

Library Resources & Technical Services

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**Promoting Research and
Best Practice in Subject
Reference Structures**

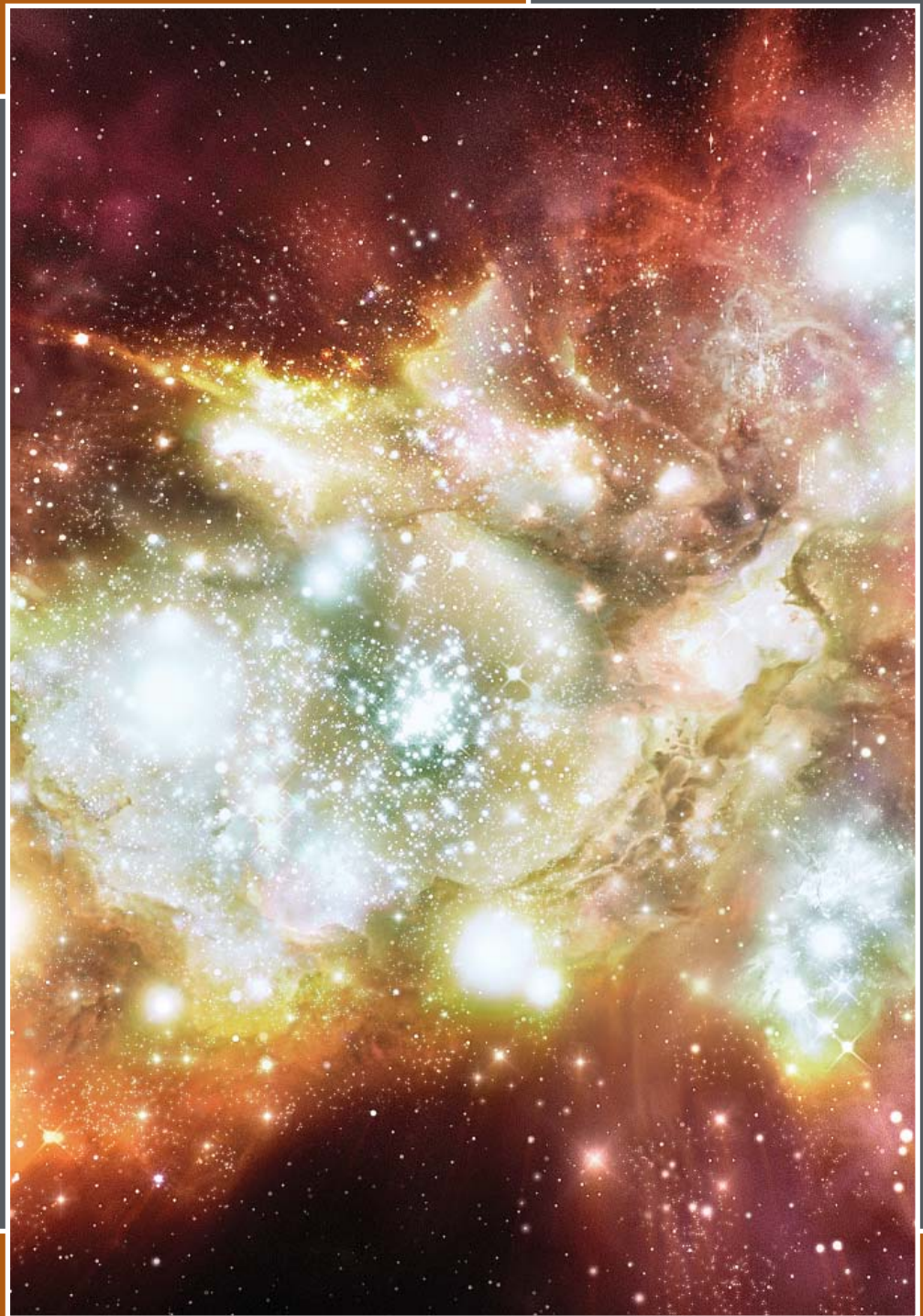
David Miller, Tony Olson, and
Sara Shatford Layne

**Factors Influencing
Competency Perceptions
and Expectations of Technical
Services Administrators**

Norm Medeiros

FRBR

Jennifer Bowen



from **ALCTS Publishing**

Differences Between, Changes Within Guidelines on When to Create a New Record

Prepared by the ALCTS
Cataloging and Classification
Section's Task Force on an
Appendix of Major and Minor
Changes



Provides guidance to the cataloger and describes what constitutes a major difference between manifestations, requiring the creation of an original record, as well as detailing major changes within a serial manifestation. Guidance is also provided regarding minor changes that would not require a new bibliographic record, but might necessitate updating an existing record.

Available online to ALCTS Members or order in print at www.ala.org/alcts/catalog.

Library Resources Technical Services &

ISSN 0024-2527

July 2005

Volume 49, No. 3

EDITORIAL 147

LETTERS TO THE EDITOR 148

ARTICLES

**Promoting Research and Best Practice
in Subject Reference Structures** 154

*A Decade of Work by the Subject Analysis Committee
David Miller, Tony Olson, and Sara Shatford Layne*

**Factors Influencing Competency Perceptions
and Expectations of Technical Services Administrators** 167

Norm Medeiros

FRBR 175

*Coming Soon to Your Library?
Jennifer Bowen*

NOTES ON OPERATIONS

Rehabilitating Killer Serials 190

*An Automated Strategy for Maintaining E-Journal Metadata
David Banush, Martin Kurth, and Jean Pajerek*

**A Comparative Study of Amazon.com
As a Library Book and Media Vendor** 204

Paul Orkiszewski

Floating Bibs and Orphan Bar Codes 210

*Benefits of an Inventory at a Small College
Linda Ernick*

BOOK REVIEWS 217

Edward Swanson, Editor

Index to Advertisers 174

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Editorial

Peggy Johnson

As I write this message from the editor, I am pondering the joy of juxtaposition. Today (March 19) is the first day of spring, yet I spent the morning shoveling eight inches of snow. In contrast, I just returned from ten days of glorious, warm, sunny weather in Arizona, where I admired cacti and the best wildflower display in decades. Both realities exist simultaneously—just like the realities we experience in libraries. Colleagues debate the virtues of ownership versus access, just-in-time versus just-in-case selection and acquisition, electronic versus print subscriptions, brief records versus full cataloging, approval plans versus title-by-title section, microform versus digital preservation, accepting copy cataloging as-is versus editing it, and so on. We hear about the digital library or the print-based library. Perhaps these are not either/or choices, but choices we will reconsider and make again and again, depending on the situation. We would do better, perhaps, to think about these as juxtaposed, that is—placed side by side for comparison or contrast.

Librarians live and work in changing times. Our user communities and their expectations, institution and parent organization priorities, technical capacity, funding, and staffing all change, and we must respond as best we can. I find myself struggling with what I think is the best response and what is the most responsible, given available resources and the changing environment. Responsible management of resources, efficiency, expediency, accountability, and improved user service are the watchwords of the day. Sometimes what librarians think is best—based on their education and experience—may not be the right choice to make today.

On the other hand, we are aware that the choices that we make today live on after us. Choosing not to add an item to the collection usually means that it will not be part of the library that future generations' use. Opting not to use a particular descriptive field or to use it in a local manner may mean that future users will not find the item—or that a future automated system cannot index it properly. What formats will have the longest life or be the easiest and cheapest to reformat and repurpose? Are we wasting limited and valuable staff time creating descriptive records that will have little value to future generations? Have we created such elaborate and cumbersome integrated automated library systems that they will sink us in the process of making them work, before we deliver the products our users really want and need?

I wish I had the answers to these and other questions that challenge me. We should not see ourselves as making compromises because we have neither the time nor funds to do it right. The reality that challenges us is making responsible choices today about collections, cataloging, access, and preservation that will serve our users in the future. And I challenge you to find joy in making choices among the juxtaposed options!

Letters to the Editor

February 28, 2005

In the January issue of *LRTS*, Janet Swan Hill repeats the oft-heard assertion that there are not enough new catalogers entering the profession. This state of affairs is not apparent to the newly graduated job seeker. When nearly every job description (by which search committees are often bound) requires a minimum of two years of experience, the implication is that there are plenty of catalogers already working who can simply be shifted around from library to library as openings occur.

I suggest that people may not be entering the cataloging profession because they cannot get hired. After more than a year of being told, "We like you but you don't have enough experience," I am strongly considering seeking employment in another area of librarianship. How can the ranks of catalogers grow if libraries won't hire people who want to be catalogers?—*Steven Knowlton, M.L.I.S., Ypsilanti, Mich. www.angelfire.com/mi4/hiresteve, knowstev@med.umich.edu*

(Update on findings reported in "The Ethics of Republishing: A Case Study of Emerald/MCB University Press Journals," by Philip M. Davis [49, no. 2].)

January 7, 2005

Article duplication within Emerald/MCB publications is more extensive than first reported. It has now been identified in seventy-three journals spanning a period from 1975 to 2003. This letter will address updates to the initial findings and react to Emerald's response. It will investigate the relationships between Emerald, MCB, and Barmarick Publications, and shed light on possible conflicts of interest in management functioning simultaneously as owners, editors, and authors. Is this a case where commercial interests have outweighed editorial independence?

Duration of Duplication and Emerald's Response

In my previous article published in the April 2005 issue of *LRTS*, I initially reported that covert article duplication could be detected as early as 1989. Earlier examples were not possible due to the limitations of the publisher's database.¹ Further investigation of MCB/Emerald print journals has identified article duplication going back to 1975 (see below for an example), indicating that this practice of covert article duplication took place over a period of almost thirty years.

Walter, C. K., and Bernard J. La Londe. "Development and Tests of Two Stockout Cost Models." *International Journal of Physical Distribution* 5, no. 3 (1975): 121–32.

———. "Development and Tests of Two Stockout Cost Models." *Managerial Finance* 3, no. 2 (1977): 85–96.

Contrary to the publisher's response that "[article duplication] was done with journals that had a nil or negligible overlap of subscribers," searches

of library and union catalogs indicate significant overlap of subscribership.² In addition, numerous instances of articles *republished in the same journal* were identified. For example:

Denman, A.R., et al. "Auditing the Cost-Effectiveness of Radon Mitigation in the Workplace." *Managerial Auditing Journal* 14, no. 9 (1999): 461–68.

———. "Auditing the Cost-Effectiveness of Radon Mitigation in the Workplace." *Managerial Auditing Journal* 15, no. 4 (2000): 153–60.

Elmuti, Dean, et al. "Inequality between Genders in the Executive Suite in Corporate America: Moral and Ethical Issues." *Equal Opportunities International* 22, no. 2 (2003): 40–58.

———. "Inequality between Genders in the Executive Suite in Corporate America: Moral and Ethical Issues." *Equal Opportunities International* 22, no. 8 (2003): 1–19.

Greenley, Gordon E. "An Understanding of Marketing Strategy." *European Journal of Marketing* 18, no. 6 (1984): 90–103.

———. "An Understanding of Marketing Strategy." *European Journal of Marketing* 23, no. 8 (1989): 45–56.

Relationships between MCB, Emerald, and Barmarick Publications

The relationship between MCB, Emerald, and Barmarick Publishers has been difficult to establish, and most attempts to contact the companies and their employees for details have gone unanswered.

What is clear is that Emerald is the trading name of Emerald Group Publishing Limited, and was previously known as MCB University Press. MCB UP Group, however, continues to be the holding company for the Emerald Group. According to an e-mail correspondence with Gillian Crawford, Emerald's head of corporate communications, the company is currently owned by two of its directors, Dr. Keith Howard and Dr. Barrie O. Pettman.

In the publisher's initial response to the findings, Emerald denied responsibility for article duplication in 2003, as the journal *Equal Opportunities International* was owned by another publisher—Barmarick Publications.³ One of the owners of Barmarick is Dr. Barrie O. Pettman, who is also an owner, director, and chairman of Emerald.⁴ Pettman is also listed as the associate editor of *Equal Opportunities International*. In addition, this journal contains an Emerald logo prominently on its cover. The journal can be purchased directly from the Emerald Web

site with fund transfers directly into the Emerald Group Publishing Limited bank account.

Involvement of Management in Duplication

According to Kathryn Toledano, Emerald's director of business development, republishing an article without acknowledgment "was something that we did, but it wasn't a business practice."⁵ This statement does not appear to corroborate with the facts: (1) article duplication was discovered in more than seventy Emerald/MCB journals; (2) duplication reached 100 percent in some journals; (3) some editorial board members were unaware of this practice; and (4) some of the owners were also functioning as editors during the period of duplication. Based on the facts, it appears that top management may have facilitated and orchestrated article duplication as a business practice.

For example, Dr. John Peters currently functions as Emerald's editorial director, and was listed as a shareholder of Emerald Group Publishing Limited at the end of 2003.⁶ He is also the editor of the journal *Management Decision* and has served as the past editor of *Internet Research* and several other journals during periods of systematic article duplication. When he became editor of *Internet Research* in 1996, for example, nearly half of the articles (seventeen out of thirty-six) published that year were duplicated in other MCB journals.

Dr. Peters also republished his own articles. For example, an article printed in the journal, *Internet Research* in 1995 was republished in *Management Decision* in 1996.

Peters, John. "The Hundred Years War Started Today: An Exploration of Electronic Peer Review." *Internet Research* 5, no. 4 (1995): 3–9.

———. "The Hundred Years War Started Today: An Exploration of Electronic Peer Review." *Management Decision* 34, no. 1 (1996): 54–59.

Dr. Peters served as the editor of *Management Decision* at that time, with Barrie O. Pettman on its editorial advisory board. When one looks at the reprinted article, the author notes do not list Peters as the editor, but as the "Director of Red Swan Ltd."

In a second example, John Peters and Keith Howard, an owner and director of Emerald, published the following article an online journal published by the Bristol Business School:

Peters, John, and Keith Howard. "Looking for Good Research in Management—A Publisher's Case Study." *Bristol Business School Teaching and Research*

Review 4 (spring 2001). Accessed Dec 31, 2004, www.uwe.ac.uk/bbs/trr/ISSUE4/Is4-1_1.htm.

This article was later found in an Emerald journal with no acknowledgement of the original publication:

———. “Looking for Good Research in Management—A Publisher’s Case Study.” *Management Decision* 37, no. 7 (2001): 594–98.

What is also clear is that the owners did not follow the guidelines for their own journal, which clearly states in its notes for contributors that, “articles submitted to the journal should be original contributions and should not be under consideration for any other publication at the same time.”⁷

Implications for Scholarly Communication

At a time when academics have expressed great fears that commercial publishers are exploiting the scholarly publishing process, these Emerald/MCB findings study suggest that the trust between the academy and a commercial publisher may have been broken. To summarize the implications for the academy:

1. Academic institutions have discovered that they have been unknowingly purchasing duplicate material for nearly thirty years.
2. Multiple copies of academic articles have disrupted the record of publication, and confusion in the literature has arisen on which copy to cite. The duplication of articles may have also artificially increased the impact factor (and thus the prestige) of these journals.
3. The peer review process, which is at the heart of scholarly communication, has been cast into doubt. Furthermore, conflicts of interest when individuals serve as owners, managers, editors, and authors of academic journals lead us to question whether these individuals may not have been acting in the best interest of scholarly communication. Commercial interests have outweighed editorial independence.

Questions to Emerald

Emerald’s first public response did not adequately address the most important issue: What specific changes has the company made to address these problems and to ensure that they will not reoccur?⁸

When academic publishing strives for transparency, why has it been so difficult to obtain information on the functions of Emerald/MCB directors? Does the company believe

that these findings suggest conflict of interest, and if not, why not? Answering these questions might help Emerald regain the trust of the academic community.—Philip M. Davis (pmd8@cornell.edu), *Life Sciences Librarian, Cornell University, Ithaca, New York*

References

1. Philip Davis, “The Ethics of Republishing: A Case Study of Emerald/MCB University Press Journals,” *Library Resources & Technical Services* 49, no. 2 (spring 2005): [I’ll insert pages].
2. Scott Carlson, “Publisher Ran Identical Articles in Multiple Journals without Acknowledgment, Librarian Finds,” *Chronicle of Higher Education*, Nov. 22, 2004. Accessed Dec. 8, 2004, <http://chronicle.com/free/2004/11/2004112205n.htm>.
3. Gillian Crawford, “Dual Publication: Emerald’s Response (Press Announcement),” Nov 2004. Accessed Dec. 8, 2004, <http://ariel.emeraldinsight.com/vl=3959651/cl=108/nw=1/rpsv/news/press/dual.htm>.
4. MCB UP Limited, “Directors and Officials,” Dec 31, 2001. Accessed Dec. 8, 2004, <http://people.cornell.edu/pages/pmd8/MCB.tif>; Emerald Group Publishing Limited (formally MCB UP Limited), “Directors and Officials,” Dec 31, 2003. Accessed Dec. 8, 2005, <http://people.cornell.edu/pages/pmd8/EGP.pdf>.
5. Carlson, “Publisher Ran Identical Articles in Multiple Journals without Acknowledgment, Librarian Finds.”
6. Emerald Group Publishing Limited, “Directors and Officials,” Dec 31, 2003.
7. Emerald, Management Decision, “Notes for Contributors.” Accessed May 1, 2005, <http://thesius.emeraldinsight.com/vl=2042105/cl=35/nw=1/rpsv/journals/md/notes.htm>.
8. MCB UP Limited, “Directors and Officials,” Dec 31, 2001.

(Written in response to “The Ethics of Republishing: A Case Study of Emerald/MCB University Press Journals,” by Philip M. Davis [49, no. 2], and his letter to the editor in this issue.)

February 1, 2005

My first reaction to Mr. Davis’s article was to doubt that this was a major issue and to shelter behind the view that “would anyone in their right mind believe that Emerald would knowingly support a practice that would undermine its standing in the library community?”

If there had been *but one complaint from a customer concerning republication* during the decades prior to Mr. Davis taking an interest in Emerald, we would have reacted accordingly. Mr. Davis’s subsequent activities and research—notably the letter referred to above and his presence at ALA Midwinter 2005—quickly disabused senior colleagues at Emerald of this notion.

It is evident that the press announcement “Dual Publication: Emerald’s Response” made in November 2004 gave insufficient satisfaction in some quarters—though we would argue that it did go some way to claiming that the

magnitude of the problem had been overstated, and that it did indeed address the fact that we had acknowledged and accepted the problem, taken steps to address it by tagging affected papers on our database, and unambiguously clarifying our procedures at our November 2004 board meeting.

In this note two issues are addressed:

- Emerald's origins—and the bearing that these had on the generation of knowledge from the field of management (which was not for dissemination to the academic community exclusively).
- The action proposed in an attempt to ameliorate the library/LIS community specifically.

There will be no attempt in this response to justify republication, though it is felt that there is some purpose in a measure of explanation as to *why* it occurred. As Mr. Davis has referred to *caveat emptor*, I will simply add a qualified *mea culpa*.

Emerald's Origins

Of considerable significance from our perspective is the fact that Emerald was rooted in research and writing, not publishing. In 1969, forty-eight members of the academic staff at the University of Bradford Management Centre, plus Dr. Barrie Pettman of the University of Hull, plus one non-academic who was associated with Dr. Pettman in the Institute of Scientific Business, became equal shareholders in a company named Management Consultants Bradford Limited (MCB).

Consulting work (not publishing) undertaken by the fifty shareholders was the purpose in forming MCB. Bradford Management Centre, one of the top three business schools in the UK at the time, was known, colloquially, as the "Businessman's Business School." This particular fact had a major impact on the nature of MCB's and, subsequently, Emerald's, publishing strategy to this day—the association between theory and practice.

Management Decision, owned by the major British publishing company IPC Ltd., was adopted by the Institute of Scientific Business as its house journal. *Management Decision* was very quickly sold to several shareholders of MCB, who established a separate company MCB (Management Decision) Ltd.

This was followed by the launch and acquisition of a number of other titles in different functional areas of management, with the result that toward the end of the 1970s groups of MCB Ltd shareholders owned MCB (Physical Distribution Management) Ltd., MCB (European Journal of Marketing) Ltd., MCB (European Training) Ltd., MCB (Social Economics) Ltd., and so on. In addition to journals

primarily targeted at the academic community, the individual companies sought to satisfy demands (arising, particularly, from the corporate sector) for publications and resources in fields such as training and development. Subject matter specialists thus acquired their own journals, which were, generally, edited by one of the shareholders of the single journal companies. Editors drew upon their subject matter networks for the generation of copy.

I was surprised, incidentally, that Mr. Davis, as a librarian, viewed "management" in his article as an area of "similar subject scope." If so there must be an awful lot of duplication of ideas (if not word-for-word text) in the thousand plus journals published in the management field!

To be absolutely clear—MCB journal companies were commercial in their formation. Investment, losses, profits were down to the owners. At one time during the early 1980s we had to enter into guarantees secured against our own properties to ensure that MCB remained in business. This was entirely consistent with the view that we had of ourselves as entrepreneurial business school academics.

As far as the journals were concerned, the aim was to despatch issues on time. Overlapping ownership of the range of journal companies probably led to what was felt to be appropriate republication to satisfy the needs of distinctly different communities; for example, an article from the *European Journal of Marketing* could well have been included also in *Physical Distribution Management*.

From about 1980 the separate journal companies were merged into a single company, MCB Publications Ltd., subsequently MCB University Press Ltd., subsequently Emerald Group Publishing Ltd.

One matter that has intrigued Mr. Davis is Barmarick Publications. Dr. Pettman's interest in publishing journals preceded the formation of MCB Limited. At the time of merging the MCB journal companies at the end of the 1970s the decision was taken not to include the Barmarick titles. MCB/Emerald has, nevertheless, continued to take responsibility (at a charge) for providing subscription management services for Barmarick publications.

As some of Barmarick's titles were located in areas that it was felt would add to the breadth of MCB's portfolio, they were included in the Emerald full-text, on-line database, first launched in 1996. The decision was taken some time ago to drop them from the Emerald full-text database in 2006.

Reverting to the origins of MCB, in addition to editing, we had absolutely no qualms in publishing accounts of our research findings in the journals owned by MCB companies. Being members of one of the leading British business schools we had confidence in the quality of research we undertook. At the personal level I was chairman of the largest, and most successful, doctoral program in management in Europe from 1978 to 1982. I co-authored

with my deputy chairman John Sharp a highly regarded book, *The Management of a Student Research Project*, 1st ed. (Alershot, England: Gower Pr., 1983 [1st ed.], 1996 [2nd ed.], 2002 [3rd ed.]). Now in my seventies it is unlikely that there will be a fourth edition to which my name will be attached! I also have experience of editing *The International Journal of Operations and Production Management* from 1981 until it was handed over to an editorial team at UMIST Manchester in 1995, and which is, so I am advised, highly regarded in North America, and is listed by ISI. Of the hundreds of papers published during my editorship there is (possibly) one instance of republication following dual submission.

What Action Do We Propose?

We are satisfied that having taken the necessary steps to address the specific problems identified by Mr. Davis that our processes of control should match those of any publishing company of standing. Our systems will stand scrutiny. I make that claim in the knowledge that some readers of this note may not be prepared to accept reassurance proffered in this way. So:

- An invitation is extended to up to five directors of ARL (Association of Research Libraries) libraries (or their designated substitutes) to spend up to one week at Emerald in Bradford, England, (at our expense) to review our processes.
- We will endow research to address issues of significance to the librarian/LIS community, in a manner to be agreed with the American Library Association.
- In instances where customers have suffered from significant and unambiguous republication—for example, in the unusual case of journals with different titles carrying substantially the same content (a consequence of acquisition)—we will ensure that these customers receive compensation.

For further information on these please contact Gillian Crawford, our head of corporate communications, at gcrawford@emeraldinsight.com.

Even-Handedness of Mr. Davis's Study

The editorial department at Emerald has been giving detailed consideration to the instances of republication cited by Mr. Davis. A conclusion they have reached is as follows:

We would like to share our findings from our own survey of Emerald journal content. We have undertaken an analysis of the database and found that 560 original papers

have been republished without proper attribution. This represents about 1.1 percent of the total database content.

Mr. Davis has correctly identified republished articles in an issue of *Career Development International* early in 2001, and a paper republished in *Equal Opportunities International* (a journal for which Emerald does not have editorial control) in 2003. These aside, there have been no instances of deliberate republication by Emerald (with the exception of anniversary issues, which are fully attributed, and a small number of book reviews) since 2001. This includes all journal articles that are contained in the ASLIB journals that were acquired by Emerald in 2001. Any example of article republication that has occurred after this date has been due to author or administrative error (this occurred three times in 2003; we have reviewed our processes to mitigate against this happening in the future).

Figure 1 shows that this is largely a historic problem. Cumulatively, 87 percent of republication took place in or prior to 1999, and more than two thirds in or prior to 1997.

It should also be pointed out that attributions were provided in some of the cases that Mr. Davis highlights. For example, figure 2 of his article refers to a paper that was republished in the *European Journal of Marketing*. Acknowledgement was made in the editorial to this journal issue. In some other cases, attributions appeared in print issues of a journal, and therefore are shown on the PDF versions on our online database.

We are in the process of updating the database to ensure all attributions are fully visible. This includes notification of subsequent publication as well as first publication.

Mr. Davis has, for reasons that are unclear to us, expressed interest in MCB/Barmarick/Emerald ownership. I trust that his suspicions have been clarified by what is written above.

He appears to accept without question that the other publishers he cites are virtually “whiter than white” in the matter of republication. It would seem, therefore, that

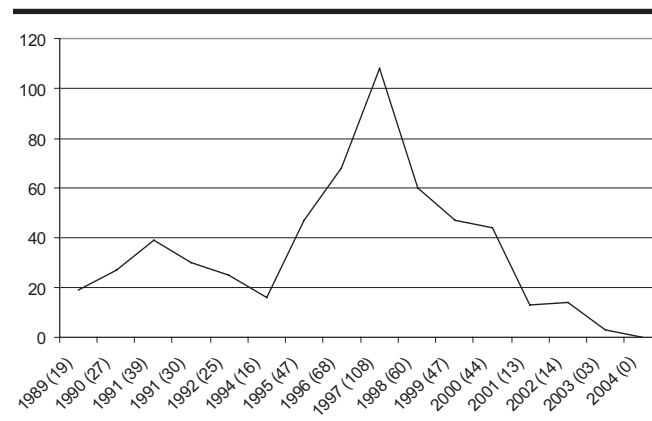


Figure 1. Instances of duplicate republication.

his somewhat gratuitous aim of “educating the publishing industry” is rather unnecessary, which causes me to reflect again on what his aims might be.

Is Mr. Davis in a position to guarantee that other publishers satisfy expected standards in the matter of republication? If he cannot offer such a guarantee, should he not

extend his study to include a number of these in order that he may reach a conclusion that is generalizable? Or is potential bias acceptable in a study of this nature?—*Dr. Keith Howard, Chairman, Emerald Group Publishing Limited, Bradford, England*

Archival Products
B/W
P/U Jan '05, p 6

Promoting Research and Best Practices in Subject Reference Structures

A Decade of Work by the Subject Analysis Committee

David Miller, Tony Olson, and Sara Shafford Layne

In 2004, the ALCTS Cataloging and Classification Section Subject Analysis Committee (SAC) produced the report "Recommendations for Providing Access to, Display of, Navigation within and among, and Modifications of Existing Practice Regarding Subject Reference Structures in Automated Systems." This document is one important outcome of nearly ten years' work by three SAC subcommittees investigating the theoretical, pragmatic, and political dimensions of improving subject access through better use of reference structure data. The work of those subcommittees is reviewed and their recommendations are described and summarized. Potential future effects of the report are discussed, as is a snapshot view of several major automation systems' current compliance with the recommendations.

The value and importance of using controlled vocabularies for subject retrieval has been well established.¹ Research has shown that the best results from subject searches in terms of recall and precision are achieved with a combination of keyword and controlled vocabulary searching.² However, subject searching remains problematic in online catalogs. Usage studies have shown that although subject searches constitute the majority of searches in online catalogs, they exhibit a high rate of failure.³

Several reasons contribute to the failure of subject searches. Some can be traced to problems with the use of controlled vocabularies, which include shortcomings in the reference structures used in online catalogs. Some of these deficiencies are:

- lack of cross references;⁴
- insufficient or lack of references connecting related broader and narrower terms;⁵
- no access to reference structures in keyword searches; and⁶
- no references linking equivalent terms from different controlled vocabularies residing in the same online catalog.

Additional factors include:

David Miller (dmiller@curry.edu) is Head of Technical Services, Levin Library, Curry College, Milton, Mass. **Tony Olson** (ajolson@northwestern.edu) is Head of Technical Services, Galter Health Sciences Library, Northwestern University, Evanston, Ill. **Sara Shafford Layne** (slayne@library.ucla.edu) is Principal Cataloger, University of California-Los Angeles.

- problems within the syndetic structures of controlled vocabularies;
- failure on the part of automated systems to utilize fully the existing reference structures in online catalogs;
- failure on the part of automated systems to include and provide access to subject reference structures in keyword indexes in online catalogs; and
- incomplete implementation of reference structures in online catalogs by librarians and system implementers.

Beginning in the mid-1990s, the Subject Analysis Committee (SAC) of the Association for Library Collections & Technical Services (ALCTS) Cataloging and Classification Section (CCS) sponsored investigations of the potential for improved subject access in catalogs through exploiting the conceptual links among controlled subject terms. Three successive SAC subcommittees, in existence between 1995 and 2004, studied and advocated subject reference indexing and display issues. See table 1 for a summary outline of these subcommittees and their work. One of the outcomes of the subcommittees' work is a document titled *Recommendations for Providing Access to, Display of, Navigation within and among, and Modifications of Existing Practice Regarding Subject Reference Structures in Automated Systems*, which was approved by SAC at the 2004 American Library Association (ALA) Midwinter Meeting.⁷ This paper will provide background, development, summary description of the recommendations, and a snapshot view of the current state of the library systems

industry with regard to these recommendations, at least as reflected by five major automated systems.

Background

The investigations began with the authorization of the Subcommittee on Subject Relationships/Reference Structures (SSRRS), which came into being between the 1995 ALA Midwinter Meeting and Annual Conference.⁸ The impetus was a discussion during the previous year of Library of Congress (LC) policy on see-also references, where concerns were expressed that:

- library catalog users need a positive response to the terms they use in a search (entry vocabulary);
- synonymous terms used in Library of Congress subject headings (LCSH) should be linked to one another in a way helpful to the user;
- the hierarchical structure of LCSH see-also references (broader term, narrower term, related term) could help users navigate subject categories and find those of interest to them;
- few online library catalogs made see-also references available, and most of those that did linked from broader terms to narrower terms but not the other way around; and
- more related-term references between synonymous headings were needed in LCSH, including headings

Table 1. Subcommittees of the Subject Analysis Committee studying subject reference indexing and display issues.

| Subcommittee | Years | Presentations | Final Report | Report URL |
|--|-----------|---|---|---|
| Subcommittee on Subject Relationships/Reference Structures (SSRRS) | 1995–1997 | | <i>Final Report to the ALCTS/CCS Subject Analysis Committee Subcommittee on Subject Relationships/Reference Structures</i> (June 1997), | www.ala.org/ala/alctscontent/catalogingsection/catcommittees/subjectanalysis/subjectrelations/finalreport.htm (accessed Oct. 30, 2004) |
| Subcommittee to Promote Subject Relationships/Reference Structure (SPSRRS) | 1997–2000 | Discussion forums at ALA Midwinter meetings (1998–2000); “Oh Say, Can We See? See Also? Subject Referencing Possibilities in OPACs” (Program at 1999 ALA Annual Conference) | [Final Report] <i>Report to the ALCTS CCS Subject Analysis Committee</i> (July 2000) | www.ala.org/ala/alctscontent/catalogingsection/catcommittees/subjectanalysis/promotesubjectre/FinalReport.doc (accessed Nov. 30, 2004) |
| Subcommittee on Subject Reference Structures in Automated Systems (SRSAC) | 2001–2004 | “Getting the Most Out of Subject References in the Online Catalog: Better Than It Used to Be?” (Program at 2003 ALA Annual Conference) | [Final Report] <i>Recommendations for Providing Access to, Display of, Navigation within and among, and Modifications of Existing Practice Regarding Subject Reference Structures in Automated Systems</i> (Dec. 1, 2003) | www.ala.org/ala/alctscontent/catalogingsection/catcommittees/subjectanalysis/subjectreference/RefStructuresFinal.doc (accessed Oct. 30, 2004) |

already linked indirectly through links to the same broader term.

As noted in the subcommittee's *Final Report*, its "creation was one result of a discussion of how (and why) to promote the display and use of broader-term reference structures."⁹ The work produced by the subcommittee went well beyond this single aspect, however. Its charge included the following tasks: "To investigate: [i] the kinds of relationships that exist between subjects, the display of which are likely to be useful to catalog users; [ii] how these relationships are or could be recorded in authorities and classification formats; [iii] options for how these relationships should be presented to users of online and print catalogs, indexes, lists, etc."¹⁰ The group took, therefore, a broad view of the nature of subject relationships, their potential encoding, and presentation, not limited by the capabilities of existing library information systems.

SSRRS's *Final Report* includes a number of appended documents that still reward study.¹¹ These are, among others, a taxonomy of no fewer than 165 subject relationships, presented both alphabetically and hierarchically; a checklist of subject relationships suitable for use in information retrieval; a report on reference displays provided by selected CD-ROM-based indexes of the period; a position paper on the importance of subject referencing in online public access catalogs (OPACs); a review of research topics; and an extensive bibliography.

The potential for improvements in subject retrieval implied by the subcommittee's research can be seen in two examples of semantic analyses quoted in the report. The term pair RAIN/CLOUD is analyzed as follows: "Associative/pairs from same hierarchy/causal relationships/dependency relationships/entity-precursor relationships."¹² The term pair WOMEN/WOMAN is analyzed as "Equivalence/same lexical term variants/morphological variants/inflectional suffix variants/irregular plural-singular pairs."¹³ Regarding these analyses, the report states, "One's first reaction is that it is not necessary to encode semantic relationships as specific as these. But on what basis can we make that judgment?"¹⁴ The conceptual net should be cast widely in order to be assured of sufficient specificity as new modes of retrieval, including concept mapping and information visualization, are developed. Users at each different level of sophistication should have more options than a single, advanced set of search options and outcomes.

Having described the big picture regarding subject relationships, SSRRS presented several findings and recommendations, some of which pointed forward to the work of the next two subcommittees. The subcommittee recommended improvements in the display of currently encoded relationships—broader terms (BT), narrower terms (NT), and related terms (RT)—and the clustering of reference

terms based on relationship type. In addition, the subcommittee recommended that SAC should establish further subcommittees for various related purposes, including producing a program on subject relationships and reference structures at an ALA Conference.

The successor Subcommittee to Promote Subject Relationships/Reference Structures (SPSRRS) took the latter task of communicating with the broader community most seriously.¹⁵ Established at the 1997 ALA Annual Conference, its charge included the following: "To promote the display of currently encoded subject relationships/reference structures to system designers (for example, OPACs, CD-ROMs, periodical indexes, thesauri). To provide discussion forums and/or programs on currently encoded subject relationships/reference structures."¹⁶ Thus, while the focus of this subcommittee narrowed to currently encoded relationships, as compared with the in-depth examination provided by the previous group, it also broadened to include a task of outreach and communication. To carry out the second part of its charge, SPSRRS hosted discussion forums at the 1998–2000 ALA Midwinter Meetings and the 1998 and 2000 ALA Annual Conferences. The subcommittee also developed a program for the 1999 ALA Annual Conference.¹⁷

Michel concluded the 1999 program with a talk that, perhaps unexpectedly for some attendees, specifically addressed the nuts and bolts of making change happen.¹⁸ Michel's talk brought home the reality that customary forms of advocacy, typically involving the presentation of research results, may be inadequate to address industrywide deficits. In fact, the subcommittee encountered difficulties in carrying out the first part of its charge, specifically in its efforts to communicate directly with the vendor community. The subcommittee drafted a letter that it intended to send to vendors with the intention of promoting dialogue. SAC, however, did not approve the letter, "in part because of concerns that [it] would not reach the 'right' people in the targeted companies."¹⁹ At both the Midwinter Meeting and Annual Conference in 1999, subcommittee members visited the exhibit booths of database and automated system vendors, and in some instances were able to identify the appropriate contact persons. In addition, the discussion forums were promoted to vendors via e-mail, with some success in terms of encouraging attendance.

In its *Final Report*, SPSRRS described a somewhat ambiguous, if evolving, situation regarding the importance of promoting subject reference structures. The implementation of "some form of LCSH thesaurus-type display" had become more common in catalogs (though less so in index databases), but was frequently incomplete in terms of necessary indexing, searching, and display features.²⁰ A seemingly stubborn "misunderstanding of the nature and potential of controlled-term subject referencing," as compared with keyword-based retrieval, remained.²¹ Finally,

the issue of how best to communicate with the vendor community was still somewhat vexing. The subcommittee emphasized that "the approval process required of any official communication is too slow for the sort of dialogue that should be taking place."²² Non-customers faced difficulties in sharing concerns directly with vendors, even in an informal way.

Many, although not all, subcommittee members wished to continue the group's work. The *Final Report* included a recommendation for reauthorization, suggesting that the charge be amended to include (among other points) that the subcommittee "explore the issues surrounding the use of thesaurus-like subject referencing structures in bibliographic databases . . . and produce a position paper on the subject."²³ At its meeting at the 2000 Annual Conference, SAC discussed this proposal and decided to form a new subcommittee. The Subcommittee on Subject Reference Structures in Automated Systems (SRSAS), the third in this series of subcommittees, was appointed by the 2001 Midwinter Meeting.²⁴ The new subcommittee's charge stated that it should: "Explore issues related to subject reference structures in the OPAC environment. Develop a position paper to guide systems designers in presenting syndetic structures effectively."²⁵ In focusing on a position paper (which eventually became the twenty-six recommendations discussed in this paper) rather than direct communication with vendors, the new subcommittee approached the problem from a perspective suggested by SPSRRS in its *Final Report*: "it may be that building awareness of subject-referencing issues within the library community as a whole will ultimately reach the vendors more efficiently."²⁶

SRSAS, in discussing its charge at the 2001 Annual Conference, decided that the most effective approach would be to concentrate on what can be done with existing subject access tools, such as the LCSH or Medical Subject Headings (MeSH), and their established reference structures (BT, NT, RT). Subcommittee members initially mapped the conceptual territory to be covered by preparing reports on a variety of topics, including:

- uses of subject vocabularies and searching tools;
- ability to browse the structure of subject vocabularies;
- complex see and see also references;
- note fields in authority records;
- relationships between main headings and subdivisions;
- display of references among multiple subject vocabularies;
- genre and topical terms and reference structures;
- hypertext links related to the subject fields in bibliographic records;
- incorporation of reference structures in keyword searches of bibliographic records;
- names and titles as subjects;

- normalization and sort order;
- blind references and missing links;
- geographic subject headings;
- reference structures and limits by location; and
- vocabulary of display.

The reports described the issues associated with each topic and, when appropriate, included examples that illustrated how these issues are or might be addressed in existing systems. Subcommittee members and guests discussed the reports at the 2002 Midwinter Meeting. Based on the reports and subsequent discussions, the subcommittee formulated twenty-six recommendations for the utilization of subject reference structures in automated systems.²⁷ A summary of the recommendations also was presented at a program organized by SRSAS at the 2003 ALA Annual Conference.²⁸

Recommendations

The recommendations concentrate on maximizing the use of existing subject reference structures in automated systems and emphasize subject reference structures supported by MARC 21 authority and bibliographic records. The recommendations include the concepts of guiding users to preferred terms from synonyms (or approximate synonyms), and also guiding users who wish to narrow, broaden, or change the scope of an initial search. Although these recommendations are directed at library systems that use MARC 21 authority and bibliographic records, the recommendations also could be used in implementing other automated systems that use different metadata schemes.

Recommendations 1 through 24 are intended for system designers, for institutions making choices among systems, for implementing and customizing systems, and for requesting enhancements to existing systems. Recommendations 25 and 26 are aimed not at system designers and implementers, but at that portion of the library community responsible for setting policies and practices regarding the creation of MARC 21 authority records. The recommendations are grouped into four sections: (I) recommendations for providing access to reference structures; (II) recommendations for display of headings and reference structures; (III) recommendations for providing navigation within and among reference structures; and (IV) concerns for the future: recommendations for librarians for modification of existing library practices in the creation of subject reference structures. The recommendations and their justifications are given with examples illustrating the implementation of some of the recommendations in the appendix. Additional examples as well as discussions concerning implementation issues and problems can be found in the full subcommittee report.²⁹

Current State of Subject Reference Structures in Online Catalogs

Five automated library systems were surveyed by the authors of this paper to determine which of the twenty-four recommendations targeted at system vendors and users have actually been implemented. Recommendations 25 and 26 were not included in this survey because they are directed at librarians. The catalogs were from the following systems: Aleph500 (ExLibris [USA]), AMICUS (Library and Archives of Canada), Millennium (Innovative Information Systems), Unicorn (Sirsi), and Voyager (Endeavor Information Systems). Data for the survey were gathered through an examination of five online catalogs by the authors, in consultation with librarians who have implemented the systems.³⁰ Information also was gathered from presentations by representatives of the five systems at the 2003 SRSAS program.³¹ The results are shown in table 2. (In order to provide an overall view of which recommendations have been implemented, the specific systems are not identified, except as System A, System B, and so on.)

As can be seen from the table, the five systems are essentially at the same level of implementation. Most of the systems uniformly provide (with a few exceptions) some basic functionality, such as:

- Indexing and display of references from 4xx and 5xx fields; for example, see [from], see also [related, narrower and broader] references (recommendation 1).
- Hyperlinks to indexes, which include reference structures, from subject headings in bibliographic records (recommendation 5); and hyperlinks from displayed references (recommendation 23).
- Inclusion of names and titles in subject searches and indexes (recommendation 8).
- Identification of source vocabulary (recommendation 13); and in a display of subject headings, the number of records retrieved for each heading (recommendation 14).
- Display of complex “see” and “see also” references from 260 and 360 fields (recommendation 17).
- Browse subject searches (recommendation 22).

On the other hand, a number of important recommendations (involving more advanced and sophisticated functionality) have not been implemented by most of the systems. These include:

- Inclusion of authority records in keyword indexes (recommendation 2) and provision of access to subject references in keyword indexes (recommendation 3), which none of the systems currently provide.
- Use of punctuation and subfielding to provide meaningful displays of subject headings (recommendation 11), which none of the systems currently provide.
- Display of references to headings with 0 postings if the heading occurs only in a subdivided form (recommendation 19), which only two of the systems currently provide.
- Indexing and provision of references from 7xx linking entry fields in authority records (recommendation 24), which only one system currently provides.

Table 2. Implementation of the recommendations for subject reference structures by five automated systems.

| Recommendation | System A | System B | System C | System D | System E |
|------------------------|----------|----------|----------|----------|----------|
| 1 (Index 4XX fields) | Y | Y | Y | Y | Y |
| 1 (Index 5XX fields) | Y | Y | Y | Y | Y |
| 1 (Index 7XX fields) | N | E | Y | N | N |
| 1 (Display 260 fields) | Y | Y | N | Y | Y |
| 1 (Display 360 fields) | Y | Y | N | Y | Y |
| 2 | E | E | N | N | N |
| 3 | N | N | E | E | N |
| 4 | Y | Y | Y | Y | Y |
| 5 | Y | Y | Y | N | Y |
| 6 | Y | Y | N | N | Y |
| 7 | U | Y | Y | N | Y |
| 8 | Y | Y | Y | Y | Y |
| 9 | N | N | N | N | N |
| 10 | N | Y | Y | Y | Y |
| 11 | N | N | N | N | N |
| 12 | Y | P | Y | N | Y |
| 13 | N | U | Y | Y | Y |
| 14 | Y | Y | Y | Y | Y |
| 15 | Y | N | P | P | Y |
| 16 | N | P | P | Y | Y |
| 17 | Y | P | N | Y | Y |
| 18 | N | N | N | N | Y |
| 19 | Y | Y | U | N | U |
| 20 | U | Y | U | Y | Y |
| 21 | N | Y | N | Y | N |
| 22 | Y | Y | Y | Y | Y |
| 23 | Y | Y | Y | Y | Y |
| 24 | N | E | Y | N | N |

Note: Y=Yes, system has recommended functionality; N=No, system does not provide recommended functionality; P=system provides partial functionality, but not all of the functionality recommended; E=forthcoming enhancement will provide functionality; U=functionality undetermined. For Recommendation 1, the indexing and/or display of each field or group of fields is indicated.

Some of the vendors are planning to enhance their systems in order to provide some of the additional functionality specified in the recommendations. These systems are identified in table 1 by the code E, which indicates an enhancement that a vendor is committed to and is actively developing for a version to be released within the next few years. Specifically, two vendors are planning to provide keyword indexing of authority records in their systems (recommendation 2), two other vendors are planning to introduce keyword-in-heading searches that provide access to reference structures (recommendation 3), and one vendor is planning to index the 7XX linking entry fields in authority records and generate equivalent term references from these fields (recommendation 24).

Conclusions

As stated earlier, building awareness in the library community and communicating with system vendors about subject referencing issues was a major problem identified by SPSRRS. The creation of the document containing the recommendations for implementing subject reference structures has the potential to solve this problem. Library and Archives of Canada and the four vendors that participated in the 2003 SRSAS program have received copies of the subcommittee's Final Report. At that program, the representatives discussed how some of the recommendations have been or will be implemented in their respective systems.

Also as noted above, one of the intended uses of the recommendations is to assist users in the formulation of enhancement requests for automated systems. This has already begun, as the recommendations have been used for developing enhancement requests for two systems. Users of other systems may choose to do likewise. Furthermore, current users of automated systems will use the recommendations to implement fully all of the functionality that is present in their systems.

The survey of the five automated systems shows that considerable progress has been made in the utilization of subject references structures in online catalogs since the formation of the first SAC subcommittee in 1995. However, much still needs to be done in order to exploit the power of controlled vocabularies and their reference structures. SRSAS's recommendations can be used as the starting point for further developments in the use of subject reference structures.

References and Notes

1. F. W. Lancaster, *Vocabulary Control for Information Retrieval*, 2d ed. (Arlington, Va.: Information Resources Pr., 1986); Thomas Mann, *Library Research Models: A Guide to Classification, Cataloging and Computers* (New York: Oxford Univ. Pr., 1993); and Arlene G. Taylor, "On the Subject of Subjects," *Journal of Academic Librarianship* 21, no. 5 (Nov. 1995): 486–91.
2. C. P. R. Dubois, "Free Text vs. Controlled Vocabulary: A Reassessment," *Online Review* 11, no. 4 (Aug. 1987): 243–52. Dubois summarizes the research done on using keyword indexing and controlled vocabularies for subject retrieval.
3. Ray R. Larson, "Between Scylla and Charybdis: Subject Searching in the Online Catalog," *Advances in Librarianship* 15 (1991): 178–90; Christine L. Borgmann, "Why Are Online Catalogs Still Hard to Use?" *Journal of the American Society for Information Science* 47, no. 7 (July 1996): 493–502; Joseph R. Mathews, "Time for New OPAC Initiatives: An Overview of Landmarks in the Literature and Introduction to WordFocus," *Library Hi Tech* 15, no. 1/2 (1997): 111–14; and Thomas A. Peters, "Why Smart People Fail: An Analysis of the Transaction Log of an Online Public Access Catalog," *Journal of Academic Librarianship* 15, no. 5 (Nov. 1989): 267–72.
4. F. H. Ayres, "Authority Control Simply Does Not Work," *Cataloging & Classification Quarterly* 32, no. 2 (2001): 51–54.
5. Jane Greenberg, "Reference Structures: Stagnation, Progress, and Future Changes," *Information Technology and Libraries* 16, no. 3 (Sept. 1997): 108–12.
6. Marguerite E. Horn, "Garbage in, Refuse and Refuse Disposal Out," *Library Resources & Technical Services* 46, no. 3 (July 2002): 98–102; Alexis J. Jamieson, Elizabeth Dolan, and Luc Declerck, "Keyword Searching vs. Authority Control in an Online Catalog," *Journal of Academic Librarianship* 12, no. 5 (Nov. 1986): 277–83.
7. Association for Library Collections & Technical Services, Subcommittee on Subject Reference Structures in Automated Systems, [Final Report] *Recommendations for Providing Access to, Display of, Navigation within and among, and Modifications of Existing Practice Regarding Subject Reference Structures in Automated Systems* (Chicago: ALA, 2003). Accessed June 4, 2004, www.ala.org/ala/alctscontent/catalogingsection/catcommittees/subjectanalysis/subjectreference/RefStructuresFinal.doc.
8. Members of the SAC Subcommittee on Subject Relationships/Reference Structures were Gregory Wool (chair), Jane Greenberg, Harriette Hemmasi, Patricia Kuhr, Dee Michel, Steven Riel, Gary Strawn, and Lynn El-Hoshy (Library of Congress consultant).
9. Association for Library Collections & Technical Services, Subcommittee on Subject Relationships/Reference Structures, *Final Report*. (Chicago: ALA, 1997). Accessed June 4, 2004, www.ala.org/ala/alctscontent/catalogingsection/catcommittees/subjectanalysis/subjectrelations/finalreport.htm.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.
14. Ibid.
15. Members of the SAC Subcommittee to Promote Subject Relationships/Reference Structures were Gregory Wool (chair), Kristin Gerhard, Stephen Hearn, Claudia Hill, Heidi

- Lee Hoerman, Gerard McKiernan, Steven Riel, and Arlene G. Taylor.
16. Association for Library Collections & Technical Services, Subcommittee to Promote Subject Relationships/Reference Structures, [Final Report] (Chicago: ALA, 2000). Accessed June 4, 2004, www.ala.org/ala/alctscontent/catalogingsection/catcommittees/subjectanalysis/promotesubjectre/FinalReport.doc.
 17. *Oh Say, Can We See? See Also? Subject Referencing Possibilities in OPACs*, a program organized by the Subcommittee to Promote Subject Relationships/Reference Structures, Subject Analysis Committee, Association for Library Collections & Technical Services, and held during the American Library Association Annual Conference, New Orleans, June 26, 1999. The program was moderated by Heidi Lee Hoerman and featured speakers Thomas Mann, "Referencing Considerations within OPACs"; Joseph Matthews, "Subject Referencing in Next-Generation OPACs"; Kristin Gerhard, "The Impact of Subject Cross-References on OPAC Search Results"; and Dee Michel, "Getting What We Want: the Politics of Interface Change."
 18. Michel, "Getting What We Want."
 19. Subcommittee to Promote Subject Relationships/Reference Structures, [Final Report].
 20. Ibid.
 21. Ibid.
 22. Ibid.
 23. Ibid.
 24. Members of the SAC Subcommittee on Subject Reference Structures in Automated Systems were Sara Shatford Layne (chair), Diane Dates Casey, Michael D. Colby, Heidi Lee Hoerman, Tony Olson, Michelle Martin Robertson, Arlene G. Taylor, and Bruce M. Trumble.
 25. Association for Library Collections & Technical Services, Subcommittee on Subject Reference Structures in Automated Systems, Web site, Accessed June 4, 2004, www.ala.org/ala/alctscontent/catalogingsection/catcommittees/subjectanalysis/subjectreference/subjectreference.htm.
 26. Subcommittee to Promote Subject Relationships/Reference Structures, [Final Report].
 27. Subcommittee on Subject Reference Structures in Automated Systems, [Final Report]. These are the recommendations referred to in the Introduction to this paper.
 28. *Getting the Most out of Subject References in the Online Catalog: Better than It Used to Be?* a program organized by the Subcommittee on Subject Reference Structures in Automated Systems, Subject Analysis Committee, Association for Library Collections & Technical Services, and held during the American Library Association Annual Conference, Toronto, June 21, 2003. The program was moderated by Tony Olson. In her talk, "Using Subject Reference Structures," Sara Shatford Layne presented a summary of the subcommittee's recommendations, with some examples of their application. Pam Armstrong, from the Library and Archives of Canada (L&AC), in her talk "Navigating Bilingual Subject Headings in AMICUS," discussed L&AC's policy of including headings from three different subject heading systems: Library of Congress Subject Headings, Canadian Subject Headings, and Répertoire de vedettes-matière in their bibliographic records, and the provision of references linking equivalent headings from the three systems in the L&AC's online catalog, AMICUS. Representatives from four vendors of automated systems then gave brief presentations on both the current use and future development of subject reference structures in their systems. The representatives were: Shelley Hofstetler, Endeavor Information Systems, "Subject References in Voyager"; Michael Kaplan, ExLibris (USA), "Subject References in Aleph500"; Claudia Conrad, Innovative Interfaces, "Subject References in Millennium"; Berit Nelson, Sirsi, "Subject References in Unicorn."
 29. Subcommittee on Subject Reference Structures in Automated Systems, *Final Report*.
 30. Shannon Hoffman, e-mail to Tony Olson, Feb. 25, 2004; and Bruce M. Trumble, e-mail to Tony Olson, Feb. 27, 2004.
 31. Armstrong, "Navigating Bilingual Subject Headings in AMICUS"; Hostetler, "Subject Access in Voyager"; Kaplan, "Subject References in ALEPH500"; Conrad, "Subject References in Millennium"; Nelson, "Subject References in Unicorn."

Appendix

Recommendations and Justifications, with Selected Examples Showing Application

Part I: Recommendations for Providing Access to Reference Structures

1. In addition to the authorized headings in authority records (MARC 21 1XX fields), all references and linking fields in authority records should be available for indexing and/or display, including see-references (both simple and complex), see-also-references (both simple and complex), and linking fields. The relevant MARC 21 fields are: 1XX, 260, 360, 4XX, 5XX, 7XX.

Reasons: All headings and references can be used to provide access to reference structures

Example: A topical subject authority record showing the fields to be indexed and/or displayed:

150: #a Cancer

360: #i subdivision #a Cancer #i under individual organs and regions of the body, e.g. #a Foot—Cancer

450: #a Cancers

450: #a Carcinoma

450: #a Malignancy (Cancer)

450: :+a Malignant tumors

550: :+w g +a Tumors

750: 2:+a Neoplasms

2. If a keyword-in-record search of bibliographic records also matches a heading or reference in an authority record, provide an option for the catalog user to “jump” to the appropriate place in an alphabetical display of headings that includes reference structures. Implicit in this recommendation is that a keyword search, while acknowledging the user’s initial intention by searching for and returning a results list of bibliographic records, simultaneously searches authority records and provides the user with the option to alter his or her search strategy.

Reasons: Has the potential for improving both precision and recall through the use of controlled vocabulary without forcing the user to select a search that uses only controlled vocabulary.

Example: A keyword search of bibliographic records is performed using the term *blimps*.

Results: three bibliographic records are retrieved, two have the term in the title, one has the term in a note. However, the system also suggests another term (the preferred term) to search on, and a search on this term, *Airships*, will retrieve 63 records. The reference to the preferred term comes from an LCSH authority record. One option (of several) for displaying the results of the keyword search is given below.

| Record # | Full Title | Date |
|----------|---|------|
| 1 | For additional information search for <u>Airships</u> | |
| 2 | Blimps & U-boats : U.S. Navy airships in the battle of the Atlantic / J. Gordon Vaeth. | 1992 |
| 3 | Blimps / Roxie Munroe | 1989 |
| 4 | Wings : the early years of aviation / Richard Rosenblum. [blimps appears in a note in the record for this title] | 1980 |

3. Provide a keyword-on-heading (a.k.a. keyword-in-heading, or keyword subject browse) search of subject headings from bibliographic and authority records that results in an initial display of headings (including reference structures) rather than of bibliographic records.

Reasons: Provides browsable access to reference structures for users who know that they want to consult a list of headings but may not have knowledge of initial words or word order in those headings, or who want to see all the headings that contain certain terms in order to make an informed selection among them.

Example:

Search term: **tragicomedy**

Results:

| Records | Headings |
|---------|---|
| 0 | English drama (Tragicomedy) <u>Broader term(s)</u> |
| 2 | English drama (Tragicomedy)—History and criticism |
| 55 | Tragicomedy <u>Broader term(s)</u> <u>Narrower term(s)</u> |
| 11 | Tragicomedy —History and criticism. |
| 1 | Tragicomedy —History and criticism—Congresses. |
| 1 | Tragicomedy —Study and teaching. |

4. Provide a left-anchored (a.k.a. left-justified) search of subject headings and reference structures that results in a display of headings (including reference structures) rather than bibliographic records. [See also Recommendation 12 for display.]

Reasons: Provides browsable access to reference structures for users who know the beginning word or words of a heading.

Example: A browse search of the LC Subject Headings Index using the search string “Tumors” could produce the following results list (first page shown).

Records Headings

- 3 Tumor proteins.
 Broader term(s): [Proteins](#); [Tumor markers](#)
 Narrower term(s): [Alpha fetoproteins](#); [\[more\]](#)
- 107 Tumors.
 Broader term(s): [Pathology](#)
 Related term(s): [Cysts \(Pathology\)](#); [Oncology](#)
 Narrower term(s): [Adenoma](#); [\[more\]](#)
 Also, subject headings beginning with the word Tumor; and subdivision Tumors under individual organs and regions of the body, e.g. Foot—Tumors
- 14 Tumors—Abstracts.
 1 Tumors—Animal models.
 1 Tumors—Animal models—Atlases.
 4 Tumors—Atlases.
 1 Tumors—Blood-vessels.

5. In a display of a single bibliographic record, hyperlink subject headings to an alphabetical display of headings that includes reference structures.

Reasons: A hyperlink that retrieves only those bibliographic records that match a particular heading fails to show the searcher any variations of the heading (e.g., with different subdivisions) or any further references that may be useful. Both precision and recall are better served by hyperlinking to the alphabetical display of headings. It is more useful to take the user to the appropriate reference structure, where options can be explored, than to take the user directly to other bibliographic records.

6. Make it possible for users to limit searching to a particular subject heading system while still incorporating see references to guide the user to preferred terms, and incorporating or linking to the reference structures of that system to guide the user in broadening, narrowing, or changing the scope of a search.

Reasons: Conflicts exist among subject heading systems with different terms being selected for the same concept; limiting to a particular system increases precision in large databases by permitting the user to select the vocabulary most suited to his or her needs (e.g., MeSH for medical searchers, LCSH for more general searchers, LC Children's for younger users) without sacrificing access to reference structures.

7. Incorporate see-references from, and provide links to, reference structures from multiple subject heading systems in a single display of headings, making it possible for users to see an array of possibilities before making a selection. [See also Recommendation 13 concerning the labeling of headings from multiple systems.] (Note: As the number of subject heading systems included in a single display increases, the importance of having concise information in that display also increases.)

Reasons: The user may not have enough information to make an initial selection of subject heading system (e.g., MeSH or LCSH?), but may instead need to see the possibilities before determining which paths to follow.

Example: This example shows the application of Recommendations 7 and 13.

Search term: Arm

Results:

(LC = Library of Congress subject; MeSH = Medical subject)

Records Headings

- 16 Arm – (LC) [[Heading information](#)]
 12 Arm – (MeSH) [[Heading information](#)]
 ARM - (MeSH)
 See: [Association of Radical Midwives \(MeSH\)](#) [[Heading Information](#)]
- 1 Arm—abnormalities – (MeSH) [[Heading information](#)]
 1 Arm—Abnormalities. (LC)
 1 Arm—Amputation – (LC) [[Heading information](#)]
 1 Arm—Amputation—Handbooks, manuals, etc. - (LC)
 2 Arm—anatomy & histology (MeSH) [[Heading information](#)]

1 Arm—congresses (MeSH)

8. Make it possible to incorporate and link to name (including personal, corporate, and geographic names) and title reference structures in subject indexes that include these entities.
Reasons: These entities can serve as subjects, and access to them is improved by inclusion of reference structures. In the old dictionary catalogs this was not a problem; it became a problem as soon as the shift to divided catalogs occurred.
9. Make it possible to apply limits but still provide access to the appropriate reference structures; and for each heading displayed, indicate the number of bibliographic records that have that heading *and* that conform to the limits applied.
Reasons: If the user can make use of and have access to *either* the reference structures, *or* the limiting features of a system, but not both simultaneously, it forces the user to make a difficult choice. Either option sacrifices the advantages of the other. Using reference structures without limiting functionality diminishes precision; using limiting without reference structures diminishes recall.

Part II: Recommendations for Display of Headings and Reference Structures

10. Because the display of headings *is* a kind of reference structure, preserve punctuation and capitalization in the display of headings (i.e., do not normalize the display).
Reasons: Punctuation and capitalization clarify meaning in headings and their reference structures.
11. Use the punctuation and subfielding present in controlled vocabularies to create meaningful arrays of headings.
Reasons: The browsable display of subject headings, arranged not just alphabetically but also following the syntactic structure of the terms, is itself a form of reference structure, as it brings similar terms together more effectively than do normalized alphabetical displays. As with the display of broader, narrower, and related terms, it makes both the clarification and the redirection of a subject quest easier.
Example: This shows the application of recommendations 10 and 11. Note the retention of punctuation and capitalization; and the use of punctuation and subfielding to create a meaningful display

Children
 Children—Age determination
 Children—Crimes against
 Children—Diseases
 Children—Research
 Children—Africa, Southern
 Children—Italy
 Children—Tennessee
 Children, Adopted
 See Adopted Children
 Children, Blind
 Children, Prehistoric
 Children (Christian theology)
 Children (International law)
 Children (Roman law)
 Children as consumers
 Children in motion pictures
 Children of artists

12. In a search resulting in a left-anchored list of headings, display at least one term immediately preceding the term that most closely matches the search. [See also recommendations 4 and 22].
Reasons: Providing a display of close matches is a form of reference structure. Many closely related headings share the same opening wording and are thus alphabetically adjacent. It makes it obvious to the user that there are preceding headings; in other words, it makes it clear that they are indeed in an index; and in the correct place in that index.
Example: This shows the application of Recommendations 12 and 22. Recommended display resulting from a browse

search on *power semiconductors*:

Power semiconductor industry

Power semiconductors

Power series

Power series rings

Power shovels

Power shovels—Electric driving

Power spectra

Power steering

13. When see references from different vocabulary sources (e.g., MeSH and LCSH) or having different functions (e.g., topical subject and form/genre) are displayed together, identify the source or function. [See also Recommendation 7]
Reasons: It is confusing to have almost identical or conflicting references displayed without any qualification that explains their presence.
Example: See the example for Recommendation 7.
14. Display number of postings associated with a heading.
Reasons: Displaying the number of postings enables the user to see whether broadening or narrowing the search through the use of the subject reference structures is desirable.
15. Display broader, narrower, and related terms; group broader terms together, related terms together, and narrower terms together. Display the groups in the following order: broader, related, narrower.
Reasons: Users may wish to broaden, change, or narrow the scope of their queries. Displaying just one or two categories of related terms restricts the freedom of the user to take advantage of these different methods of altering the scope of a query.
16. Identify broader, related, and narrower terms as broader, related, and narrower.
Reasons: Displaying related terms is more useful if the nature of the relationship is indicated explicitly.
Example: This shows the application of Recommendations 15 and 16.

Mycology

| | |
|-------------------|-------------------------|
| Broader term(s): | <u>Botany</u> |
| | <u>Microbiology</u> |
| Related term(s): | <u>Fungi</u> |
| Narrower term(s): | <u>Lichenology</u> |
| | <u>Medical mycology</u> |
| | <u>Mycologists</u> |

17. Make it possible for an institution to choose to display complex see and see also references “up front”—specifically the 260 and 360 fields. Also, as an option, make it possible to display general notes (e.g., 667, 680).
Reasons: These complex references are useful and give necessary explanations to users of the catalog
Examples:

Ecology

See also subdivision Environmental aspects under subjects, e.g. Agricultural chemicals—Environmental aspects; Nuclear power plants—Environmental aspects; and headings beginning with the word Ecological

Zaire

Subject Usage: This heading is not valid for use as a subject. Works about this place are entered under Congo (Democratic Republic)

18. Systems should offer institutions an array of options for the placement of references (BT, RT, NT, Complex see references, 7XX references) relative to headings.
Reasons: The decision to select a particular option will depend on the size and complexity of the catalog and the perceived needs of the users of that catalog.

19. Make it possible to display reference structures with 0 postings if a heading exists in the database in subdivided form only (i.e., make suppression of reference structures with 0 postings optional and/or dependent on the existence of a given heading whether subdivided or alone)

Reasons: If a main heading exists only in subdivided form, the references to that main heading are still useful to users of the catalog.

Example:

Records Headings

0 Luxemburg (City)

See: Luxembourg (Luxembourg)

The “see” reference takes the user to:

Records Headings

0 Luxemburg (Luxembourg)

1 Luxemburg (Luxembourg)—Buildings, etc.

3 Luxemburg (Luxembourg)—History

Note that the see reference would be appropriate, since the heading has associate records in its subdivided form.

20. Missing links in multi-level links: make it possible to display 0-posting headings if any see-also references associated with the headings have postings.

Reason: Unless these 0-posting headings are displayed, a user of a particular catalog may be unable to navigate to broader or narrower headings that are of interest. Headings with 0-postings are sometimes needed in order to link two terms that do have postings, if one term is a broader term for the 0-postings heading and another term is a narrower term for that 0-postings heading.

Example: A library has some bibliographic records with the heading, Soil science; and some bibliographic records with the heading, Soil conservation; but no bibliographic records with the heading, Soil management. It would still be desirable to have a browse search on the term “Soil management” result in a display like the following:

Records Headings

0 Soil management

Broader term(s): Soil science

Narrower term(s): Soil conservation

21. In the cases where there are non-unique see-references, display all the possibilities.

Reasons: See references are not necessarily unique, and the user should be given all the possible choices in order to make an informed selection.

Example:

Labor and laboring classes: *see* Working class
 Labor movement
 Labor

Part III: Recommendations for Providing Navigation within and among Reference Structures

22. Make it possible for the user to browse the entire vocabulary, not just the elements of the vocabulary that are an exact match to the user’s search [See also recommendation 12].

Reasons: Adjacency is a form of reference structure; often, adjacent words or terms are similar in meaning.

Example: see the example for Recommendation 12.

23. Provide hyperlinks from displayed references; these hyperlinks should take the user to the appropriate place in a headings display (i.e., a display that includes the reference structure).

Reasons: A hyperlink that goes directly to bibliographic records fails to show the searcher any subdivided instances of the hyperlinked heading, or any further references to narrower, broader, or related terms.

24. Make use of references between and among subject heading systems (e.g., LCSH and MeSH; Canadian Subject Headings and Répertoire de vedettes-matière; etc.). These references are found in the 7XX fields in subject authority records.

Reasons: Users searching in online catalogs with multiple subject heading systems should be directed to equivalent terms in all systems.

Examples:

Asian Canadians (CSH)

Related terms:

Chinese Canadians (CSH)

Japanese Canadians (CSH)

South Asian Canadians (CSH)

Equivalent terms:

Canadiens d'origine asiatique (RVM)

Aviation (MeSH)

Broader terms:

Transportation (MeSH)

Narrower terms:

Aircraft (MeSH)

Space Flight (MeSH)

Equivalent terms:

Aeronautics (LCSH)

Part IV: Concerns for the Future: Recommendations for Librarians for Modifications of Existing Library Practices in the Creation of Subject Reference Structures

25. Encourage the use of 7XX fields in subject authority records when a library employs more than one subject heading system.

Reasons: This will enable systems to use these fields for the generation of references. [See also recommendation 24].

26. Address the problem of reference structures for geographic names that are no longer valid for use as subjects by [i] creating separate subject authority records for geographic names that **can** be used as both subjects and corporate names; or [ii] by implementing the coding already present in the MARC 21 authority format that indicates whether a reference is valid for subjects and/or names

Reasons: The current practice makes it extremely difficult for systems to provide the appropriate reference structure for both subject and descriptive usage of geographic names.

Factors Influencing Competency Perceptions and Expectations of Technical Services Administrators

Norm Medeiros

This study investigates the factors that influence perceived and expected daily task competencies for technical services administrators; that is, the competencies technical services administrators claim to possess (perceived) and those they believe they ought to possess (expected) in the areas of acquisitions, cataloging, and serials. For the purposes of this paper, a technical services administrator is defined as one who oversees, at a minimum, the acquisitions, cataloging, and serials units in his or her library. The author surveyed 116 technical services administrators via e-mail in fall 2003, receiving a response rate of 54 percent and an acceptable use rate of 53 percent. The survey was designed to correlate perceived and expected competencies with: (1) an incumbent's professional background; (2) tenure in current position at present institution; and (3) size of technical services unit as measured in full-time equivalents (FTE). The study concludes that incumbent tenure and size of the technical services unit affect both perceived and expected competencies, with the latter having a greater effect. Professional background affects competency possession, but has only a marginal effect on competency expectation. The findings reveal that administrators with ten or more years in their current positions who have noncataloging backgrounds and at least ten FTE in their technical services units are least likely to know the daily procedures of their technical services units. Administrators with ten or more years in their current positions who have cataloging backgrounds and at least ten FTE in their technical services units are least likely to feel they ought to know the daily procedures of their technical services departments. These administrators are also least likely to have responsibilities that fall outside of technical services.

In his excellent essay, "Leadership versus Management in Technical Services," Donald Riggs contends, "Leadership begins where management ends."¹ Riggs juxtaposes a technical services *manager* who is concerned with procedural "know-how" and a technical services *leader* who is concerned with procedural "know-why." Riggs concludes, "Leaders, not managers, will move technical services into the twenty-first century."² The study that follows is the result of the author's interest in learning what perceptions counterparts held towards their roles, specifically how much hands-on know-how they possessed and believed

Norm Medeiros (nmedeiro@haverford.edu) is Coordinator, Bibliographic and Digital Services, Haverford (Pa.) College.

they should possess to successfully administer their departments. This study is intended as only a *prima facie* glimpse of the responsibilities and attitudes of those surveyed. Speculations based on the survey results are meant to encourage further investigation in this area.

Literature Review

Besides Riggs' essay, surprisingly few papers have been published within the last twenty years that address technical services management, and only a smattering of these that pertain to the role of the administrator. As one would expect, many of these management papers focus on organization of technical services, especially due to changes resulting from automation. Boissonnas offers such a piece, which describes the changes to Cornell's technical services organization.³ Boissonnas discusses Cornell's self-study that eventually yielded a less-hierarchical organization. The restructuring resulted in greater delegation to and authority for department heads, which served to increase the flexibility of the technical services unit as a whole. Manning describes how differing organizational structures affect a manager's accomplishments.⁴ Manning details the technical services organizational charts for various university and public libraries, illustrating the many ways divisions can be organized to achieve their goals. Manning relates management with organization, and recognizes that planning, communication, and specialized knowledge are important criteria for a technical services administrator. Bloss and Lanier point to flexibility as a leading cause of reorganization within technical services departments.⁵ They argue that middle managers soon will have greater influence for coordinating activities between departments, offering staff mentorship, and providing new ideas to their units, rather than their traditional procedural responsibilities. Allen and Williams point to technology as the driving force behind technical services reorganizations.⁶ They consider physical changes necessitated by desktop computers as a force behind changing workflows. As in the articles mentioned earlier, these authors consider flexibility a key resultant from such organizational changes, though they do not state how these changes affect the supervisory role of the technical services head.

Gleason and Miller argue for a move towards a "technical services coordinator" rather than the more traditional "assistant director for technical services."⁷ The authors contend that positions of assistant director unnecessarily mirror roles played by the director. Further insinuating another management layer between unit heads and decisions is wasteful and unnecessary, the authors maintain, especially given management theory that touts low-level decision-making as being most successful. A technical

services coordinator is more apt to keep the bigger picture in mind, making sure interdepartmental processes flow effectively. The authors further argue that organization and facilitation skills are more important than a strong technical services background, as such a background could cause the coordinator to intrude upon department head decisions. Younger and Gapen offer a historic perspective on technical services divisions and, like Gleason and Miller, note the differences between coordination and direction.⁸ They contend that libraries are moving away from a hierarchical centralization of traditional technical services departments under an associate director and into organizations where the department heads are vested with authority for their units. Accepting Gleason and Miller's and Younger and Gapen's contentions, what competencies are appropriate for a technical services administrator today?

Research Method

The author distributed an electronic survey to 116 technical services administrators during fall 2003 (see appendix). The survey response rate was 54 percent, with an acceptable use rate of 53 percent. Survey recipients were chosen at random from the *American Library Directory*.⁹ Surveys were distributed to an even number of administrators at large (more than 15,000 students), medium-to-large (10,000 to 14,999 students), small-to-medium (5,000 to 9,999 students), and small (fewer than 5,000 students) institutions. The survey scope was limited to three traditional technical services areas: acquisitions, cataloging, and serials. The survey covered:

- the respondent's tenure as technical services administrator at his or her present institution;
- the respondent's professional background prior to becoming a technical services administrator;
- the respondent's ability to perform daily tasks in each of the three departments;
- the degree to which the respondent felt he or she *should* have the knowledge to perform daily tasks in these units;
- additional responsibilities the respondent held in the library (eight options were listed: archives and preservation, bibliographic instruction, collection development, computer hardware and software administration, digital projects, reference desk, Web development, and other); and
- comments on the changing nature of the respondent's position.

The survey was designed to measure the effects of professional background, incumbency tenure, and depart-

mental staffing on perceived and expected competencies. The rate of other responsibilities was measured, though considered neither an independent nor dependent variable since knowing whether these rates were causal or resultant cannot be readily determined.

An inherent problem with the survey discovered during analysis of the results was the lack of questioning as to why a respondent felt she ought to possess procedural competency in a given area. Since it is possible, likely even, that some respondents answered affirmatively because they do not have a professional librarian in a particular department, an adjusted expectation rate was included in the results. The adjusted expectation removes affirmative answers from the equation when a department does not have a professional FTE within it. As an example, if ten of thirty respondents claim they ought to know the daily procedures of the serials department, and five of these ten affirmative-responding administrators do not have a professional FTE in their serials departments, these five affirmative results are excluded as part of the adjusted measurement. The result, in this example, is an adjusted expectation rate of 20 percent (five of twenty-five) compared to an unadjusted rate of 33 percent (ten of thirty). Clearly, future studies must seek to learn the reasons behind expectation responses.

Results

The responses reflect the equitable demographic distribution of the survey. Of the sixty-one acceptable responses, twenty were from large institutions, ten from medium-to-large institutions, eleven from small-to-medium institutions, and twenty from small institutions. The results draw on three independent variables: professional background, incumbent tenure as technical services administrator at his or her current institution, and combined number of FTE in the respondent's technical services division. The rate of other library responsibility was measured. As mentioned above, an adjusted expectation rate based on availability of at least one professional FTE in each department was also included. This adjustment takes into account the possibility a technical services administrator would express expectation of daily task competency to offset not having a professional librarian in a particular department.

The first study compared the perceived and expected competencies of technical services administrators with a cataloging background versus those with a background other than in cataloging (see table 1).

The perceived and expected competency rates for acquisitions show little difference. After adjustment, administrators with a noncataloging background expect to have significantly greater competency, perhaps because 34 percent of these administrators have a background in

acquisitions. By comparison, 52 percent of respondents identified themselves as having a cataloging background, 7 percent identified themselves as having a serials background, and 7 percent identified themselves as having a background outside of technical services. Perceived and expected competency values are greatest in the area of cataloging. Even after adjustment, 41 percent of administrators with a cataloging background felt they ought to have daily task competencies, revealing perhaps an ownership urge for cataloging-related activities in their libraries. In the area of serials, administrators with a cataloging background have greater competency in this area, perhaps due to cross pollination of serials and cataloging. The adjusted expectation rates, however, are fairly equal between administrators with cataloging and noncataloging backgrounds.

The overall perceived competency rate for administrators with cataloging backgrounds is significantly greater than for administrators with noncataloging backgrounds, attributable to the very high perceived competency rate (81.25 percent) in the area of cataloging. Even though the majority of administrators with noncataloging backgrounds have backgrounds in acquisitions, the same high perceived competency rate does not exist in the acquisitions area. This may mean that administrators with a cataloging background retain and continue to develop their cataloging skills at a level appropriate for front-liners, whereas the same may not be true for administrators with an acquisitions background. The overall expected competency rates are much closer for the noncataloging and cataloging backgrounds, and the adjusted rates are closer still. With the exception of computer hardware and software administration, technical services administrators with noncataloging backgrounds are more involved in other library operations. Such involvement outside of technical services may encumber more of their time, leaving less to apply toward the daily tasks of their technical services units. This involvement may be one cause for the lower perceived competency rates for administrators with noncataloging backgrounds when compared to those with cataloging backgrounds.

The second study compared perceived and expected competencies of respondents with ten or more years as technical services administrator at their current institutions, versus those administrators with fewer than ten years of tenure as administrator at their current institutions (see table 2).

Administrators with fewer than ten years of experience in their current positions expressed greater perceived and expected competencies for tasks within each of the three departments. One wonders if this greater competency percentage is attributable to these administrators being more recently removed from the trenches and, therefore, still maintaining skill sets even after moving into their current administrative positions. Alternatively, perhaps the

administrators with more than ten years of experience recognize a need on their part to remove themselves from the daily tasks of their units in order to focus on other issues. Since a number of respondents indicated that personnel and human resources issues were a significant source of time expenditure for them, these more senior administrators are more likely to have such responsibilities placed on them. Curiously, the rate of other responsibility was a bit higher for administrators with fewer than ten years as technical services administrator, perhaps substantiating claims of a generalist trend among newer librarians.

The third study compared the perceived and expected competencies of technical services administrators with ten or more FTE in their divisions versus those administrators with fewer than ten FTE in their divisions (see table 3).

The contrast between these two groups is stark, though not surprising. With the exception of the adjusted serials expectation rate, administrators with fewer than ten FTE in their technical services units possessed considerably greater daily task competency and felt they ought to possess such competency. The fewer staff to

which duties can be delegated no doubt forces technical services administrators from smaller libraries to maintain more hands-on expertise. These administrators are no less active in nontechnical services areas in their libraries when compared to administrators who oversee technical services units with ten or more FTE.

Examining responsibility rates for activities outside of traditional technical services areas reveals that administrators at smaller institutions as a group are more actively involved in collection development and reference work, whereas administrators at larger institutions as a group are more actively involved in digital initiatives, archives and preservation, and Web development.

Discussion

The comments of numerous respondents indicate that technical services administrators are spending significantly more time on management issues in their libraries today than in years past. Some of the comments that indicate this

Table 1. Professional background

| | Noncataloging (%) | Cataloging (%) |
|--|-------------------|----------------|
| Perceived competency of acquisitions daily tasks | 51.72 | 53.13 |
| Expected competency of acquisitions daily tasks | 37.93 | 34.38 |
| Adjusted expectation based on professional FTE in acquisitions dept. | 31.03 | 18.75 |
| Perceived competency of cataloging daily tasks | 55.17 | 81.25 |
| Expected competency of cataloging daily tasks | 31.03 | 43.75 |
| Adjusted expectation based on professional FTE in cataloging dept. | 27.59 | 40.63 |
| Perceived competency of serials daily tasks | 51.72 | 59.38 |
| Expected competency of serials daily tasks | 27.59 | 31.25 |
| Adjusted expectation based on professional FTE in serials dept. | 20.69 | 15.63 |
| Overall perceived competency rate | 52.87 | 64.58 |
| Overall expected competency rate | 32.18 | 36.46 |
| Overall adjusted expected competency rate | 26.44 | 25.00 |
| Other responsibilities | | |
| Archives and preservation | 27.59 | 18.75 |
| Bibliographic instruction | 17.24 | 15.63 |
| Collection development | 68.97 | 56.25 |
| Computer hardware and software administration | 31.03 | 34.38 |
| Digital initiatives | 24.14 | 18.75 |
| Reference desk | 37.93 | 28.13 |
| Web development | 20.69 | 18.75 |
| Other | 34.48 | 28.13 |
| Rate of other responsibilities | 32.76 | 27.35 |

trend are: "My position has become much more managerial"; "More time is devoted to working upward with library administrators"; and "The primary change has been less involvement in operations and more in administration."

Technology is also noted as a reason for a decline in daily task competencies. A number of respondents commented on the ways technology has left them less knowledgeable about the daily work in their units. Some of these comments are: "Technology has made jobs in cataloging, acquisitions, and serials much more specialized"; "Computerization has led me to become less knowledgeable in the details of day to day procedures"; and "Most tasks are now computer-related and it is very time-consuming trying to keep up."

Given these comments, one can infer administrators with ten or more years in their current positions have significant managerial responsibilities that often take them away from the daily work of their unit. More senior administrators who are also among the subgroup having units with ten or more FTE have likely vested responsibility with department heads in order to free time towards managerial

needs. Thus, little need exists for these administrators to maintain task competency. Moreover, since task competency requires proficiency with ever-changing technologies, it may not be a stretch to believe that less senior administrators are more familiar with these technologies and, as a result, are better able to maintain daily task competencies. Equally important to this investigation are administrators' views on whether they ought or ought not possess departmental task competencies. To this end, professional background does not appear to be a factor in expected competency. Position tenure and FTE clearly do affect expected competencies, with the latter being a more significant factor. Administrators with ten or more years in their positions may, by this point in their tenure, have assumed administrative responsibilities within their libraries or campuses or both that necessarily require them to spend less time on the daily activities of their technical services units. These administrators, who have sufficiently large technical services units, may recognize the value in delegating responsibility to department heads. Administrators with fewer than ten years in their positions, on the other hand,

Table 2. Tenure as technical services administrator at present institution

| | At least ten years (%) | Fewer than ten years (%) |
|--|------------------------|--------------------------|
| Perceived competency of acquisitions daily tasks | 50.00 | 54.29 |
| Expressed expected competency of acquisitions daily tasks | 26.92 | 42.86 |
| Adjusted expectation based on professional FTE in acquisitions dept. | 15.38 | 28.57 |
| Perceived competency of cataloging daily tasks | 61.54 | 74.29 |
| Expressed expected competency of cataloging daily tasks | 34.62 | 40.00 |
| Adjusted expectation based on professional FTE in cataloging dept. | 30.77 | 37.14 |
| Perceived competency of serials daily tasks | 53.85 | 57.14 |
| Expressed expected competency of serials daily tasks | 23.08 | 34.29 |
| Adjusted expectation based on professional FTE in serials dept. | 15.38 | 20.00 |
| Overall perceived competency rate | 55.13 | 61.90 |
| Overall expressed expected competency rate | 28.21 | 39.05 |
| Overall adjusted expected competency rate | 20.51 | 28.57 |
| Other responsibilities | | |
| Archives/preservation | 26.92 | 20.00 |
| Bibliographic control | 11.54 | 20.00 |
| Collection development | 61.54 | 62.86 |
| Computer hardware/software administration | 34.62 | 31.43 |
| Digital initiatives | 19.23 | 22.86 |
| Reference desk | 19.23 | 42.86 |
| Web development | 11.54 | 25.71 |
| Other | 30.77 | 31.43 |
| Rate of other responsibilities | 26.92 | 32.14 |

may not yet be vested with the same administrative responsibility within their libraries or campuses. Administrators with fewer than ten FTE in their units are often part of the regular work force, and therefore more easily maintain, and feel they ought to maintain the skills necessary to contribute to their technical services departments.

Conclusion

Future study must determine why administrators feel they ought to know daily departmental tasks. Including such a question would control for cases where administrators feel responsible for task competencies because no professional librarian resides within the department. Additionally, more detail about the time spent managing, coordinating, and collaborating within one's library, campus, or both will provide a more complete picture of the pressures placed on administrators' time. Perhaps investigating outcomes of the varying attitudes towards competency possession and expectation would offer a

glimpse into the success of particular administrative styles. Including such an assessment component may contribute to professional development for new or aspiring technical services administrators.

References

1. Donald E. Riggs, "Leadership versus Management in Technical Services," in *Developing Leadership Skills: A Source Book for Librarians*, eds. Rosie L. Albritton and Thomas W. Shaughnessy (Englewood, Colo.: Libraries Unlimited, 1990), 266.
2. Ibid., 234
3. Christian M. Boissonnas, "Managing Technical Services in a Changing Environment: The Cornell Experience," *Library Resources & Technical Services* 41, no. 2 (1997): 147–54.
4. Leslie A. Manning, "Technical Services Administration," in *Library Technical Services: Operations and Management*, ed. Irene P. Godden, 249–59 (Orlando, Fla.: Academic Pr., 1984).
5. Alex Bloss and Don Lanier, "The Library Department Head in the Context of Matrix Management and Reengineering," *College & Research Libraries* 58, no. 6 (1997): 499–508.

Table 3. FTE in technical services division

| | At least ten FTE (%) | Fewer than ten FTE (%) |
|--|-------------------------|---------------------------|
| Perceived competency of acquisitions daily tasks | 36.67 | 67.74 |
| Expressed expected competency of acquisitions daily tasks | 20.00 | 51.61 |
| Adjusted expectation based on professional FTE in acquisitions dept. | 20.00 | 29.03 |
| Perceived competency of cataloging daily tasks | 53.33 | 83.87 |
| Expressed expected competency of cataloging daily tasks | 16.67 | 58.06 |
| Adjusted expectation based on professional FTE in cataloging dept. | 16.67 | 51.61 |
| Perceived competency of serials daily tasks | 50.00 | 61.29 |
| Expressed expected competency of serials daily tasks | 26.67 | 32.26 |
| Adjusted expectation based on professional FTE in serials dept. | 20.00 | 16.13 |
| Overall perceived competency rate | 46.67 | 70.97 |
| Overall expressed expected competency rate | 21.11 | 47.31 |
| Overall adjusted expected competency rate | 18.89 | 32.26 |
| Other responsibilities | | |
| Archives/preservation | 26.67 | 19.35 |
| Bibliographic control | 13.33 | 19.35 |
| Collection development | 50.00 | 74.19 |
| Computer hardware/software administration | 36.67 | 29.03 |
| Digital initiatives | 26.67 | 16.13 |
| Reference desk | 13.33 | 51.61 |
| Web development | 23.33 | 16.13 |
| Other | 36.67 | 25.81 |
| Rate of other responsibilities | 28.33 | 31.45 |

6. Nancy H. Allen and James F. Williams, "The Future of Technical Services: An Administrative Perspective," *Advances in Librarianship* 19, no. 2 (1995): 159–89.
7. Maureen L. Gleason and Robert C. Miller, "Technical Services: Direction or Coordination?" *Technical Services Quarterly* 4, no. 3 (1987): 13–19.
8. Jennifer Younger and D. Kaye Gapen, "Technical Services Organization," in *Technical Services Today and Tomorrow*, 2nd ed., ed. Michael Gorman, 165–81 (Englewood, Colo.: Libraries Unlimited, 1998).
9. *American Library Directory*, 57th ed. (Medford, N.J.: Information Today, 2004).

Appendix. Invitation and Survey

Dear <survey respondent>,

I am conducting a survey of technical services coordinators to learn how their responsibilities have changed over time. The results of this survey will be used as a component of my research in this area.

The survey should take no more than five minutes to complete if you choose to participate. I will keep your responses confidential. The survey is available at: <survey URL>.

Thanks for your help.

Best regards,

Norm Medeiros

Coordinator, Bibliographic and Digital Services

Haverford College

nmedeiro@haverford.edu

Technical Services Coordinator Profile

1. How many students attend your institution?
☐ 15,000+ ☐ 10,000–14,999 ☐ 5,000–9,999
☐ fewer than 5,000
2. How many FTE work in technical services (acquisitions, cataloging, and serials)?
☐ 50+ ☐ 40–49 ☐ 30–39 ☐ 20–29 ☐ 10–19
☐ fewer than 10
3. How many professional FTE work in acquisitions?
☐ 20+ ☐ 15–19 ☐ 10–14 ☐ 5–9 ☐ 1–4
☐ none
4. How many professional FTE work in cataloging?
☐ 20+ ☐ 15–19 ☐ 10–14 ☐ 5–9 ☐ 1–4
☐ none
5. How many professional FTE work in serials?
☐ 20+ ☐ 15–19 ☐ 10–14 ☐ 5–9 ☐ 1–4
☐ none
6. How many years have you been the technical services coordinator at your current institution?
☐ 25+ ☐ 20–24 ☐ 15–19 ☐ 10–14 ☐ 5–9
☐ fewer than 5
7. Including all institutions at which you've worked, how many years have you been a technical services coordinator?
☐ 25+ ☐ 20–24 ☐ 15–19 ☐ 10–14 ☐ 5–9
☐ fewer than 5
8. Prior to becoming a technical services coordinator, in which department was your primary responsibility?
☐ Acquisitions ☐ Cataloging ☐ Serials
☐ Other (please specify)
9. Do you know the daily procedures of the Acquisitions Department well enough to perform these tasks if necessary for an extended period of time?
☐ Yes ☐ No ☐ Not sure
10. How long do you think it would take you to learn the daily tasks of the Acquisitions Department?
☐ less than a month ☐ 3–6 months ☐ 1–2 months ☐ more than 6 months

11. Do you know these daily procedures as well or better than everyone in the Acquisitions Department?
☐ Yes ☐ No ☐ Not sure
12. Do you think you should know these daily procedures as well or better than the Acquisitions staff?
☐ Yes ☐ No ☐ Not sure
13. Do you know the daily procedures of the Cataloging Department well enough to perform these tasks if necessary for an extended period of time?
☐ Yes ☐ No ☐ Not sure
14. How long do you think it would take you to learn the daily tasks of the Cataloging Department?
☐ less than a month ☐ 3–6 months ☐ 1–2 months ☐ more than 6 months
15. Do you know these daily procedures as well or better than everyone in the Cataloging Department?
☐ Yes ☐ No ☐ Not sure
16. Do you think you should know these daily procedures as well or better than the Cataloging staff?
☐ Yes ☐ No ☐ Not sure
17. Do you know the daily procedures of the Serials Department well enough to perform these tasks if necessary for an extended period of time?
☐ Yes ☐ No ☐ Not sure
18. How long do you think it would take you to learn the daily tasks of the Serials Department?
☐ less than a month ☐ 3–6 months ☐ 1–2 months ☐ more than 6 months
19. Do you know these daily procedures as well or better than everyone in the Serials Department?
☐ Yes ☐ No ☐ Not sure
20. Do you think you should know these daily procedures as well or better than the Serials staff?
☐ Yes ☐ No ☐ Not sure
21. What activities outside of technical services do you perform (please check all that apply)?
☐ Archives/preservation
☐ Bibliographic instruction
☐ Collection development
☐ Computer hardware/software administration
☐ Digitization projects
☐ Reference desk
☐ Web development
☐ Other (please specify)
22. Comments you'd like to make regarding how your responsibilities as a technical services coordinator have changed over time.

Index to Advertisers

| | |
|-----------------------------------|----------------|
| ALCTS | cover 2 |
| Archival Products | 153 |
| Library of Congress | 189 |
| Library Technologies | cover 3 |

FRBR

Coming Soon to Your Library?

Jennifer Bowen

The Functional Requirements for Bibliographic Records (FRBR) data model holds great potential for improving access to library resources, but may not affect all libraries in the same way. The Joint Steering Committee for Revision of AACR, assisted by the work of its Format Variation Working Group, is exploring ways to incorporate FRBR into the next edition of the Anglo-American Cataloguing Rules to facilitate collocation at the level of the FRBR entity expression. Several library system vendors are also adding FRBR-based functionality to their systems. A combination of these two approaches to FRBR can provide significant benefits to users. Most FRBR entities and attributes are already present in library catalog records, and the influence of FRBR can also be seen in existing library activities. FRBR is thus not something totally foreign, but a fresh, more rigorous way of thinking about what libraries already do that provides a basis for designing new ways to improve users' access to library resources.

Recent discussions in the library community about the Functional Requirements for Bibliographic Records (FRBR) data model have generated many questions that do not seem to have easy answers.¹ How is the FRBR model likely to affect most libraries . . . and when? Should cataloging managers be preparing to retrain their departments in something entirely new? Do other library staff members need to be concerned with FRBR, or is it just a cataloging thing? How can a library prepare for something that is not a new standard (and thus has no firm date of implementation) and that will not affect all libraries in the same way? Some librarians are becoming so apprehensive about FRBR that the term “FRBRphobia” comes to mind.

While the FRBR model offers great potential for influencing the way that we think about bibliographic data, we must first understand the components of the model itself well enough to make that possible. Unfortunately, discussions of FRBR sometimes make this difficult by focusing on how the most complicated bibliographic situations fit (or do not seem to fit) into FRBR's entity/attribute structure. This can give the misleading impression that the model is complex and difficult to learn. The theoretical nature of the FRBR model, which does not relate directly to any familiar data content or tagging standard, may make the possible effects of FRBR on individual libraries or library applications difficult to predict and understand. FRBR can seem very remote from daily library activities, and thus may appear to be of limited value except to cataloging theorists.

To address these concerns about FRBR, understanding some of the specific processes through which FRBR will begin to affect libraries is important. This paper will address some of these processes by first examining the effect of FRBR on cataloging through efforts to incorporate portions of the FRBR model into the Anglo American Cataloguing Rules (AACR), next by exploring the possible impact of FRBR on the development of online library systems and

Jennifer Bowen (jbowen@library.rochester.edu) is Head of Cataloging, Rush Rhees Library, University of Rochester, Rochester, New York.

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how libraries can respond to and participate in this effort, and, finally, by exploring possibilities for relating FRBR to other library projects.² Through the discussions in this paper, libraries will begin to be able to address the following questions:

- What do we need to know about FRBR in order to recognize it when it arrives?
- To prepare for its arrival, what questions should we be asking about FRBR, and to whom? and
- What are some simple and effective ways to introduce the FRBR model to others in the library community?

Incorporating FRBR into AACR: The JSC Format Variation Working Group

The Joint Steering Committee for Revision of AACR (JSC) is engaged in various efforts to incorporate aspects of the FRBR model within AACR. Beginning in 2001, the JSC commissioned a wholesale analysis of terminology within AACR2.³ The JSC also embarked on an effort to examine one specific aspect of the FRBR model: the FRBR Group 1 entity expression.⁴ JSC charged a special group to study and make recommendations for how this entity could be incorporated into AACR2. The JSC's Format Variation Working Group (FVWG) was active from 2001–2004 and, when it was first charged, included members from all of the JSC's constituent countries (the United States, Canada, the United Kingdom, and Australia).⁵ While the group had several different terms of reference requesting that it undertake various specific tasks for the JSC, all of these tasks had the common element of dealing with the FRBR entity expression.⁶ Much of the group's efforts focused on proposing actual revisions to AACR2, but the group also developed a strong role in forging relationships with system vendors who are interested in implementing the FRBR data model.

Cataloging an Expression?

FVWG's first terms of reference asked the group to investigate the feasibility of creating catalog records at the level of the FRBR Group 1 entity expression, rather than at the level of the entity manifestation, as is the current practice for most library cataloging.⁷ In order to assess the practicality of such a dramatic change to current cataloging practice, the working group undertook an experiment to create catalog records for expressions that exist in multiple manifestations.⁸

Because the working group chose cataloging examples for the experiment that were sets of manifestations, each

known to represent the same expression, the group's experiment did not completely simulate the experience that a library catalog department would encounter if cataloging expressions. Most libraries do not catalog a group of manifestations of the same expression all at the same time, but instead acquire one manifestation at a time. Therefore, a cataloger would not necessarily have access to all bibliographic data related to a particular expression when cataloging a manifestation. In creating a catalog record for an expression, the cataloger in a typical library catalog department also would need to determine the relationships between manifestations at the time that the first manifestation is acquired, perhaps without having access to additional manifestations or to all relevant bibliographic data about the expression. Participants in the working group's controlled experiment did not have to be concerned with this situation.

While FVWG's experiment considerably simplified what would be the real-life experience for a typical catalog department in cataloging expressions, many members of the group were still unsure where to start to create a bibliographic record for an expression. For example, what should be used as the title of the expression: the title of the earliest manifestation or of the first manifestation cataloged? Or perhaps the uniform title for the work? What should be considered the date of the expression? One member described a blurring between expression and manifestation in many elements of current catalog records, as general notes and variant titles also could not automatically be assumed to belong to either the expression or to the manifestation.⁹

Most FVWG members found the group's attempt to catalog an expression more difficult than first expected, except in some specific situations. When cataloging reproductions, creating a catalog record for an expression worked well when the bibliographic description of the reproduction did not vary from that of the original. However, participants in the experiment still questioned whether or not bibliographic data related to the original manifestation (such as the statement of responsibility) belonged to the expression, the original manifestation, or both.

In an exception to the overall difficulty of the experiment, the sound archivist on the working group reported that creating catalog records for an expression was very logical and intuitive for resources in a sound archive. He reported that his institution was already creating catalog records for expressions and linking all manifestations to that expression successfully. For sound recordings, a specific performance or event is considered an expression, so that in the sound archive all recordings of the same performance or event represent manifestations of that same expression.¹⁰

Based upon the results of its cataloging experiment, FVWG suggested that the process of cataloging an expres-

sion fits very logically with the way that an archivist may work with related resources within a collection and may be appealing in other situations, as well. However, the group expressed significant concern about the possibility of making expression-level cataloging the norm for all library materials. In a real situation where a library acquires one manifestation at a time, records for expressions might require frequent revision and maintenance as more information about an expression becomes available over time. The group concluded, on a practical level, that this lack of information about the expression at the time of cataloging the first manifestation has the potential to greatly complicate the process of cataloging.¹¹

On a theoretical level, FVWG pointed out the incongruity between the FRBR data model and the practicality of cataloging:

FRBR is organized in such a way that the entities of work, expression, manifestation and item each derive logically from the entry that precedes it, in a progression from the abstract to the concrete. This is the reverse of the way that cataloging is actually carried out. Where actual day-to-day cataloging is concerned, manifestation and item-level information are essential to the use of the material, and work and expression level information should derive logically from it, rather than the other way around.¹²

As a result of its experiment, the group recommended in its first report that, for the most part, libraries should continue their current practice of cataloging manifestations. On the other hand, the group also reaffirmed the need to provide access to expressions within catalogs, but recommended that this be achieved instead through an exploration of expression-based collocation, rather than expression-based cataloging.¹³ Such an approach could target those records within a library catalog that would most benefit from being grouped according to expressions, without totally changing the way that libraries catalog.

Collocation at the work and expression level will enable a catalog to show the relationships between different expressions and manifestations of the same work when that work exists in multiple expressions and manifestations. This is frequently the case in the humanities. However, not all bibliographic records will benefit from this collocation: access to works and expressions that exist in only a single manifestation may not be significantly improved through using expression-level collocation. And, single-manifestation works represent by far the majority of the materials in library catalogs. According to research conducted by OCLC, the 47 million manifestations in the OCLC WorldCat database represent 32 million different works,

making an average of only 1.5 manifestations per work. Ninety-nine percent of all works in WorldCat have seven manifestations or less.¹⁴ Thus, the benefits of FRBR collocation apply to only a small segment of records a library catalog, but, according to OCLC, to the most important segment—that is, to works that are the most widely held in library catalogs.¹⁵ The results of OCLC's research reaffirms the validity of the FVWG's recommendation to retain the status quo of basing catalog records at the manifestation level, rather than dramatically changing all cataloging in order to provide better collocation for only a small percentage of all library resources.

After concluding its initial experiment to catalog expressions, FVWG, under JSC's direction, shifted its work to studying two different methods for achieving expression-level collocation within a catalog for those materials that will benefit from it. The first method, cataloger-created collocation, refers to the assignment of specific headings for each expression by the cataloger; the second, system-created collocation, refers to an online system providing additional collocation of search results using bibliographic data already present in bibliographic records. Both of these methods will be described below.

Headings for Expressions in AACR: Why?

In order to allow catalogers to create headings to explicitly identify and differentiate expressions, the JSC requested that FVWG propose new rules for AACR2 for constructing headings for expressions.¹⁶ JSC envisioned headings for expressions to be extensions of headings for works that now exist as uniform titles or as a name/uniform title headings. A cataloger would create an expression-level heading by adding expression-level attributes or other identifiers for the expression to a uniform title for a work.¹⁷ If incorporated into the current edition of the code, new general rules for expression-level headings would logically be placed after the general rules for constructing uniform titles for works within chapter 25 of AACR2.

The addition of rules for creating expression-level headings to the cataloging code would help to further JSC's strategic goal to include the function of the catalog within the scope of a new edition of AACR.¹⁸ Cataloger-assigned headings for expressions would illuminate the relationship between resources described in a catalog; thus, adding rules for creating these headings to AACR would be an important step toward moving AACR beyond describing primarily the content of individual bibliographic records as well as toward defining how a catalog should function. The presence of rules for constructing expression-level headings within AACR would affirm that collocation at the expression level, as well as at the work level, is essential to the functionality of a catalog.

With many libraries not currently even assigning uniform titles for works, why add rules to AACR that would require even more effort by catalogers to apply, and perhaps further complicate the cataloging process? Libraries may want to consider constructing headings for expressions for those subsets of their collections that would most benefit from FRBR. Headings for expressions may be particularly useful when a library owns extensive materials in a specific area, especially when the collection contains many expressions of the same work or many manifestations of the same expression. For example, when a library develops a rich collection of related materials in response to local research interests, an extra level of collocation may draw attention to this collection and increase its accessibility to users. Expression-level headings also could be used in subject headings and in related-work headings to more finely relate resources to each other at the expression level rather than at the work level.

A library would be unlikely to routinely assign headings for expressions to more than small, discrete portions of its collection. Many libraries would not use expression-level headings at all. However, the presence of rules for the creation of such headings in AACR would provide a valuable tool that catalogers could be drawn upon when needed.

Writing Rules for Expression-Level Headings

FVWG, in what was to be its final report to JSC, proposed a revision to the general rules for chapter 25 of AACR2 to accommodate headings for expressions.¹⁹ After discussing the group's report, JSC decided, at its meeting in April 2004, to fold the proposals from the group into the overall development of the new edition of the code (AACR3), and to forward the report to the soon-to-be appointed editor of AACR3.²⁰ FVWG's report was not made available publicly via JSC's Web site at that time. While the fate of individual proposals for chapter 25 in the group's report remains uncertain at this point, the general issues identified by the group surrounding the creation of rules for expression-level headings still merits discussion.

In addition to proposing new rules for the construction of expression-level headings, FVWG proposed revisions for the general rules for constructing uniform titles within chapter 25 of AACR2, with the goals of clarifying the general rules, making them easier to use, and making them more consistent with the FRBR data model. The group attempted to make as many of the new rules as compatible with existing headings as possible to minimize the number of heading changes that would be necessary should the revised rules be implemented. This was not always possible, however, especially in cases where existing headings use expression-level elements (such as language) interspersed with work-level elements.²¹

One recommendation made by FVWG, in an attempt to provide more clarity to the rules, was to drop the use of the ambiguous term "uniform title" in chapter 25, because the term currently has several different meanings in the glossary of AACR2. The group recommended replacing the term "uniform title" with the more neutral and more descriptive term, "constructed title."²²

The new rules for establishing headings for expressions proposed by FVWG used a model that adds elements to a uniform title for a work to further identify and differentiate an expression. This model would allow a cataloger to add one or more elements to the heading for a work to the point of fully identifying and differentiating a specific expression, or, depending upon the needs and policies of a particular library, a cataloger could add fewer elements to the heading (maintaining the specified order of additions) to organize the headings in the catalog under a particular attribute of the expression, such as language or mode of expression. This may be an attractive solution when a library wants additional collocation for many expressions of the same work, but does not need full expression-level headings for each one.²³

The current rules in chapter 25 of AACR2 contain an important precedent for this type of partial-expression heading: Rules 25.5C and 25.5D call for the addition of language (an attribute of the expression) to the end of a uniform title for a work. Therefore, current uniform titles that include language go beyond functioning as uniform titles for works. However, they may not fully identify an expression either, if more than one expression of a work exists in the same language. They function at a level in between the two, and serve to differentiate one group of expressions from another group of expressions. Such headings, which contain an attribute of an expression such as language or mode of expression as their final element, would serve the function of guide-cards within the catalog.²⁴

Determining the best order of elements within an expression-level heading, and thus determining the best order for the new rules themselves, proved a challenge for FVWG. The group decided to organize its proposed rules according to the type of situation that may result in a new expression: translations, revisions and abridgements, and differences in mode of expression.²⁵ Figure 1 provides examples for what expression-level headings might look like for each of these situations, according to the rules proposed by FVWG. These examples are based on proposed new rules, so that headings constructed using the actual rules as they are incorporated into AACR3 may vary considerably from these examples regarding the selection of elements, order of elements, and punctuation.

Once the order of the proposed rules was established, however, each of the situations represented in figure 1 presented a further challenge: in each case, several possible

bibliographic elements could be added to the heading to identify an expression. For example, a translation may be identified by the language of the translation, the name of the translator, or the date of translation; a revised edition may be identified by the edition statement (2nd edition and so on), the name of the editor, or the date of the revision; a performance of a work intended for performance may be identified by the names of the performers, the date of performance, or by the mode of expression.²⁶ How should the cataloging rules provide guidance for selecting what element to add to a heading when, even in similar situations, different catalogers may have different bibliographic data available to them? This question will need to be carefully considered during the preparation of new rules for AACR3.

In addition to the practical concerns discussed above regarding making the rules for expression-level headings easy to use, FVWG also had a general concern about the inherent limitations of using a precoordinated string of terms within a heading for access to expressions. Whatever order of elements is selected for use in the rules will collocate by one attribute of the expression at the expense of the other attributes.²⁷ This may or may not be useful to a particular user of the catalog. For example, if the mode of expression is an element of the heading string, then the headings will sort by this element (sound, text, and so on) and perhaps obscure other relationships between expressions (such as language) or between expressions that may have been derived from each other.²⁸ Because of concerns about the inflexibility of precoordinated headings for expressions, the group recommended in its report that, when such headings are implemented, the AACR community should insist upon separate online coding for each element in the heading to provide for the greatest possible flexibility in displaying these elements within online systems.²⁹

Preparing for Expression-Level Headings

Cataloging rules for the construction of expression-level headings are still in the proposal stage and are unlikely to appear in AACR3 until 2007 at the earliest.³⁰ Thus, catalogers may wonder how best to prepare for what may come once rules that cover these headings are included within AACR3. One way to do this is to engage in discussions among various groups of experts who are working to make operational the FRBR entities of work and expression. Discussions within FVWG, on the International Federation of Library Associations (IFLA) FRBR Review Group's discussion list and in other venues, show that many gray areas

will need further discussion (for example, is a Braille edition of a book a new expression, or a new manifestation?).³¹

Librarians (especially catalogers) should begin to discuss the application of the theoretical FRBR model to real-life cataloging situations. However, becoming too immersed in the potential complexities of specific examples may be counterproductive because it may obscure the real value of the FRBR model. To retain a sense of perspective in these discussions, catalogers are advised to weigh rigorous adherence to the FRBR model against a concern for what will best help users to understand the relationships that exist within a catalog. Instead of debating whether or not two resources represent the same expression or the same work, consider instead whether or not catalog users would benefit from having those resources grouped together under the same heading in the catalog. One of the underlying goals of FRBR's creators was to address the needs of catalog users, and these needs may outweigh the value of strictly adhering to the details of the FRBR model.³²

Even though full headings for expressions are not currently defined and cannot be used legally in catalog records at this time, catalogers can still begin to consider potential uses for these headings within their own library catalogs, and also to think about how the functionality of library systems can contribute to collocation at both the work and the expression levels. When headings for expressions begin to appear in catalog records, library systems must be able to extend their current functionality for collocating headings containing uniform titles to a new level of specificity in order to accommodate these headings.

FRBR and System Vendors

While cataloger-constructed headings for expressions hold much potential for improving collocation in online catalogs, they obviously will be useful only in those cases where a cataloger has assigned them within a bibliographic record. Because such headings will be applied only in certain situations, catalogers also must look at what additional collocation at the work and expression level library systems

Heading for a Translation:

Homer. *Illiad*. English (Pope)

Heading for a Revision:

Melville, Herman. *Moby Dick*. Abridged ed.

Heading for an Expression in a Different Medium than the Original:

Berlioz, Hector, 1803-1869. *Symphonie fantastique*. Sound (Solti)

Figure 1. Examples of headings for expressions.

can do, or should be able to do, using the bibliographic data already present within the library's bibliographic and authority databases.

As one of its early tasks, FVWG was charged to pursue the creation of an experimental database to test the feasibility of system-based expression-level collocation.³³ The group considered the ability to test expression-level collocation in a live database a high priority throughout its work. Instead of creating its own database, however, the group collaborated with system vendors who were currently implementing elements of FRBR collocation in order to learn from their experiences. FVWG posted a call for system liaisons on December 9, 2002, to various library automation-focused discussion lists to invite system vendors to establish liaisons with the group and discuss issues related to the implementation of FRBR.³⁴ As of spring 2004, the group had established relationships with eleven system vendors.³⁵

In 2002, OCLC began hosting meetings during American Library Association (ALA) conferences for interested "FRBR Implementers" that were to be attended by system vendors as well as by representatives from the Library of Congress and from FVWG. Agendas at meetings of this ad hoc FRBR Implementers' Group consist of verbal reports, occasional demonstrations, and discussion about progress toward implementing FRBR in an online environment. During the past two years, attendees at meetings of this group have demonstrated a wide range of commitment levels regarding implementing FRBR in their systems. Some vendors have already implemented many elements of FRBR, others have been planning to do so or are just getting started, and still others are still considering whether or not to implement FRBR.³⁶

FVWG members used the FRBR Implementers' Group meetings as an opportunity to keep system vendors informed about plans to implement headings for expressions, answered questions from various vendors about how to implement collocation using existing bibliographic and authority data, and, in general, encouraged system vendors to keep pursuing this effort.³⁷ Now that FVWG has finished its work, OCLC will take over coordination of this informal group of FRBR implementers. JSC will continue to maintain a liaison relationship with the group.³⁸

The relationships with system vendors established during meetings of the FRBR Implementer's Group provided an opportunity for FVWG to engage more directly in the actual online implementation of FRBR. Both OCLC and VTLS requested that members of the group look at and provide feedback on their FRBR-based system interfaces. Group members viewed a demonstration of an early system prototype for FRBRizing the OCLC WorldCat system.³⁹ They were also asked to participate in a review group related to the redesign of WorldCat for Resource Discovery.⁴⁰ Some mem-

bers also reviewed VTLS's FRBR-based Virtua system.⁴¹ Finally, with the assistance of members of the Music Library Association, FVWG looked at a version of the Library of Congress music files that were FRBRized by VTLS.⁴²

In an attempt to get the broader library automation community thinking about how FRBR might be implemented in a MARC21-based environment, FVWG submitted a discussion paper on this topic to ALA's Machine-Readable Bibliographic Information Committee (MARBI) in 2002.⁴³ This paper contained a discussion of several possible methods of implementing FRBR, including the possibility of creating headings for expressions and controlling these headings through the use of authority records for expressions. While the discussion paper was written early in FVWG's work and so did not present the group's full proposal for constructing expression-level headings, it accomplished the group's objective of encouraging system implementers to start discussing the possible need for additional content designation in order to implement FRBR.

Talking with System Vendors about FRBR

As of August 2004, several library system vendors have working FRBR-based systems available to their customers. Therefore, this is now an opportune time for libraries that would like to take advantage of FRBR collocation to begin talking to their vendors about their plans to implement FRBR. However, talking about FRBR is not always easy, and some libraries may not know what questions to ask of their vendors. Libraries also may have difficulty assessing the answers they receive to their questions, because methods for implementing the theoretical FRBR model vary greatly from one system to another.

The emphasis on collocation within the FRBR model makes a system's user interface a likely focus for FRBR implementation. If a vendor says that they are implementing FRBR in their system, libraries should ask what their FRBR interface would look like to users. Will users be aware that they are looking at a FRBR-like record structure (for example, does the interface itself include such FRBR terms as "work" and "expression"), or will that structure be hidden behind the interface? How will users navigate through search results? Can they browse results at both the work and expression level? Is the vendor performing usability testing on its FRBR user interface, and, if so, how, and on what users?

Libraries may want to take their questioning of their system vendor about FRBR to another level by also asking about the internal workings of the FRBR-based system. Does the system store the records in a FRBR-based record structure (in work records, expression records, and so on) or in a more standard format, such as MARC21? If the data is stored in a FRBR-based structure, can it still be extracted in a standard format, such as MARC21? How does the sys-

tem link such records, and how are the links maintained? How does the implementation of FRBR affect the cataloging interface? Will staff operations (cataloging, acquisitions, circulation) benefit from the implementation of FRBR, or will it only affect the online catalog?

While more and more library system vendors are implementing at least some elements of FRBR into their systems, other vendors are not. Because FRBR is a data model developed by library professionals, some vendors still question whether library users really want or need the improvements that FRBR may offer. Unfortunately, very little usability data is available publicly that demonstrates that a FRBR-based catalog interface makes library catalogs easier to use and understand, although a few vendors may have done such testing on their own systems for their internal use. Until such hard data is available, pressure from customers—and in particular from potential customers—may be the most effective way to convince a vendor that implementing FRBR is worth the associated development costs. Libraries that attempt to lobby their current system vendor may want to compile lists of known problems with the system that implementing FRBR would help to solve, or to restate unfilled enhancement requests in terms of FRBR.

Do-It-Yourself FRBR

As pointed out by various experts on FRBR, the potential benefits of implementing the FRBR data model in an online catalog are many, including better collocation, more efficient navigation of search results, and better bibliographic control in a global environment.⁴⁴ Unfortunately, because FRBR is not a standard for resource description, content designation, or data structure, the benefits of FRBR are unlikely to find their way uniformly into all library catalogs and databases. And, efforts to incorporate FRBR into AACR3, and possibly also into MARC21, are years away. What can libraries do in the meantime, besides lobbying their system vendors? Libraries can look for opportunities to implement some aspects of the FRBR model within other activities that are more under the library's immediate control. Such opportunities may come in new Web site design, database creation, project proposals, and policy decisions that libraries make now regarding metadata content that will position the library to implement FRBR in the future. And, finally, opportunities may come simply by finding ways to engage in discussions of FRBR with colleagues and helping them to visualize its impact.

FRBR at the University of Rochester

At the University of Rochester (UR) in Rochester, New York, FRBR has already arrived as a fundamental compo-

nent of two Web projects that were designed to provide easier access to particular segments of UR's River Campus Libraries' (RCL) collections. Based on a user-centered design, these Web projects use bibliographic data already present in the libraries' MARC records to provide simple alternatives to cumbersome online catalog searches. Creating these Web sites allowed library staff to respond directly to specific needs of the UR community.

RCL maintain two collections of nonprint materials that are intended not only to support the university's academic programs, but also for recreational use by students and faculty. The first, a collection of around 7,500 videos and DVDs, supports the Film and Media Studies program at UR's River Campus, and also provides an alternative to a video rental store for the UR community. The second collection, of about 1,000 music CDs, supports course reserves for music classes at the River Campus as well as recreational listening.⁴⁵ While all of the items in both collections are cataloged in the university's online catalog, users cannot browse these collections through the catalog.⁴⁶ To search either collection using the catalog, a user must limit his or her search by location or format (or both) and then key in an appropriate search term. The libraries had no easy way to allow users to quickly just see what they have.

To respond to this user need, staff in the Art and Music Library and Multimedia Center asked RCL's systems staff to design interfaces to these collections that would bypass the library catalog. In particular, they wanted to be able to show library users dynamically generated lists of all movie directors represented in the video and DVD collection and of all performers on musical sound recordings. To accomplish these tasks, one of the libraries' systems analysts, Jeff Suszczynski, designed Web sites making use of designations of function in the form of MARC relator codes (USMARC subfield 4) that, for the most part, were already present in the library's bibliographic records.⁴⁷ In FRBR terms, relator codes in headings show the relationship between the person or corporate body (FRBR Group 2 entity) and the resource being cataloged.⁴⁸ Such codes are often the only way to identify these relationships in a predictable place in the catalog record, thus allowing systems to automatically use them to provide additional collocation in results displays.

Using MARC relator codes in UR's bibliographic records, the library's systems analyst created dynamically generated Web pages for each of the two multimedia collections. The Web sites are generated using the following process: a Structured Query Language (SQL)-based script written in Perl, an open source programming language, queries the library's MARC-based online catalog to extract relevant bibliographic data both from the system's Oracle tables and directly from the system's MARC records. The library's ColdFusion server then populates an SQL table from the text files created during the previous process,

and then queries the SQL table to retrieve relevant bibliographic data based upon the criteria selected by the library user on the Web site.⁴⁹

For videos and DVDs, the site allows users to view a dropdown list of all movie directors represented in the collection and then, with one click, to initiate a search of the online catalog to view all movies by a particular director. For music CDs, another page allows the same browsing capability for either performers or composers.⁵⁰ See figures 2 through 5.

Each site also provides other browsing capabilities frequently requested by library users and staff and that also have a relationship to FRBR. Users can browse all movies in the collection by the film's primary language. In FRBR terms, this provides a level of collocation analogous to partial expression-level headings that include language, as discussed earlier in this paper. The Web sites also allow both collections to be browsed by genre (which, in the FRBR model, is analogous to the work-level attribute form).⁵¹ For videos and DVDs, the libraries use primarily a selection of the Library of Congress moving image genre terms with local additions.⁵² For audio CDs, the libraries created a special local list of very broad musical genres (jazz, classical, and so on) that mimic the categories found in record stores.

While theoretically the UR libraries should have been able to implement the Web pages described above simply by querying the existing bibliographic records in the database, in reality the existing records needed some maintenance to make the data more consistent. The libraries have a policy of using relator codes for headings on audio recordings and videos, but the codes had not been applied consistently through

the years. This is not surprising. Because the UR's current online catalog makes no use of relator terms, the libraries had no compelling reason to devote staff time to maintaining codes that previously had no immediate value to the library.

Because cataloging staff suspected that some records would need bibliographic maintenance, the libraries' systems department generated reports from the library catalog to allow catalogers to assess the extent of the problem. Both collections being queried for the Web sites are of manageable size (about 7,500 videos and 1,000 CDs), so cataloging staff determined that the maintenance necessary to add the missing relator codes was manageable. With the assistance of a cataloging intern, the data was cleaned up over the course of a summer.

The systems analyst encountered an additional problem during the coding of the Web sites caused by the library's practice of not using the relator term "cmp" for composers on sound recordings, in accordance with Library of Congress practice.⁵³ In order to correctly identify composers for the Web sites, the systems analyst used the following criteria to identify an entry for a composer on a sound recording:

- A main entry (100 or 110 field) that either contains a subfield 4 "cmp" or no subfield 4 at all.
- A personal name added entry (700 or 710 field) that either contains a subfield 4 "cmp" or a uniform title (determined by the presence of a subfield t) or which lacks both a subfield 4 and a uniform title.⁵⁴

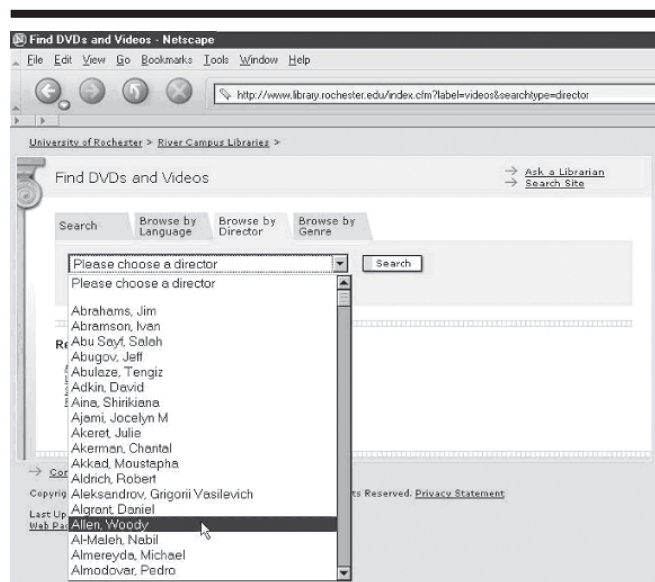


Figure 2. Dropdown list that allows browsing of all directors within "Find DVDs and Videos."

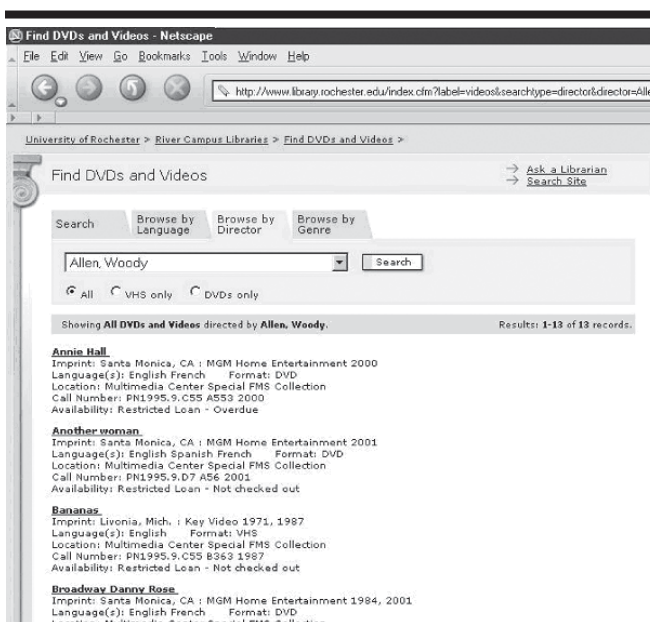


Figure 3. Result of selecting Woody Allen from list of directors within "Find DVDs and Videos."

Even using these criteria, some errors appeared when the bibliographic records were queried for the Web site, which necessitated some additional record cleanup before the composer browse feature of the sound recordings Web site could be implemented.

The UR libraries learned some important lessons from these small projects to show FRBR relationships using existing MARC data. The projects demonstrated the value of using designations of function (in the UR's case, in the form of relator terms) and, particularly, the value of using them in a consistent manner throughout the database. Evidence shows that current cataloging policies that limit the use of relator codes are counter-productive to a system-based approach to implementing FRBR.⁵⁵ While using designations of function consistently in bibliographic headings results in a cost in terms of cataloging staff time, the broader cataloging community should still reconsider the appropriateness of existing restrictions on the use of these designations in light of new ways that libraries can use the designations in FRBR-related projects. To address these restrictions, ALA's Committee on Cataloging: Description and Access initiated a rule revision proposal to JSC that would begin the process of easing restrictions on designation of function in Rule 21.0D in AACR2 to allow them to be used more broadly.⁵⁶

Another important lesson learned is that the success of projects to FRBRize existing MARC records depends upon the quality of the data being used. If data cleanup is required, the cost of this cleanup must be weighed carefully

against the potential benefit of the FRBR implementation, with consideration given to the size of the collection that needs cleanup. Fortunately, because only a small percentage of records in most collections will benefit from FRBRized displays, libraries can focus on cleaning up just these portions of their collections.⁵⁷

The potential of independent FRBR projects such as those undertaken at UR suggests possible future actions to facilitate data cleanup of existing bibliographic records associated with the implementation of FRBR. Batch cleanup of records to add missing data may provide a cost-effective way to prepare a database for FRBR. A library may accomplish this using its own staff, perhaps using a combination of batch cleanup and maintenance of individual records. Libraries implementing FRBR may want to form cooperative projects to share the cleanup of particular collections of records or, as an alternative, libraries may want to outsource data cleanup for FRBR to a vendor. Authority control vendors who already offer bibliographic cleanup services may want to consider expanding their services to include enriching bibliographic data needed for FRBR implementation.

Visualizing FRBR

As discussed in this paper, understanding FRBR and how it will affect libraries can be difficult. Not all libraries will be affected in the same way, and the FRBR model itself may be difficult to comprehend without devoting some measure

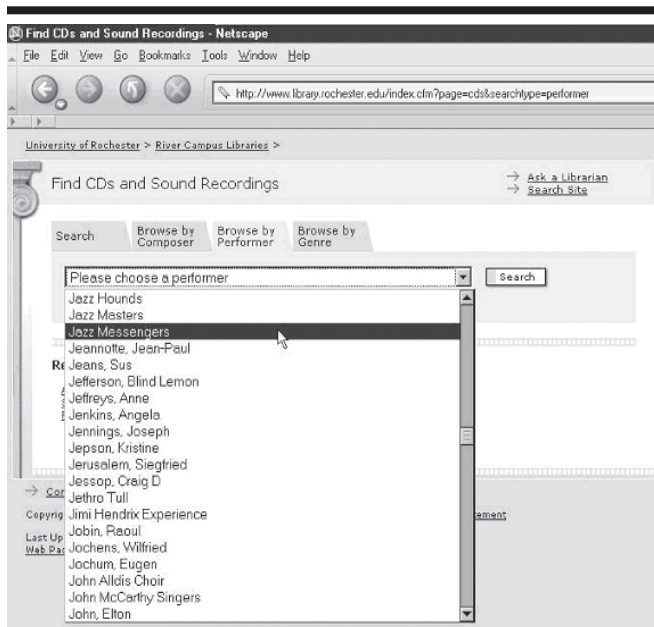


Figure 4. Dropdown list that allows browsing of all performers within "Find CDs and Sound Recordings."

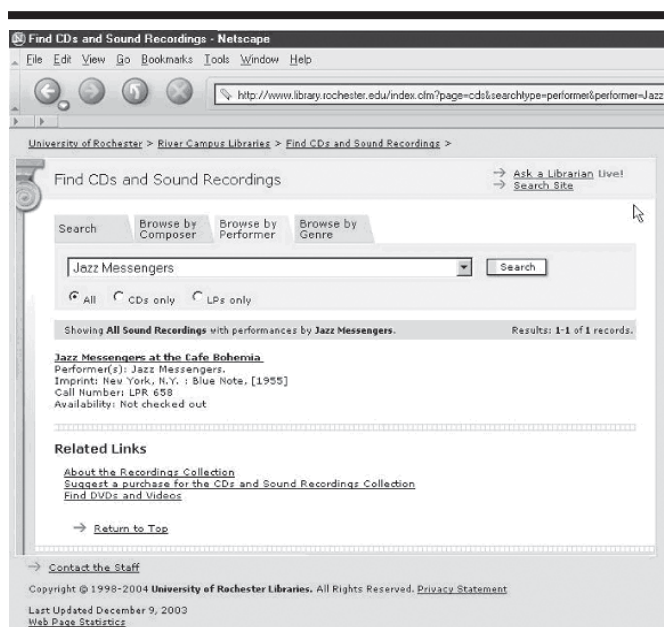


Figure 5. Result of selecting Jazz Messengers from list of performers within "Find CDs and Sound Recordings."

of time to it. To simplify this process, finding ways to visualize FRBR can be very helpful.

UR's Web site projects presented an opportunity to discuss an existing problem and its solution in terms of the FRBR model, thus giving staff at the UR a small taste of what FRBR's value could be. Other opportunities also exist for discussing current problems in terms of FRBR. For example, an acquisitions staff member may select a bibliographic record from a bibliographic utility for an item on order, and then the record is found to not match the actual item when it arrives in the library. This common situation could be described to staff in terms of the difficulty in choosing between many similar manifestations for the same expression in a particular bibliographic utility.

Finally, simple visual images can sometimes communicate more clearly than a wealth of charts and diagrams of entities, attributes, and relationships. With the assistance of the UR libraries' former graphic designer, Michael Donovan, the author created a series of mock-up images of results display screens for the libraries' online catalog and used them to introduce FRBR to a diverse group of library staff.⁵⁸ These simple screens show resources grouped according to the relationships between them, and are based on putting together some preexisting sorting capabilities of the UR's online system with new capabilities related to FRBR.

For comparison to the status quo, the series of screen-mockups is prefaced by an example showing the results of an actual keyword search (in this case a keyword search on "Susan B. Anthony" with a relevance sort) showing how the UR's online system currently groups results from keyword searches (see figure 6). Since a screen shot of the actual search results only shows the first few hits from the search, a chart summarizing the content of the highest-relevance

results provides a broader context and demonstrates the lack of collocation provided by the current system (see figure 7).

The screen mockups (see figures 8–14) contrast vividly with the relevance sort by grouping results according to the relationships of the resources to the term searched; for example, resources either *by* or *about* Susan B. Anthony. Figures 8–11 show how a user would navigate through search results by first viewing works, then expressions, then manifestations *by* Susan B. Anthony. Finally, figures 12–14 show a comparable navigation through subject headings and subdivisions (resources *about* Susan B. Anthony), aided, in figure 14, by the option to sort according to expression-level attributes in an approach similar to the guide card concept discussed above.⁵⁹ This approach communicates the value of FRBR very effectively to colleagues who have no understanding of, or patience for, anything that resembles cataloging theory.

What's Next

The success of the UR's FRBR-based projects has inspired additional discussions in RCL about what else can be done locally to draw upon the experience gained designing Web sites and creating screen prototypes. Usability testing by

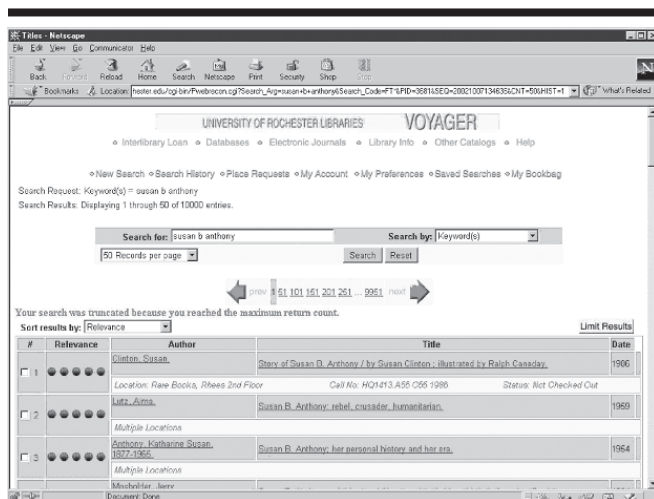


Figure 6. Result of a keyword search on "Susan B. Anthony" in UR's online catalog using a relevance sort.

1. Biography
2. Biography
3. Biography
4. Susan B. Anthony Preservation District
5. Her Writings
6. Biography
7. Biography
8. Biography
9. Correspondence
10. Virgil Thomson opera recording
11. Biography
12. Proceedings of her Trial
13. Virgil Thomson opera recording
14. Music from the Ken Burns film
15. The Ken Burns film
16. Biography
17. Biography
18. Analysis of her writings
19. Women's Studies Newsletter
20. Her papers
21. Biography

Figure 7. Susan B. Anthony keyword search in UR's Online Catalog

library staff of the entire library Web site has revealed that users, especially undergraduates, have considerable difficulty using the online catalog and databases. In response to this, the libraries have created a project, named Results Navigator, to design a new interface to library materials that even beginning searchers can use to find comprehensive, high-quality resources. This interface will allow users to organize results according to relationships defined in FRBR and will provide a vehicle for testing the FRBR

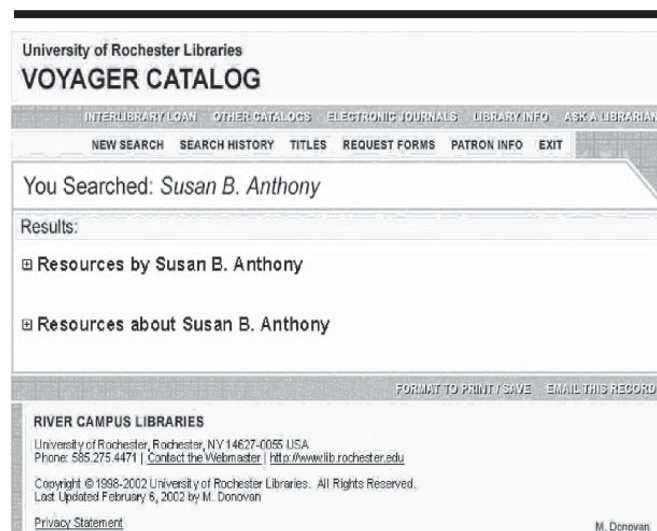


Figure 8. Search results grouped according to the relationships between the search terms and the resources retrieved in a hypothetical FRBR-based online catalog.

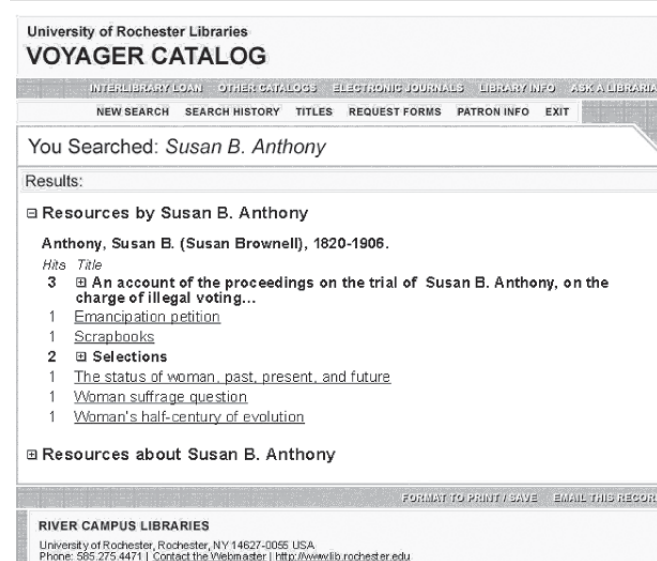


Figure 9. Expansion of hit list under "Resources by Susan B. Anthony" from figure 8, showing FRBR work-level results display.

model from a usability perspective to identify those aspects of the model that are most valuable to users. The project will ultimately result in the development of open source software that will be easily transferable to other libraries.

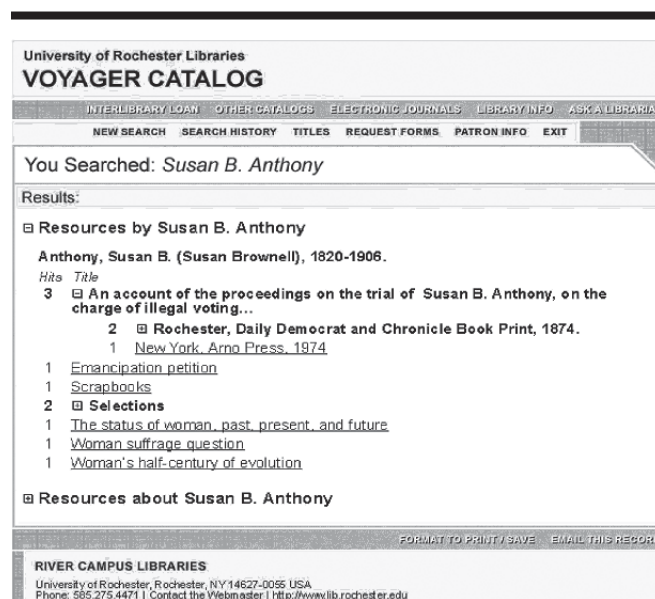


Figure 10. Expansion of hit list under "An account of the proceedings on the trial of Susan B. Anthony" from figure 9, showing FRBR expression-level results display.

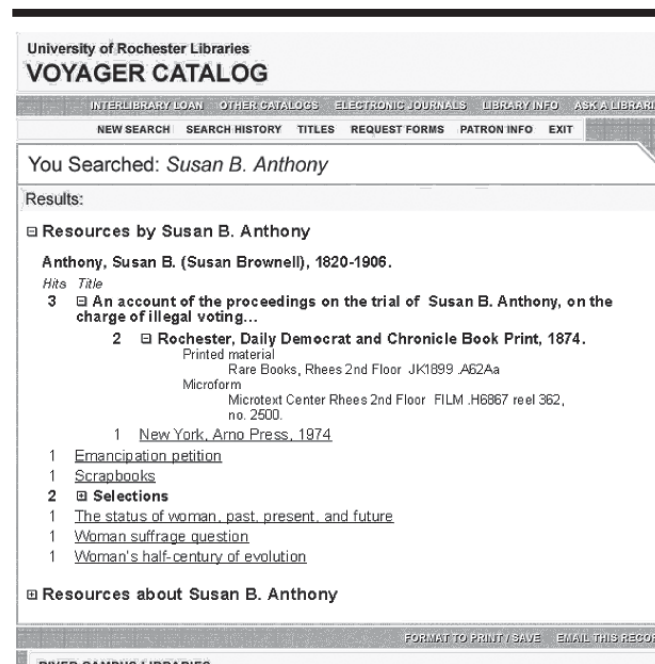


Figure 11. Expansion of hit list under "Rochester, Daily Democrat and Chronicle Book Print, 1874" from figure 10, showing FRBR manifestation-level results display.

RCL are currently designing a platform that can be used for the design of Results Navigator, and are seeking funding for the project.

Summary

The FRBR data model holds great potential for improving user access to library resources, but may not affect all libraries in the same way. JSC, assisted by the work

of FVWG, is working to incorporate FRBR into the next edition of the Anglo American Cataloguing Rules to allow catalogers to create headings that are more easily collocated at the level of the FRBR entity expression. Several library system vendors also are working either to restructure their systems based on FRBR or to provide additional FRBR-inspired capabilities to enhance users' ability to view and navigate search results. A combination of these two approaches to FRBR can provide significant benefits to users of library catalogs.

Rather than thinking about FRBR as difficult to understand and uncertain in its possible implementation, library professionals should keep in mind that library catalog records already contain many of the entities and attributes defined in FRBR and, thus, library catalogs already incorporate some elements of FRBR. The influence of FRBR can also be seen in projects that are already underway in libraries. FRBR is thus not something new and foreign, but a fresh, more rigorous way of thinking about what libraries already do that provides a basis for designing new ways to improve users' access to library resources.

References and Notes

1. International Federation of Library Associations Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records: Final Report* (Munich: K.G. Saur, 1998). Accessed Aug. 21, 2004, www.ifla.org/VII/s13/frbr/frbr.pdf.
2. Throughout this paper, the acronym AACR refers to the

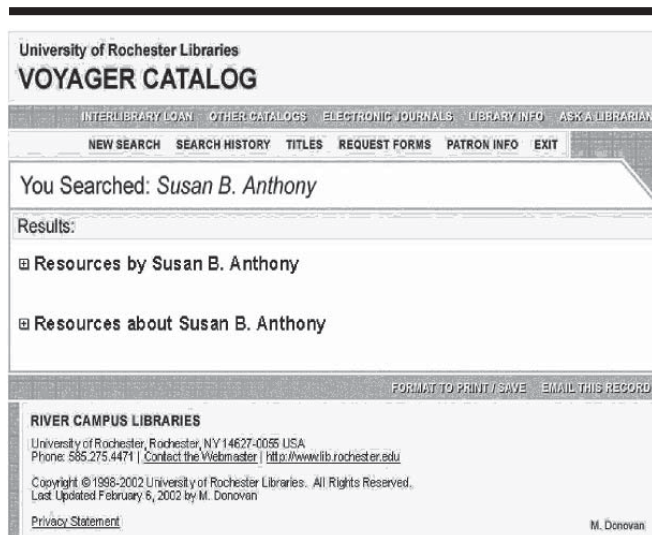


Figure 12. Return to initial search results display (same as figure 8).

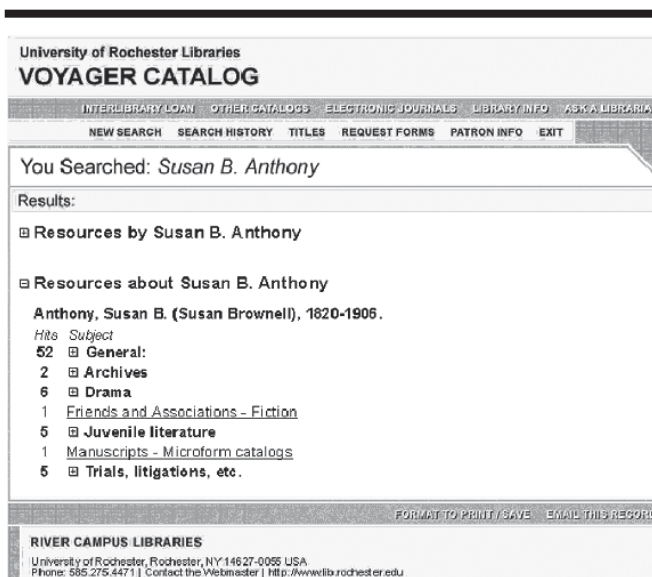


Figure 13. Expansion of hit list under "Resources about Susan B. Anthony" showing subject-based results display.

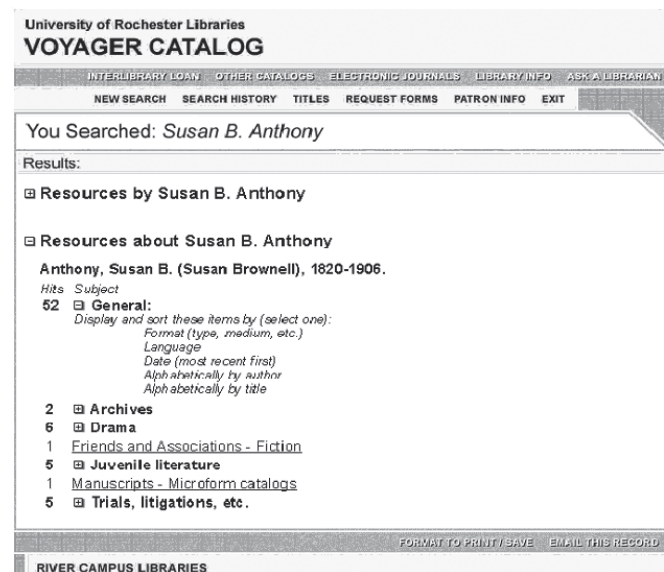


Figure 14. Expansion of hit list under "General" subjects (no subdivisions) showing sort options using expression-level attributes of the resources retrieved (format, language) as well as sort options by date, author, and title.

- cataloging code, Anglo-American Cataloguing Rules, in its broadest sense. The acronym AACR2 refers specifically to *Anglo-American Cataloguing Rules*, 2d ed., 2002 rev. (Chicago: ALA, 2003). The acronym AACR3 refers to the new edition of the rules in preparation at the time of this writing. The new edition, with the working title AACR3: *Resource Description and Access*, is described on the Web site of the Joint Steering Committee for Revision of Anglo-American Cataloguing Rules. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/current.html.
3. Joint Steering Committee for Revision of AACR, "Incorporating FRBR Terminology in AACR: Terms of Reference," Nov. 24, 2001. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/frbr1.html.
 4. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records*.
 5. Joint Steering Committee for Revision of AACR, "Format Variation Working Group," June 22, 2004. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/current.html#ForVarWG; Joint Steering Committee for Revision of AACR, "Format Variation Working Group: Membership," Oct. 13, 2003. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/forvarwg2.html.
 6. Joint Steering Committee for Revision of AACR, "Format Variation Working Group: Terms of Reference," Feb. 29, 2001. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/forvarwg1.html; Joint Steering Committee for Revision of AACR, "Format Variation Working Group: Terms of Reference," Nov. 24, 2001. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/forvarwg1rev.html; Joint Steering Committee for Revision of AACR, "Format Variation Working Group: Terms of Reference," Oct. 20, 2002. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/forvarwg1add.html.
 7. Joint Steering Committee, "Format Variation Working Group: Terms of Reference."
 8. Joint Steering Committee for Revision of AACR. Format Variation Working Group, *Interim Report #1*, Oct. 8, 2001. Accessed Aug. 19, 2004, www.collectionscanada.ca/jsc/docs/forvarwg3.pdf, 5–6.
 9. Ibid.
 10. Ibid.
 11. Ibid.
 12. Ibid., 8.
 13. Ibid.
 14. Rick Bennett, Brian F. Lavoie, and Edward T. O'Neill, "The Concept of a Work in WorldCat: An Application of FRBR," *Library Collections, Acquisitions & Technical Services* 27, no. 1 (spring 2003), 45–59. Accessed Aug. 26, 2004, www.oclc.org/research/publications/archive/2003/lavoie_frbr.pdf.
 15. Ibid.
 16. Joint Steering Committee, "Format Variation Working Group: Terms of Reference."
 17. Committee on Cataloging: Description and Access. ALA Representative to the Joint Steering Committee, *Report on JSC Meeting, 13–15 May, 2002, New Haven, Connecticut*, June 6, 2002. Accessed Aug. 21, 2004, www.libraries.psu.edu/tas/jca/ccda/jsc0206.html.
 18. Joint Steering Committee for Revision of AACR, *Strategic Plan for AACR*, May 17, 2004. Accessed Aug. 21, 2004, www.collectionscanada.ca/jsc/docs/chair79rev3.pdf.
 19. Joint Steering Committee for Revision of AACR, Format Variation Working Group, *Sixth Interim Report*, Feb. 13, 2004. JSC Document number 4JSC/Chair/71/Rev/Chair follow-up/7. (As of Aug. 24, 2004, access to this document is restricted.)
 20. Matthew Beacom, "JSC Format Variation Working Group [Letter to Discharge the FVWG]," June 17, 2004. Accessed Aug. 24, 2004, www.collectionscanada.ca/jsc/docs/forvarwg5.pdf.
 21. Joint Steering Committee for Revision of AACR, Format Variation Working Group, *Sixth Interim Report*.
 22. Joint Steering Committee. Format Variation Working Group, *Sixth Interim Report*, 4.
 23. Ibid.
 24. The concept of guide cards to identify expressions in catalog displays is described in Library of Congress, Network Development and MARC Standards Office, *Displays for Multiple Versions from MARC21 and FRBR* (Washington, D.C.: Library of Congress, 2003). Accessed Aug. 21, 2004, www.loc.gov/marc/marc-functional-analysis/multiple-versions.html.
 25. Translations were treated first to maximize compatibility with existing headings that already include language under AACR2 Rules 25.5C and 25.5D.
 26. The FRBR model considers some of these identifying elements as attributes of the expression, while others (persons or corporate bodies) represent Group 2 entities that have a relationship to the expression. See IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records*, 23–25; 35–40.
 27. Joint Steering Committee. Format Variation Working Group, *Sixth Interim Report*.
 28. Responses from Italy regarding the FRBR model express a related concern about the leveling out of different types of expressions. Three types of expressions are defined, each determined by how closely a particular expression is related to the original expression: from revisions and so on of the original, to "expressions of expressions." See Associazione Italiana Biblioteche, Gruppo di Studio sulla Catalogazione, "An Italian Comment on Functional Requirements for Bibliographic Records: Final Report." Accessed Aug. 25, 2004, www.aib.it/aib/commiss/catal/frbrengh.htm, section 1.
 29. Joint Steering Committee. Format Variation Working Group, *Sixth Interim Report*.
 30. Joint Steering Committee, *Strategic Plan for AACR*.
 31. Instructions for subscribing to the FRBR discussion list are available at: IFLA Cataloguing Section, FRBR Review Group, "The FRBR Review Group's Discussion List," Sept. 9, 2003. Accessed Aug. 25, 2004, www.ifla.org/VII/s13/wgfrbr/listserv.htm.
 32. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records*, 2.
 33. Joint Steering Committee, "Format Variation Working Group: Terms of Reference."

34. Joint Steering Committee for Revision of AACR, Format Variation Working Group, *Fourth Interim Report*, Apr. 15, 2003. Accessed Aug. 21, 2004, www.collectionscanada.ca/jsc/docs/forvarwg4.pdf.
35. Joint Steering Committee. Format Variation Working Group, *Sixth Interim Report*.
36. Joint Steering Committee. Format Variation Working Group, *Fourth Interim Report*.
37. Ibid.
38. Rich Greene, e-mail message to the author, Sally Strutt, and Matthew Beacom, July 9, 2004; Sally Strutt, e-mail message to the author, July 21, 2004.
39. Joint Steering Committee for Revision of AACR, Format Variation Working Group, "London Meeting, September 6, 2002. Minutes." Accessed Aug. 21, 2004, www.collectionscanada.ca/jsc/docs/forvarwglondon.pdf.
40. Deb Bendig, e-mail message to members of the JSC Format Variation Working Group (including the author), Apr. 13, 2004.
41. The FRBR aspects of the VTLIS Virtua system are described in: Vinod Chachra and John Espley, *Navigating FRBR with Virtua: ALA/CLA, Toronto: Sunday, June 21 2003; AALL, Seattle: Sunday, July 19, 2003*. Accessed Aug. 20, 2004, www.vtls.com/documents/FRBR.PPT.
42. Vinod Chachra, e-mail message to Barbara Tillett, Patrick LeBoeuf, and the author, Feb. 24, 2003.
43. Joint Steering Committee for Revision of AACR, Format Variation Working Group, *Dealing with FRBR Expressions in MARC 21: Discussion Paper no. 2002-DP08* (Washington, D.C.: Library of Congress, 2002). Accessed Aug. 20, 2004, www.loc.gov/marc/marbi/2002/2002-dp08.html.
44. Glenn Patton, *What Can FRBR Do for You?* presentation at the ALA/CLA Annual Conference, June 22, 2003. Accessed Nov. 23, 2004, www.ala.org/Content/NavigationMenu/ALCTS/Continuing_Education2/Presentations/Patton-FRBR.ppt; Chris Oliver, *FRBR: Functional Requirements for Bibliographic Records. What Is FRBR and Why Is It Important?*, presentation at the Canadian Metadata Forum, Sept. 19, 2003. Accessed Nov. 23, 2004, www.collectionscanada.ca/metaforum/n11-228-e.html; Barbara B. Tillett, *The FRBR Model (Functional Requirements for Bibliographic Records)*, presentation at the University of Virginia, Nov. 2002. Accessed Nov. 23, 2004, www.iath.virginia.edu/sds/FRBR.htm.
45. This collection of around 1,000 music CDs at the University of Rochester River Campus is distinct from the much larger collection of more than 16,000 music CDs held by the Eastman School of Music's Sibley Music Library, which is also a part of the University of Rochester.
46. University of Rochester, "Voyager Catalog." Accessed Aug. 25, 2004, <http://groucho.lib.rochester.edu>.
47. Library of Congress, Network Development and MARC Standards Office, *MARC 21 Concise Format for Bibliographic Data*, 2003 Concise ed. Accessed Aug. 21, 2004, www.loc.gov/marc/bibliographic; Library of Congress. Network Development and MARC Standards Office, *MARC Code Lists for Relators, Sources, Description Conventions: Web Version*, July 27, 2004. Accessed Aug. 21, 2004, www.loc.gov/marc/relators.
48. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records*.
49. Jeff Suszczynski, e-mail message to the author, Apr. 29, 2004.
50. University of Rochester, River Campus Libraries, "Find Videos and DVDs," Apr. 14, 2004. Accessed Aug. 20, 2004, www.lib.rochester.edu/index.cfm?page=videos; University of Rochester, River Campus Libraries, "Find CDs and Sound Recordings," Dec. 9, 2003. Accessed Aug. 20, 2004, www.library.rochester.edu/index.cfm?page=cds. Both Web sites were designed and created by Jeff Suszczynski, library systems analyst for River Campus Libraries.
51. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements for Bibliographic Records*.
52. Brian Taves, Judi Hoffman, and Karen Lund, *The Moving Image Genre-Form Guide* (Washington, D.C.: The Library of Congress, 1998). Accessed Aug. 21, 2004, www.loc.gov/rr/mopic/migintro.html.
53. Library of Congress, *Music and Sound Recordings Online Manual. X00 Personal Names, General Information*, 2004. Accessed Aug. 26, 2004 via Cataloger's Desktop 2004, issue 3 (Aug. 2004) via institutional subscription.
54. Jeff Suszczynski, e-mail message to the author, Jan. 26, 2004.
55. Hegna and Murtomaa concluded that the lack of designations of function impeded their ability to conduct a FRBR analysis of bibliographic records in Finnish and Norwegian collections. See Knut Hegna and Eeva Murtomaa, *Data Mining MARC to Find: FRBR?*, Mar. 13, 2002. Accessed Aug. 21, 2004, <http://folk.uio.no/knuthe/dok/frbr/datamining.pdf>.
56. Committee on Cataloging: Description and Access, "Designations of Function (21.0D)," Aug. 9, 2004, JSC document 4J SC/ALA/58/rev. (As of Aug. 27, 2004, access to this document is restricted. An earlier version [July 26, 2004] is available via the committee's Web site.) Accessed Aug. 27, 2004, www.libraries.psu.edu/tas/jca/ccda/docs/tf-210d2rev.pdf.
57. Chachra and Espley estimate that 5 to 15 percent of records in most databases are good FRBR candidates. See Chachra and Espley, *Navigating FRBR with Virtua*.
58. Jennifer Bowen, "Navigating Through Voyager: Should FRBR Be in Our Future?" in *Visioning Voyager: What If Voyager Could Do THAT?*, paper given on the occasion of the Mid-Atlantic Voyage User's Group Meeting, Cornell University, Oct. 28–29, 2002. Accessed Aug. 26, 2004, www.library.rochester.edu/IN/REF/attachments/MAVUG_files/frame.htm. Slide mockups were created with the assistance of Michael Donovan, graphic designer for River Campus Libraries.
59. Library of Congress, *Displays for Multiple Versions from MARC21 and FRBR*.

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Notes on Operations

Rehabilitating Killer Serials An Automated Strategy for Maintaining E-journal Metadata

David Banush, Martin Kurth, and Jean Pajerek

Cornell University Library (CUL) has developed a largely automated method for providing title-level catalog access to electronic journals made available through aggregator packages. CUL's technique for automated e-journal record creation and maintenance relies largely on the conversion of externally supplied metadata into streamlined, abbreviated-level MARC records. Unlike the Cooperative Online Serials Cataloging Program's recently implemented "aggregator-neutral" approach to e-journal cataloging, CUL's method involves the creation of a separate bibliographic record for each version of an e-journal title in order to facilitate automated record maintenance. An indexed local field indicates the aggregation to which each title belongs and enables machine manipulation of all the records associated with a specific aggregation. Information encoded in another locally defined field facilitates the identification of all of the library's e-journal titles and allows for the automatic generation of a Web-based title list of e-journals. CUL's approach to providing title-level catalog access to its e-journal aggregations involves a number of tradeoffs in which some elements of traditional bibliographic description (such as subject headings and linking fields) are sacrificed in the interest of timeliness and affordability. URLs and holdings information are updated on a regular basis by use of automated methods that save on staff costs.

The enormous expansion of electronic journals available in full text, particularly those bundled in large aggregator packages, has been both a boon and a burden to libraries and users. The benefits of these resources for users—fast and nearly ubiquitous access to content, easy virtual browsing of individual issues and articles—are obvious. But the complexity of managing licenses, tracking expenditures, and providing accurate information about available titles and coverage has introduced challenges exponentially greater than the well-documented (and oft-lamented) variability of traditional print serials. Clearly, users want quick, convenient access to electronic journal content; certainly, libraries want to provide that access. The conundrum lies in identifying and maintaining the most effective means to inform users about what is available. A single

solution suitable for all contexts remains elusive.

Although frustrated by the difficulty of finding the magic bullet for simplified e-journal metadata management, librarians have not abandoned the search. Catalog librarians in particular have wrestled for some time with the problems surrounding e-journals. Catalogers know well the challenge of how best to provide access to these highly visible and popular, but extremely volatile, resources. In some institutions, traditional methods of serial bibliographic control—title-by-title cataloging, with each title viewed for verification of descriptive details, modes of access, and the recording of detailed holdings information—have continued, with varying degrees of success. In others, more streamlined processes have been adapted. In yet others, particularly smaller institutions with

David Banush (dnb8@cornell.edu) is Head, Bibliographic Control Services, Central Technical Services, and **Martin Kurth** (mk168@cornell.edu) is Head, Metadata Services Online Library, Cornell University, Ithaca, New York. **Jean Pajerek** (jnp8@cornell.edu) is Head of Technical Services and Information Management, Cornell Law Library.

few if any catalogers dedicated solely to serials, no catalog-level access is provided; staff are simply unable to maintain the catalog entries. National policies, particularly as outlined by the Cooperative Online Serials Cataloging Program (CONSER), have evolved as practices were tried, then altered or abandoned as changing circumstances and experiences dictated. Yet even as libraries have adapted practices to accommodate changing realities, certain assumptions about bibliographic record content (for example, the need to provide classification, standard subject headings, linking entries to related titles, and detailed descriptive notes) have remained largely intact.

Libraries, of course, have experimented with new approaches to bibliographic control for e-journals. Over the past decade, librarians have explored and implemented various alternative means to facilitate title-level access through the catalog to e-journals by using data that originate outside of the library. In the late 1990s, the Program for Cooperative Cataloging's (PCC) Standing Committee on Automation urged vendors to create MARC bibliographic records themselves and supply them to customers as part of the aggregator bundle. Some vendors have heeded the call, but many others have not, leaving significant gaps that libraries must cover with their own resources. Serials management companies like Serials Solutions, which emerged in response to librarians' (and end users') frustrations with licensed but uncataloged e-journals, have expanded their own services to include MARC records. They offer a way to fill in the coverage gaps created by those aggregators that do not supply bibliographic data along with their content. Yet these developments, while undeniably positive, come at a cost that many libraries cannot afford. They require some level of systems expertise, the ability to handle batch loading routines, and, of course, the financial resources not only to sup-

port the staff with such expertise, but also to pay any applicable subscription costs for the services.

Like other institutions dealing with intellectual access to electronic journals and the maintenance of titles and coverage data, Cornell University Library (CUL) has used various strategies, sometimes in accordance with national policies, and occasionally at odds with them, to provide the best possible service to users. While doing so, CUL technical services staff naturally have had to balance e-journal access with many other competing processing needs in times of static or declining staffing levels for technical services activities. This paper describes the work CUL staff have recently completed to develop and implement an e-journal management approach that assembles techniques developed locally and at other institutions into a comprehensive workflow for e-journal access and record maintenance. The strategy varies from CUL's own past practices, from current national practice as outlined by CONSER, and from traditional cataloging methods for serials titles. The method relies heavily on automation and brief bibliographic records. It challenges an implicit assumption of traditional serials bibliographic control by presuming that up-to-date title and coverage information is more important than full MARC cataloging, including access by classification and subject headings. Most importantly, the heavy use of automation and persistent identifiers in the records enables CUL staff to locate, extract, update, reuse, replace, or completely delete bibliographic data quickly and with relative simplicity in batches and obviates the need for one-by-one record processing by staff. The methods CUL has developed and employed in this strategy are scalable and applicable to other kinds of resources; indeed, they also may serve as a model for one method of automated metadata management for other institutions.

A Review of the Literature on E-journal Access

Studying the library literature offers an opportunity to place CUL's current approach to e-journal access in an historical context. The history of library access to e-journals since the mid-1990s presents itself as concurrent movements from single-record to separate-record cataloging approaches, from manual to automated processes, and from fuller to briefer bibliographic records. Though libraries have sought to use the library catalog to provide more or less integrated access to print and electronic versions of journals during this period, the stand-alone e-journal database or Web list has continued to be a primary delivery mechanism for e-journal access. The single most influential factor in determining e-journal access strategies has been the emergence of the aggregator package as the dominant form for commercial distribution of e-journals. The mutability of aggregator holdings and the ease with which library selectors can add or cancel aggregator subscriptions have prompted library programmers to devise automated techniques that simplify the maintenance of e-journal records in sets. A close examination of the literature will help substantiate these claims.

Using the library catalog as a mechanism to enable users to discover and connect to e-journals dates from about 1994. Around that time, early Web-based catalog interfaces began to appear, providing direct links to e-journal content via the 856 electronic location and access field that MARC developers had added to the MARC bibliographic format in 1993.¹ As end user and library staff interest in e-journals increased in the 1990s, many library practitioners responded by reasserting their belief that the library catalog should serve as the central site for access to all library resources, regardless of format.² At the same time, other practitioners favored Web lists

or databases that segregated and highlighted e-journals for easy access, thus providing separate access mechanisms for e-journals that were successors to the printed lists of serial title and holdings information that libraries had historically provided as complements to catalog entries for serial titles.³ The experience of the Perry Library at Old Dominion University clearly exemplifies such an evolution from printed periodical list to Web list to online periodicals database.⁴ By 1998, catalog and noncatalog access mechanisms had become commonplace. At that time, Shemberg and Grossman noted that 78.8 percent of institutions belonging to the Association of Research Libraries (ARL) and 39 percent of non-ARL libraries surveyed offered online catalog access to e-journals; at the same time, 87.1 percent of ARL libraries surveyed and 48.8 percent of non-ARL libraries surveyed used Web lists for e-journal access.⁵

In those libraries choosing to add e-journal holdings to their catalogs, library technical services operations accepted the responsibility of creating programmatic processing workflows to increase catalog access to e-journals. Early timesaving strategies often employed manual cataloging processes, such as those at Auburn University and the University of Texas at Austin, to add 856 fields and other fields related to electronic access to libraries' records for their e-journals' print counterparts.⁶ The University of Pennsylvania's decision to perform manual separate record cataloging for electronic versions of print journals ran counter to the more common manual single-record workflows.⁷ Following the explosion of e-journal access in aggregations, however, all manual e-journal cataloging approaches became problematic. Authors such as Calhoun and Kara in 1999, followed by Jones in 2001, expressed their preference for automated ingest and maintenance of e-journal catalog records as expedient strategies for technical services units

seeking to keep pace with the acquisition and de-acquisition of e-journals in unprecedented numbers.⁸

The availability of e-journal metadata from external sources and the desirability of using automated methods to load and maintain record sets for aggregated e-journals have led many libraries, exemplified by the University of Tennessee, Knoxville, and the University of Glamorgan, to prefer adding separate records for e-journal titles, separate, that is, from the records for those titles' print equivalents.⁹ In 1999, Martin and Hoffman surveyed forty-three Research I and Research II academic libraries to study how they provided access to e-journals from aggregators.¹⁰ Of the libraries that added catalog records for aggregated e-journal titles, 20 percent used the single-record approach (combining e-journal information and print-journal information in a single-record), 16 percent added separate records, 9 percent used both methods, and 30 percent gave no indication of the approaches used.¹¹ The PCC Standing Committee on Automation Task Group on Journals in Aggregator Databases in early 2000 further legitimized automated, separate-record approaches to e-journal cataloging by recommending automated methods for creating e-journal record sets derived either from MARC print-journal records or from non-MARC e-journal metadata supplied by e-journal or third-party vendors.¹² The task group's report was also significant because it offered strategies for creating less-than-full-level MARC records for e-journal titles. That library reliance on automated handling of vendor-supplied e-journal metadata had become a growing trend was reflected in an informal Research Libraries Group (RLG) survey from January 2003.¹³ The survey revealed that nine of twenty-three RLG member respondents used external sources for e-journal record sets, and that seven of the fourteen member libraries that did not use external sources

were either planning to do so or were investigating their use.

Though more and more libraries began using vendor-supplied metadata in automated, separate-record cataloging methodologies for e-journals, libraries did not universally adopt such approaches. Stalberg reports, for example, that library staff at St. Joseph's University elected to do manual, single-record cataloging for their aggregated e-journals because records for them were not available from external sources; further, St. Joseph's staff combined the information for e-journals offered by more than one aggregator into a single record because they believed that users preferred to retrieve one record per e-title.¹⁴ Other libraries, such as Hong Kong Baptist University, implemented multiple workflows involving a mixture of manual and automated processes.¹⁵ Hong Kong Baptist staff performed manual, single-record cataloging for print journals and e-journals in aggregations whose holdings tended to be stable, while they used an automated workflow for e-journals in unstable aggregations that collocated all versions of an e-journal in one bibliographic record. The cataloging community came to call the latter approach (that is, using manual or automated processes to create a single bibliographic record for all electronic versions of a given title) "aggregator-neutral" cataloging when CONSER adopted it as policy in 2003. The next section of this paper presents a detailed discussion of CONSER policies on e-journal cataloging.

Libraries using automated approaches to e-journal cataloging varied in the fullness of the MARC records they loaded into their catalogs. Using a mixed-level approach, Hong Kong Baptist University added some brief e-journal records to their catalog, but they loaded vendor-supplied full MARC records when they were available.¹⁶ In a single-level approach, the University of Tennessee, Knoxville, and the Western North

Carolina Library Network (WNCLN) added brief records exclusively.¹⁷ The records were created from their vendor-supplied non-MARC source data. In an alternative approach to choosing between full and brief records, WNCLN staff looked for ways to augment their brief records with classification data and subject terms derived from classification numbers.¹⁸

Though many libraries devoted a great deal of effort to adding e-journal holdings to their catalogs, they also continued to use non-catalog methodologies, such as Web lists and standalone databases, to facilitate e-journal access.¹⁹ Auburn and Hong Kong Baptist Universities offered e-journal access via the library catalog, yet they also extracted catalog data to create Web lists of their e-journals.²⁰ Librarians at Yale University created “jake” as a cooperative database that collocated access data for e-journal full-text and indexing sources.²¹ In what may have signaled an emerging trend in e-journal access, the Colorado Alliance of Research Libraries expanded on the jake database to develop an architecture that supported a hybrid approach, relying on both the library catalog and an external database of e-journal information. According to Meagher and Brown, developers of the Colorado Alliance’s Gold Rush database envisioned that libraries using Gold Rush would link from 856 fields in MARC e-journal records to a Gold Rush display containing links to aggregators that offer full text for a given title as well as to abstracting and indexing services that index it.²²

Most practitioners writing about e-journal access methodologies have addressed their libraries’ attempts to develop e-journal processing strategies that sought to minimize the effort needed to maintain e-journal records over time. That the need to update e-journal records is a legitimate concern for libraries is reflected in the Western North Carolina report that more than one-third of the 8,000 e-journal

records supplied by their vendor contained changes in the first bimonthly update file they received.²³ Libraries have devised a variety of techniques to respond to such volatility in e-journal access. In the manual approach used at St. Joseph’s University, staff added separate note fields for information corresponding to different e-journal versions in order to simplify record maintenance.²⁴ Hong Kong Baptist University staff placed unique identifiers for e-journal titles in 035 fields to enable monthly overlays of e-journal records.²⁵ Western North Carolina programmers wrote record matching scripts that allowed record overlays and field deletions.²⁶ And, finally, Oregon State University developers designed a local application that uses MARC 001 field matching to delete vendor-supplied records for dropped titles.²⁷

A general trend emerges from the overview of the literature on e-journal management—namely, the use of externally supplied metadata in automated processes to create MARC records in varying levels of richness that can be modified or removed in record sets. The e-journal management innovations and variations reported in the library literature reflect how important straightforward e-journal access is to libraries and how challenging it is for libraries to provide that access.

E-journal Cataloging Practices

CONSER Policy

Even with the trend toward more automated processing and externally supplied e-journal descriptive information, traditional cataloging has continued to play a significant role in many libraries’ e-journal management strategies. But traditional bibliographic control practices for serials have not remained static. Indeed, a look at the evolution of national-level cataloging practices as outlined by

CONSER reflects the challenges that e-journal description and access have posed to efficient, effective bibliographic control. Over the past decade, CONSER has endorsed various approaches for contributing e-journal cataloging records to its database, most recently (since July 2003) the aggregator-neutral record. The shifts in policy have naturally been influenced by changes in the MARC 21 standard, AACR2, the limits of public displays offered by integrated library systems vendors, and, of course, catalogers’ increasing levels of experience with e-journal cataloging.

Prior to the July 2003 implementation of the aggregator-neutral record, CONSER guidelines offered libraries the option of creating a separate bibliographic record for an e-journal that also exists in print format, or of combining information about print and e-versions in a single bibliographic record. Under these guidelines, a print serial title and multiple electronic versions of the same title would appear on a single record if that record also covered the print version. However, if a cataloger chose to catalog print and electronic versions separately, the guidelines required that a cataloger create a separate record for each electronic version of a serial issued by a different distributor or aggregator. Previously, CONSER guidelines did not permit a record describing an electronic serial with reference to multiple aggregators that did not also contain the description for the original print version.

As e-journals proliferated, and an increasing number of titles became available through more than one aggregator, CONSER decided that its policy of creating a separate record for each aggregator’s version of an e-journal made these records “confusing and hard to maintain.”²⁸ That the creation of separate records for different electronic versions of the same title “increase[s] the likelihood of inadvertent duplication, frustration for

searchers, and irritation and confusion for all concerned” was becoming increasingly obvious.²⁹ CONSER decided, therefore, that the time had come to rethink the separate record policy with an eye toward providing less-confusing catalog records and minimizing the need for local editing.

CONSER’s most recent solution to the problem of multiple records for different versions of e-journals is the aggregator-neutral record. The aggregator-neutral record is a bibliographic record that is “separate from the print [and] that covers all versions of the same online serial on one record.”³⁰ Under the current policy, catalogers would represent the electronic versions of a title, such as *ABA Banking Journal*, which is available from at least four different aggregators, with a single catalog record instead of four separate records. Because they reflect the title at a more abstract work level, aggregator-neutral records lack certain elements of description associated with separate records for specific iterations of e-journals, such as a uniform titles qualified by aggregator name. The goal is to present the searcher with one-stop shopping for all electronic holdings of any given title for which it has a license to provide access. At the time of this writing, OCLC is presently using a combination of automated and manual processes to collapse records in the CONSER database and edit them to conform to the guidelines for aggregator-neutral records.

Cornell University Library Practice

The rapidly changing nature of e-journal publishing and the evolution of cataloging standards intended to accommodate the changes spearheaded by CONSER have led to the development of practices at CUL that diverge from CONSER’s recently implemented policy. In the mid-1990s, the “single record versus separate records” question was debated at length at Cornell, as it was at many other libraries. CUL

developed local guidelines that allowed for the creation of combined print and electronic records in cases where CUL’s holdings included the print version of a title although the local policy stated a preference for separate records unless there was a compelling reason not to create them. In the early days of e-journal cataloging, catalogers at CUL had the luxury of being able to conduct detailed analyses of e-journal aggregators to determine the most efficient and cost-effective way of cataloging them. Decisions on whether to create separate records for e-versions or to use the combined record approach were based on factors such as the size of the collection, the percentage of the collection owned by CUL in print form, the availability and completeness of bibliographic records, the amount of local editing required, and the feasibility of batch-loading the records.

When an e-journal was supplied by more than one source, early CUL policy was to create a single holdings record with an online location representing all the e-versions. The holdings statement was compressed to reflect the combined coverage offered by the multiple providers. For example, the *American Journal of Philology* is part of both JSTOR (for back issues) and Project Muse (for current issues). The holdings statement for the e-version of the title conflated the coverage into a simple statement, v.1 (1880)- . The resulting OPAC display allowed users to see at a glance that the library’s electronic holdings went all the way back to the first volume of the publication. Eventually, CUL staff discovered that the lack of granularity in these combined holdings statements presented maintenance problems when, for example, one of the providers discontinued or changed its coverage and a cataloger had to determine where that provider’s coverage ended and another’s began.

Being able to spend the time to do so, however, was a rare occurrence; CUL did not generally undertake sys-

tematic maintenance of e-journal cataloging records. One exception was the ProQuest database, one of Cornell’s largest and most heavily used aggregations. High-level staff maintained the ProQuest data manually. In addition, staff outside of Central Technical Services did manual maintenance on a few small or medium-sized aggregations, using updated information supplied by vendors. CUL technical services staff updated other e-journal records on an ad hoc basis, typically in response to reports of problems from public services staff or library users.

By spring 2001, e-journal publishing was expanding at an exponential rate and was undergoing changes that library technical services staff could not afford to ignore, such as the practice of some e-journal suppliers to limit access by imposing embargoes or moving walls on their coverage. Catalogers no longer had time to create and maintain individual records manually for each title in every aggregation purchased by the library, or even to update the existing print records with additional e-journal information. E-journal publishing had outstripped the library’s ability to keep up with it using traditional cataloging methods. CUL technical services management felt that the volume of e-journal cataloging and maintenance called for a new approach to e-journal bibliographic control. The technical services managers decided to provide title access to large numbers of e-journals in aggregations by creating and adding to the catalog abbreviated, machine-generated bibliographic records, dubbed “sleek” records. At the time, the library anticipated that full-level cataloging would eventually be supplied to replace the sleek records. However, resources have yet to become available to upgrade the sleek records to full-level records.

Initially, technical services staff used a locally developed program to generate sleek records from title lists supplied by vendors. In fall 2001, CUL contracted with Serials Solutions

to purchase title-level bibliographic data for e-journal aggregations not yet cataloged and for updated data for those e-journal sets already cataloged. Every two months, CUL received a spreadsheet from Serials Solutions with the journal title, International Standard Serials Number (ISSN), start date, end date, provider, and URL. Information technology staff in Central Technical Services converted the Serials Solutions-supplied spreadsheet into a tab-delimited text file and ran the data through a locally developed Perl (a high-level programming language) script to generate pseudo-MARC records. These records were then converted into MARC by using a utility called MARCEdit.³¹ The resulting records were then loaded into the CUL catalog by means of a customized Visual Basic program.

CUL technical services staff assigned the sleek records a MARC encoding level 3 ("abbreviated level") and elected not to export the records to the bibliographic utilities. The records included the title information, URL, coverage information, and aggregator information extracted from the Serials Solutions spreadsheet. They did not include subject headings, call numbers (or classification numbers), information pertaining to preceding or succeeding titles (780, 785 fields), or the availability of other formats (530, 776 fields).

Occasionally, because of interface or content changes in a given aggregator package, an entire set of sleek records had to be removed, as when the Dow-Jones Interactive package became Factiva. This process was facilitated by including a special, searchable 899 field in the sleek records that identified the aggregator associated with the title. Staff populated the 899 field using a controlled vocabulary of abbreviations or codes, one specific to each aggregator or provider. The 899 was added manually or via automation, depending on how the record was created. The 899 field is illustrated in figure 1.

The machine-generated sleek records solved some of CUL's e-journal cataloging problems. The library was able to provide title-level access to its e-journals through the catalog, but record maintenance was still an unresolved issue, as CUL sought a method for automated maintenance as well as automated record creation. The CUL database still included e-journal records that had been created at different times, reflecting a variety of sometimes contradictory rules and policies. Applying an automated, across-the-board maintenance routine to this disparate set of records would prove to be challenging. In summer 2002, library management formed a committee to address the increasingly complex issues associated with e-journal cataloging, particularly the need for a systematic approach to ongoing maintenance of e-journal catalog records.

The CUL E-journal Maintenance Task Force: Goals and Objectives

In July 2002, the CUL Technical Services Executive Group (TSEG)

created the Electronic Journal Maintenance Task Force to examine the library's policies on e-journal access and to recommend new strategies for maintaining the collection of electronic journals to which the library provides access. As noted above, CUL technical services units did not necessarily coordinate their handling of e-journal maintenance. In fact, staff in the several processing centers took various approaches to maintenance, from manual efforts to the use of Serials Solutions data. Although an in-house manual covered cataloging issues for electronic resources generally, CUL had no true institution-wide maintenance policies or best practice in place.

This bric-a-brac approach reflected the generally decentralized processing environment at CUL. For TSEG, which represents all of the CUL processing centers and sets technical services policy at the system level, an uncoordinated, scattershot maintenance strategy was no longer desirable. The group wanted a more cohesive approach. TSEG wished to ensure better service to users while simultaneously rationalizing

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260 _ |a [S.l.] : |b Kluwer Journals Online
362 0_ |a 1997-
500 _ |a Title from Serials Solutions journal URL list.
538 _ |a System requirements: Internet connectivity, World Wide Web browser and
Adobe Acrobat reader.
538 _ |a Mode of access: World Wide Web.
856 40 |3 Current issues |u http://encompass.library.cornell.edu/cgi-
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948 1_ |a 20011204 |b s |d sleek |e cts |f ?
948 2_ |a 20030319 |b m |d batch |e cts |f j

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Locally-defined 899 code indicates the aggregator to which the title belongs.

Figure 1. A sleek record in the CUL catalog.

the effort expended in handling and managing maintenance systemwide. The charge that the group drafted for the task force called for the work to take place over the course of one year. Among other things, the charge instructed the four-member task force to examine past and current cataloging practices for e-journals; explore their maintenance implications; assess the feasibility of using vendor-supplied MARC records; develop a plan for creating a title list of all e-journals that could be derived from the library catalog; and, most importantly, create a plan for the ongoing maintenance of e-journal bibliographic and holdings data in the Cornell catalog.

A unifying, though implicit, theme running through the various specific actions the charge put forth was clear to the task force: achieve the best possible result with maximum flexibility and the most parsimonious use of financial and human resources. The underlying assumption of the charge was that existing maintenance efforts were both too expensive and too limited to be justifiable or sustainable. Users, public services staff, and technical services managers seemed to agree, if only tacitly, that the volatile nature of e-journals required a vastly faster and more efficient approach than any manual maintenance effort could provide. Moreover, task force members concluded that, given a very tight financial situation in the library generally, receiving additional funds for purchasing records from outside sources or for hiring additional staff to handle manual maintenance were not realistic scenarios. Thus the task force quickly determined that the solution most likely to win the backing of TSEG would be heavily automated and would make use of tools and data already available. The group carried out all subsequent analyses and formulated the potential strategies in that spirit.

Identifying E-journals in the CUL Database

Several members of the task force worked to identify the complete set of e-journals within the CUL catalog. This ostensibly simple task proved more daunting than originally anticipated, in part because of the variations in both local and national cataloging practice over the years and also because CUL had never used any locally defined code as a marker or identifier for e-journals. Selecting records for e-journals from the CUL database was only possible by using standard data in the MARC bibliographic and holdings records. However, variations in practices made accounting for all of the possible combinations of MARC fields in CUL bibliographic and holdings records complicated. Though the group had members with considerable expertise in the use of Structured Query Language (SQL), a standard computer language for accessing and manipulating databases, devising the most effective and comprehensive means to identify the body of e-journals was a challenging undertaking. After numerous attempts, the group concluded that a concatenated series of five Microsoft Access queries against the CUL Voyager database successfully identified the subset of e-journal records.³²

Once the queries had identified the records, the task force then proposed a method to code them. Unique coding would facilitate their identification and extraction in a more rapid, flexible manner than the SQL queries could provide. After considerable discussion, the group decided to use a locally defined bibliographic record code to specify e-journal titles. The principal advantage of the approach was that the use of locally defined MARC fields in the bibliographic record had become standard practice at CUL. Moreover, CUL staff had no comparable means of harvesting

such data from other sources (such as holdings records), and creating the mechanisms to do so would have entailed higher opportunity costs than the task force was willing to assume. Since 2000, CUL staff had been using the locally defined 948 MARC bibliographic field for statistics-gathering purposes, and a subfield (f) and value (e) had previously been defined in that field for electronic resources generally. The task force defined a new value for e-journals (j) to distinguish them from other e-resources and proposed to implement the new coding scheme in two phases: first prospectively (and manually), as catalogers added new titles to the database, and then retrospectively through automation, adding the codes to the bibliographic records previously identified via the queries. This work was completed by March 2003.

The ability to extract e-journal bibliographic data from the catalog quickly allowed the task force to meet another of its objectives: generating a Web-based title list on demand of all e-journals available from Cornell. Data extracted from the MARC records could now be used for creating such a list. Previously, the library relied on data from Serials Solutions to create its title list, but the investigations done in identifying e-journal records in the catalog indicated that more than 4,000 titles, or nearly 25 percent of all e-journals, were not covered by Serials Solutions and were thus unrepresented in the list. The majority of these titles were items that were free or available from small institutes, government agencies, professional societies, or independent publishers of varying types. Although another group of staff developed the specific plans for generating the list and displaying it, the task force's work laid the foundation for the inclusion of these resources in the title list alongside their more commercially prominent counterparts.

Data Analysis, Cleanup, and Preparation

With the coding to identify e-journal records in place, the task force began a series of analyses to study those records in more detail. Among the most important questions the group needed to answer were how many e-journal titles had been cataloged as separate records and how many had been added to their print counterparts on a single record. CUL cataloging staff had employed both practices, depending on the prevailing national and local consensus at the time, the availability of staff resources, or relative institutional priorities. Over the course of time, a separate record policy had emerged as a default as a result of the sleek record approach, but staff had handled many large aggregator sets (such as ProQuest) using a single-record method. Moreover, some single records represented both print (or print and microform) and multiple aggregators' versions of the resource. Exactly how many titles had been done one way or another was unknown. The task force was interested in standardizing the database so that when the library implemented its new workflow, the data would reflect as much internal consistency as possible. The group understood that without a consistent policy of using either single or separate records, the application of automated solutions for e-journal maintenance would become much more complicated.

Coding the full set of CUL e-journals with identifying values made extracting and analyzing them simple. To determine the number of titles given single-record treatment (internally referred to as multiple version, or "mulver," records), the task force first had to determine which bibliographic records for e-journal titles also had holdings records indicating that both print and electronic holdings were attached. Bibliographic or holdings records that were suppressed from

public view were considered inactive and were therefore ignored in the data harvest and analysis. Using those rough criteria, the task force was able to identify nearly 3,500 titles that had been done as single (mulver) records. A small subset of these (fewer than 400 titles) represented "multi-mulvers," that is, single records with more than one link to electronic text. Separating these records manually—moving to a separate record for the electronic version—would have been a significant task. The group estimated that cleaning up a single record ("demulverization") and creating a new separate record for the electronic version, moving holdings, and other clean-up tasks would take an experienced staff member roughly twenty minutes. Thus, the group calculated that a manual clean-up of all 3,500 mulver titles would have involved more than 1,100 staff hours, or 27.5 work weeks for one full-time staff member.

Task force members felt that this amount of time was unacceptably high. Instead, the group chose to explore an automated approach to record clean-up, with manual efforts reserved only for those titles that would fall outside automation's reach. After consulting with appropriate staff about the feasibility of returning mulver records to their print-only state programmatically, group members develop a detailed sheet of specifications for such a routine. The specifications called for removing certain fields from the bibliographic record that pertained to the electronic version (such as 538 mode of access notes, 506 restrictions notes), as well as the holdings record associated with the electronic version of the item. The coding identifying the title as an e-journal record was also removed. Testing of the routines in the CUL test catalog proved encouraging, and the group moved forward with a batch job that quickly cleaned up the mulver records.

To address the titles that fell outside of the automated cleanup routines,

the task force wrote various queries against the set of all e-journal records. The reports from these queries contained the titles, record ID numbers, and other data. Task force members forwarded the information on to cataloging staff for manual cleanup. Several hundred records were handled in this fashion. Because the number of titles requiring manual cleanup represented a very small percentage of the overall number of titles, CUL cataloging staff completed most of this work in a period of several weeks.

Current Approach to Cataloging and Maintenance

The maintenance and cataloging policy laid out by the task force centered on separate record cataloging for each title, including individual records for each electronic manifestation of a title. The approach essentially extended the existing sleek record approach to all titles for which external metadata was available. The task force had many spirited discussions, not only about the best way to approach the issue of separate records and coverage from multiple aggregators, but also about other consequences of the decision to use automated e-journal record maintenance. Ultimately, the group elected to use a separate record approach, with one record for each version or expression of the title. Thus, for titles provided by multiple aggregators (such as JSTOR, ProQuest), CUL represents each version with a separate record and holdings statement. The task force decided to follow this method because the use of completely separate records would simplify automated maintenance routines. The separate records, with their e-journal and 899 codes in the locally defined MARC fields, also make identifying all of the records provided via a given set a relatively simple task, should that provider be

dropped or have a blanket change in coverage.

The maintenance process consists of two separate but interdependent steps. First, using title and holdings data provided by Serials Solutions, the information technology librarian generates a series of brief catalog records for each title. Many of the e-titles have print version records in the CUL catalog. Moreover, in certain instances, the library also receives the same title (though not necessarily the same coverage) from multiple aggregators. To assist users in making sense of the resulting OPAC displays, the task force recommended generating a uniform title for each record created from the Serials Solutions data. A series of conditional statements was built into the routines for generating the MARC data, adding or editing (as appropriate) a 130 field using the title proper and a parenthetical qualifier for the aggregator. The group felt the use of these titles, though not strictly in accordance with current cataloging codes and practices, would help users distinguish among the different versions of the titles available in the catalog. Figure 2 illustrates a CUL sleek record that contains a machine-generated 130 field.

The automated routine adds note fields, but only those that apply across all titles, such as access restrictions, basic system requirement notes, and source of title notes. Holdings records using the coverage dates and at the level of specificity provided by Serials Solutions are also created at the same time. In addition, for licensed resources, the 856 field is modified to include a prefix that indicates one of two different authentication types—all of Cornell, or all of Cornell except the Weill Medical School campus in New York City. A code that represents the authentication type is stored in the locally defined 906 field of the MARC record.

That these records are brief deserves emphasis. Given the limitations of the source data, some of the common fields found in standard serial MARC records are omitted. For example, the routines cannot assign classification numbers, even at a general level. The program cannot supply title linking fields (77X, 780/785) or any title-specific notes. For aggregators whose coverage is known to be limited to a particular range of dates in the publication's history, a generic note is generated for public display. In the case of JSTOR, for example, with its moving wall of con-

tent coverage, the program adds the note "Most recent issues not available. Please check resource for coverage." The message alerts catalog users that coverage restrictions apply, but does not specify if the moving wall is for three or five years. Because the text appears as the hyperlink to the content in the CUL Voyager catalog, users can readily see it in the results display. All of the brief MARC records are given encoding level 3 (abbreviated level), and they are not exported to the bibliographic utilities.

Although used extensively, CUL does not rely on Serials Solutions e-journal metadata for every title. For ProQuest, CUL loads the free, full MARC data set provided by the vendor. ProQuest staff adapt these records from existing records representing their print counterparts. CUL staff take that file and perform a preloading routine to add particular notes (such as 506 restrictions notes) or to remove unwanted fields before loading them into the catalog. As with the Serials Solutions-based records, holdings data is loaded as reported by the vendor. Using similar criteria, the same routine used for the Serials Solutions titles also creates uniform titles for ProQuest records. Linking fields are often present in these records, but may not be in each record; CUL staff do not check for the presence of the data or verify its accuracy if it is supplied. Because many ProQuest titles have embargoes on coverage, the task force specified that the program should add a generic note ("Most recent issues may not be available. Check resource for coverage.") to each record. The generic disclaimer makes no attempt to determine if an embargo applies to any particular title. A further step is replacement of the 856 value from ProQuest with a locally created persistent URL (PURL). The ENCompass system, which CUL uses as its platform for the e-journal title list, has a character limit of 255 characters.

```

022 __ |a 0569-4345
040 __ |a NIC |c NIC
130 0_ |a American Economist (New York, N.Y. 1960 : Online : Business Source
Premier)
245 10 |a American Economist |h [electronic resource].
260 __ |a [S.l. : |b s.n.]
362 0_ |a 1964-
500 __ |a Title from Serials Solutions list.
506 __ |a Access restricted to licensed institutions.
538 __ |a System requirements: Internet connectivity and World Wide Web browser.
538 __ |a Mode of access: World Wide Web.
856 40 |u http://encompass.library.cornell.edu/cgi-
bin/checkIP.cgi?access=gateway_standard%26url=http://search.epnet.com/direct.asp?db
=buh&jid=%22AEC%22&scope=site |z Connect to full text.
899 __ |a BusSourcePrem
906 __ |a gs
948 0_ |a 20031211 |b i |d batch |e cts
948 1_ |a 20031211 |b s |d batch |e cts |f j

```

Figure 2. CUL sleek record with machine-generated 130 field added.

Because many ProQuest URLs exceed that limit, this step is necessary to load the records into the ENCompass e-journal repository.

Titles covered by neither Serials Solutions nor ProQuest are given full catalog records and are handled manually. CUL selectors complete a networked electronic resource selection form to initiate the cataloging of new titles. Acquisitions staff winnow out titles available from Serials Solutions or ProQuest and pass the remaining selections on to cataloging staff for handling. Acquisitions staff also search all such titles in the bibliographic utilities for cataloging copy; if found, the copy is edited as appropriate for inclusion in the CUL catalog. Resources lacking copy are given full, original records. These records include the local MARC coding identifying them as e-journals, but in most cases lack the 899 field codes that associate them with a particular aggregator set. Descriptions and holdings are based on viewing the resource itself and are created according to national practices. The manually created records are given the appropriate encoding level and are exported to the bibliographic utilities along with most other newly cataloged CUL resources.

CUL has now largely automated maintenance for e-journals. Several times a year, updated ProQuest records (obtained from the vendor) and a refreshed data set from Serials Solutions are compared with the records in the CUL catalog that were generated from those sources via machine matching. This automated mechanism provides regular updates to more than 80 percent of the more than 25,000 titles in the e-journal collection.

The process runs in a series of steps. Title and coverage data are maintained within the Serials Solutions Web interface. The Serials Solutions database is the database of record for most of CUL's licensed electronic journal sets. Approximately

every two months, Serials Solutions sends CUL an updated file reflecting changes made to titles and coverage information. When the file is received at Cornell, it is converted into a tracking table within a Microsoft Access database. The table records the information supplied, as well as other administrative metadata, including whether the particular aggregator set is included in the automated workflow. (Some sets, such as HeinOnline, have data available but are not refreshed, as noted above.)

For titles in aggregations that CUL continues to license, MARC records are generated from the Serials Solutions data set. The resulting file is placed on a local file server. Then, a process is run that compares the new records within each aggregator set (based on the aggregator code in the 899 field) with existing records in that same set from the Voyager catalog. Based on a title match within the set, the 856 and coverage data are compared. If they are different, the record is updated with the new data. If a record is in the new set, but not already in the catalog, then the new record is added. If a record already exists in the catalog, but is not in the new Serials Solutions file, then the record in the catalog is marked for deletion.

When a new aggregator package is added to the CUL collection, the process enables the rapid creation of records for that set. New records sets are processed on demand. This involves running a custom Perl script that converts the Serials Solutions data into MARC records, then loads them into the Voyager catalog through calls to Endeavor's BatchCat API (Application Program Interface).

Appropriate 899 aggregator codes are added to the records before loading; they are then placed in the routine automated maintenance queue.

For titles that fall outside of the automated routines, only passive maintenance is performed. That is,

after a title has been added to the catalog, no regular checking is done, and records are updated or deleted only after reports of problems from users or public services staff. At the time of this writing, CUL does not employ a URL checker, though the implementation of such software has been discussed.

E-journal Title List

The development of an automation-rich maintenance routine was a significant milestone in the E-journal Maintenance Task Force's work, but it was not the end of that work. TSEG had also charged the team to create a Web list of e-journals based on data in the CUL catalog. Although CUL had maintained a Web list of online e-journal titles via the Cornell University Library Gateway from the late 1990s onward, the list had only contained data provided by Serials Solutions. The older Web list did not, therefore, reflect more than 5,000 CUL e-journal titles not covered by Serials Solutions but indexed in the catalog. Thus, users who relied on the Web list rather than the catalog were unaware of a very substantial number of both licensed and free-access journals in electronic format.

Task force members agreed that a complete, accurate Web list of e-journals would represent a significant step forward in e-journal access for CUL end users. The 899 codes to identify e-journals and aggregators added as part of the new maintenance routine also were intended to permit library staff to extract data from MARC e-journal records for use in other applications, either for public access or administrative support. Once CUL technical services units implemented the e-journal and aggregator coding, library staff were able to extract some or all of the catalog's e-journal records with straightforward databases queries. Information tech-

nology staff in technical services used the harvested MARC data to generate brief e-journal entries for a new Web list called "Find E-journals," which offers searching and browsing functionality via Endeavor's ENCompass digital library management system. In addition to using the ENCompass system for the Find E-journals Web list, CUL uses ENCompass for its "Find Databases" service, which provides access to approximately 1,000 electronic reference sources, and for "Find Articles," which enables federated searching of selected abstracting and indexing databases.

The CUL technology specialists created a series of scripts to draw from MARC fields 110, 130, 240, and 245 to construct individual title headings for the Web list that generally follow the syntax of uniform titles. Additional scripts convert e-journal metadata from MARC to a local implementation of Dublin Core that contains title, identifier (URL), relation (aggregator code), and bibliographic record number elements. The title element in Find E-journals also contains coverage information appended to the title portion of the element content. The title is the only element that displays to the public. An example of one of the XML-encoded records for Find E-journals appears in figure 3.

To ensure harmony between Find E-journals and the catalog, CUL technical services staff have established a workflow that updates the catalog, extracts catalog data, encodes catalog data in XML using the Find E-journals element set, and loads Find E-

journals records into ENCompass for delivery to CUL users. Putting this workflow in place relieved the uncertainty that staff and users had had about whether the catalog or the Web list offered more complete access to CUL e-journals. It also has simplified the answer that technical services staff can give when asked about the differences between the two e-journal access methods: the e-journal content in both systems is now the same.

Drawbacks and Benefits of the CUL Approach

CUL spends hundreds of thousands of dollars to purchase access to e-journal aggregations. Such an investment would not be justified if library users were unable to access these resources easily and conveniently. In considering how best to facilitate e-journal use, the library found itself confronted with the need to reconcile incompatible priorities: to create and maintain bibliographic records for expanding sets of e-journals while also being asked to cut or reallocate significant portions of its operating budget. Technical services managers realized that doing both concurrently could only be accomplished through automated means, and that the approach could force CUL to make some difficult compromises. In the course of determining the best possible automated solution for the creation and maintenance of e-journal records in the CUL catalog, the E-journal Maintenance Task Force considered a number of possible strategies,

each entailing its own set of advantages and disadvantages. Clearly, no single strategy would be entirely satisfactory to all of the library's constituents. But the need to provide title-level access through the online catalog using an automated procedure with minimal human intervention was one of the group's guiding principles. The solution the task force arrived at involves a number of tradeoffs, but critical library stakeholders believe that the benefits to users outweigh the disadvantages.

What are the negatives and positives of the CUL e-journal maintenance approach? As with most applications of bibliographic control, the plusses and minuses of the e-journal workflow are relative to the various constraints and resources in the CUL context. What one considers a drawback or a benefit is a function of perspective. That is, others may disagree as to both the kind and degree of seriousness each positive or negative represents. Only the most salient, from the authors' perspective, follow below.

Among the most significant drawbacks to CUL's current separate record policy is the proliferation of catalog records for e-journals. Multiple representations of the same title create OPAC displays that can be difficult for library users and staff to interpret. CUL has tried to alleviate this situation by adding a uniform title, qualified by "Online" and the name of the aggregation, to all the machine-generated e-journal records loaded into the catalog. The library also has considered changing OPAC displays for journal title results to make better use of the qualifiers in the uniform titles. However, even with these adaptations, the displays are not ideal for catalog users. Moreover, the practice of creating a separate record for each version of an e-journal title runs counter to CONSER's current aggregator-neutral policy of creating a single record for multiple electronic versions of a title. This inhibits CUL's ability to harvest records from that

```
<eJrecord>
  <voyagerID>4941910</voyagerID>
  <title>Cardiovascular ultrasound (Online : Directory of Open Access Journals)
[2003-] </title>
  <relation>DOAJ</relation>
  <identifier type="URI">http://www.cardiovascularultrasound.com/home/</identifier>
</eJrecord>
```

Figure 3. An XML-encoded "Find E-journals" record

database and to contribute to it. Thus, while the library's policy responds to local processing demands and the needs of users for timely, accurate title and holdings coverage, it provides less than ideal displays and follows a practice that runs counter to current national serials cataloging practices.

Neither is the CUL approach entirely consistent. Despite the general policy to create separate records for print and electronic versions of journals, some instances of mulver records remain in the CUL catalog. Because of a decision the library made to purchase and load records for United States government documents from MARCIVE, and because many MARCIVE records for e-journals are mulver records, CUL elected to accept them without modification. The decision was made in the interest of expediency. While the inconsistency of this practice and the added confusion it may cause end users are unfortunate, trends in the federal government publications universe suggest that the problem may be only temporary. As the publication of government information continues to shift from tangible to electronic format, separate e-version records will likely replace the multiple version records.

Another shortcoming is that the brief, machine-generated e-journal records lack subject analysis. The absence of subject headings and classification limits subject access to title keyword searching (assuming the journal title includes subject-related words, which is not always the case). Since analysis of CUL's catalog transaction logs indicates that fewer than 6 percent of all catalog searches are subject searches, library managers do not believe that the lack of subject headings in these records will greatly compromise catalog searching, but the likelihood of serendipitous discovery, even via keyword searching, is reduced. Because the brief records carry no controlled vocabulary terms for subject access, programmatic

breakdowns of the title list by subject is rendered nearly impossible.

A further drawback to the abbreviated, machine-generated records is that they do not include any linking information to inform users about preceding or succeeding titles or other related titles, including print versions. E-journal providers vary in their treatment of title changes, but in many cases a journal can only be retrieved under its latest title, even though earlier issues may be available online. A user searching the catalog under an earlier title may not get a result. Reference librarians have been made aware of this situation and need to keep it in mind as they assist users in searching for e-journals. However, users searching without assistance from library staff well may remain ignorant of all holdings available to them.

The lack of persistent identifiers for individual e-journal titles is another compromise that the brief records necessitated. The absence of a unique, stable record identification tag makes the method resistant to services that depend on identifiers, such as bibliographic record numbers for match points in record updates. Such services include electronic resource management applications, for example, the Innovative Interfaces Electronic Resource Management system. And, while CUL staff are able to manipulate and manage large volumes of e-journal metadata quickly and efficiently, e-journals that are not issued as part of an aggregation continue to be excluded from the automated maintenance routine. Thus, no systematic refreshing of these titles takes place; cataloging staff continue to maintain these titles manually and only on an ad hoc basis.

Depending on external metadata suppliers such as Serials Solutions introduces other complexities into processing workflows: ongoing inclusion of journal titles and aggregations in vendor databases needs to be

monitored by library staff; workflows need to handle titles with diacritics in a normalized way; workflows need to account for titles with initial articles to ensure correct indexing in title browse displays; and holdings and coverage data, which Serials Solutions receives directly from publishers, is not always reliably accurate. Experience also has shown that vendors do not always provide timely information about e-journals. While expedient, reliance on external providers for e-journal-related data may result in some inaccuracies in catalog records.

Finally, CUL's automated workflows are not yet sufficiently mainstreamed for handling by lower-level library staff. The need for information technology-savvy librarians and staff members to process the routines introduces the possibility of processing bottlenecks. Maintenance of titles in both the catalog and standalone lists or databases also requires double maintenance and makes keeping both the catalog and the standalone service in sync more challenging.

Yet despite these potential shortcomings (and other possible disadvantages not specifically enumerated here), the CUL approach offers several very significant advantages. Chief among these is timeliness. Library users rely upon the accuracy and timeliness of the information they find in the catalog. This is especially true in the case of electronic resources, where verification of catalog information by examining a physical piece is not possible, and the ability to connect to a resource depends upon the accuracy of the URL in the catalog record. Invalid URLs and outdated holdings information frustrate library users and staff. Using current data from Serials Solutions to generate and maintain records means that URLs and holdings information are updated regularly and require neither a separate routing for URL checking nor any manual labor on the part of CUL staff.

Though currently handled by high-level staff, the record creation and loading process will inevitably become routine. At that time, lower-level staff will be able to perform these tasks instead of librarians. The cost of automatic record creation and maintenance is already much lower than either the cost of purchasing and maintaining complete records from an outside source, or the cost of creating and maintaining full- or core-level records in-house; using lower-level staff to run the routines will reduce costs even further.

Another plus is having the means to identify e-journals by aggregator in the catalog. This allows the e-journal data gathering processes to be greatly simplified. For example, CUL can produce a complete title list of e-journals and holdings on demand, or provide some subset of the list based on other criteria, such as supplier, publisher, or coverage dates. Library staff can analyze coverage overlaps and evaluate new aggregator packages more effectively. When coupled with improved usage statistics-gathering methods for e-journals (such as Project COUNTER data), CUL's collection management decisions can be made with better and more complete information.³³

The scalability of the model and its potential for use with other kinds of resources are other strong positives. Library staff also may apply the coding combinations that identify format and aggregation to bibliographic records for locally created digital collections, monographic or serial. Records for such sets therefore can be easily extracted for batch manipulation, extraction, and sharing. The coding and extract process also allows the library the flexibility to reuse MARC data for other, non-MARC-based applications. As noted above, CUL staff already are extracting the e-journal MARC data for the Find E-journals service. Once properly coded, MARC records for other library resources potentially can

be extracted, mapped to appropriate metadata schema, and used in digital repositories for resource discovery. Thus, the library can offer users multiple avenues for accessing electronic content without investing significant staff hours in creating and maintaining multiple metadata records for those resources. At CUL, MARC records have already been extracted and mapped to various metadata schema for locally produced digital library projects.

Recommendations for Further Study

The CUL approach assumes that title-level access and holdings data are more important to end users than other trademarks of traditional serials bibliographic control, such as subject access via a controlled vocabulary, detailed descriptive notes, and classification. The library's assumption was based in part on an informal analysis of the CUL online catalog transaction logs, which indicated very low use for both subject and call number searching. However, the data in the logs can be ambiguous, represent only a snapshot at one point in time, and may not, in any case, hold true in other institutions. A more thorough examination of user needs and expectations with regard to bibliographic records for e-journals would benefit the broader community and may reveal interesting things about the way users view the metadata that libraries present to them.

The CUL approach to maintenance also assumes that the automated processes developed could have applications to other kinds of resources and are scalable. Although internal evidence suggests that both assumptions are valid, CUL has not attempted any systematic exploration of that validity, nor have librarians and staff tried to ascertain the limits of any scalability. Further investigation into that issue might be interesting and fruitful.

Another area of potential interest

would be a study comparing the total cost of the CUL homegrown automated e-journal management solution with a simpler, but superficially more expensive method, such as purchasing MARC record data from a third party. CUL's decisions were driven in part by an inability to secure funding for the purchase of such records. However, a *post hoc* examination of the process might lead to revealing data about the actual costs incurred and how they compare to the direct expenditure required for obtaining records from a third party.

Conclusion

Although the authors believe the CUL e-journal management process to be innovative, efficient, and effective, they also readily acknowledge the contextual nature of its appeal. In the CUL environment, a heavily automated approach is a solution that is both sustainable and scalable. Alternative paths, such as the purchase of externally supplied MARC data, were closed to the library for lack of financial or human resources. Other institutions with greater or lesser means in particular areas almost certainly would arrive at different conclusions, based on the needs and expectations of their users, public services staff, bibliographers, systems staff, and others. Thus, the solutions presented here are not necessarily intended to serve as a benchmark for all other e-journal metadata management strategies; instead, they are offered as instructive examples of what can be achieved.

References and Notes

1. Eric Lease Morgan, "Description and Evaluation of the 'Mr. Serials' Process: Automatically Collecting, Organizing, Archiving, Indexing, and Disseminating Electronic Serials," *Serials Review* 21 (Winter 1995): 1-12.
2. Erin Stalberg, "Bibliographic Access

- to Titles in Aggregator Databases: One Library's Experience at Saint Joseph's University," *The Serials Librarian* 39, no. 4 (2001): 19–24; Wayne Morris and Lynda Thomas, "Single or Separate OPAC records for E-journals: The Glamorgan Perspective," *The Serials Librarian* 41, no. 3/4 (2002): 97–109.
3. Tina E. Chrzastowski, "E-journal Access: The Online Catalog (856 field), Web Lists, and 'The Principle of Least Effort,'" *Library Computing* 18, no. 4 (1999): 317–22; Jim Holmes, "Cataloging E-journals at the University of Texas at Austin: A Brief Overview," *The Serials Librarian* 34, no. 1/2 (1998): 171–76.
4. Carol A. Kiehl and Edward H. Summers, "Comprehensive Access to Periodicals: A Database Solution," *Library Collections, Acquisitions & Technical Services* 24, no. 1 (2000): 33–44.
5. Marian Shemberg and Cheryl Grossman, "Electronic Journals in Academic Libraries: A Comparison of ARL and Non-ARL Libraries," *Library Hi Tech* 17, no. 1 (1999): 26–45.
6. Thomas R. Sanders, Helen Goldman, and Jack Fitzpatrick, "Title-Level Analytics for Journal Aggregators," *Serials Review* 26, no. 4 (2000): 18–29; Holmes, "Cataloging E-journals."
7. Louise B. Rees and Bridget Arthur Clancy, "Cataloging Electronic Journals: Learning to Weave the Web," *Internet Reference Services Quarterly* 3, no. 3 (1998): 29–43.
8. Karen Calhoun and Bill Kara, "Aggregation or Aggravation? Optimizing Access to Full Text Journals," *ALCTS Journal Online* 11, no. 1 (2000), under "Separate Record Technique." Accessed Jan. 22, 2005, web.archive.org/web/20010214020324/www.ala.org/alcts/alcts_news/v11n1/gateway_pap15.html; Wayne Jones, "More Than One Record," *The Serials Librarian* 41, no. 1 (2001): 17–20.
9. William A. Britten et al., "Access to Periodicals Holdings Information: Creating Links between Databases and the Library Catalog," *Library Collections, Acquisitions & Technical Services* 24, no. 1 (2000): 7–20; Wayne Morris and Lynda Thomas, "Single or Separate OPAC Records for E-journals."
10. Charity K. Martin and Paul S. Hoffman, "Do We Catalog or Not? How Research Libraries Provide Bibliographic Access to Electronic Journals in Aggregated Databases," *The Serials Librarian* 43, no. 1 (2002): 61–77.
11. Ibid.
12. Library of Congress, Program for Cooperative Cataloging Standing Committee on Automation Task Group on Journals in Aggregator Databases, *Final Report*, Jan. 2000. Accessed May 20, 2004, <http://lcweb.loc.gov/catdir/pcc/aggfinal.html>.
13. Karen Smith-Yoshimura, e-mail to RLG Technical Services Strategy Focus Group mailing list, Jan. 24, 2003.
14. Stalberg, "Bibliographic Access to Titles in Aggregator Databases."
15. Yiu-On Li and Shirley Leung, "Computer Cataloging of Electronic Journals in Unstable Aggregator Databases: The Hong Kong Baptist University Library Experience," *Library Resources & Technical Services* 45, no. 4 (2001): 198–211.
16. Ibid.
17. Britten et al., "Access to Periodicals Holdings Information"; Robert N. Bland, Timothy Carstens, and Mark A. Stoffan, "Automation of Aggregator Title Access with MARC Processing in Member Libraries of WNCN," *Serials Review* 28, no. 2 (2002): 108–12.
18. Bland, Carstens, and Stoffan, "Automation of Aggregator Title Access."
19. Calhoun and Kara, "Aggregation or Aggravation?"; Elizabeth S. Meagher and Christopher C. Brown, "Gold Rush: Integrated Access to Aggregated Journal Text through the OPAC," *Library Resources & Technical Services* 48, no. 1 (2004): 69–76.
20. Sanders, Goldman, and Fitzpatrick, "Title-Level Analytics"; Li and Leung, "Computer Cataloging."
21. Daniel Chudnov, Cynthia Crooker, and Kimberly Parker, "Jake: An Overview and Status Report," *Serials Review* 26, no. 4 (2000): 12–17.
22. Meagher and Brown, "Gold Rush."
23. Bland, Carstens, and Stoffan, "Automation of Aggregator Title Access."
24. Stalberg, "Bibliographic Access."
25. Li and Leung, "Computer Cataloging."
26. Bland, Carstens, and Stoffan, "Automation of Aggregator Title Access."
27. Terry Reese, "Aggregate Record Management in Three Clicks," *D-Lib Magazine* 9, no. 9 (2003), under "Record Overlay." Accessed Jan. 22, 2005, www.dlib.org/dlib/september03/reese/09reese.html.
28. Library of Congress CONSER Program, "FAQ on the Aggregator Neutral Record," May 29, 2003. Accessed June 15, 2004, www.loc.gov/acq/conser/agg-neut-faq.html.
29. Library of Congress CONSER Program, "Single Records for Online Versions of Print Serials." Accessed June 15, 2004, <http://lcweb.loc.gov/acq/conser/singleonline.html>.
30. Library of Congress, CONSER Program, "FAQ on the Aggregator Neutral Record."
31. Terry Reese, "MARCEdit Home Page." Accessed July 23, 2004, <http://oregonstate.edu/~reaset/marcedit/html>.
32. The authors will make the SQL queries available to interested parties.
33. Project COUNTER (Counting Online Usage of Networked Electronic Resources) is an international initiative designed to serve librarians, publishers and intermediaries by facilitating the recording and exchange of online usage statistics. More information can be found on the COUNTER Web site. Accessed Jan. 22, 2004, www.projectcounter.org/about.html.

Notes on Operations

A Comparative Study of Amazon.com As a Library Book and Media Vendor

Paul Orkiszewski

Amazon.com offers convenience, Web extras, and competitive pricing to its customers. Does this mean it could be a major player in the library marketplace? To answer the hypothetical question "What if the library bought everything from Amazon?" this paper reports on an in-house study of Amazon's potential and performance as a library vendor, using order data from the Belk Library at Appalachian State University.

Amazon.com, from its incorporation in 1994, has become a business and cultural phenomenon. The firm's founder, Jeff Bezos, was *Time Magazine's* man of the year in 1999, and the story of Amazon's meteoric growth and corresponding fall is legendary. During the dot-com bust of 2000–2002, its per share price fell from its historical high of \$113 in 1999 to \$5.51 in 2001, and the company went from Wall Street darling to pariah.¹ Since then, Amazon has reported its first annual net profit of \$35.3 million for 2003, and share prices have bounced back.² The company continues an aggressive strategy of technological innovation and expansion, including acquisition of the Chinese online retailer Joyo.com in August 2004 for \$72 million.³ Whatever its eventual fortunes as a business enterprise, Amazon has become enmeshed in contemporary culture; it makes news and inspires comment because of its name and history. Indicative of the omnipresence of Amazon.com, a keyword search in *Infotrac ASAP* using "Amazon.com" retrieved 2,189 articles, while a search using "Barnes & Noble," its largest books and media competitor, retrieved 956 articles. These results do not reflect Barnes & Noble's big-

ger market share of \$5.95 billion in sales, compared to Amazon's \$4 billion in books and media for 2003.⁴

Amazon is also the object of some interest within the library world. Coffman created a large ripple with a March 1999 article that argued for using Amazon as a model for libraries to collectively build a single, seamless worldwide library collectively.⁵ Other articles have proposed emulating Amazon's reviews and reader's advisories, reported on linking to Amazon content from the online catalog, or described the experience of selling withdrawn titles or unwanted donations through Amazon Marketplace.⁶ Several articles appeared after Amazon introduced their search-inside-the-book feature, which indexes the full-text of 120,000 titles and allows for browsing of small sections of retrieved books.⁷ Just as coffee shops in bookstores are the inspiration for the spate of cafés in new library buildings, so also are Amazon's pictures of book jackets and reviews the inspiration for similar services from library book vendors.

Much of the research and commentary either holds up Amazon as a model or laments libraries' failures to achieve in almost forty years of library computerization what Amazon

Paul Orkiszewski (orkiszewskip@appstate.edu) is Coordinator of Acquisitions, Appalachian State University, Boone, North Carolina.

has delivered in a fraction of the time. This paper looks at the online retailer from a more prosaic angle: how does it perform as a library book and media vendor? Based on such measurable criteria as price, selection, reliability, and speed, how is Amazon best used? As a personal shopper, having spent \$1,372.03 at the Web site in five years, this author finds Amazon convenient, fast, and consistently well-priced.⁸ Does this personal experience translate into a positive institutional one?

Library vendors, particularly large ones offering a full range of products and services, including approval plans, approach their business as a collaborative effort between themselves and their library clients. They work with libraries to develop highly detailed subject and format profiles that help to streamline the selection and acquisition of new materials. Discounts are agreed upon up front and the exceptions are known in advance. Successful client-vendor relationships depend on frequent communication to solve problems and identify new areas of service. Although Amazon offers bulk buying for institutions using a line of credit, it does not claim to be or act like a traditional library vendor. Amazon's pricing policies assumedly are based on an algorithm involving measurable inputs and outcomes, but an e-mail inquiry as to how they discount and market books received this polite response, "Due to the competitive nature of our business, our policy is not to give out information on the inner workings of our company."⁹

Institutional Background and Methodology

To get some idea of the inner workings of Amazon and the resulting implications for libraries, this study used pricing and availability information available from their Web site and order data collected from the integrat-

ed online catalog of the Belk Library at Appalachian State University. Appalachian State University is a comprehensive university of approximately 750 faculty members and 14,000 students, 10 percent of whom are graduate students. Depending on fluctuations in the economy and state budgets, the library spends \$500,000 to \$600,000 per year on monographs, adding 15,000 to 19,000 titles per year. This study used two sets of order records drawn from the online catalog: one set of all 3,448 firm orders paid between September 1 and November 30, 2003, and analyzed March through July, 2004; and a second set of all 1,686 firm orders paid during August 2004 and analyzed September 1 through 22, 2004. For both sets, each title was searched in Amazon to check the discounted and list price. Titles that were not found after several search permutations were marked as unavailable through Amazon, although some of these could represent the author's inability to search the titles correctly. Titles that were only available through the Amazon Marketplace, an online clearinghouse for vendors and individuals selling used copies of titles, were treated as if they were unavailable.

Availability

Out of 5,134 orders, 327 would not have been available from Amazon (see table 1). Most of these 327 orders required special handling: available only from the publisher, archival material for special collections, foreign imprints, or out-of-print titles. Sixty-seven titles were listed in Amazon as being no longer available. Forty-nine titles supplied by the library's primary monographs vendor and, though apparently not requiring special ordering, were not listed in Amazon.

Pricing

The library purchased 4,644 items from traditional book vendors for \$166,649.87. These same materials could have been purchased from Amazon for \$179,415.68 (see table 2). The list price for these orders was \$196,623.08.

Belk Library contracts with a library vendor to supply some books on approval and to provide notification slips for other newly published titles. Approval and firm order books are supplied at a nominal discount of 16.5 percent. The actual discount is lower as some publishers are excluded, usually because the vendor is unable to

Table 1. Items not available from Amazon.com

| Type of order | # unavailable | % of all unavailable | % of all orders |
|---------------------|---------------|----------------------|-----------------|
| Publisher direct | 157 | 32.0 | 3.1 |
| Special collections | 149 | 30.4 | 2.9 |
| No longer available | 67 | 13.7 | 1.3 |
| Used | 50 | 10.2 | 1.0 |
| Not found | 49 | 10.0 | 1.0 |
| Foreign imprints | 18 | 3.7 | 0.4 |
| Total | 327 | 100 | 6.4 |

Table 2. Cost for all orders available from Amazon.com

| Vendor | Cost for 4,644 orders | % discount from list | Per unit cost |
|-----------------|-----------------------|----------------------|---------------|
| Amazon | \$179,415.68 | 8.75 | \$38.63 |
| Library vendors | \$166,649.87 | 15.24 | \$35.88 |
| List price | \$196,623.08 | 0.00 | \$42.34 |

negotiate its own discount with those publishers. The library vendor supplied 3,517 of the 4,644 orders studied at a cost of \$138,588.39. The same orders were available from Amazon for \$151,049.55 (see table 3). The list price for these orders was \$164,148.61.

Amazon does not discount every title. For the two sets of order records analyzed, Amazon discounted 44 percent of the September through November 2003 orders and 52 percent of the August 2004 orders (see table 4).

Newer titles seem more likely to be offered at a discount than older items. The orders from August 2004 were more likely to be listed at a discount than those from the year before. During January through February 2004, the library bought 181 items from Amazon. The same items were checked again in September 2004. Twelve titles were listed as no longer available, although they could have been bought from Amazon's Marketplace service. Seven titles were listed as having a new list price. The remaining 162 titles, which had been purchased at a 20 percent average discount, had an average discount of

11 percent seven months later (see table 5).

The idea that pricing is fluid may come as a surprise to librarians, who are used to relatively stable book and media prices and negotiated discounts with book vendors. But upon reflection, an online store taking advantage of technology to set prices to maximize sales and profits makes sense. In a study of pricing and price competition at Amazon and Barnes & Noble, Chevalier and Goolsby found that the average discount at Amazon varied between 2.1 percent and 19.2 percent and the average discount at Barnes & Noble varied between 10.6 percent and 11.3 percent from April 14 to August 3, 2001.¹⁰

Amazon's discounted titles are offered at a significantly lower price than library vendors. Had the library bought all available titles discounted by Amazon, the savings would have been \$6,412.37 or 12.3 percent below the paid price. This is a significant saving, but it must be weighed against the cost of the extra staff time to research the best price for thousands of titles. Overall the library gets a better price using its standard ven-

dors without additional labor. If one could predict what Amazon discounts, one might either search this subset of orders in Amazon before sending them to a traditional vendor or simply send all of certain kinds of orders to Amazon, knowing that the odds of a lower price are in the library's favor. The problem lies in predicting what will be discounted.

Predicting Discounts

As noted above, newer titles seem to be discounted more than older ones. Another possible predictor is subject area. To examine if a relationship exists between subject and lower price, 4,319 orders with Library of Congress (LC) call numbers in their bibliographic records (MARC fields 050 or 090) were analyzed as a group. Table 6 lists subjects and the number of discounted titles sorted by the percentage available at a discount. Some strong relationships between subject and likelihood of discount are evident, but this may represent buying patterns at Appalachian State University as much as discounting patterns at Amazon. Drawing conclusions from these relationships is difficult. Why are 72 percent of the art and 70 percent computer science books discounted, while only 21 percent of the philosophy and 20 percent of the political science titles are discounted? One might hypothesize that books with a broader appeal are discounted more frequently. This is true for bestsellers. Of the one hundred best-selling books listed on Amazon on October 5, 2004, ninety-one were discounted, but a correlation between the volume of sales and discount below the bestseller level is not evident. For example, the art book *Meret Oppenheim: From Breakfast in Fur and Back Again* (Kerber Verlag, 2004), a dual English/German book about the artist known for her surrealist, fur-covered cup, *Le Déjeuner en Fourrur*, lists at \$35 and sells on Amazon for \$23.80. Its Amazon sales

Table 3. Cost of orders from primary book vendor

| Vendor | Cost for 3,517 orders | % discount from list | Per unit cost |
|----------------|-----------------------|----------------------|---------------|
| Amazon | \$151,049.55 | 7.98 | \$42.95 |
| Primary vendor | \$138,588.39 | 15.57 | \$39.41 |

Table 4: Items available at a discount from Amazon

| Orders | Total available | No. discounted | % discounted |
|----------------|-----------------|----------------|--------------|
| Sep.–Nov. 2003 | 3,266 | 1,442 | 44 |
| Aug. 2004 | 1,378 | 716 | 52 |
| Total | 4,644 | 2,158 | 46 |

Table 5: Library purchases from Amazon, Jan.–Mar. 2004

| # of titles | Jan.–March 2004 | | Sept. 2004 | |
|-------------|-----------------|----------------------|------------|----------------------|
| | Price | % discount from list | Price | % discount from list |
| 162 | \$3,525.76 | 20% | \$3,929.88 | 11% |

Note: 181 items purchased Jan.–Mar. 2004; 12 unavailable 9/2004; 7 had new list prices 9/2004.

rank is 1,268,441, which is considerably less popular than *Al Qaeda's Great Escape* (Brassey's, 2004) which is ranked at 61,461, but is sold at its list price of \$26.95.

A stronger relationship between publisher or type of publisher and the discount is apparent. All orders were grouped by publisher and assigned a category: academic, juvenile, media, trade, or university. For this study, academic publishers are those that produce and market for the academic and research community and include such publishers as Routledge, Wiley, Palgrave Macmillan, Sage, Ashgate, and Blackwell. Trade publishers produce books for the general public and include such publishers as Knopf, W. W. Norton, HarperCollins, Random House, and Viking. The other categories are self-explanatory. Analyzing only those publishers for which Belk library acquired three or more titles, one sees that trade, media, and juvenile publishers are discounted much more frequently than university or academic publishers (see table 7). University presses and academic publishers have a narrow and, to some extent, captive audience, and may not be as interested in increasing sales with Amazon at the cost of a deeper discount to their wholesale price. They also may be unable to offer discounts because of narrower margins due to the necessity of recovering initial costs on short print runs.

The bibliographic format of orders also was analyzed for correlation with Amazon discounting (table 8). All but 2 of 133 DVDs, mostly feature films and operas, were available from Amazon at a discount. Audiobooks on CD or audiocassette also were more likely to have a lower price. Scores, videocassettes, music compact discs, and CD-ROMs were significantly less likely to be discounted. The discounting on music CDs might reflect buying patterns at Appalachian State University, where classical, jazz, and bluegrass are emphasized.

Table 6. Discounted orders by subject

| Subject | Total orders | No. available at discount | % available at discount |
|----------------------|--------------|---------------------------|-------------------------|
| art | 383 | 276 | 72 |
| computer science | 56 | 39 | 70 |
| home economics | 48 | 33 | 69 |
| theater & dance | 139 | 93 | 67 |
| foreign languages | 65 | 40 | 62 |
| sport & recreation | 120 | 73 | 61 |
| biology | 61 | 35 | 57 |
| English | 458 | 255 | 56 |
| agriculture | 37 | 19 | 51 |
| chemistry | 2 | 1 | 50 |
| education | 345 | 168 | 49 |
| technology | 152 | 74 | 49 |
| business | 106 | 48 | 45 |
| religion | 144 | 63 | 44 |
| mathematics | 17 | 7 | 41 |
| history | 540 | 222 | 41 |
| music | 232 | 94 | 41 |
| communications | 153 | 61 | 40 |
| anthropology | 49 | 19 | 39 |
| general | 60 | 21 | 35 |
| economics | 165 | 56 | 34 |
| psychology | 115 | 39 | 34 |
| geology | 27 | 9 | 33 |
| statistics | 3 | 1 | 33 |
| physics & astronomy | 37 | 12 | 32 |
| sociology | 266 | 81 | 30 |
| health sciences | 182 | 54 | 30 |
| military science | 17 | 5 | 29 |
| geography & planning | 70 | 20 | 29 |
| criminal justice | 86 | 21 | 24 |
| philosophy | 90 | 19 | 21 |
| political science | 94 | 19 | 20 |
| TOTAL | 4319 | 1977 | 46 |

Table 7: Discounted orders by publisher

| Type of Publisher | Total orders | No. discounted | % discounted |
|-------------------|--------------|----------------|--------------|
| Academic | 1,159 | 205 | 18 |
| University | 678 | 250 | 37 |
| Trade | 658 | 560 | 85 |
| Media | 95 | 76 | 80 |
| Juvenile | 94 | 74 | 79 |
| Totals | 2,984 | 1165 | 43 |

Table 8: Discounted orders by format

| Format | Total orders | # discounted | % discounted |
|------------------|--------------|--------------|--------------|
| Book | 4389 | 1995 | 45 |
| DVD | 133 | 131 | 98 |
| CD | 82 | 16 | 20 |
| Spoken recording | 14 | 10 | 71 |
| CD-ROM | 10 | 3 | 30 |
| Videocassette | 9 | 2 | 22 |
| Score | 7 | 0 | 0 |
| Totals | 4644 | 2157 | 46 |

Fulfillment and Speed

Between July 1, 2002, and September 30, 2004, the library placed and received 1,056 orders from Amazon for which it paid \$24,570.30. Average time between order and receipt was two weeks, compared to an average of three weeks for all vendors and four weeks for the library's primary book vendor. Amazon or the library cancelled 1.7 percent of the orders because they were unavailable. The library uses Amazon to try to fill orders cancelled by other vendors. When these reorders are not counted, the cancellation rate drops to 0.83 percent, which is more than the rate for the library's primary book vendor, (0.51 percent), but less than the rate for all other vendors (2.33 percent) and for all nonapproval orders, (1.08 percent) (see table 9).

Summary

The Amazon database is very comprehensive. Almost all of the library's purchases that did not have to be ordered through a producer could have been purchased from Amazon. Also, Amazon allows other vendors to link their stock to Amazon records, which makes proceeding to an out-of-print copy, when a new copy is not available, convenient. Although known as a discount site, Amazon does not discount every item. If the library had placed all of its orders with Amazon, it would have spent 7.7 percent more for those orders. The amount of discount varies over time. Some items that were offered at a dis-

count in the past may later be offered at list. Other items may have a lesser discount. Books about art, computer science, home economics, and theater are significantly more likely to be offered at a discount. Trade books are more likely to be discounted than academic or university publishers. DVDs are more likely to be discounted than other formats. Amazon is faster than other library vendors and comparably reliable in filling orders.

Conclusion

This small study attempts to answer the hypothetical question: "What if Belk Library bought everything from Amazon?" The results show that standard library vendors provide a good value for services offered and can compete with Amazon's prices. Amazon compares favorably to other suppliers in selection, availability, and fulfillment, and considerably better in speed. Libraries interested in using Amazon should find it useful for trade and popular press books, DVDs, and book and media items that need to be acquired quickly. In addition, Amazon's Marketplace service for used material from third-party vendors and individuals is convenient and competitive with other online sources for used books. If Amazon wants to win a larger share of the library market, they may consider discounting more items in their database, especially audio recordings and books from academic and university publishers. With the addition of library-specific services, such as physical processing or providing a mechanism for libraries to add covers, tables

of contents, and perhaps book content to library catalogs, Amazon has the potential to be a major library vendor.

In their February 2001 article, Nardini and Abbott suggested that Amazon might affect library book vendors the same way a new Wal-Mart on the edge of town drains the life out of the main street with overwhelming price competition.¹¹ Since July 1, 2002, when Belk Library first set up an account, Amazon has become its fifth largest supplier in sales and its third largest in volume. This was not in response to an administrative directive to use Amazon, but the result of acquisitions staff using a vendor they have found reliable. Worth noting is Amazon's significant sales growth at Appalachian State University without the expense of sending sales representatives, marketing to libraries, or renting booths at conferences. If Amazon continues to grow, perhaps the library vendor main street will get quieter.

References

1. Standard & Poor's, "Amazon.com," *Standard & Poor's Stock Reports*, Aug. 24, 2004, S&P Netadvantage. Accessed Sept. 21, 2004, www.netadvantage.standardandpoors.com.
2. Amazon.com, 2003 *Amazon.com Annual Report*, 2004. Accessed Jan. 30, 2005, http://media.corporate-ir.net/media_files/irol/97/97664/reports/Annual_Report_2003041304.pdf.
3. "Amazon.com Acquires Chinese Web Retailer," *Wall Street Journal*, Aug. 20, 2004, eastern edition, B.2, ProQuest Newspapers. Accessed Sept. 21, 2004, <http://proquest.umi.com>.
4. Barnes & Noble, 2003 *Annual Report*, 2004. Accessed www.barnesandnobleinc.com/pdfs/

Table 9: Speed and fulfillment

| Vendor | Average weeks between order and receipt | % received within 2 weeks | % received within 4 weeks | % cancelled |
|----------------------|---|---------------------------|---------------------------|-------------|
| Amazon | 2 | 71.31 | 85.70 | 1.70 |
| Amazon w/o reorders* | 2 | 73.78 | 88.19 | 0.83 |
| Primary book vendor | 4 | 24.35 | 77.47 | 0.51 |
| All other vendors | 3 | 51.02 | 78.08 | 2.33 |
| All orders | 3 | 34.09 | 78.04 | 1.08 |

*Orders cancelled by another vendor as unavailable

- bnannual2003.pdf; Amazon.com, 2003 *Amazon.com Annual Report*, 21.
5. Steve Coffman, "Building Earth's Largest Library: Driving into the Future," *Searcher* 7, no. 3 (Mar. 1999): 34-47.
 6. Carol Tenopir, "Running with the Amazons," *Library Journal* 128, no. 20 (Dec. 2003): 34; Andreas Geyer-Schulz, Andreas Neumann, and Anke Thede, "An Architecture for Behavior-based Library Recommender Systems," *Information Technology and Libraries* 22, no. 4 (Dec. 2003): 165-74; Patrick Lo, Owen Tam, and Joe Chow, "Enhancing Bibliographical Records by Adding Amazon URL Links: Lingnan University Library's Experience," *Journal of East Asian Libraries* 129 (Feb. 2003): 61-76; Jennifer Burek Pierce, "Weeding the Amazon Way," *American Libraries* 35, no. 7 (Aug. 2004): 90.
 7. Karen Schneider, "Search Inside Envy," *Library Journal Net Connect* (Winter 2004): 28; Walt Crawford, "Losing What Counts: The Swamping Phenomenon," *EContent* 27, no. 6 (June 2004): 42-43; Irene E. McDermott, "Search Inside the Book: A New Reference Tool?" *Searcher* 12, no. 3 (Mar. 2004): 41-44; Michael A. Banks, "Amazon.com Opens the Books," *Online* 28 no. 2 (Mar./Apr. 2004): 30-33; Joseph Janes, "Books Are for Use," *American Libraries* 35, no. 1 (Jan. 2004): 92.
 8. Amazon.com, author's personal order history, accessed Sept. 22, 2004.
 9. Nikki P., "Your Amazon.com Inquiry," e-mail message to the author, Jan. 8, 2004.
 10. Judith Cevalier and Austan Goolsbee, "Measuring Prices and Price Competition Online: Amazon.com and BarnesandNoble.com," *Quantitative Marketing and Economics* 1, no. 2 (June 2003), 203-22.
 11. Bob Nardini and John Abbott, "Issues in Vendor/Library Relations: Will Amazon Wal-Mart the Book Vendors?" *Against the Grain* 13, no. 1 (Feb. 2001): 72-74.

Notes on Operations

Floating Bibs and Orphan Bar Codes Benefits of an Inventory at a Small College

Linda Ernick

This paper describes an inventory project completed at a small college during summer 2004, including the approach used, problems encountered, and benefits that resulted. It provides a step-by-step account of how the inventory was conducted using Innovative Interfaces' Millennium software with a laptop and a laser scanner. The intent in providing this level of detail is to assist others who might be undertaking an inventory for the first time, in the hope that much of what applies to Millennium software will apply to other library software systems as well.

In spring 2004, the Anne Bridge Baddour Library (ABBL) at Daniel Webster College began to plan for an inventory of its collections. Several reasons suggested the time was right for an inventory: the collections had not been inventoried in recent memory, a visit from the accreditation committee was scheduled for 2006, and, with no new books arriving during a budget freeze, staff had more time for a large project. This paper details the approach used, problems encountered, and benefits that resulted from an inventory at a small college. It concludes with practical suggestions for libraries embarking on an inventory project of their own.

Daniel Webster College is a four-year, private college located in Nashua, New Hampshire. While the college offers undergraduate degrees in traditional areas such as business management, computer science, and social science, it also attracts many students with its aviation curriculum. The campus has approximately 1,200 students, of which about half are residential students and half are nontraditional students. The library is correspondingly small, with a staff of five full-time and three part-time employees, and a collection of about 33,000 volumes. The library uses

Millennium software by Innovative Interfaces, Inc. (III).

Literature Review

The recent literature surrounding library inventories describes the various approaches used in a regional library system, the hardware and software used for an automated inventory, and the benefits of an annual inventory.¹ Another recent publication details an inventory hampered by the dual impediments of moving to temporary quarters and a database made inaccurate by the retrospective conversion of this database to an integrated software system eleven years earlier.²

The following paper differs from these in its scope. It provides a step-by-step, practical account of how staff at a small library conducted an inventory using Millennium software with a laptop and a laser scanner. The author describes the problems encountered and the benefits that resulted. The intent in providing this level of detail is to assist others who might be undertaking an inventory for the first time, in the hope that much of what was learned in this project will apply to other libraries as well.

Linda Ernick (ernick@dwc.edu) is Technical Systems Librarian, Anne Bridge Baddour Library, Daniel Webster College, Nashua, New Hampshire.

Testing

Since all of the items in the ABBL collection have bar codes and the library owns Millennium's inventory control module, the logical approach was to conduct an automated inventory. The small collection size of approximately 33,000 volumes prescribed a survey of each item in the collection, rather than the use of proportional sampling. The question then became whether to use the Percon portable bar code reader acquired from the library's software vendor (III), or to use a laptop in conjunction with one of the Metrologic MS951 laser scanners positioned at three workstations in the library. This became an issue because of the difficulties encountered during initial experiences using the Percon portable bar code scanner. This unit comes with an attached light pen so difficult to operate that it renders the entire device virtually unusable. This difficulty was identified during a preliminary scan of the small staff reference collection (seventy-two items) a few weeks before the inventory was to begin. During this test, one might have to run the light pen over a single bar code more than twenty times before it registered on the unit. At that rate, inventorying the thousands of volumes in the library's collection would take an inordinate amount of time. A call to the III help desk resulted in the software vendor promptly sending a new light pen to attach to the Percon reader. However, this new light pen functioned only slightly better than the old, so it was still not a feasible option for running an inventory.

The Innovative Users' Group (IUG) electronic discussion group was an invaluable source of information on workarounds. Through this group, library staff learned of the Top Gun laser module, a more user-friendly attachment to the portable bar code reader; however, the campuswide budget freeze prevented the purchase of any new hardware. As an

alternative, IUG members proposed obviating the light pen issues by using a laptop attached to a laser scanner instead. This was the approach used in the library.

The first obstacle the library needed to overcome was obtaining a laptop. At one time, four laptops had circulated to the campus community, but these were not replaced as each failed over the years, and the library had only one laptop remaining. A staff member had an old laptop at home with the necessary software (Notepad) and the requisite serial port for the scanner, so the library was able to use this rather than take the library's one laptop out of circulation. The library also used existing hardware rather than purchasing new equipment in consigning the seldom-used bar code scanner at the reference desk to the inventory project for the summer. When connected to the laptop, this scanner successfully read bar codes into Notepad on the first attempt, without requiring installation of any drivers. Using this configuration, all the items in the staff reference collection were scanned within about half an hour. The only additional tools needed for a large-scale inventory were a wheeled cart and an extension cord to eliminate battery-life issues with the laptop.

Timing

The best time in an academic library to conduct any project that is disruptive, even if only mildly so, is during a school vacation. The summer vacation was the best time to do this at Daniel Webster College because it was the longest break and inventory was expected to take several weeks. The library's goal was to begin the inventory in mid-May, after the students left, and to have it done by July 1. As the halfway point of the summer, this seemed the likely time for the staff to turn its attention to other projects

that had been slated for the school break. In addition, July 1 was the date when the part-time reference librarian would leave for a six-week vacation and the priority of staffing her hours at the reference desk would limit staff availability to carry out the inventory.

The inventory was begun in late May, as soon as possible after the students graduated May 15. Staff started with the circulating collection, the largest at 28,404 items, and finished that area in fifteen days. Staff then moved on to the reference collection and finished this area of 4,522 items in four days. Next was 310-item aviation video collection, which took only one hour to scan. A small flight center collection is located off site. Because this collection only contains forty-five items, printing the shelf list for this location and checking off those items that were present was easier than bringing the laptop to the off site location. A small feature video and DVD collection had been inventoried in the same manner over winter break; those collections were not reinventoried. In addition, the library has a small paperback collection that was not inventoried; because it exists purely for entertainment purposes and consists entirely of donations, the time necessary to survey it was not justified. Neither was the collection of audiovisual equipment inventoried, since these items are kept in a locked closet and anyone working at the circulation desk is prompted to inventory the contents of each item upon check in or check out. All of the bar code scanning, from start to finish, took almost exactly one month, from May 25 to June 24. The scanning was done in two- to three-hour shifts by two people, working about six hours a day, at an average of 307 volumes per hour. Since only one laptop was available, only one person could scan at a time. Examination of the reports generated from uploading the bar codes into the Millennium system was carried out simultaneously with

the actual scanning of items. The systems librarian also worked with these reports during the week between the time scanning was completed and the July 1 deadline.

Staffing

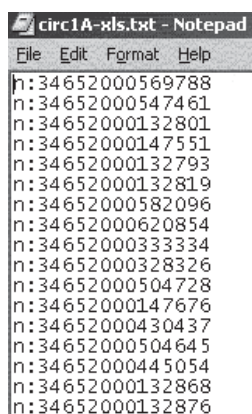
While the systems librarian did much of the scanning, one person could not do this alone, if only because one's arm tended to ache too badly after about four hours of the repetitive motion. The cataloging assistant, who had some free time owing to the lack of new acquisitions, was recruited to help. The part-time reference librarian assisted by shelf-reading the collection a few steps ahead of those doing the scanning. The reference librarian also helped to comb through the reports produced by Millennium's inventory control module. In addition, the circulation supervisor supported the project by shelf-reading areas of the collection that the reference librarian could not get to before they were due to be scanned. Since ABBL has only five full-time and three part-time staff members, the inventory process effectively involved half of the staff.

Software

Millennium's inventory control module is a separate area of the integrated library system that perform three functions: printing a shelf list, comparing a file of bar codes to the shelf list in the system, and transferring a set of bar codes to a review file. Review files in the Millennium system are a means of creating lists based on specific criteria; these lists can then be used to run statistical reports or to isolate a group of records for maintenance purposes. ABBL used this module for the second purpose listed above, comparing a file of bar codes to the shelf list order in the system. Once a file of bar codes has been uploaded

to the inventory control module and compared to the internal shelf list, the inventory date field in the record for these items is populated with the date the report was run.

The only other software programs used were Notepad, Microsoft Excel, and the file transfer software WS_FTP LE. Notepad and Excel are fairly standard on most computers, and WS_FTP LE is freely available for download on the Web. Bar codes were scanned into a simple text file in Notepad. The Percon portable bar code reader would have automatically converted the bar codes into a format the inventory control module could read; since this portable reader was not being used, the text files had to be manipulated before being transferred to the Millennium system. This was accomplished by using Excel to add the prefix "n:" to every bar code, then saving the file back to a text file. The result is illustrated in figure 1. This formatted text file was uploaded to the library's Millennium server using WS_FTP LE; reports were then run within Millennium.



```
n:34652000569788
n:34652000547461
n:34652000132801
n:34652000147551
n:34652000132793
n:34652000132819
n:34652000582096
n:34652000620854
n:34652000333334
n:34652000328326
n:34652000504728
n:34652000147676
n:34652000430437
n:34652000504645
n:34652000445054
n:34652000132868
n:34652000132876
```

Figure 1. Formatted text file with "n" added.

Files

Had the library been using the Percon bar code reader, the size of a given

text file would have been limited to this hardware unit's capacity of about 3,000 bar codes. Because the inventory was being conducted with a laptop, however, the only limitation on the size of the files was the space on a floppy disk. For logistical purposes, small text files were created, each corresponding to a given bookcase. To manage these files, creating a numbered diagram of the bookcases in each collection was necessary. Text files were named according to the bookcase with which they corresponded in this diagram. As an example, a file called "circ1A.txt" would correspond to side A of bookcase number one in the circulating collection; "ref2B.txt" represented side B of bookcase number two in the reference collection, and so on.

Sequence of the Project

The largest collection should be inventoried first; items that are missing from smaller collections often have been misshelved in the larger collection. The circulating collection at ABBL is the largest collection. When student workers reshelve books and overlook a reference or aviation label on the spine of the book, they usually place them (in error) in the circulating collection. These misshelved books were discovered when, for instance, an item listed as missing in an inventory report for the reference collection also would contain an inventory date corresponding to a date when staff had been scanning bar codes in the circulating collection. These items were not missing altogether, but rather missing from their home collections.

Problems

Since items in the new books or display case areas are ultimately bound for the circulating collection, the library does not maintain separate location codes for these new arrivals. Thus these are

technically located in the circulating collection, even though they are not physically located there. As a result, the inventory reports flagged these items as missing from the circulating collection. This oversight was detected early in the process. If the item's home bookcase was in a part of the circulating collection that had not yet been scanned, the item was simply shelved in the appropriate home bookcase in the circulating collection. If, however, the appropriate location in the circulating collection already had been scanned, its bar code was inserted into the proper place in the text file and the report for that row was run again.

The error message that appeared most frequently on the inventory reports was "error misshelved." Often, particularly with multivolume sets, consultation with the shelves showed that, in fact, these items were in the right place. The error occurred because of the way the records are stored in the system. Millennium has bibliographic records that represent the intellectual content of a work. Item records representing the physical item itself are attached to these bibliographic records. The Millennium software expects items to be on the shelf in the same order that their item records are attached to a bibliographic record in the system. If volume 3 of a work is cataloged a few minutes before volume one, then volume three will appear as item one in the system, though it is item three on the shelf. Figure 2 illustrates the record for a multivolume set, in this case the series American National Biography.

As the illustration shows, the bibliographic record in the top pane has an order record and several item records attached to it in the lower frame. The item records are attached to the bibliographic record in reverse chronological order, a manner opposite to the way the Millennium system would expect. Volume 24, which Millennium would expect to be the last attached item, is in this case item

number 2; volume 23, which should be the next-to-last item, is item number 3, and so on. In reality, volume 1 was first on the shelf, followed by volume 2 and so on, but the inventory report flagged these volumes as misshelved because the items were attached in a different order in the system. Figure 3 shows the resulting inventory report. The "Last Item Shelved" message in this illustration

shows that the last item the system considered to be correctly shelved was volume one. Volumes two and three are shown as misshelved. Not shown in figure 2 are the remaining twenty-one volumes, all of which are tagged as misshelved in the report. Once the item records had been rearranged chronologically in the system, the inventory report no longer flagged these as misshelved.

| B10308520 | | BIBLIOGRAPHIC Information | |
|-----------------------------|--|--|--|
| CALL # | CT213 .A68 2002 | | |
| TITLE | American national biography. Supplement 1 / editors Paul Betz, Mark C. Carnes. | | |
| IMPRINT | New York : Oxford University Press, 2002. | | |
| Summary of Attached Records | | | |
| ORDER | 01 > | LOCATION: ref; FUND: ref; STATUS: a | |
| ITEM | 02 > | LOCATION: ref; BARCODE=34652000633808; VOLUME=v.24 | |
| ITEM | 03 > | LOCATION: ref; BARCODE=34652000633782; VOLUME=v.23 | |
| ITEM | 04 > | LOCATION: ref; BARCODE=34652000633766; VOLUME=v.22 | |
| ITEM | 05 > | LOCATION: ref; BARCODE=34652000633725; VOLUME=v.21 | |
| ITEM | 06 > | LOCATION: ref; BARCODE=34652000633733; VOLUME=v.20 | |
| ITEM | 07 > | LOCATION: ref; BARCODE=34652000633774; VOLUME=v.19 | |
| ITEM | 08 > | LOCATION: ref; BARCODE=34652000633741; VOLUME=v.18 | |
| ITEM | 09 > | LOCATION: ref; BARCODE=34652000633717; VOLUME=v.17 | |
| ITEM | 10 > | LOCATION: ref; BARCODE=34652000633618; VOLUME=v.16 | |
| ITEM | 11 > | LOCATION: ref; BARCODE=34652000633626; VOLUME=v.15 | |
| ITEM | 12 > | LOCATION: ref; BARCODE=34652000633667; VOLUME=v.14 | |

Figure 2. Record for a multivolume set.

SHELF LIST INVENTORY REPORT Mon Nov 29 2004 for LOCATION REFERENCE - 1st Floor

| | | |
|---|----------------|--------------------|
| Beginning barcode and call # | 34652000542934 | CT213 .A68 2002 v. |
| Ending barcode and call # | 34652000201697 | E175.8 .F37 |
| Total number of items that exist in this range | 247 | |
| Number currently checked out | 0 | |
| Number of items with off-shelf status | 0 | |
| Number expected to be on the shelf | 247 | |
| A. Number of barcodes in input file | 265 | |
| B. Number of barcodes in input file that do not belong in this area of the shelves | 24 | |
| C. Number of barcodes in input file that are in wrong place in this area of the shelves | 36 | |
| D. Number of barcodes that are MISSING from the input file | 6 | |

ERROR REPORT FOR LOCATION REFERENCE - 1st Floor

| Status | Call Number | Title |
|-------------------|----------------------------|----------------------|
| LAST ITEM SHELVED | 542934 CT213 .A68 2002 v.1 | American national bi |
| ERR msh | 632545 CT213 .A68 2002 v.2 | American national bi |
| ERR msh | 632541 CT213 .A68 2002 v.3 | American national bi |

Figure 3. Inventory report.

The shelf order of items, as understood by the Millennium system, also could be thrown off if a call number had been keyed with extra spaces. However, in many cases an item was, in fact, misshelved, in spite of the library staff's best efforts to catch these errors through shelf reading. These were repositioned in the correct location, thereby making the shelves more accurate.

The bar code scanner's occasional tendency to misread a bar code was an unexpected and, at times, very misleading, complication in the inventory process. At one point, the scanner input every bar code as a string of symbols into Notepad. Fortunately the manual for the bar code reader contained a bar code which, when scanned, restored the reader to its default settings. When the bar code misread a single digit, this could be more problematic. A 4 might be read as a \$, or a 7 as a /. Where the bar code scanner misread numbers as symbols, they were fairly easy to catch, as they leapt out to the eye when scanning a report. However, the scanner periodically misread a number as another number, with a 4 being read as a 6, a 9 as a 7, and so on. These were indicated on the reports with the message "bar code not in database," and a good deal of time was spent tracking down the correct digit. The best way to identify the correct number was to open the text file in Notepad, and use the "find" command in the Notepad toolbar to locate at least a portion of the flagged bar code. Based on the bar code preceding this one, staff was able to locate the book on the shelf and correct its bar code in the report. An example of Notepad's "Find" command highlighting a portion of a bar code is shown in figure 4.

The "bar code not in database" error message also alerted staff to bar codes that had been keyed incorrectly during cataloging. A great many such errors were corrected. These might otherwise have been detected only

sporadically, through failed checkouts and the like.

Database Cleanup

The inventory provided for database cleanup on both simple and more complex levels. On a simple level, the status of many items was corrected. For instance, books that were marked as missing or checked out but were present in the expected location on the shelves were updated to reflect a status of available. Conversely, items marked as available that were never scanned during the inventory were marked missing. Some items turned up that were not in the system at all, for whatever reason. Having been identified during the inventory, these have now been cataloged. Four items were located that had been marked lost and paid. Staff attempted to contact the patrons who had paid for the replacement cost of these items in order to reimburse them.

The locations in the catalog were another simple area where the inventory enabled greater accuracy. Sometimes items are intentionally relocated to another collection, as when a previous year's edition of a reference book is transferred to the circulating collection upon the arrival of the current edition in the reference collection. In many cases, the location code in the system had not been updated to reflect this change. All such items were corrected in the catalog, and thus the findability of the collection is greatly improved.

Many simple bar coding errors were discovered using the inventory reports. Bar codes that had been attached to a book but never entered into the system were indicated by the "bar code not in database" message. These orphan bar codes were reunited with their corresponding bibliographic parents. The reports also flagged cases where a single bar code, intended to represent only one item, had been assigned to the records for two different items. New bar codes were insert-

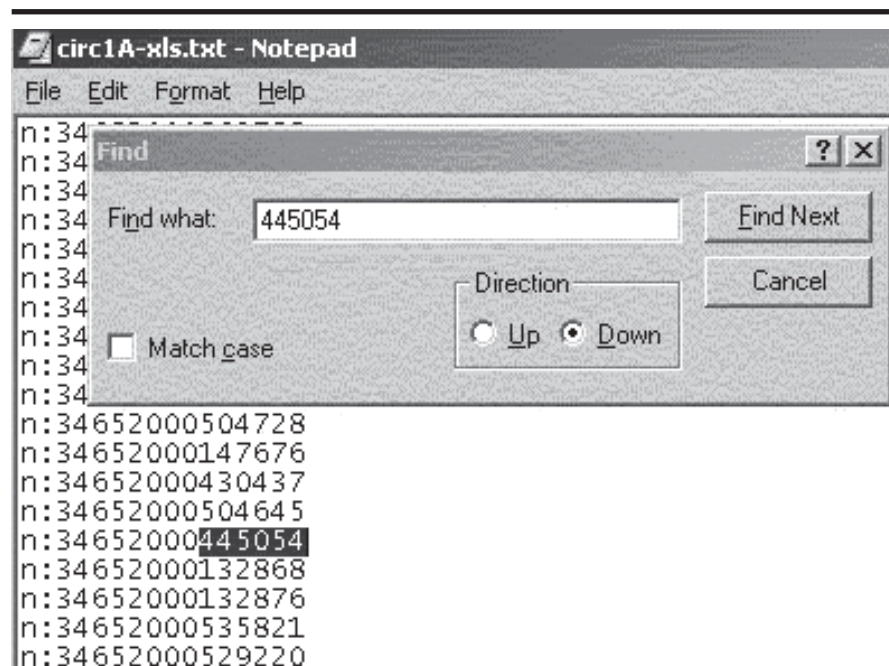


Figure 4. Use of Notepad's "find" command to find a portion of bar code.

ed into these records. Bibliographic records that had no attached item records at all were indicated in the reports by the message "error no item record." These floating bibs have now been anchored to their item-level counterparts in the system.

In addition to these types of simple errors, the catalog had more complex cataloging inaccuracies that the inventory enabled the library to amend. Ever since the library had migrated from Data Research Associates's MultiLIS system to Innovative's Millennium in October 2000, the library had a problem with the MARC tags 090 (local call number) versus 050 (Library of Congress call number) in certain records. For a large number of items, the catalog would display the number in the 050 field, while the number in the 090 field was what actually appeared on the spine of the book. Where these two numbers differed, sometimes wildly, this would render the book virtually lost. The previous systems librarian had come up with an ingenious software-based solution to this problem, but a small group of records had escaped this correction. When investigating the reports, these items were very apparent; they would have an "error misshelved" message next to them. Simply eyeballing the report would show that the call number for that particular item differed greatly from the surrounding ones.

Results

The inventory showed that a very small portion of the collection was missing—only about 0.68 percent. This may be a tribute to either the integrity or the students or of the library's 3M security system, but it also could be attributed to the low circulation of the collection; there were 2,552 circulation transactions from the circulating collection and 10,710 from the library as a whole in the 2003/2004 academic year. These small circulation

figures reflect the small size of Daniel Webster College.

Going Forward

For items flagged as missing in the reports, the shelves were checked and then the records were either marked as missing or updated with an inventory date if the items were found. If the item was still found to be missing, a note was added in the item record stating, "Missing in Summer 2004 inventory." Lists of items with this note will be generated and searched for on a quarterly basis. The records for these items will be deleted if they have still not been located after the fourth quarter, at which time decisions about replacement will be made.

Conclusion

The inventory was beneficial on several levels. First, in giving an accurate picture of what was on the shelves, it allowed the corresponding records in the system to be corrected. Second, it improved the shelf order of books in the ABBL collection. Third, it gave the staff a meaningful project during a budget crisis, when no new books were arriving. Finally, in anchoring orphan bar codes and floating bibs to either their parents or children, the inventory improved the usability of the collection and the catalog. Other libraries likely will find many of the same benefits when they conduct inventory. This paper concludes by offering practical suggestions (based on the author's experiences) for libraries considering, or already committed to, an inventory project.

Practical Suggestions

- *Decide whether or not you are going to allow items to circu-*

late while you are conducting the inventory. I decided to let items circulate because our system would account for these items as "OK checked out" in the inventory reports. The inventory date field in the item record would not get populated for these items; however, the last checkout field of the item record should provide enough proof that the physical item was released from the library on a particular date.

- *If you do allow items out, decide what you are going to do with them when they come back.* Some libraries might decide to collect returned items on a cart for several months after the inventory and update the inventory date field for these items as they come back. I decided the need to get items back into circulation as quickly as possible outweighed the benefits of updating the inventory date in the records for these books. Instead, I am relying on the last check-in field in these records to indicate to staff members the last time this item was ever seen, as opposed to the inventory date field that I am using for the bulk of the collection.
- *Reshelve display books and any other items that may be separate from other collections if they are not listed as having a separate location in the catalog.* Otherwise these will turn up missing in the reports.
- *Shelf-read first.* Items that are out of order on the shelves will lengthen the error reports generated by the software.
- *Draw a map.* Create a diagram of the stacks holding your collections and label them with the range of call numbers they contain. Then number each bookcase. For instance, in our circulating collection, I started

with the bookcase containing call numbers that begin with A and labeled this bookcase 1, with the left side being 1A and the right side being 1B, and so on. Then I could point to a location on the map when updating other workers on our progress. Be sure to write the dates you inventoried a given row on the map as you go along; if you are cannot find an item, and the inventoried date field of its item record contains a recent date, at least you will be able to consult your map to determine approximately where that item is. Then you can bring up the corresponding text file of bar codes, and use the find command on the Notepad toolbar to locate the bar code in the file. Note the bar code preceding it, and look up the corresponding call number in your system to determine location on the shelf.

- *Inventory your largest collection first.* Our work-study students, who do much of our reshelving during the academic year, can not always keep our various small collections straight, and so the circulating collection becomes the catchall for items that should be shelved in reference, new books, aviation, and so on. If you do your default collection first, these misshelved items can be identi-

fied and returned to their proper homes in time to provide smoother reporting on smaller collections.

- *Clean up the database as much as you can before you start running the reports.* When items are withdrawn, we mark them with either the letter d or w in the suppress field of the bibliographic record. The presence of either of these letters in this field suppresses them from the public catalog, while allowing us to retain the records in our system should we need to consult them for statistical or accounting purposes. However, the Millennium inventory control module still expects these types of records to be on the shelf, and so these throw off the reports. Extract the data you need from these withdrawn items, then delete the records altogether before running any reports.
- *Try to keep up with the reports.* Because we are a small operation, I was heavily involved with the actual scanning of bar codes, and almost entirely responsible for examining the resulting reports. I kept the scanning going at a brisk pace, but was not always able to look at the results as soon after the scanning as I would have liked. Since our collections were still open to the public, getting an accurate picture of what was

on the shelves was like trying to hit a moving target, which worsened as time passed and items were checked out from or returned to the shelves.

- *Check and double check.* The inventory reports will list an item as missing even if it correctly has a status in the system of lost and paid, or withdrawn. Be careful to check and double check all items listed as missing so that you do not include them in your inventory statistics when they are not, in fact, missing. Although they may not be on the shelves, they are accounted for in other ways.

References

1. Fred P. Borchuck, David Parsley, and Patrick Dunn, "Library Book Inventory Practice in TBR Libraries: A Survey," *Tennessee Librarian* 49, no. 1, (Summer 1997): 10-18; Virginia Marie Allen, "Automated Library Inventory Using Bar Codes (at the Mary and John Gray Library)," paper presented at the 23rd Annual Conference of the International Association of Aquatic and Marine Science Libraries and Information Centers, Charleston, S.C., Oct. 5-9, 1997; Melissa Stearns, "Going to the Shelves: Annual Inventory," *Mississippi Libraries* 62, no. 4 (Winter 1998): 81-82.
2. Judith W. Wild, "Inventory at Brooklyn College, 1998-1999: An Original Method," *Library Resources & Technical Services* 46, no. 2 (Apr. 2002): 62-71.

Book Reviews

Edward Swanson, Editor

Innovative Redesign and Reorganization of Library Technical Services: Paths for the Future and Case Studies. Ed. by Bradford Lee Eden. Westport, Conn.: Libraries Unlimited, 2004. 480p. \$45 paper (ISBN 1-59158-092-7).

Brad Eden has pulled together a rich compilation that extensively covers the topic of restructuring technical services. Part 1, consisting of a literature review and five chapters, approaches the subject of technical services redesign from a research or theoretical perspective. The fifteen chapters of Part 2 constitute the lion's share of the work, presenting case studies and practical experiences of managers on the front lines of change in technical services. Taken as a whole, the book collects in one place an impressive body of experience, insight, evidence, and practical guidance on technical services redesign, staffing challenges, workflows, and issues of quality, as well as lessons learned about initiating and leading change.

Of immediate use to library leaders who are considering change in technical services are the numerous models for reorganization offered by the authors. For example, Ruth Bogan provides a fascinating application of the core competency model originally introduced in the *Harvard Business Review*. Cheryl Martin's chapter reports on workflow analysis as a reorganization methodology, as does Andrea Rabbia's highly readable chapter. Two authors, Annette LeClair and Karen Ramsey, note the importance of taking a proactive stance in technical services planning; for example, LeClair remarks "rather than waiting to be asked what they might contribute

[to incorporating electronic resources and developing a library Web site], the Technical Services librarians proposed and committed resources to a working solution" (249). Rhonda and Jack Glazier's chapter deals with merging previously separate departments. Many authors address the impact of shrinking departments, and Patricia Banach's chapter explains how her library coped with an extreme case of downsizing. Besides the number of organizational models, sample organization charts, and techniques offered, many authors provide excellent lists of references, so that, in combination with Laurie Lopatin's extensive literature review, the reader can expect few if any omissions of key articles from the late 1980s to 2002.

Many common threads weave themselves through the chapters in Eden's compilation. Perhaps the strongest theme is the notion that technical services is and will be faced with constant rapid change. Second strongest is the theme of changing roles and job requirements for technical services librarians on the one hand and support staff on the other. Along these lines, Vicki Toy Smith and Kathryn Etcheverria's survey results illuminate the issues of shifting roles, and Karen LeTarte, Charles Pennell, and Shirley Hamlett offer a helpful look at the literature and key issues around career paths for library support staff. Interestingly, Pamela Cline Howley's time series survey (first conducted in 1989 and then in 2003) documents evolutionary rather than revolutionary change in staffing patterns; similarly, Nadine Ellero's analysis of hundreds of cataloger job descriptions (1997 to 2003) indicates that change in technical services

practitioners' roles is slower than is often thought.

Other oft-articulated themes across chapters include shrinking technical services departments faced with rising demand for new services, especially e-resource access; the emergence of flatter, more team-based and collegial organizational structures; an increase in cross-training, particularly of support staff; and more joint initiatives between technical services and other functional groups in the library. Less frequent but still prevalent among these essays are discussions of outsourcing. Mary Mastraccio's chapter "Quality Cataloging with Less" is particularly helpful; it includes ten separate reference lists on key topics related to outsourcing.

Editor Brad Eden and the many authors who contributed to this book have succeeded in presenting both research-based findings and practical evidence to support decision making on technical services staffing, workflow, and organizational structures in the current environment. The authors are mainly from academic libraries in the United States, and many of the chapters emphasize cataloging. Nevertheless there is worthwhile material for readers whose responsibility is acquisitions, and some chapters venture into database management; access services, including interlibrary loan; and government documents. Three contributors who offer contrast and variety are a law librarian, the chief of cataloging in the U.S. Government Printing Office, and a metadata librarian working on a geospatial information repository. While one may not wish to read this book from front to back, it is an excellent sourcebook for ideas, examples, and key references to the library literature.

Some may be tempted to compare Eden's compilation with the second edition of Michael Gorman's highly influential *Technical Services Today and Tomorrow* (Englewood, Colo.: Libraries Unlimited, 1998). Generally, Eden's book has a more modest scope; it will be more useful to those involved in the day-to-day work of leading a technical services department or unit, and less useful to opinion leaders and library and information science educators or students. Having said that, a side-by-side comparison of Gorman's introductory chapter "Technical Services Today" and Pat Lawton and Deborah Rose-Lefmann's "What is Technical Services?"—both definitional treatments of the topic—yields worthwhile insights. Other chapters in Gorman's compilation that might usefully supplement Eden's are Roxanne Sellberg's "Cataloging Management" and the oft-cited essay by Jennifer Younger and Kaye Gapen, as revised by Cecily Johns, "Technical Services Organization." Another work to supplement Eden's compilation is Michael Buckland's well-known *Redesigning Library Services: A Manifesto* (Chicago: ALA, 1992). While more than a dozen years have passed since its publication, Buckland's chapter "Bibliographic Access Reconsidered" predicted the significant expansion of the catalog's scope and the organizational challenges about which Eden's authors have written. Buckland's essay is well worth the time of the reader who has picked up Eden's book.

For the most part, Eden's contributors do not seriously challenge traditional definitions of technical services. Should an aspiring author or editor be willing to take it on, a helpful companion to Eden's book would feature a more systematic, future-oriented treatment (*à la* Buckland's 1992 manifesto) of how library technical services might or should be transformed over the next five to ten years. A useful starting point for such a work could be a review of some articles on

the applicability of knowledge management to the future of libraries, followed by an exploration of the implications for technical services. Several such articles—including an infamous one by T. Davenport called "Blow up the Corporate Library"—appear in a compilation that assembles a number of International Federation of Library Associations and Institutions (IFLA) papers on knowledge management.¹—Karen Calhoun (ksc10@cornell.edu), Cornell University Library, Ithaca, N.Y.

Reference

1. Thomas H. Davenport and Larry Prusak, "Blow Up the Corporate Library," in *Knowledge Management: Libraries and Librarians Taking up the Challenge*, ed. Hans-Christoph Hobohm (Munich, Germany: K.G. Saur, 2004). First published in *International Journal of Information Management* 73 (1993): 405–12.

IFLA Cataloging Principles: Steps Towards an International Cataloging Code: Report from the 1st IFLA Meeting of Experts on an International Cataloging Code, Frankfurt, 2003. IFLA Series on Bibliographic Control, vol. 26. Ed. by Barbara B. Tillett, Renate Gömpel, and Susanne Oehlschläger. München, Germany: K. G. Saur, 2004. 186 p. €58 cloth (ISBN 3-598-24275-1).

This volume assembles presentation papers, background papers, and other materials related to the First International Federation of Library Associations and Institutions (IFLA) Meeting of Experts on an International Cataloging Code (IME-ICC), held in Frankfurt am Main, Germany, July 28–30, 2003. The goal of the meeting as stated by Barbara Tillett in her introduction was "to increase the ability to share cataloging information worldwide by promoting standards for the content of bibliographic records and authority records used in library catalogues" (10). This work builds on the foundation of the Paris Principles drawn up

by the 1961 International Conference on Cataloging Principles (ICCP). Objectives of the meeting included reviewing existing cataloging codes with an eye toward harmonization, and drafting of a general statement of cataloging principles. The statement would incorporate recent concepts deriving from IFLA's work on the Functional Requirements for Bibliographic Records (FRBR) and the Functional Requirements and Numbering for Authority Records (FRANAR), changing models for Universal Bibliographic Control (UBC), and new definitions of seriality.

Both the 1961 Paris Principles and the final December 19, 2003, draft of the new Statement of International Cataloging Principles are included in the volume. The latter is also published in number 20 (Jan. 2004) of the online newsletter of the Standing Committee of the IFLA Cataloging Section, SCATNews (www.ifla.org/VII/s13/scatn/news20.pdf). The new statement of principles reflects FRBR/FranAR terminology for entities and relationships, updates the Paris Principles recommendations regarding heading choice and formulation, and identifies "the convenience of the users of the catalogue" (21) as the guiding principle for constructing cataloging codes.

Barbara Tillett's presentation paper on "A Virtual International Authority File" discusses how the principle of user convenience has altered the direction of UBC efforts. As originally conceived, UBC called for each national library to establish authorized headings for its own personal and corporate authors, and for other libraries to adopt those headings as the universal form. In practice, this proved an extremely difficult goal to achieve given the differences in cataloging codes used by the national libraries and the language-specific nature of each country's authority work. Tillett describes how new technologies for linking records and navigating among

files have made possible a reconceptualization of UBC. Each national library is now responsible for establishing all name headings for its users consistent with its rules and language preferences. These authority records are then interconnected in a widely accessible Virtual International Authority File (VIAF) to enable libraries to search and retrieve useful information from other national libraries' authority files. Ultimately, VIAF could enable users to search with the headings of their preferred community to find records in the local library or other database, wherever it may be.

Two other presentation papers are included in the volume. John D. Byrum's "IFLA's ISBD Programme: Purposes, Process, and Prospects" describes the history of the International Standard Bibliographic Descriptions (ISBDs), the process by which they are created, reviewed, and revised, and current issues, including correlating FRBR and ISBDs, dealing with multi-format publications, and managing series and standard number information. Patrick Le Bœuf discusses a wide range of FRBR issues in the lively "Brave New FRBR World." Of particular interest is his suggestion that FRBR needs a "package content" level intermediate between expressions and manifestations to account for the aggregation of expressions that often make up a single bibliographic resource (47).

A collection of background papers discusses various aspects of heading choice and formulation, the major focus of the 1961 Paris Principles. A few highlights: Pino Buizza and Mauro Guerrini's "Author and Title Access Point Control" opens with the cogent observation that, "Forty years later we find the *Paris Principles* had positive effects on the choice of headings but not on their form; each code followed its particular course, mostly retaining its local tradition" (72). The paper goes on to review these divergent traditions as they apply to name headings.

Appended to the paper is a list of the multiple forms found when prominent names are searched across ten national library databases. Guerrini also contributes "Corporate Bodies from ICCP up to 2003," a valuable account of the history of corporate body concepts and naming conventions in library cataloging. He analyzes the conflicting rationales that underlie varying cataloging practices, in particular regarding the vexed concept of corporate authorship.

Ingrid Parent's "From ISBD(S) to ISBD(CR): A Voyage of Discovery and Alignment" recounts the events and decisions that led the ISBD(S) Working Group to widen the focus of ISBD(S) to encompass continuing resources in general. Such changes cannot be made profitably in isolation, and Parent stresses the importance of ensuring that AACR, ISBD, and ISSN rules for title changes in particular all keep pace with one another. Ann Huthwaite's "Class of Materials Concepts and GMDs" discusses the problems posed by multifformat resources and offers suggestions for how to resolve them. Rather than defining a chief source and prescribed sources of information for each class of materials, she recommends a general rule to use the "source which provides most complete information" and trusting cataloger's judgment (150). She also sees a need to divide the current list of General Material Designator terms into expression and manifestation level terms, and to find a suitable place for the former. A series of brief summaries from the Meeting of Experts working groups and various lists of the participants round out the volume.

This book will be of interest to anyone following the development of cataloging concepts and rules at the international level. As is often true at this level, the discussion is pulled in conflicting directions. Wading into these issues, the reader can see the vision of well integrated complemen-

tary records enabling users to navigate a vast sea of diverse resources easily; yet one also feels the competing wash and undertow of varying local practices, concepts, and maps of the contents of that sea. Meanwhile, the work goes on. The second IME-ICC was held in Buenos Aires, Argentina, August 2004. For more information about the first and second IME-ICC meetings see the conference Web sites: www.ddb.de/news/ifla_conf_index.htm (IME-ICC1) and www.loc.gov/loc/ifla/imeicc (IME-ICC2).—*Stephen Hearn* (s-hear@tc.umn.edu), *University of Minnesota, Minneapolis*

Essential Classification. By Vanda Broughton. New York: Neal Schumann, 2004. 324pp. \$55 paper (ISBN 1-55570-507-3).

In 1964, Barbara Kyle published an excellent little book in the Teach Yourself series, *Teach Yourself Classification* (London: EUP, 1964). This is a clear exposition of the basic essentials of classification for those unacquainted with the discipline. Some forty years later, Vanda Broughton has done likewise for the twenty-first century with the publication of this basic introduction for those who have no background in classification, a discipline that Barbara Kyle commended as a compulsory school subject. *Essential Classification* is primarily concerned with library classification and other methods of subject retrieval. Despite the title, the work also handles such retrieval methods as subject headings and thesauri, which, although they have strong links with classification per se, are not really classifications in the strict sense. This book is based largely on the author's experience in teaching subject retrieval and has strong affinities with a programmed text, containing exercises scattered throughout with answers and explanations. It is written in an informal style and will be easily digested by those who have little acquaintance with classification.

The book begins by looking at the basic principles of classification and briefly reviews other forms of classification before proceeding to bibliographic ones. Enumerative, analytical-synthetic, and faceted classifications are distinguished, and matters of main class order, literary warrant, and notation are looked at before the main problems, those of document description and the translation of that description into the terms of either a classification scheme or a subject headings list or both, are discussed. The systems used in the Library of Congress (LC) are first selected for review, a sensible choice since the Library of Congress Classification (LCC) works best when accompanied by the Library of Congress subject headings (LCSH), and the two together provide a good starting point for an exposition of systematic combined with alphabetical systems. (A minor point—LCSH now occupies five volumes, as correctly noted in the bibliography, although not in the text, and the “Red Books” are now green). There are some comments on the nonpolitically correct language to be found in these standard systems, but the point could legitimately be made that the listing of a term does not signify approval, merely the fact that literature exists on the topic.

The intricacies of the tables in LCC are clearly explained, using Class H, by far the most complex of all the places where these occur, as the pattern for demonstration. The introduction of the Web-based version has greatly simplified the practical application of these, but they still remain a problem for the novice. Cutter numbers, again, although familiar to an American audience, are not often found in England and these, too, cause students unaccustomed to them some difficulty. The point that only LC will create the “right” Cutter number for a particular work is worth noting, since with a new book, a cataloger has no

way of knowing what cutter number will be assigned, since it is totally dependent upon LC stock.

LCC and LCSH are followed by the Dewey Decimal Classification (DDC)—this classification is also developed more extensively in a companion work in the same series, *Essential Dewey*, by John Bowman (New York: Neal-Schuman, 2005). Clear instructions on how to handle complex subjects that do not fit precisely into a given class number and the complexities of number-building are well demonstrated. Class 8, which is probably the easiest to classify when one knows the right answer, and one of the most difficult for the novice who has no idea of how to build up numbers, is avoided, as is class 78, another class that requires very clear thinking as well as a good understanding of the basic principles of facet analysis.

The Universal Decimal Classification (UDC), unlike its parent DDC, merits two chapters, the first setting out the general principles on which the scheme is based while the second is devoted to the use of the auxiliary tables. The scheme is clearly explained and the plentiful supply of exercises will assist the novice through notational intricacies as well as the plethora of tables that form the jigsaw pattern necessary for the precise identification of subjects which that scheme permits.

The work concludes by discussing faceted classifications, although inevitably facet analysis pervades the discussion throughout, in a general way. Here the exposition is more specific, giving attention to the work of Ranganathan and of the Classification Research Group, and going into deeper explanation of the principles of hierarchy, order in array, citation order, and schedule order. This leads naturally into that constant stumbling-block, the principle of inversion, which is clearly explained and well-illustrat-

ed with copious examples. The final chapter discusses the management of classification and is followed by a useful glossary and suggested further reading where many of the standard works are listed.

There are inevitably a few errors. The author appears not to be very familiar with avian classifications, so it was perhaps unfortunate to select them in the discussion of types of classification. Figure 1.4 mixes orders and families and omits the essential division into passerines and non-passerines, treating the former as if it were a family, and Sibley and Munro developed their classification well before 1993, which is the date when they published their *World Checklist of Birds* (New Haven, Conn.: Yale Univ. Pr., 1993), based on their earlier work, *Distribution and Taxonomy of Birds of the World* (New Haven, Conn.: Yale Univ. Pr., 1990), and on Sibley and Ahlquist's *Phylogeny and Classification of Birds* (New Haven, Conn.: Yale Univ. Pr., 1990). The proofreading has clearly been thorough, though again one instance slipped through the net on page 157, where it is stated that the cutter number for Rabuzzi is R33 and on the next line it appears in the class mark as R28.

Despite minor blemishes, this work will be one that many novices both in schools of library and information studies and in the actual working environment will relate to and find a palatable and manageable introduction to a discipline which many find mystifying in the early stages. Its provision of exercises and answers (often the best way of working out how a class number should be built, when one has little knowledge of a classification scheme) make it a teach yourself book in the twenty-first-century style.—I.C. McIlwaine (imcilwaine@aol.com), *Editor in Chief, Universal Decimal Classification, Norfolk, England*

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Association for Library Collections & Technical Services
a division of the American Library Association

50 East Huron Street, Chicago, IL 60611 • 312-280-5038

Fax: 312-280-5033 • Toll free: 1-800-545-2433 • www.ala.org/alcts