited records waiting for review."[3] After records in the Tempsave file are edited, they can be moved to the Save file. "The Data file is used for receiving records downloaded from Utlas" with the exception of rejected records, which are received in the Tempsave file.[4] (Records that are rejected during the download process are downloaded into the Tempsave file as well.)

When records are uploaded and downloaded, archive files are created automatically which ensure that a file is never lost. "These files are in MARC communication format, and can be copied to diskette for storage, or for transfer to another system."[5]

## DISKS

As of March 1990, the annual subscription to CD-CATSS includes four disks: Pre-1986 English, Pre-1986 Non-English, and two current disks that include bibliographic records in all formats, 1986 to 1989 and 1989 to the present. The most current disk is updated quarterly. A retrospective Serials disk and a LawMARC disk are also available.

The arrangement of the material on the disks is unique when compared to other, similar products in which the material on the disks is divided alphabetically. The arrangement on the disks can have a considerable impact on workflow.

## SEARCHING CD-CATSS

In the bibliographic services department of York University Libraries, new material is searched by the bibliographic assistants on the Current disks of CD-CATSS. If the book in hand matches the record on CD-CATSS, the location (090 field) and Yorkline record sequence number (035 field) are added to the

record. (The Yorkline record sequence number is taken from the purchase order slip that accompanies the book after it has been received in the acquisitions department. The number is assigned by the Yorkline system when a provisional record is created for acquisitions purposes. This brief bibliographic record will be overlayed by the cataloging copy that is found.) The record is printed out and the "save" command is given, which adds the record to the Save file on the CD-CATSS workstation.

If an exact match is not found, the book is set aside to be re-searched on the pre-1986 disks, or, if it has an imprint of 1986 or later, depending on its priority, it will be searched online in CATSS or held to be re-searched on the next quarterly cumulation of the Current disk.

## HIT RATE ON CD-CATSS

The hit rate for current material has been 60-70 percent on the two current disks. However, as the disk becomes more out-of-date during the course of the quarter, the hit rate declines.

## THE CD-CATSS RECORD

The records from CD-CATSS are in USMARC format—a distinct advantage for a library using NOTIS.

The disadvantage of the CD-CATSS records is not being able to identify easily the source of records from LC, the National Library of Canada, or the British Library. User contributed cataloging does not give any identification of the library that created the copy. Hopefully, Utlas will address this problem on future disks.

## SEARCHING CATSS

If copy is not found on CD-CATSS, the CATSS database can be accessed through the CD-CATSS workstation and records can be imported into the Tempsave file. Once records are in the Tempsave file, they can be edited, printed out, and transferred to the Save file.

The connection to CATSS is at a baud rate of 1200. After the script files have been set up and tested, connecting to CATSS is easy—two commands, "connect" and "CATSS," are all that is needed, and either the first letter of each can be typed or they can be selected

from the menu by moving the cursor and then pressing the return key.

Once connected, the user is presented with the familiar request to logon by entering the institution's account number and password. Searching CATSS through the CD-CATSS workstation is the same as searching CATSS by direct access through a terminal.

At York, work is batched together to be searched on CATSS so that it is done in a single session and not interspersed with searching the CD. Records obtained from CATSS are added to the Save file so that CD-CATSS records and CATSS records end up in the same file.

## UPLOADING

Usually the Save file is uploaded daily to Utlas from each workstation. The upload facility on CD-CATSS is very easy to use and involves only two commands—"connect" and "upload." Records can be uploaded at a 1200 or 2400 baud rate. Switching the baud rate is simple to do by using the "environ" and "characteristics" commands.

York uses a 2400 baud rate, and a Save file of 100 records requires two to three minutes for the transaction to be completed. York has been doing daily uploads to Utlas since May 15, 1989. During the period May 1989 to February 1990, approximately 22,000 bibliographic records were uploaded. Each day approximately 100 new bibliographic records are uploaded from each CD-CATSS workstation.

After the records are uploaded, they are assigned CATSS record sequence numbers as they are added to the CATSS database and headings (names, series, and subjects) are validated against the authority file.

## DOWNLOADING

The records usually are downloaded into the Data file or the Tempsave file of the CD-CATSS workstation the next day. Records in the Data file are archived and copied onto a diskette and sent to York's library computing department, where the data are transferred to Yorkline. Records from the daily download are normally available in Yorkline the following day.

The rejected records are added to the Tempsave file during the download process and are reviewed later. Most of the records are rejected because they are duplicates of records that already exist in York's CATSS file. Sometimes a record is rejected because of an error in the coding of the record. These are corrected in the Tempsave file and sent to the Save file for a second chance.

Statistics and error reports are received at the end of a download session and are automatically sent to the printer attached to the CD-CATSS workstation (see figure 1). The error reports include notification of duplicate bibliographic records, coding problems in bibliographic records, and problems with authority records (see figure 2). The authorities reports indicating conflicting ASNs (Authority Sequence Numbers) or Heading Found-Tags Incompatible are the same messages that are received in online CATSS when using authority control (see figure 2).

## THE ROLE OF LIBRARY COMPUTING

The role of York's Library Computing Services in developing the record movement has been invaluable. Their expertise in manipulating the files of bibliographic records and dealing with problems from the CD-CATSS workstation has made this workflow successful.

Library computing services has modified two of the NOTIS mainframe (CICS/MVS) GTO (Generic Transfer Overlay) programs. These modified programs are used to load the records into Yorkline. The microcomputer GTO programs which control communications between the PC and CICS are not used.

In addition, Library Computing transfers the originally cataloged records from Yorkline onto a diskette once a week and sends it to bibliographic services so that the records can be added to York's CATSS file via the CD-CATSS workstation.

## FIELD 035 AND THE OVERLAY PROCESS

In September 1989, York implemented the acquisitions module of the NOTIS system. In the integrated environment, the provisional or brief bibliographic record created for acquisitions purposes is overlaid when cataloging copy is searched and found after the book is received. The Yorkline record sequence number is added to the 035 field of the provisional record in Yorkline by the acquisitions staff when they are creating the provisional record and the order record.

Bibliographic services staff add the

```
Page:    3                    UTLAS INTERNATIONAL                    90/03/07
                             Database Integration                      10:05
                             Upload Statistics Report
================================================================================
Source:  YRKFULC
File:    YRKAGG
Job Type: LOAD WITH AUTHORITY CONTROL


Total Records Read:         103
               Processed:   103
               Updated:     100
               Rejected:      3

               ADDS    Requested:          0
                       Completed:        100
                       Rejected:           3
                       Low RSN:      9492444
                       High RSN:     9492543

               CHANGES Requested:        103
                       Actual:            0
                       Changed to Add:   103

               DELETES Requested:          0
                       Found:             0
                       Not Found:         0
```

*Figure 1. Upload Statistics Report.*

Yorkline record sequence number to the record on CD-CATSS before the record is saved. The basis of the match or overlay of the provisional record in Yorkline is on the 035 field.

## FILE MOVEMENT

Keeping track of the files that are uploaded and downloaded daily is very important. York uses a form designed by Library Computing to record the history of each file (see figure 3). By checking the CD-CATSS Records Report, the following can be determined:

• Name of file (assigned by Utlas) when the file is uploaded date and time of upload/download

• Number of records in the file uploaded

• Whether there were any problems associated with the upload/download

• Who uploaded/downloaded the file

• Number of records downloaded

• Number of records rejected (if any)

• The name of the data file after it was archived

## ORIGINAL CATALOGING

To reduce Utlas costs further, York felt the same process could be used to add original cataloging to York's CATSS account, thereby making it available to other Utlas users. Original cataloging is done on the in-house system. Each record that is cataloged originally on Yorkline is given a command that flags it as

one that will be sent to CATSS. Library computing then transfers these records to a diskette.

Staff in bibliographic services add the file of records to the hard disk of the CD-CATSS workstation and de-archive the records into the Save file. These records are then uploaded to CATSS in the same way any other Save file is uploaded.

## SUMMARY OF RECORD MOVEMENT

Exact copy is brought into the Save file from either the CD or online CATSS (see figure 4). The Save file is uploaded to CATSS, where the records are assigned record sequence numbers and added to York's CATSS file. Authorities are also checked at this point and headings in the bibliographic records are linked to the Utlas authority file. Any authority records that are used in this process are added to York's weekly tape product.

The bibliographic records under authority control are subsequently downloaded to the Data file of the CD-CATSS workstation. The Data file is archived and the records are copied onto a diskette. Library computing staff load the records into Yorkline using modified versions of NOTIS's GTO (Generic Transfer Overlay) CICS/MVS programs. If a provisional record exists in Yorkline, the full cataloging record overlays it in Yorkline.

```
Page:     2                    UTLAS INTERNATIONAL           90/03/05
                               Database Integration               12:55
                               Upload Error Report
=========================================================================
Source:   YRKFULC
File:     YRKAGD
                         Heading found - tags incompatible : 20098494 151
650      .0......    005  $aSouth Asia$zPolitics and government.
                         Heading found - tags incompatible : 20204877 151
650      .0......    001  $aPakistan$xPolitics and government$y1971-
                         Heading found - tags incompatible : 17473487 151
650      .0......    002  $aPakistan$zDefenses.
                         Heading found - tags incompatible : 17473487 151
650      .0......    005  $aSouth Asia$zPolitics and government.
                         Heading found - tags incompatible : 20130778 151


Search Tag (010): $a    77173072

*** WARNING *** Quality Check Diagnostic:
010      ........    001  $a    77173072
                         Tag already present in       9189992
020      ........    001  $a0404046908
                         Tag already present in       9189992
*** WARNING *** Writing record to REJECT file.


Search Tag (245): $a[Public hearings]. --

100      10......    001  $aManitoba Task Force on Meech Lake.
                         Heading found - tags incompatible : 29768556 110
*** WARNING *** Quality Check Diagnostic:
FIXED    ........    001  01:880706 02:      s 03:  1989 05:   mbc 10:      s 13:
  r
                         17:    eng 19:     c 30:    m 31:     a 32:      0 33:
  a
                         Fixed field invalid:  13
*** WARNING *** Writing record to REJECT file.


Search Tag (245): $aEnvironmental guidelines for resettlement projects in the hu
mid tropics /$cby Peter R. Burbridge,

650      .0......    003  $aTropics$xEnvironmental aspects.
                         Heading found - tags incompatible : 20135170 151
```

*Figure 2. Upload Error Report.*

Original cataloging is taken weekly from Yorkline and put onto a diskette in library computing. The records are added to the hard disk of the CD-CATSS workstation and de-archived into the Save file. From the Save file, the records go through the same process as records from CD-CATSS and CATSS.

After the original cataloging has been added to the CATSS database and authorities are checked, the records under authority control are downloaded into the Data file in the same way that cataloging copy is downloaded.

## STAFFING

On May 15, 1989, the original catalogers stopped typing CATSS coding sheets and started to input their cataloging directly in Yorkline; the online and offline CATSS copy catalogers stopped making their changes either directly online on CATSS or on printouts from CATSS and are now editing all copy directly on Yorkline. This meant the data entry operators were freed from their main task—data entry. They were trained in their new capacity of bibliographic assistants to search for copy on CD-CATSS and CATSS. Corrections to bibliographic records in Yorkline and cataloging added copies continue to be part of their responsibilities.

## CONCLUSION

Searching is fast and easy with CD-CATSS. Anyone with previous CATSS experience can teach themselves how to search on this product.

**UPLOADED**

Operator's Initials:_____

Date:_____  Time:_____

Workstation:_____

File Name:_____  Number of Records:_____

Uploaded Successfully:  Yes or No

Comments:

---

**DOWNLOADED**

Operator's Initials:_____

Date:_____  Time:_____

Workstation:_____

File Name:_____  Number of Records:_____

                              Number of Rejects:_____
Archived to:_____

Renamed:_____

Comments:

*Figure 3. CD-CATSS Records Report.*

The excellent response time when searching on CD-CATSS makes up for the need to do multiple searches if copy is not found. Using CD-CATSS as the first source of copy results in savings of online CATSS costs. Online CATSS is still used but to a lesser extent than before May 1989. CATSS costs at York have decreased by approximately one-third. The savings incurred by using CD-CATSS will not necessarily be the same for all users. The volume of work and workflow used will determine costs. In general, "as cataloging workload increases, however, CD-ROM systems become less expensive."[6]

CD-CATSS is flexible and adaptable; there are many ways to use CD-CATSS in a cataloging or an acquisitions workflow. York has a fairly complex workflow as maintaining its CATSS database was a priority for interlibrary loan, authority control, and shared cataloging purposes.
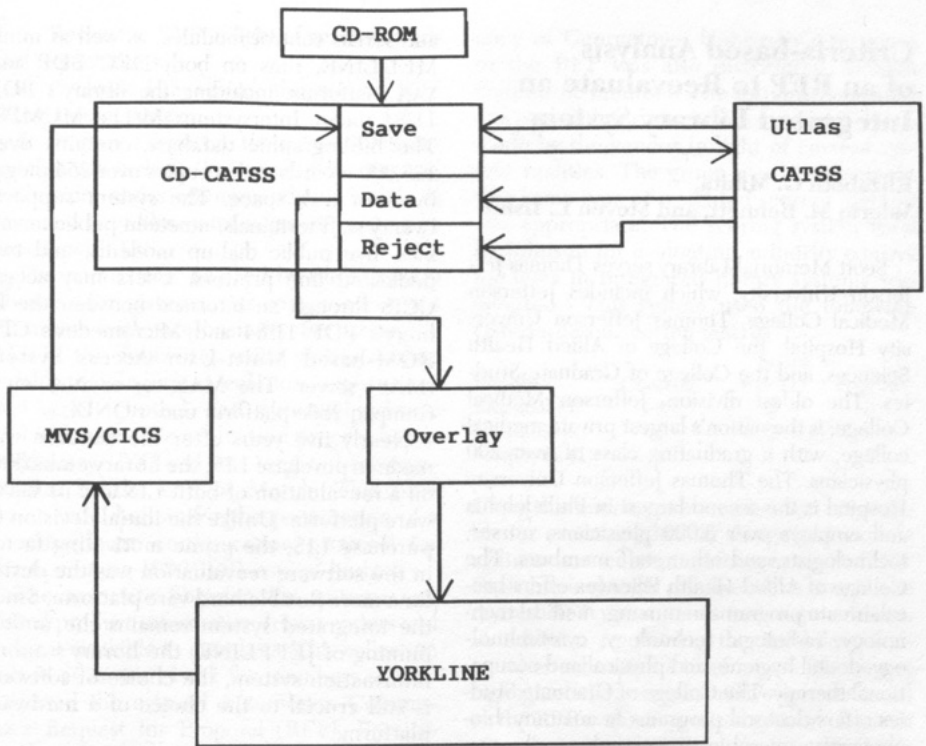
The USMARC format is an advantage for

*Figure 4. Yorkline Record Movement.*

anyone using an in-house system based on USMARC format. The time delay in receiving records is a disadvantage of using a CD product. Utlas allows a three-day turnaround time for downloading records although the records are often downloaded the day after they are uploaded.

When file transmission problems occur, the files can be held up for longer periods of time. However, if a file is lost, it can be uploaded a second time by de-archiving the copy of the file that the system makes automatically when any file is uploaded. This has only been necessary twice in a ten-month period. Although not all staff using CD-CATSS need a DOS background, knowledge of DOS is beneficial for manipulating the archive files and for solving problems when they occur.

Using a CD-ROM cataloging product can have an impact on resource sharing if the user does not add original cataloging copy to the database of their bibliographic utility. "Such a product provides options for technical service

operations—i.e., using a library network only for acquiring MARC formatted member cataloging or, in the extreme, not using a library network at all."[7] York chose to integrate CD-CATSS into its workflow in such a way that York's CATSS database is maintained on a title level basis for derived and original cataloging.

## REFERENCES

1. Utlas, *CD-CATSS User's Guide* (Toronto: Utlas, 1989), p. 1–2.

2. Ibid., p.3–10.

3. Ibid., p.3–11.

4. Ibid., p.3–10.

5. Ibid., p.3–11.

6. William Saffady, "The Cast of Automated Cataloging Support," *Library Technology Reports* 25, no.4:581 (July-Aug. 1989).

7. Ann Allan, "Chasing MARC: Searching in Bibliofile, Dialog, OCLC, and RLIN," *Journal of Academic Librarianship* 15, no.6:340 (Jan. 1990). ∎∎

# Criteria-based Analysis of an RFP to Reevaluate an Integrated Library System

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Scott Memorial Library serves Thomas Jefferson University, which includes Jefferson Medical College, Thomas Jefferson University Hospital, the College of Allied Health Sciences, and the College of Graduate Studies. The oldest division, Jefferson Medical College, is the nation's largest private medical college, with a graduating class of over 200 physicians. The Thomas Jefferson University Hospital is the second largest in Philadelphia and employs over 3,000 physicians, nurses, technologists, and other staff members. The College of Allied Health Sciences offers baccalaureate programs in nursing, medical technology, radiologic technology, cytotechnology, dental hygiene, and physical and occupational therapy. The College of Graduate Studies offers doctoral programs in anatomy, biochemistry, microbiology, pathology, pharmacology, and physiology.

In July 1985, the Automation Committee of Scott Memorial Library chose Georgetown University's Library Information System (LIS) software for its integrated system. In January 1986, the library purchased LIS along with Georgetown's miniMEDLINE module, a locally defined subset of MEDLINE. The availability of miniMEDLINE was an important factor in the selection of LIS. Bibliographic records from OCLC archival tapes were loaded in May of that year. The online public catalog was released in March 1987.

The library's local integrated system, JEFFLINE, currently includes access to LIS, miniMEDLINE, and Micromedex's Computerized Clinical Information Systems (CCIS). LIS, which currently comprises circulation, cataloging, online public catalog, acquisitions

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and serials control modules, as well as miniMEDLINE, runs on both DEC PDP and VAX platforms, including the library's PDP 11/84 under Intersystems M/11+ MUMPS. The bibliographic database contains over 125,000 records and occupies over 254 megabytes of disk space. The system supports twenty staff terminals, nineteen public terminals, five public dial-up modems, and two dedicated line printers. Users may access CCIS through an interface between the library's PDP 11/84 and Micromedex's CD-ROM-based Multi-User Access System (MAS) server. The MAS server runs on a Compaq 286e platform under QNIX.

Nearly five years after the decision was made to purchase LIS, the library embarked on a reevaluation of both LIS and its hardware platform. Unlike the initial decision to purchase LIS, the prime motivating factor in the software reevaluation was the desire for a more flexible hardware platform. Since the integrated system remains the underpinning of JEFFLINE, the library's online information system, the choice of software is still crucial to the choice of a hardware platform.

To demonstrate the evaluation method, this paper highlights the modules used to create and maintain the bibliographic and holdings databases. These databases are central to most functions in an integrated library system. An accurate and up-to-date public catalog allows access and control of the library's holdings. Catalog and holdings records are also subject to national standards (e.g., MARC, subject and name authority systems) and, unlike the other modules, they may be evaluated in terms of adherence to these external and measurable standards. The evaluation of these modules will serve as an illustration of how a library may undertake a reevaluation of its integrated system in a cost-effective and timely manner.

## METHODOLOGY

An LIS Re-Evaluation Committee was formed on December 15, 1989, with the following charge:

1. Collect information on integrated library systems that are currently commercially available. Only those running on DEC or IBM platforms will be considered.

2. Review the original RFP.

3. Revise the RFP in light of current needs and expectations.

4. Evaluate LIS against the revised RFP using a point system.

5. Prepare a report to the university librarian that will include the revised RFP, the LIS evaluation, and a recommendation either to pursue a new library management system or remain with LIS.

The committee, chaired by the associate librarian for systems, was composed of five librarians with responsiblity for managing LIS in the following areas: online public catalog, cataloging, circulation, acquisitions and serials control, and systems hardware and software. The evaluation process began in January 1990 and was targeted for completion by the end of March. This time frame would allow for the preparation of a new hardware configuration proposal for the upcoming 1990/1991 capital budget.

The associate librarian for systems collected product information from vendors and made it available to members. This collection served as an idea bank for members as they reviewed the original Automation Committee's Request for Proposal (RFP). Because vendor product information did not identify all of the features that were applicable for committee review, online databases were searched for relevant information. The group also conducted a literature review of integrated library systems which met the first condition of the charge. The business and library literature, while not extensive, did include some valuable references to system features and selection, but no article could be found concerning the reevaluation of an automated system.

To establish a format for revision and editing, sections 3 and 4 of the RFP comprising functional and technical specifications were entered into machine readable format, and a print copy of the specifications was distributed to each committee member. Segments of the RFP were added, changed, or removed in order to clarify specifications that may have been unclear or omitted in the original document.

The committee then attempted to define broad criteria for effective analysis of the rewritten functional specifications so that a baseline could be established to evaluate each item in light of our current needs. A

copy of Georgetown University's response to the RFP was also distributed to each committee member. The response was used as a tool to determine the accuracy of claims made by the vendor in light of current system realities. The group was in agreement that some type of weighted scoring method was appropriate. The scoring system used by Johnson for evaluating authority control modules in integrated library systems was adopted.[1] This system used the following criteria-based scoring matrix:

|  | **Score** | | |
|---|---|---|---|
| **Weight** | Good (2) | Fair (1) | Poor (0) |
| Essential (3) | 6 | 3 | 0 |
| Desirable (2) | 4 | 2 | 0 |
| Peripheral (1) | 2 | 1 | 0 |

Using this matrix, each member was responsible for evaluating his/her designated module against our current software capabilities. Each hierarchically numbered section in the revised RFP was entered into a spreadsheet. In addition to scoring the modules, each member submitted a brief report. The report highlighted the strengths and weaknesses based on the RFP evaluation, raised general concerns not reflected in the RFP (such as vendor viability and support), and concluded with a recommendation either to retain the system or to reissue the RFP. The associate librarian for systems then presented the final report to the university librarian, integrating these individual recommendations.

## EVALUATION OF BIBLIOGRAPHIC MANAGEMENT MODULES

LIS provides for the management of the bibliographic database through a module that supports the following functions: (1) downloading, creating, editing, and deleting of MARC records, (2) an online shelflist, (3) a MeSH thesaurus, (4) authority control, and (5) reporting. Functions for the creation and maintenance of holdings records are located within another module. The section of the revised RFP covering these functions is reproduced in appendix A.

Figure 1 contains the spreadsheet used for evaluating the bibliographic management functions outlined in appendix A. The numbers in the first column correspond to the specific section of the revised RFP being scored. The second column is based on

| | Number | LIS Ans | Ideal Val | Wt | Score | Act Val | S/R |
|---|---|---|---|---|---|---|---|
| **Bib Record Creation and Maintenance** | 3.1.1 | | 198 | 99 | 56 | 150 | 0.76 |
| | | | | | | | |
| Bibliographic Record Standards | 3.1.1.1 | | 32 | 16 | 6 | 15 | 0.47 |
| | 3.1.1.1.1 | Y | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.1.2 | Y | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.1.3 | Y | 4 | 2 | 2 | 4 | 1.00 |
| | 3.1.1.1.4 | Y | 4 | 2 | 1 | 2 | 0.50 |
| | 3.1.1.1.5 | Y | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.1.6 | | 6 | 3 | 0 | 0 | 0.00 |
| Bibliographic Record Sources | 3.1.1.2 | | 30 | 15 | 8 | 24 | 0.80 |
| | 3.1.1.2.1 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.2.2 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.2.3 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.2.4 | P | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.2.5 | P | 6 | 3 | 1 | 3 | 0.50 |
| Bib Record Maintenance | 3.1.1.3 | | 22 | 11 | 7 | 17 | 0.77 |
| System Check | 3.1.1.3.1 | | 14 | 7 | 4 | 10 | 0.71 |
| | 3.1.1.3.1.1 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.3.1.2 | Y | 4 | 2 | 1 | 2 | 0.50 |
| | 3.1.1.3.1.3 | P | 4 | 2 | 1 | 2 | 0.50 |
| Human Intervention | 3.1.1.3.2 | | 8 | 4 | 3 | 7 | 0.88 |
| | 3.1.1.3.2.1 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.3.2.2 | P | 2 | 1 | 1 | 1 | 0.50 |
| Bibliographic Record Authority Control | 3.1.1.4 | | 32 | 16 | 8 | 21 | 0.66 |
| | 3.1.1.4.1 | Y | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.4.2 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.4.3 | Y | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.4.4 | P | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.4.5 | P | 4 | 2 | 1 | 2 | 0.50 |
| | 3.1.1.4.6 | Y | 4 | 2 | 2 | 4 | 1.00 |
| Bibliographic Record Deletion | 3.1.1.5 | | 36 | 18 | 11 | 32 | 0.89 |
| | 3.1.1.5.1 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.5.2 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.5.3 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.5.4 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.5.5 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.5.6 | N | 2 | 1 | 0 | 0 | 0.00 |
| | 3.1.1.5.7 | Y | 4 | 2 | 1 | 2 | 0.50 |
| Item Records | 3.1.1.6 | | 42 | 21 | 15 | 39 | 0.93 |
| | 3.1.1.6.1 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.6.2 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.6.3 | Y | 4 | 2 | 2 | 4 | 1.00 |
| | 3.1.1.6.4 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.6.5 | Y | 4 | 2 | 2 | 4 | 1.00 |
| | 3.1.1.6.6 | Y | 6 | 3 | 2 | 6 | 1.00 |
| | 3.1.1.6.7 | P | 6 | 3 | 1 | 3 | 0.50 |
| | 3.1.1.6.8 | Y | 4 | 2 | 2 | 4 | 1.00 |
| Management Reports | 3.1.1.7 | | 4 | 2 | 1 | 2 | 0.50 |
| | 3.1.1.7.1 | P | 4 | 2 | 1 | 2 | 0.50 |

*Figure 1. Extract of LIS Reevaluation Spreadsheet.*

Georgetown's formal response to the RFP and indicates whether they claimed that a specific feature was present (Y), not present (N), or only partially available (P) in their system. The third column contains the ideal value, which is the product of the weight (column 4) and the score (column 5). The final column contains the satisfaction ratio

(S/R), the ratio between the actual value and the ideal value. The highest satisfaction ratio was represented by a 1.0.

The highest satisfaction ratios were assigned to the functions for creating holdings records (.93) and for deleting MARC records from the database (.89). The lowest satisfaction ratios were assigned to the functions for providing name authority control (.66) and for creating management reports (.50). In addition to scoring each individual RFP section, a score and a satisfaction ratio were calculated for each group of related sections under a common outline heading. These group scores were then combined to arrive at an overall score and satisfaction ratio. The overall satisfaction ratio for the bibliographic management functions was .76 compared to a combined system score of .73.

In addition to analyzing the results of the RFP-based evaluation, the report on the bibliographic management modules also included the following concerns:

1. *Lack of complete MARC record.* Fixed fields are stripped from downloaded records. Although this does not present any immediate problem, it results in the creation of a "nonstandard" MARC record. This may have implications for the migration to, or the function of, future systems.

2. *Lack of indexing for some MARC added entry fields.* LIS does not currently index name subjects, geographic subject headings, or uniform title subjects.

3. *Treatment of name subjects.* A "quick fix" method for gaining access to name subjects requires the use of the function designed for creating topical subjects (650s) and does not allow the use of all legitimate subfields for name headings.

## COMMITTEE'S RECOMMENDATION

While the overall satisfaction ratio of .76 indicates that the bibliographic management functions perform adequately, there are significant weaknesses (e.g., authority control, .66) and serious concerns. A library's database represents an enormous investment of time and resources, and it should survive any particular system. The system should protect this valuable asset by favoring standards and quality control over convenience. Based on the satisfaction ratio and the above concerns, the bibliographic management librarian's recommendation was to reissue the RFP. However, in light of the evaluation of all of the modules, the committee recommended that LIS be retained for two years, followed by another reevaluation.

## CONCLUSION

Scott Memorial Library's reevaluation of its integrated library system offers a straightforward cost-effective model for other libraries contemplating an evaluation of their existing system. Use of the original selection criteria set forth in the RFP provided committee members with structure and direction, which minimized the total number of hours spent on this project. Revision of the RFP allowed for the identification of current library needs. The revised document provided the criteria for the assessment of whether the system meets those needs.

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## APPENDIX A. EXTRACT OF REVISED FUNCTIONAL SPECIFICATIONS

### 3.1.1. Bibliographic Record Creation and Maintenance

The database will contain bibliographic records for all materials in the library's collection including: monographs, serials, media materials, computer files, archives and manuscripts, and vertical file folders. The majority of these materials are classified according to the Library of Congress (LC)/National Library of Medicine (NLM) classification systems; Dewey and locally created call numbers are used for some smaller collections. Journals are unclassified. The bibliographic standards for description have varied through the years according to ALA rules, AACR1, and AACR2 with some local adaptation. Medical Subject Headings (MeSH) are used for subject access. Library of Congress name authority is followed. All records in the initial load must be transferred from the library's existing LIS database.

**3.1.1.1   Bibliographic Record Standards**

   3.1.1.1.1   Support all current MARC formats for library and archival materials and be able to support format integration when implemented.

   3.1.1.1.2   Support changes to the MARC formats as issued by the MARC Office of the Library of Congress.

   3.1.1.1.3   Support the addition of locally defined MARC fields and tags, e.g., the item identifier or a purchase order number.

   3.1.1.1.4   Support less than complete MARC records, e.g., OCLC Level K cataloging.

   3.1.1.1.5   Store the complete MARC record so that it is possible to display a wholly reconstructed MARC record.

   3.1.1.1.6   Existing utility to export a wholly reconstructed MARC record in OCLC MARC format.

**3.1.1.2   Bibliographic Record Sources**

   3.1.1.2.1   Support record entry from OCLC/MARC tapes.

   3.1.1.2.2   Support record entry via online OCLC interface. The bidder must guarantee software enhancements to accommodate future OCLC changes in format or display of bibliographic records.

   3.1.1.2.3   Support record entry in MARC format via online local input. A workform and system prompts must be provided.

   3.1.1.2.4   Support the entry of temporary records, for example, an on-order record or a circulation record for an item without a bibliographic record in the database.

   3.1.1.2.5   Bidder will detail the procedure to be used for loading the initial database from the library's existing LIS database. That database must be fully loaded, and the OCLC interface for ongoing input of bibliographic data must be operational before performance testing begins.

**3.1.1.3   Bibliographic Record Maintenance**

   **3.1.1.3.1   System Check**

      3.1.1.3.1.1   Replace records having duplicate OCLC numbers with the record that has the latest transaction date.

      3.1.1.3.1.2   Flag records lacking specific MARC fields such as call number or title.

      3.1.1.3.1.3   Delete temporary on-order or circulation record and transfer necessary data when the permanent bibliographic record is added.

   **3.1.1.3.2   Human Intervention**

      3.1.1.3.2.1   Edit any field of the bibliographic record with online reindexing of the edited field if necessary. Editing must involve a minimum of data reentry.

      3.1.1.3.2.2   Format and print labels for book spine and pocket that conform to the OCLC label display.

**3.1.1.4   Bibliographic Record Authority Control**

   3.1.1.4.1   Create authority indexes based on the bibliographic records that comprise the initial database. Authority indexes are needed for personal and corporate names (added entry and subject); series; and subject headings (topical and geographic) and their subdivisions.

   3.1.1.4.2   Check all authority controlled access points on records added to the database against authority indexes and flag new access points.

   3.1.1.4.3   Permit online editing of authority indexes and perform global changes on all bibliographic records linked to the edited index entry.

   3.1.1.4.4   Permit the addition of full cross-references ("see" and "see also") to the authority indexes.

   3.1.1.4.5   Indicate source of authority, e.g., local input, tape load, LC Name Authority File (NAF), Mesh, LC Subject Heading, local subject heading.

   3.1.1.4.6   Include decision on series treatment as part of authority index.

### 3.1.1.5 Bibliographic Record Deletion

3.1.1.5.1 Permit the deletion of bibliographic records from the online database.

3.1.1.5.2 Cancel the authority file links to deleted bibliographic records.

3.1.1.5.3 Delete authority file records with no linked bibliographic records, i.e., blind references.

3.1.1.5.4 Prevent deletion of bibliographic record with item identifier(s) attached.

3.1.1.5.5 Prevent the deletion of authority records with bibliographic records attached.

3.1.1.5.6 Delete bibliographic record from database when a duplicate OCLC record with a cancel transaction code is received.

3.1.1.5.7 Store all bibliographic and authority records deleted from the database in a separate file accessible by staff, with no public access from the online catalog.

### 3.1.1.6 Items Records

3.1.1.6.1 Every physical item in the collection must be assigned a unique item identifier (I.D.), a bar code conforming to the standards established by Code 39, which will be linked to the appropriate bibliographic record(s).

3.1.1.6.2 One I.D. may be linked to multiple bibliographic records, e.g., serial analytics, in-analytics.

3.1.1.6.3 Most items will be assigned an I.D. during the acquisitions or serials receiving function (3.3.6, 3.4.4.). An I.D. may also be assigned during the bibliographic record creation or circulation functions.

3.1.1.6.4 The I.D. will be added to the record by an optical input device or keyboard.

3.1.1.6.5 The I.D. will be "dumb," i.e., not based on call number or publication type. Rather, an I.D. must be assigned randomly so that if an item loses its I.D. label, a new I.D. can be assigned immediately.

3.1.1.6.6 Location, e.g., Reference, Patient Education, Stacks; and circulation status, e.g., on-shelf, bindery, repair, circulating, will be linked to each I.D.

3.1.1.6.7 The I.D. may be deleted for lost, withdrawn, and missing items. Bibliographic records must be deleted separately. If all item identifiers are deleted from a bibliographic record, the record will be flagged for possible deletion.

3.1.1.6.8 Bidder will detail the procedure for creating item records and for labeling each item in the existing collection. The contractor is expected to supply item labels for the existing collection and for one year's new accessions.

### 3.1.1.7 Management Reports

The bidder will describe reports available in addition to those in 3.1.1.7.1. All statistics must be maintained online for a minimum of two years to allow for the comparison of statistics for the current and at least one previous year. Reports must be available on at least a monthly, fiscal year, and fiscal year-to-date basis. Reports may be processed and printed offline.

3.1.1.7.1 Provide the following statistics both as a total and broken down by format, e.g., serial, monograph, audiovisual; by location; and by subject (based on call number):

- Total items
- Total titles
- Bibliographic records added
- Bibliographic records deleted
- Items deleted: total and subtotals for lost, withdrawn, or missing

# Recent Publications

## Book Reviews

**Bawden, David.** *User-Oriented Evaluation of Information Systems and Services.* Brookfield, Vt.: Gower, 1990. 224p. $54.95 (ISBN 0-566-05209-1).

This book succeeds admirably in accomplishing its two main aims: "to empahsize the importance of evaluation, and to encourage users of information systems to carry out evaluations of systems and services of direct relevance to them" and "to put forward the idea of 'user-oriented' evaluation (UOE), a form of evaluation primarily suitable for use in an operational environment."

It is a thorough and balanced contribution to the history of information systems evaluation. As such, it would serve quite well as a library school text. However, busy practitioners hoping to find a recipe for doing UOE will be disappointed. An excellent alternative for practitioners with prescriptive needs is F. W. Lancaster's *If You Want to Evaluate Your Library* (Library Association, 1988). Bawden provides an extensive bibliography, which he augments by in-text references, illustrative summaries, a basic reading list, and a list of twelve papers that are "particularly good examples of UOE ideas." The chapters "Nature of Evaluation" and "Evaluation and Selection of Information Technology" are a neophyte's dream—textbook concise, yet not so general as to be abstract. Throughout the work the author does a fine job of promoting just the type of evaluation most needed in libraries during economically hostile times—qualitative, pragmatic, eclectic, holistic, small scale, and case study oriented.

Bawden credits Cyril Clevernon with coining the term *UOE* in 1974. Since then, variations on the term have been used by librarians and social scientists. UOE involves an evaluation of some operational information system or service, rather than a laboratory or strictly quantitative evaluation of an experimental system. UOE is "action research" in the "real world" performed by information profession-als/practitioners set on improving service. The main purpose of UOE is to solve some specific and local problem via techniques of microevaluation and failure analysis. However, "the UOE style of evaluation does not permit any rigid definition of how to proceed in any given case."

The chapter "Evaluation of Information Systems" provides ideas for and examples of UOE principles as they apply to the evaluation of library materials and collections, bibliographic search systems, printed indexes, numeric databases, OPACs, in-house databases, SDI systems, and document delivery systems. The least useful section of the book consists of the three invited commentaries at the end. Ironically, Cyril Cleverdon's is the most abstract and removed fron the thrust of Bawden's work. It discusses relevance judgments in experimental tests. The other two commentaries were written by library science faculty at the University of Sheffield. The first describes utilization of a UOE style approach to an analysis of patterns of information use by social scientists, and the second defends the continued importance of laboratory experimentation in the development of information retrieval systems. Bawden himself is principal information scientist at Pfizer Central Research in Kent and was originally an organic chemist.—*Eddy Hogan, California State University, Sacramento.* ∎∎

***Converting Information for W.O.R.M. Optical Storage: A Case Study Approach.*** Ed. by Judith Paris Roth. Westport, Conn.: Meckler, 1990. 284p. $49.50 (ISBN 0-88736-380-6).

This collection of papers focuses on methodologies for converting paper documents into digital images for storage on optical discs, a technology that is becoming increasingly important for archival storage in industry, libraries, archives, hospitals, and other institutions. While the collection is very useful for archivists or records managers who are considering undertaking such a project, it is not

intended as an introduction for those who know little about the subject.

Section 1 contains three general papers that provide overviews of electronic image management, optical disc technology, and document conversion methodology. Section 2, the bulk of the volume, consists of seven detailed case studies of conversion projects. The case studies represent a variety of applications, including conversion of military records, medical and legal documents, radiology images, engineering drawings, law enforcement documents, and photostatic deed records. The papers are accompanied by a glossary of terms and acronyms, an unannotated bibliography of recommended readings, and a directory of conversion firms.

The inclusion of the word *WORM* in the title is somewhat misleading because there is relatively little emphasis on write-once, read-many technology. The fact that most of the projects described use WORM as a storage medium is incidental to the conversion process, which is the real focus of the papers.

The so-called introductory chapters seem to assume that the reader has at least some knowledge of the technology. They are more like state-of-the-art reviews and do not really introduce basic concepts. Of particular interest, however, is a comparison by Gerard A. Santelli and James J. Hurley of optical storage versus microfilm for document storage.

The glossary is also not of much help to the novice reader. Basic terms such as *grey scale*, *digital*, and *resolution* are not included. Terms and acronyms that are used but not defined in the papers are missing from the glossary. For example, one paper uses the acronym *CAR* without defining it, and this term is also not in the glossary. On the other hand, many technical terms which are not used in the papers and are not essential to understanding the material are included in the glossary. The volume's index is only three pages long and does not capture many of the terms a reader might be interested in looking up.

The case studies provide valuable, detailed descriptions of conversion decision processes, techniques, and workflows. Although three of the papers are written by vendors of imaging hardware and software systems, one acting as coauthor with the customer, the papers are objective and do not contain marketing propaganda. An article on the ODISS project, a pilot project by the National Archives and Records Administration to convert military records, gives a particularly good summary of the steps involved in preparing documents for scanning, performing the scanning itself, doing quality control, recording the images to optical disc, and using the optical discs for reference retrieval. A paper from the National Library of Medicine goes into great detail about the imaging system developed there, even providing flowcharts and detailed file design for the software. A particularly interesting application is the EDICON system, which stores pictures and descriptions of criminal suspects, enabling witnesses to view an electronic lineup for suspect identification. This collection is recommended for librarians, archivists, and record managers who already know the basics of electronic imaging and want detailed information about implementing a conversion project.—*Fae K. Hamilton, Information Technology Consulting, Carlisle, Massachusetts.* ■■

***DISC Magazine: A Technical Publication for Producers and Suppliers of CD-ROM Products and Services.*** Monthly. Ed. by Linda Helgerson Falls Church, Va.: Helgerson Associates, Inc. 1991. $44.95/yr. ISSN 1052-4053.

Competing journals that cover the same or similar topics are like rival armies on a battlefield. The different armies—publishing houses—each vie for captured readership and the prize of being the "best," "largest," or some other nondistinctive superlative with the use of titular subtitles (which they hope will attract readership and subscriptions).

Optical media, particularly CD-ROM, is hot and has been for years. A hefty slew of serials focuses on CD-ROM, and this particular publishing cornucopia divides into user/producer and generalist/technical camps. Ulrich's *International Periodicals Directory* indexes most CD-ROM publications in three categories: Computers—Electronic Data Processing; Computers—Software; and Library and Information Sciences—Computer Applications. The main contenders on this particular battlefield are Helgerson Associates (the aggressive new kid on the block), Meckler Corporation (the stale dowager), Pemberton Press (the respected statesman), and Learned Information (a Johnny-come-

lately). (I have not considered non–U.S.-based publications, such as *CD-ROM International* or *CD-ROM Newsletter,* or the many and varied technical engineering and computer journals, such as those authored by IEEE.)

Generalist users/producers with a passing interest should consider *CD-ROM Today* ($34.95). It is the eleven-times-a-year supplement to *Learned Information Today: The Newspaper for Users and Producers of Electronic Information Services. CD-ROM Today* has a broad, shotgun approach to CD-ROM; contains news releases, product profiles, industry news, hardware/software applications, and advertisements; and appeals to a nontechnical audience. For user-oriented librarians who are slightly more involved with CD-ROM, the next level is *CD-ROM Librarian: The Largest Circulation Optical Media Review for Information Professionals* ($75). The eleven-times-a-year Meckler publication is sister to *Database Searcher* and *Computers in Libraries,* was the first on the market—with three or four title changes—and has videodisc roots. It provides product reviews and articles, relies heavily on advertising, and is particularly noted for containing an ongoing supplement to *CD-ROMs in Print.* Further along on the continuum, for users only, lies *CD-ROM EndUser: The Magazine for Buyers and Users of CD-ROM Products and Services* (free to qualified subscribers). This montly publication is informative but not scholarly and is supported by extensive advertising. It is the sister publication of, and companion to, Helgerson's new montly, *DISC Magazine: A Technical Publication for Producers and Suppliers of CD-ROM Products and Services.* Other titles in the Helgerson arsenal include *CD-ROM Sourcebook, CD-ROM Shopper's Guide, Quarterly Market Reports, and CD Data Report: The Definitive Monthly Newsletter of the CD-ROM Industry* ($295; a montly, since 1984, for executives in the CD-ROM and related optical-storage technologies industries). One resource that has a foot in both camps, by attempting to address both technically apt or inep CD-ROM users and producers, is *CD-ROM Publishers and Users* ($86). The bimonthly sister of Pemberto's *ONLINE* and *DATABASE,* formerly known as *Laserdisk Professional,* offers a full spectrum of substantive articles, reviews, and news notes and is considered by many to be the premier CD-ROM publication. Pemberton Press' approach is to combine the two elements, users and producers, into one publication. Helgerson Associates has chosen to divide the two populations into distinct and separate publications, *CD-ROM End User* and *DISC Magazine.*

As a publication with an exclusive technical approach, the only competitors to *DISC Magazine* are segments of *CD-ROM Professional, CD-ROM Librarian,* and some of the engineering/computers science serials. This review is based upon the fall 1990 premier issue and should be considered preliminary—one can never tell the true nature, rigor, and direction of a serial based only on the first issue. In addition, there are promised features of the magazine, such as disc/in/DISC, that I have not reviewed. (Publication of *DISC Magazine* has been postponed and is now scheduled for mid-1991.)

*DISC Magazine* combines two-thirds substantive articles and information and one-third advertising (approximately 99 pages of 148 total were devoted to communicating information and sharing ideas). The magazine has a traditional layout and contains a mixture of feature and short articles, departments (Standards, Hardware, Multimedia, and Book Reviews), and columns (Editorial, Adam's Quest, Premastering, Recall and Precision, Chicken & Egg, Interviews, and Distribution). What will be unique about this magazine is the disc/in/DISC feature—an actual CD-ROM that is included with each issue. Edited by Steve Soto, the monthly disc/in/DISC "will contain the text of the magazine, multimedia files, user contributed files, message databases, special issues, product demonstrations, paid electronic advertisements, shareware files, bulletin boards on CD-ROM, and much more."

My familiarity with Helgerson Associates' *CD-ROM EndUser* leads me to believe that their style with *DISC Magazine* will be similar—timely and accurate reporting (although at times characterized by sloppy and inattentive writing by some of the contributors) and bold, direct, and assertive commentary. With a missionary zeal, they say what they believe, and they believe what they say; they are not prophets—this means readers should not become hypnotized and loose their questioning

skepticism. While *DISC Magazine* is intended to be a technical- and production-oriented publication, there is material of general interest to information professionals who are unconcerned with the technical aspects of information technology. For example, the article "Knowledge Processing Chaos Bedevills Scholarly Publishing" contained material that I could put to immediate professional use.

*DISC Magazine* is too new at this point to receive my overwhelming endorsement. The issue I reviewed was well laid out and contained appropriate, timely, and useful information. If Helgerson Associates is able to hold to its promise of disc/in/DISC and maintain the quality and standards of the premier issue, this publication will benefit not only the producers and distributors of CD-ROMs but the consumers as well. Any library with a technical clientele—in fields such as optics, engineering, or computer/information science—would benefit from adding this magazine to their collection, as would any information technology or systems office. Indeed, any library that has a critical mass of CD-ROM and is becoming more involved with CD-ROM issues should probably consider subscribing.—*Bill Coons, Stouffer Hotels Library, Cornell University.* ∎∎

**Expert Systems in Libraries.** Ed. by Rao Aluri and Donald E. Riggs. Norwood, N.J.: Ablex, 1990. 342p. $52.50 (ISBN 0-89391-589-0).

Aluri and Riggs include the work of twenty-five expert systems writers and practitioners in libraries. The text includes four background chapters and thirteen chapters, each focusing on a specific application or development area. Aluri has included a selected bibliography of more than 400 titles. Taken together, these contributions present a picture of some of the best-known expert systems projects in libraries.

Richard Vedder provides an excellent overview of the nature of expert systems. He concisely and clearly describes their architecture, the tools required to build expert systems, and the costs and benefits of using them. Vedder identifies seven phases in the expert systems development process: identification, conceptualization, formalization, implementation, testing, integration, and maintenance. He indicates that most expert system

applications in libraries have not moved past phase five, implementation.

Kenneth Harmon offers an overview and comparison of conventional and expert system software programming. Examples of applications are presented for the range of tools and languages available. He concludes that when considering cost, personnel, and the scarcity of domain experts, the PC-based expert system tool is the most practical development approach for libraries.

Dale Cluff addresses management and budget issues related to expert systems development and maintenance. He addresses the controversial aspects of expert systems implementation in libraries and stresses the importance of having a broad base of support.

Donald Riggs provides general assessment of the future impact of expert systems in libraries. While his treatment of the effects is on target, he does not deal with future expert systems development areas. It was disappointing that Riggs did not consider how expert system developments in other fields might be transported to the library environment.

Thirteen chapters focus on specific expert system applications. Six discuss issues and applications in reference work. Two discuss the role of expert systems as online search intermediaries. Four discuss expert systems applications in the areas of classification, descriptive cataloging, and indexing. One addresses the integration of computer-assisted instruction and expert system technologies. Samuel Waters, Karen F. Smith, Howard D. White and Diana Woodward, James R. Parrott, and Donald White discuss expert systems in the reference area.

Waters reviews current applications and development efforts for reference advisory systems. Waters notes several areas of reference work where expert systems development opportunities exist, including directional questions, bibliographic instruction, reference interviews, citation retrieval, full-text retrieval, concept searching, and the creation of smart reference books that combine the strengths of hypermedia and expert systems technologies. His references to other applications and developments in this area are valuable networking information for any who are undertaking work in this field. Waters' citation of shell software used is particularly helpful, since the subject index does not con-

sistently cite discussions of tools throughout the text.

Smith discusses POINTER, a computer-assisted reference program that directs users to reference tools that may identify specific titles and holdings in a subject area. POINTER, which does not reason or characterize the nature of the sources it references, is not an expert system. Its expertise lies in the questions it asks users. Smith emphasizes her goal of developing a system that could be maintained by government documents librarians.

White and Woodward discuss *Refsearch,* an expert system that assists users in identifying sources for specific questions. White and Woodward's most valuable contribution to the work is their extensive discussion of the theory of reference work. They describe the preliminary conceptualization and design work which preceded the coding and testing of the system. Their chapter also supports logic and analytical skills as top qualities of knowledge engineers. Parrott provides a review of the theories and models of reference work, considers which features have been addressed by expert systems, and identifies features that deserve further examination. In a second chapter, Parrott describes the University of Waterloo's Online Reference Assistance system (ORA).

Nute describes SCHOLAR, a PROLOG-based expert system that identifies scholarships and determines eligibility of students. He provides examples of the rules used to identify scholarships and provides a sample consultation. In their chapters, Mark Chignell et al. and Raya Fidel address the application of expert systems to online information retrieval, including the multifaceted role of the search intermediary.

Fidel identifies several intermediary systems currently available or under development for public access, including CITE, CONIT, and CANSEARCH. She distinguishes between these "helper" intermediary systems, which assist users in the selection of search terms, and intermediary expert systems, which attempt to replicate the performance of an expert searcher.

Bonnie Dowell and Philip Crews explore the future applications of intelligent computer-assisted instruction (ICAI) in libraries. ICAI incorporates learning scenarios that

test, diagnose, and generate feedback for the formulation of new strategies. Several examples are provided that illustrate the power of ICAI systems, including GUIDON, SCHOLAR, and WHY.

The chapters by Ann Sandburg-Fox and by Irene Travis are the only two that address expert systems in technical services functions. Both illustrate the "rule-based interpretation" character of many technical services expert systems. Sandburg-Fox presents an impressive conceptual model of the selection of a main entry. Those not familiar with the AACR2 rules and their interpretations may find this chapter more difficult to work through than those that present conceptual models of reference processes. However, the content is well worth more than one reading. Travis' discussion of the application of knowledge-based systems to classification addresses the broader topic of the structure and representation of knowledge. Her treatment of classification and the relevant technologies is comprehensive. She discusses the growing integration of expert and natural-language understanding systems. She discusses three systems, CoalSORT, EP-X, and the BIOSIS automatic indexing system, that incorporate classification in the form of semantic networks and describe common data structures, such as frames and semantic networks.

Humphrey describes the prototype MedIndEx system under development at the National Library of Medicine. Background discussions of indexing and thesauruses are presented. This project has received coverage in professional literature and conference presentations. Perhaps the most valuable contribution of this presentation of the project is Humphrey's tutorial on frame languages. Combined, the chapters illustrate both the conceptual and programming level of effort required to develop an expert system that, as Vedder notes, can be expected to operate on an apprentice level of ability. The presentation of sample code and system structures is particularly welcome, since many working in this area are anxious to share detailed information. We also note the high-quality graphic presentations throughout the text. The author and subject indexes are also useful, given the wealth of information provided throughout the text.

What is missing, however, is a chapter pre-

senting an overview of expert systems in libraries. The inclusion of such an opening chapter would have established a context for the reader to compare the differences in expert system structures, approach, rate of developement, and project scale between functional areas of the library. The theoretical bases presented by the contributors present an excellent opportunity to undertake such a comparison. While many of the contributions are pioneering or noteworthy in their scale, they do not give the reader a picture of the extent of work in progress in this area of library systems work. While it is not possible to include contributions to the field, a review of the author index indicates that the works of Charles Bailey, Judy Myers, Craig Robertson, Roy Chang, and Lloyd Davidson are not included in the text. Despite these limitations, however, the book makes an important contribution to the conceptual development base of expert systems in libraries.—*Denise Bedford, Systems Consultant, Aspen Systems, Inc.* ■■

*Information Ethics: Concerns for Librarianship and the Information Industry: Proceedings of the Twenty-Seventh Annual Symposium of the Graduate Alumni and Faculty of the Rutgers School of Communication, Information and Library Studies, April 14, 1989.* Ed. by Anne P. Mintz. Jefferson, N.C.: McFarland, 1990. 86p. paper, $11.95 (ISBN 0-89950-514-7).

This compilation of four papers presented at the Rutgers Symposium in 1989 includes an introduction by Anne P. Mintz and a selective annotated bibliography by Susan J. Kaplan as well as brief bibliographies with each of the papers. The authors are professors, working librarians, and a lawyer, all of whom are well qualified to speak on the issue of information ethics. The book is a philosophical examination of the issues involved in information ethics. It is designed to stimulate thought and discussion but not to provide examples or a code of ethical behavior.

The first paper discusses the philosophical background of ethics and presents ethical theories using the example of the right to information. This paper, by Diana Woodward, presents a difficult subject logically and concisely with helpful explanatory notes. The author

provides a common background of definition for the papers that follow.

Robert Hauptman covers ethical concerns in reference, computer technology, and law librarianship. His paper discusses censorship, conflict of interest, and confidentiality.

The responsiblity for liability and negligence on the part of information workers is discussed by Robert F. Barnes in relation to information technology. The question of a librarians's liability for malpractice or misinformation is discussed by Silva Barsumyan, a lawyer and information specialist.

The papers progress logically from general to specific concerns in information, and they are followed by a report of questions and discussion by seminar participants. An additional feature of this volume is a compilation of statements on ethics from various library and information agencies. Since some of these, even those from ALA, are not easy to locate, this is a very useful addendum.

Robert Hauptman's book, *Ethical Challenges in Librarianship* (Oryx Press, 1988) offers a more specific and practical treatment of ethical problems in libraries, but there is no other recent volume that presents ethics as a philosophical and theoretical discussion. The FBI "Current Awareness" program, attempts at censorship, and conflict of interest accusations have all been in the information news in the last year. These issues involve no single type or size of library. They should concern all information professionals. The time to think about ethical issues is now, hopefully before we are presented with an ethical dilemma.

This volume is affordable enough to be on the shelves of every practicing and potential information professional. I strongly recommend that each person also read, think about, and discuss the issues raised here and in other professional forums. If we are the professionals we claim to be, we need to articulate an ethical framework to guide our decision making.—*Susan E. Hocker, Louisiana State University Libraries.* ■■

**Lane, Elizabeth S.** *Microcomputer Management & Maintenance for Libraries.* Westport, Conn.: Meckler, 1990. 205p. $39.50 (ISBN 0-88736-522-1).

*Microcomputer Management & Maintenance for Libraries* is a general introduction to the basic issues facing library personnel

contemplating their first purchase of micro (personal) computers. It is written for an audience with little or no computer experience and is intended to guide the reader through the process of planning the acquisition of microcomputers for either office or public use. The book consists of thirteen chapters covering items that need to be considered before undertaking a major microcomputer purchase. The emphasis throughout is on planning; it is not a how-to book on computer purchase or repair.

Section 1 consists of nine chapters on the general planning necessary before a purchase of microcomputers occurs. The author has included chapters on how to go about the planning process; on needs assessment, which helps the reader evaluate what types of tasks are to be performed by the microcomputers and what general types of hardware and programs will best meet those needs; and on system requirements—how to plan for system needs such as adequate electrical supply, cooling and heating, and the human and financial resources needed to keep any system running. Also included are chapters on systems evaluation, which contains a useful overview of microcomputer components and terms; on purchase and installation—how to select a reliable vendor, with a discussion of other items that an organization might need to purchase in conjunction with the computers, such as furniture; on orientation and training; and on planning for staff support of day-to-day computer operations.

Section 2 contains chapters addressing specific maintenance issues that will arise once microcomputers are in place and that should be considered in advance of a purchase. A chapter on preventive maintenance discusses items such as routine cleaning of screens and keyboards, and protecting equipment from damage; it lists tools and software that might be useful for maintenance procedures. In Lane's chapter on responsive maintenance (or emergency repair), she outlines the procedures for diagnosing and isolating problems. She has included a list of items to check in the event of a computer malfunction, which would be very useful for any computer user. The final chapter discusses planning for maintenance costs and how to evaluate repair facilities and service contracts.

Although some of the material is repetitive, the author has been careful to avoid using jargon and computerese and has included a glossary of computer terms in an appendix. Overall, the book should be quite helpful for a computer novice faced with the prospect of bringing microcomputers into a library environment.— *Kathleen Rehn, New York Public Library.* ■■

**LaPier, Cynthia B.** *The Librarian's Guide to WordPerfect 5.0.* Supplement to Computers in Libraries, no.14. Westport, Conn.: Meckler, 1990. 177p. $39.50 (ISBN 0-88736-493-4).

If any one application is predominant among library microcomputer users, it is word processing, and if any one word processing application has gained ascendancy in libraries, it is WordPerfect. WP is a very powerful, highly sophisticated program and thus can intimidate new users. That is why there are a great many books available designed to assist people in learning, even mastering, the program. This volume falls into that category, but unlike the others, it is aimed specifically at librarians. The intended audience for this volume is both the librarian who must learn to use WordPerfect and the manager who wants to motivate staff to be more creative in their use of word processing. LaPier assumes no prior word processing experience on the part of the reader.

The book is specific to version 5.0 of WordPerfect, but the introduction includes a brief description of the major changes in version 5.1, which is currently available. There is a reading list that provides citations to reviews of WP 5.0. In addition to a general index of topics, there is an index to function keys. She begins and ends by reminding us that, in this age of technology, it is incumbent upon librarians to pay careful attention to the impressions they create through printed materials in the minds of patrons, board members, and fund-givers. "Librarians . . . must model what we expect to be second nature for our patrons." If we expect them to use new technology—like online catalogs—we must show that we are embracing technology as well.

Following the introduction, which briefly discusses general word processing, and a short chapter on WordPerfect basics, the book comprises two parts. Part 1 covers function keys, while Part 2 gives examples for creating and working with documents.

In Part 1, LaPier devotes a chapter each to function keys F1–F10. She examines the purpose of each function key when pressed by itself or in combination with the Shift, Control, or Alt keys. If a particular keypress brings up a menu of choices, she notes that and explains what every option does. In many cases, there is also an illustration of the menu as it appears on the screen.

Part 2 presents a variety of procedures one would use to achieve particular results, such as creating a letterhead or publication masthead, cover sheet, three-fold pamphlet, bar graph, or other types of documents a library might need. LaPier also shows how to perform standard operations like sorting, moving and copying blocks, changing fonts, and searching for and replacing text. Chapters in this section provide step-by-step instructions, listing the specific keystrokes required and explaining what the result of each step will be. Whenever appropriate, there is an illustration of what the document will look like.

LaPier's effort to provide librarians with a guide to using WordPerfect in a library setting is generally successful. The explanations are clear, and the examples should encourage more creative use of the word processor. *The Librarian's Guide to WordPerfect 5.0* is recommended for all but advanced users of WordPerfect.—*Dan Marmion, Oklahoma State University.* ■■

**Morton, Herbert C., and Anne J Price.** *The ACLS Survey of Scholars: Final Report of Views on Publications, Computers, and Libraries.* Lanham, Md.: University Press of America, 1989. 148p. $27.50 (ISBN 0-8191-7260-X).

This is an enlarged report of a survey (originally published in 1986) prepared by the director and staff associate of the Office of Scholarly Communication and Technology of the American Council of Learned Societies (ACLS). It includes additional analysis of the original survey findings, Mitchell's technical appendix, Kantor's examination of library data, comments on retired respondents, and a copy of the questionnaire.

The project is a good example of a carefully designed and interpreted study. The questionnaire was mailed to 5,385 individuals, selected at random from memberships of seven American societies in humanities and social sciences, and the response rate was 75 percent. Numerous tables summarize participants' profiles and responses to the questionnaire. The authors compensate for potential bias in sample selection and ackmowledge the survey's weakness in dealing with opinions about issues, rather than the issues themselves ( e.g., "We do not know whether it is the nature of the library that causes satisfaction, or whether it is something in the nature of the respondent," p.115).

Participants were considered scholars by virtue of their education and position, irrespective of the contributions they made to scholarship. This may in part explain the diversity of esponses to some questions (e.g., one-third of all respondents systematically monitored only journals they subscribed to, while about 10 percent subscribed to only one journal. Similarly, 23 percent of all respondents did not publish anything in referred journals, and many did not know whether their library offered guidance to its resources).

"Some results of the [survey] confirm what is generally known; others help identify or clarify new issues" (p.13), but in both cases, participants' responses reinforced common perceptions. The issues addressed in the report include participants' reading habits (most depended primarily on their own collections and subscriptions); high dissatisfaction with the peer review process (although more than half of the participants served as referees or editors); agreement with the importance of disseminating prepublished material (yet "a fourth of all respondents report that no one in their department . . . shares any of their research interests" (p.32)). Other issues include ownership of minicomputers (25 percent of the respondents never used a computer), and library relevance—recognition of full access to resources and satisfaction with library services but no reference to their use. Overall, the authors were impressed by the high level of interdependence among scholars, publishers, research librarians, and learned societies.

Of special interest to librarians will be Kantor's analysis of answers related to the impact of new technology on the "library in transition" and his suggestion of replicating the study for local use.

This book provides an up-to-date status

report on American humanists' and social scientists' perceptions of their enviroments. It is strongly recommended to all students of scholarly communications.— *Joseph Z. Nitecki, School of Information Science and Policy, State University of New York at Albany.* ∎∎

**McFarland, Thomas D., and Reese Parker.** *Expert Systems in Education and Training.* Englewood Cliffs, N.J.: Educational Technology Publications, 1990. 252p. $34.95 (ISBN 0-87778-210-5).

Authored by two educators from Lewis-Clark State College in Lewinston, Idaho, *Expert Systems in Education and Training* provides an excellent treatment of artificial intelligence (AI) research and its relationship to knowledge engineering, expert systems, and intelligent computer-assisted instruction (ICAI). The book successfully establishes three objectives: to discuss the uses and possibilities of expert systems and ICAI for educators and trainers; to present the conceptual structures of AI and expert systems in terms relevant to educators and trainers; and to investigate intelligence and problem solving and their relationship to the transfer of expertise, consulting, and teaching.

The work is divided into five chapters, and each details a major concept and its relevancy to educators. The introduction presents intelligent machines in the future followed by sections on AI research, knowledge engineering, expert systems, and ICAI. Each chapter is ingeniously structured using the best educational methods to instruct the reader. The authors use a "knowledge map" to lead off each chapter. This is an effective visual-spatial device that allows the reader to grasp immediately the scope of the chapter. The map is followed by a segment called ". . . in the future," which offers the opinions of AI leaders and educators concerning the plausibility of developments in those topics represented in the "knowledge map." The chapter text describes and illustrates concepts and current practice using "boxes" to supplement the information and engage the reader in independent investigation. The chapters conclude with a chapter summary, a directions section that discusses implications for educators, a judgment "scorecard," and a list of topical references.

Throughout the book, the authors balance theory and practice in a lively presentation of applications and research. The use of timely and accessible examples, such as computer chess and cultural diversity, keep the text interesting and stimulating. Figures, charts, and checklists are abundant, cleanly designed, and easy to understand.

*Expert Systems in Education and Training* serves simultaneously as an introduction, a guide for self-teaching, and an excellent textbook for students. This book is recommended for purchase by libraries serving educators and trainers in all fields, as well as individuals looking for a solid introduction to expert systems.—*Betsy Wilson, University of Illinois at Urbana Champaign.* ∎∎

**Nicholls, Paul T.** *CD-ROM Collection Builder's Toolkit: The Complete Handbook of Tools for Evaluating CD-ROMs.* Weston, Conn.: Pemberton, 1990. 180p. paper, $29.95 (ISBN 910965-01-3).

This professional reference book is essential reading for anyone involved in evaluating and selecting CD-ROM materials. Paul T. Nicholls, "Research Perspectives" columnist for *CD-ROM Professional*, has compiled an excellent collection of resources and guidelines for CD-ROM collection development.

After an overview of current CD-ROM technology and its library applications, subsequent chapters cover aspects of evaluation and selection. The heart of the book is the chapter "Core Reference Materials on CD-ROM"; it describes specific products and rates them using "the same 4-star system used in Reese and Steffey's 'Book Review' column in *CD-ROM Professional*." The five areas rated for each CD-ROM entry are installation, data quality, search power, ease of use, and bottom line. In addition, publisher citation, hardware and software requirements, update schedule, price, and ordering information are given with a brief description and summary of recommendations from reviewers. Finally, a list of several current reviews from journal publications is given for each product. Chapter 9 is an alphabetical arrangement of core CD-ROM products reviewed in Chapter 8 along with additional products. Lists of reviews are repeated for each. The "Library Applications Bibliography" is another very informative, valuable section; it is

divided into smaller subject areas such as "security" and "end-user training" and includes books and journal articles. A short index completes the work.

This unique paperback is accurate and timely for all librarians and information specialists. In the last five years CD-ROM technology has established itself as standard fare in support of public service and also in technical processing operations in many libraries. Although cataloging support products like BiblioFile and CD-ROM public-access catalog systems such as LePac and Intelligent Catalog are not covered in detail, more extensive reviews of them are listed in the "Directory of CD-ROM Product Reviews." Nicholls selected core products best suited for public, school, and academic libraries.

*CD-ROM Collection Builder's Toolkit* is a treasure trove of information for all information professionals and will help them evaluate and select CD-ROMs for their particular situations.—*Susan Awe, Natrona County Public Library, Casper, Wyoming.* ■■

**Pettersson, Rune.** *Visuals for Information: Research and Practice.* Englewood Cliffs, N.J.: Educational Technology Publications, 1989. 315p. $37.95 (ISBN 0-87778-218-0).

Here is a carefully prepared, comprehensive, and well-written basic explanation of the principles of communication, with special attention to visual images. Communication principles should be familiar to all librarians whether they work primarily with print or nonprint collections, including slides, photographs, films, videos, and multimedia items. Books, after all, are as much visual images requiring comprehension and interpretation as are the pictorial materials librarians deem "nonbook" materials. An understanding of the differing meanings and impacts of various kinds of visual images would seem, to this reviewer, to be important knowledge for specialists whose responsibilities include recommending the most appropriate informational materials to meet specific user needs.

*Visuals for Information* is divided into four mammoth chapters, which cover communications, perception, learning and memory, literacy, and designing visuals for information. The first chapter explains basic concepts of communication as a discipline, types of communication markets, media formats, consumers, and displays. The second draws heavily on principles of psychology to explain how people perceive and interpret visual images of all kinds as well as how they remember and learn. The third covers languages, both symbolic and visual, and, most important, combinations of the two, pointing out their differences, conflicts, and synergies. The final chapter covers the content and execution of visuals to be used for conveying information, and could be employed to positive advantage by librarians producing informational materials of all kinds.

Studying applictions of infography—the execution of verbo-visual information—might help improve the effectiveness of library publications and instructional materials. It also might inspire greater creativity among the library and information science professionals who prepare them, some of whom appear to think that all pages must be crammed with text from top to bottom and margin to margin. Readers might but should not be put off by the peculiar idiom of communications as a discipline, and they should not assume that they know it all because they work with information all the time. In particular, librarians and information scientists should not overlook this communications primer because it deals with something often called "educational technology." *Visuals for Information* is the kind of book information professionals should be able to read absorb as a teach-it-to-yourself tool, perhaps taking the place of a formal course in the fundamentals of communication.

Many illustrations, diagrams, charts, and tables furnish living proof of the value of visual images combined with text. End-of-chapter references are lengthy lists covering an international literature. The lion's share of the citations are from U.S. publishers, followed by Swedish publishers (the author's country), but publications from Great Britain, Germany, Nigeria, and other countries are also represented. The book has both a detailed table of contents and brief subject index somewhat lacking in depth. Also, it seemed rather unusual to this reviewer to find the index terms lowercased and lacking any indentations, apparently all at the same level of hierarchy. Readers should be prepared to use the table of contents to supplement the index,

since quite a few terms are missing in the latter. Not all personal names mentioned in the text are given in the index, and some terms one might have expected in the index, such as *linguistic combinations,* are present solely in the table of contents.

*Visuals for Information* is recommended for library and information science professionals who have never been exposed to a course in communications and who would do well to utilize the concepts explained in this primer in their manipulation of visual technologies. In particular, it will be useful for people engaged in database design, screen display design, and verbo-visual materials for bibliographic instruction, such as how to use an OPAC.—*Sheila S. Intner, Graduate School of Library and Information Science, Simmons College.*   ■■

**Research Access through New Technology: Studies in Library & Information Science, No.1** Ed. by Mary E. Jackson. New York: AMS, 1989. $32.50 (ISBN 0-404-64001-X).

Among those on the front lines of the access-versus-ownership issue in libraries are the practitioners and administrators of interlibrary loan and library resource sharing. The aim of this collection of essays is to bring into focus the major trends in these spheres of librarianship, with special attention given to the impact of technological developments. Two central themes are established: the overall picture—how interlibrary loan and resource sharing have developed and where they're headed; and more specific descriptions of the applications and impacts of technologies to this area of library work.

Of broad interest is Noelene P. Martin's essay, which lays out very nicely the salient issues involved. These include the economics of information transfer and the place of interlibrary loan in the information structure, for which three areas are selected to illustrate some of the inherent challenges. Covered are access to bibliographic information; increasing access to more libraries by more libraries—considering problems of supply and demand imbalances and conflicts in priorities, both in terms of workload and budget allocations; and technological progress, with its uncertainties, inconsistencies, costs, and conflicts. Also of general interest are Christopher Wright's projections on the changing nature

of the interaction between the Library of Congress and the infrastructure of the nation's libraries and Danuta Nitechi's description of the Linked Systems Project, which has the potential to change, dramatically, the way in which patrons access materials that are not locally available. The range of specific essays includes the impact of technologies on interlibrary loan staffing by David S. Ferriero, commercial document delivery services in interlibrary loan by Sue Kennedy, a description of a statewide telefacsimile project in Pennsylvania by Charles Peguese, and cost-analysis methodology for interlibrary lending by Virginia Boucher and Stephen P. Dickson. Though the linked concerns of interlibrary loan and resources sharing continually increase, both in terms of activity and attention, library literature has yet to reflect this—making this collection a valuable contribution. While some aspects of resource sharing activity are not covered (as acknowledged in the introduction, this is intended to highlight rather than describe comprehensively), those topics included are well detailed. The editor and contributors to this work are nationally reknown in library resource sharing with substantial experience in both practical and theoretical aspects of the topic addressed. The intended audience for this work is modestly defined as "interlibrary loan librarians, public service administrators, library school faculty with interest in resource sharing, as well as network and systems staff." I would add library administrators, who are concerned with these issues which cross over public service lines into collection development, management, and planning. Most essays conclude with bibliographic notes, and a fairly detailed index is included at the end.—*Barbara Beaton, University of Michigan.*   ■■

**Tenopir, Carol, and Jung Soon Ro.** *Full Text Databases.* New Directions in Information Management, no.21. Westport, Conn.: Greenwood, 1990. 251p. $39.95 (ISBN 0-313-26305-5).

Over the past decade, the variety and availability of full text databases (FTDBs) has increased steadily. According to the authors' comparison of 1980 and 1989 listings in the *Directory of Online Databases*, FTDBs have jumped from 5 to 34 percent of all databases available on one or more systems. These re-

sources have reached far beyond earlier markets in law firms (legal codes and decisions), news media (newspapers and wire services), and corporate offices (business and financial services). Vendors like Dialog and BRS have brought them into the standard repertoire of reference librarians, and end users have begun to encounter them on CD-ROM. Electronic encyclopedias and news services appear on online catalogs and consumer-oriented systems like Compuserve and Prodigy.

Clearly, FTDBs are of great interest for those who work with online services. A quick scan of the literature shows a steady stream of articles, both practical and theoretical, but Tenopir and Ro have made the first book-length attempt to survey this rapidly growing field, with a long overdue handbook of resources that should prove useful for several audiences. It is part overview of databases, part review of research, and part agenda of recommendations—for online searchers, vendors and database producers, and researchers.

The first three chapters make good introductory reading for students and would-be searchers, setting the scene with a tour of fifteen online vendors with "substantial full text offerings" of interest to the library market. Included are a brief historical background and sketches of the vendors' overall content and some of their most important databases. The authors also summarize special search and display features that have evolved for searching FTDBs on systems originally designed for bibliographic searching. (The word *evolved* is deliberately chosen. The authors note: "Rarely does the development of a full text search system progress logically or systematically"; rather, it lurches ahead with one eye turned toward users, the other toward the competition.)

To improve upon evolution and draw practical implications from research into FTDBs seems one of the central motives of the book. Tenopir and Ro begin the next section with an extensive review essay on twenty-five years of research into FTDBs—early feasibility studies, user studies, evaluations of retrieval performance, exploration of system enhancements that might improve retrieval. They follow with three chapters on their own research—comparing results from full text searching with use of "value-added" fields like descriptors and abstracts; comparing different strategies in using proximity operators, fields, and logical operators; exploring automatic ranking algorithms to improve precision; and taking a closer look at end-user behavior and expectations. Students might benefit from these chapters, as a snapshot of the scope and tools of library research, but they are aimed more directly at researchers, whether on the faculty of schools of library and information science or library practitioners, serving as an example and a call for the kind of work that needs to be done.

The last three chapters make explicit the implications of research. Chapter 8, "Implications of Research for Searchers," is the briefest and seems the lightest part of the book. It offers good, commonsense advice and is worth reviewing by students and searchers alike, although there is little that could not have been drawn from a discussion group of experienced online searchers. It is the "Implications of Research for Database Producers and Vendors" and "Future Research Needs and Directions" chapters, however, that bring *Full Text Databases* to a solid and useful conclusion.

The authors advance a detailed and far-ranging wish list of improvements for databases and search systems—full range of proximity operators, value added fields, automatic ranking and language enhancement, quality control, better displays, helpful user interfaces, better documentation, and, above all, providing searchers with maximum flexibility and control over their own strategies. The authors state their agenda for further research into the structure of databases, search systems, and human factors of end-user searching, which points the way toward search system improvement.

To summarize, *Full Text Databases* is strongly recommended and belongs in any academic library as a tool for professional staff as well as a resource for studies in information retrieval. It should also be considered as a text that could be used in courses on online database searching.—*Elliot Kanter, University of California, San Diego.* ■■

# Other Recent Receipts

*Listed here are books and other publications recieved for review that are of potential inter-*

est to LITA members. *Some of these materials may be reviewed in later issues of* ITAL.

Bloxham, Katrina, and Mary Feeney. *Desktop Publishing for Librarians on the IBM PC.* Brookfield, Vt.: Gower, 1991. 200p. paper, $49.95 (ISBN 0-566-03637-1).

Byrne, Deborah J. *MARC MANUAL: Understanding and Using MARC Records.* Englewood, Colo.: Libraries Unlimited, 1991. $260p. paper, $29.50 (ISBN 0-87287-813-9).

Cargill, Patrick. *A Desktop Guide to Computers in Business.* St. Joseph, Mo.: GreenTree, 1990. 305p. $29.95 (ISBN 0-9626385-3-6).

*CD-ROM Information Products: An Evaluative Guide and Directory, v.1.* Ed. by C. J. Armstrong and J. A. Large. Brookfield, Vt.: Gower, 1990. 488p. $84.95 (ISBN 0-56-603626-6).

Chen, Ching-chih. *HyperSource on Optical Technologies.* Chicago: American Library Assn., 1989. 300p. paper, $29.50, $26.55 LITA members (ISBN 0-8389-7359-0).

*Continuing Education of Reference Librarians* (also published as *The Reference Librarian*, no.30/31). Ed. by Bill Katz. Binghamton, N.Y.: Haworth, 1990. 273p. $34.95 (ISBN 1-56024-020-2).

Cornish, Graham P. *Copyright: Interpreting the Law for Libraries and Archives.* (Chicago: American Library Assn., 1990.) 114p. $26, $23.40 ALA members (ISBN 0-85365-709-2). ALA Order Code L709-2-0010.

*Dial In 1990–1991: An Annual Guide to Library Online Public Access Catalogs in North America.* Ed. by Michael Schuyler. Westport, Conn.: Meckler, 1990. paper, $49.50 (ISBN 0-88736-579-5).

*Electronic Information Systems in Sci-Tech Libraries.* Ed. Cynthia A. Steinke. Binghamton, N.Y.: Haworth, 1990. 151p. $22.95 (ISBN 1-56024-067-9).

*From Data Protection to Knowledge Machines: The Study of Law and Informatics.* Ed. by Peter Seipel. Computer/Law Series, no.5. Cambridge, Mass.: Kluwer, 1990. 284p. paper, $53 (ISBN 90-6544-501-3).

Gredley, Ellen, and Alan Hopkinson. *Exchanging Bibliographic Data: MARC and Other International Formats.* Chicago: American Library Assn., 1990. 329p. $43.50, $39.15 ALA members (ISBN 0-8389-2151-5). ALA Order Code: L899-4-0010.

*Guidelines for Bibliographic Records for Preservation Microform Masters.* Prepared by Crystal Graham. Washington, D.C.: Association of Research Libraries, 1990.) 15p. $3.

*Information Technology: Design and Applications.* Ed. by Nancy D. Lane and Margaret E. Chisholm. Boston: Hall, 1991. 330p. $39.95 (ISBN 0-8161-1908-2).

*Integrated Online Library Catalogs: Supplement*

*to Computers in Libraries, no.21.* Ed. by Jennifer Cargill. Westport, Conn.: Meckler, 1990.) 91p. $35 (ISBN 0-88736-675-9).

*Issues for the New Decade.* Ed. by Alphonse F. Trezza. Boston: Hall, 1991. 164p. paper, $22.50 (ISBN 0-8161-1939-2).

Machovec, George S. *Telecommunications and Networking Glossary.* LITA Guides, no.3. Chicago: American Library Assn., LITA, 1990. 68p. paper, $12.50, $11.25 LITA members (ISBN 0-8389-7476-7).

Machalow, Robert. *Using Microsoft Excel: A How-to-do-it-Manual for Librarians.* How-to-do-it Manuals for Libraries, no.11. New York: Neal-Schuman, 1991. 238p. paper, $35 (ISBN 1-55570-075-6).

*Microcomputers for Information Management (An International Journal for Library and Information Services).* Ed. by Ching-chih Chen. Norwood, N.J.: Ablex, 1990. $80/yr. institutions, $32.50/yr. individuals. ISSN 0-7422342.

Miller, Rosalind E., and Jane C. Terwillegar. *Commonsense Cataloging: A Cataloger's Manual.* 4th ed. rev. New York: Wilson, 1990. 180p. $23 U.S. & Canada (ISBN 0-8242-0789-0).

*Preservation Organization and Staffing. SPEC Kit #160.* Washington, D.C.: Association of Research Libraries, 1990. $30, $20 ARL Members. ISSN 0160-3852.

*Preserving Knowledge: The Case for Alkaline Paper.* Washington, D.C.: Association of Research Libraries, 1990. $9, $18 nonmembers (ISBN 0-918006-18-X).

*Rewritable Optical Storage.* Ed. by Judith Paris Roth. Westport, Conn.: Meckler, 1990. 150p. $45 (ISBN 0-88736-534-5).

Saffady, William. *Optical Storage Technology 1990–1991: A State of the Art Review.* Westport, Conn.: Meckler, 1990. 200p. $49.50 (ISBN 9-88736-594-9).

Schuyler, Michael, and Elliott Swanson. *The Systems Librarian Guide to Computers.* Supplement to Computers in Libraries, no.18. Westport, Conn.: Meckler, 1991. 125p. $39 (ISBN 0-88736-580-9).

*Subject Authorities in the Online Environment: Papers from a Conference Program held in San Francisco, June 29, 1987.* Ed. by Karen Drabenstott. ALCTS Papers on Library Technical Services and Collections, no.1. Chicago: American Library Assn., 1991. 115p. paper, $20, $18 ALA members (ISBN 0-8389-0558-7). ALA Order Code: 0558-7-0010.

*Teaching Technologies in Libraries: A Practical Guide.* By Linda Brew MacDonald and others. Boston: Hall, 1991. 275p. $34.95 (ISBN 0-8161-1906-6).

*Text Information Management: An Overview of PC Products and Services, 1991.* Ed. by Peter Hyams and Gayle Bryant. Brookfield, Vt.: Gower, 1990. $48 (ISBN 0-904933-74-1).

Turko, Karen. *Mass Deacidification Systems: Planning and Managerial Decision Making.* Washington, D.C.: Association of Research Libraries, 1990. 31p. $8, $15 nonmembers (ISBN 0-918006-19-8).

*Virtual Reality: Theory, Practice and Promise.* Ed. by Sandra K. Helsel and Judith Paris Roth. Westport, Conn.: Meckler, 1991. 143p. paper, $39.50 (ISBN 0-88736-728-3). ■■

# Letters

To the Editor:

I have written enough books and reviewed enough books written by others to understand that the reviewer has no obligation to please the author. Complaining about that process is a total waste of time, and of no interest to anyone else. However, precisely because I do understand something about the obligations of a reviewer, I am forced to write with regard to James C. Thompson's review of my book *Librarians and the Awakening from Innocence (ITAL,* Dec. 1990). That essay is not a review of the book at all; it is rather a personal attack and denigration of the principles I have expressed over the years. Why Thompson would feel so personally vindictive I cannot guess. To the best of my knowledge I have never even met him. I will comment here on only three specific examples.

Thompson quotes me correctly concerning "the near absence of material concerned with automation" (thereby presumably making the book irrelevant for *ITAL* readers) but he does not finish the quote. ". . . although much of my management career has been in large-scale sophisticated information facilities. I conclude from this that I have not written about computerization because I do not consider it a major management issue. As Peter Drucker reminds us, automation is not about machines. It is about how people work." That is the context of my argument, and that would be fair game for attack.

The reviewer argues that my writings offer no solutions for the problems of librarians. My work, and this is clearly spelled out throughout the book, is not the musings of an academician. It is based on 25 years of management experience, and on tactics that worked for me and now work for my students. If nothing works for Thompson I am truly sorry for his library.

Finally, Thompson ventures to save the prospective readers the trouble by telling them what I "really" mean. If he argued that this is what he thought I meant, I would only consider him wrong, and that is no sin. However, what he says I mean turns out not to be what I mean at all, and I suspect I would know.

The reviewer dredges up a therapist from a Burt Lancaster movie I have never seen as his straw man (while accusing me of creating straw men), and then suggests that I be discarded as Lancaster presumably discards his straw man. Since I am not a therapist but a practicing manager writing about management, I don't understand the point.

I apologize for taking up space with this letter. However, book reviewing involves a responsibility for objective reporting, and the readers of *ITAL* deserve that.—*Herbert S. White, School of Library ond Information Science, Indiana University, Bloomington.* ∎∎

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