Notes on Operations

Swimming with the Fiches

Reviving the International Aerospace Abstracts Collection to Make It Discoverable and Accessible to Researchers

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When the authors discovered a forgotten microfiche collection, they knew they needed to determine a process to make the information discoverable and accessible to researchers. Using a combination of manual data entry, cross-checking against printed indexes, and batch conversion of data using MarcEdit, they devised processes and workflows for creating reasonably good metadata for this large collection and for loading the MARC records into their local integrated library system. Their methods can serve as a model for any collection for which basic metadata would be useful in enhancing discovery and access.

Imagine yourself stumbling upon a forgotten microfiche collection in the far reaches of your library. Fiche is no longer a preferred format for information storage, but before online databases were commonplace, microformats allowed libraries to provide access to large collections in a small footprint. This format is alien to many of today's users. With the rapid evolution of research libraries away from warehouses for physical items and toward spaces for collaborative creation, research, and learning, many uncataloged or undercataloged collections are being moved off-site or discarded. This may cause these collections to become lost. Microformat collections are especially susceptible to this fate because few libraries have cataloged these collections at the title level. The absence of good title level metadata makes it difficult for libraries to know what they own and for users to find what they seek.

A newly discovered or rediscovered microformat collection raises many questions: Is the collection still useful to users? Has it been cataloged? If not, does metadata exist? What are the best methods for ensuring discovery and access? Does the library still own the equipment required to access the information in this format?

These questions were explored through a case study of an extensive collection of full-text aerospace engineering papers issued on microfiche from 1967 to 1973 held at Penn State University (PSU) Engineering Library that are abstracted and indexed in International Aerospace Abstracts (IAA), published by the Technical Information Service of the American Institute of Aeronautics and Astronautics (AIAA). Microformats are flat pieces of film containing microphotographs of document pages. The IAA papers are a collection of journal articles, conference papers, monographs, and theses from mostly Soviet Bloc scientists and engineers. This collection is important to researchers because it covers international aerospace research during the height of

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the space race between the Soviet Union and United States. Most of the papers are in English or Russian, and approximately two dozen other languages are represented. While the information contained in the collection is partially duplicated in other sources, IAA is one of the only resources to gather Soviet Bloc technical aerospace information in one place.

Microfiche collections in STEM (science, technology, engineering, and mathematics) subjects are particularly easy to overlook because this format is far less prevalent than in the humanities or social sciences. In Heynen's extensive survey of microformat collections held by libraries, the vast majority of sets are historical, literary, or humanistic in focus. Of the eighty-five sets given highest priority for cataloging by libraries, only three are science-related: Landmarks of Science parts 1 and 2, and United States National Technical Information Service Selected Reports in Microfiche (SRIM). IAA does not appear on the lists.[1] The goal of this case study is to help librarians tasked with making decisions about microformat collections and, more broadly, about any collection that runs the risk of being overlooked. Decision points, workflows, results, and cataloging practices are explored.

Literature Review

Libraries acquired microforms for a variety of reasons. They offered a way for libraries to provide access to large collections in an economical and space-saving way.[2] Additionally, microform collections contained research material that was not readily available electronically and did so in a format ideal for long-term preservation.[3] These factors made microformat collections desirable to libraries since the 1940s. Even in the digital age, some information is still only available on microform. Despite this fact, microforms are often not treated in a similar manner to other library materials.[4] Almost all library-held microform collections are under- or uncataloged, resulting in a lack of understanding of the value these collections bring to the library.[5]

Since the first use of microforms, user perceptions of them have been relatively poor. This has been further compounded by the prevalence of electronic formats and the rise of web search engines. Users prefer information in a format that is easy to access, which is typically not the case for microformats.[6] Libraries tend to rely on print indexes or finding aids to provide access to their microform collections. Patterson notes, "Most users today neither understand nor gracefully accept a structure which requires that they consult multiple online or print guides, each presenting a variety of layouts, command languages, and retrieval methods."[7] This creates a barrier to access and devalues the wealth of information available on microform. Librarians are not immune to these perceptions; Banerjee discovered that librarians also avoid searching these print indexes.[8] Patterson asks, "If we [librarians] don't value [microformats] by providing a comparable level of detailed access points, is there any reason for our users to?"[9]

The resistance to microformat use was created in part by a lack of good cataloging. Libraries have been faced with the challenge of cataloging large microform collections for years, and literature on the topic dates backs several decades. With the advent of online catalogs, creating and sharing metadata became more feasible, and the literature discusses approaches to bringing microforms under bibliographic control. Wilson's work on bibliographic control provides the rationale and foundation to make materials discoverable and accessible.[10] Additionally, Reichmann and Tharpe provide an overview of the status in 1972 of microform bibliographic control and methods to improve it, which is still a challenge for libraries today.[11]

Heynen's 1984 report, described above, is a good summary of the state of microforms cooperative cataloging at that time.[12] That same year, Lucas described OCLC's attempts to spearhead and coordinate the cataloging of what it called "major microforms collections."[13] Two years later, Joachim extended the discussion with a paper describing recent developments in the bibliographic control of microforms, detailing efforts by the Association of Research Libraries, OCLC's Major Microforms Project, the Research Libraries Group, and various individual libraries to catalog and share cataloging for microform sets.[14]

The technological aspects of making microforms discoverable and accessible came to the fore in literature of the late 1980s and 1990s. Jones discussed online catalog access, and Dodd described efforts to cooperatively load tapes for major microform sets.[15] Some authors described efforts to catalog specific sets, such as the Slavery Pamphlets Collection or the Nineteenth-Century Legal Treatises Microfiche Collection.[16] More recent publications have focused on the organizational and procedural aspects of improving access to microforms.[17] Despite these efforts, libraries are prevented from fully cataloging microform collections because of several factors, including workload, complexity, and lack of staff, resources, and institutional commitment.[18]

The literature suggests that progress has been made on creating at least minimal bibliographic records for microforms. Duffy and Weisbrod wrote that the most common way that microform collections are cataloged is with a single record for the entire set, though this perpetuates the need for users to rely on print indexes and guides to locate individual titles.[19] In a later study, they acknowledged that while these printed guides provide minimal access, they cannot help users locate the physical item.[20] These extra steps continue to increase user resistance to using microformats.

Table 1. Significance Criteria

Collections Council of Australia Criteria	IAA Collection
Historic significance	Collects papers from Soviet Bloc aerospace engineering (space science) during the height of the space race (1967–71)
Artistic significance	Not applicable
Scientific or research significance	Contains information not widely available during the period and provides access to international scientific research
Social or spiritual significance	Not applicable

Although title level cataloging of microforms presents challenges, its many benefits make it a worthwhile investment for libraries. The literature suggests that in any collection, items with better quality cataloging tend to receive more use.[21] Libraries collect materials that are beneficial to users and want these items to be used; cataloging microforms makes them more visible and can be leveraged to encourage researchers to use these valuable resources.[22] Providing title-level catalog records for microform collections also enables libraries to evaluate their collections for duplication and to make retention decisions.[23] With space becoming ever more precious, title-level cataloging allows libraries to create cooperative agreements to share microforms across multiple locations, thus reducing the microform footprint at a single library.[24]

These issues are still occurring in today's information environment, and libraries need to better administer their microform collections. Libraries increasingly face deteriorating microformats or pressure to withdraw these seldom-used materials.[25] Cheney states that even if they are not withdrawn, "over time, if current practices continue or are not addressed, these collections will become entirely invisible," and the valuable research they contain is in danger of being lost.[26] Nonetheless, microforms still have a place in the library because they provide a variety of materials for users in a stable, space-saving format.[27]

Finding the IAA Collection

In a dark corner of the PSU Engineering Library are four microfiche cabinets bearing the ambiguous label "R1-R4." They sat undisturbed for many years and were largely ignored because of their out-of-the-way location and staff turnover. This collection was rediscovered as part of a larger project to get a clearer picture of all microfiche collections held in the Engineering Library. The discovery of approximately sixty thousand IAA microfiche issued from 1967 to 1971 came as a shock to the authors, who then had to determine exactly what this collection was and if it was still a useful collection.

Determining the Significance of the Collection

When a microfiche collection is discovered, the first step is to determine exactly what it contains and its significance to users and the library. The Collections Council of Australia provides criteria on assessing collection significance.[28] For a collection to be considered significant, it must have historic, artistic, scientific, or research potential, or it must have social or spiritual value. The IAA collection meets two of these criteria, as outlined in table 1. In addition to these criteria, the authors determined significance from the number of libraries that held the collection and the cost to originally purchase the collection, as described in detail below.

Once the significance of the collection was determined, the next step was to research the library's acquisition of the collection. If possible, tracking down how the library first purchased the collection is useful. For some microfiche collections, libraries subscribed and received fiche as it was published, similar to how libraries currently subscribe to online databases. Because of retirements at the authors' institution, the knowledge of the acquisition and local importance of the IAA collection was lost. The next means to determine significance was to use guides to the literature.[29] These books provide an overview of the collection, its contents, and libraries that held the collection in the past. Guides to the literature were invaluable in determining the IAA collection's significance. They provided publisher information, type of information contained on the fiche, and a starting point to view other libraries' catalogs to provide guidance on cataloging practices. During this initial phase, it was discovered that the authors' institution held print IAA serial indexes for 1967–73, which had been regularly compared to the fiche collection. Fortuitously, the print indexes were marked with red check marks to indicate which fiche pieces were owned. These indexes were crucial because the library did not collect everything published that is indexed in the serials for the years held. Papers published as part of AIAA conference papers were excluded from the IAA collection because of a simultaneous direct subscription to print full-text AIAA conference papers. Additionally, by using the guide to the literature and

the indexes, the authors determined that the information contained in the microfiche is partly duplicated in other sources. This was indicated in the indexes by notation of original publication sources, such as the AIAA conference. However, the microfiche is one of the only resources to gather full-text Soviet Bloc technical aerospace information into one collection.

The authors next searched OCLC WorldCat to determine whether the collection or parts thereof were cataloged and available to library users. No records were found, either for print versions of the titles reproduced in the microfiche or for the microfiche themselves. Despite this, WorldCat was useful in determining that the IAA collection was abstracted and indexed in the ProQuest Aerospace database. The full text of the items themselves, however—monographs, theses, conference proceedings, meeting papers, and journal articles—were unavailable, either in the database or in print. Many current library users are unfamiliar with microfiche and expect information to be accessible digitally, so determining a method to make this material accessible to users was critical. Furthermore, according to *Aeronautical Engineering: A Continuing Bibliography with Indexes*, as of 1982, IAA microfiche were available at $4.00 per fiche on demand or $1.35 per fiche for standing orders.[30] Earlier supplements were priced lower; for example, standing-order fiches were $1.10 in 1980. The authors believe that the PSU Libraries acquired the collection on standing order in the late 1960s and early 1970s. Pricing information for these years suggests a figure of $.50–$1.00 per fiche, which would place the cost of acquiring the collection at between $30,000 and $60,000 because some titles are filmed on multiple fiche. Adjusting for inflation, a cost of $30,000 in 1967 is more than $200,000 in 2016 dollars—another compelling reason to make the collection discoverable and accessible.[31] All these factors combined demonstrated significance to the authors; the collection contained historically valuable and rare information, no other library appeared to have access to the collection, and the price to acquire it was considerable.

Determining How to Catalog

For almost thirty years, the only access provided to the collection was via a single collection-level record in the local catalog for the "IAA papers"—a cryptic title that barely hinted at the extent of nearly sixty thousand unique titles and the richness of the highly specialized aeronautics texts in more than twenty languages (see figure 1).

For unknown reasons, the record was never submitted to WorldCat. As a result, only researchers using the local catalog were aware of the collection's existence. Because the IAA papers reproduce the full text of tens of thousands of titles, it was determined that the best method to provide access was to individually catalog each fiche in addition to updating the set record. This approach would provide title, author, and accession number access to users.

The authors first contacted the original publisher, AIAA, to determine whether they had metadata available for the collection. AIAA had sold all rights to ProQuest and could not provide assistance. The lack of representation in WorldCat confirmed the importance of devising a method to make the titles in the collection discoverable. Digitization would have been ideal, but constraints on staff resources, ProQuest's rights ownership of the metadata, and access to a functioning microformat reader in the authors' library meant that the most efficient and timely method to provide access was through title-level catalog records.

The PSU Libraries is no stranger to cataloging large microform collections to enhance discoverability and access. In the mid-1990s, the Libraries undertook a project to catalog titles in the extensive microfilm collection Victorian Fiction and Other Nineteenth Century Fiction. More than sixteen hundred MARC records were created in the local catalog for this collection by reading catalog cards and examining the film reels. These records were contributed to WorldCat for use by other institutions. The Victorian fiction project was completed within several months by a copy cataloger versed in AACR2 (the prevailing cataloging rules at that time), MARC format, and the features of the local OPAC. A copy cataloger was not available to catalog the IAA papers, nor were there catalog cards from which data could be transcribed, so a more streamlined approach was devised that required neither cataloging expertise nor knowledge of the local integrated library system. Staff in the Engineering Library transcribed information from the fiche headers into a spreadsheet, which was transformed into rudimentary MARC records using MarcEdit. The basic MARC records were enhanced using a combination of global edits and more sophisticated data manipulation involving regular expressions. As in the Victorian fiction project, creating full-level cataloging records for thousands of titles was not feasible, and a minimal-level approach was used. For each title, library staff transcribed the accession number, the primary author's name, the title, the language of the original resource, the number of pages, the year of publication, and the journal or other source from which the text had been reproduced. With many years' experience serving aerospace faculty and students, the engineering librarians were confident that these materials would be searched for and located by citation information (i.e., author, title, or accession number rather than by subject area), so no attempt was made to assign subject headings apart from the generic "Aeronautics" added to every record. Geographical subdivisions were deemed inappropriate given the global coverage of the collection: texts in twenty-four languages from both

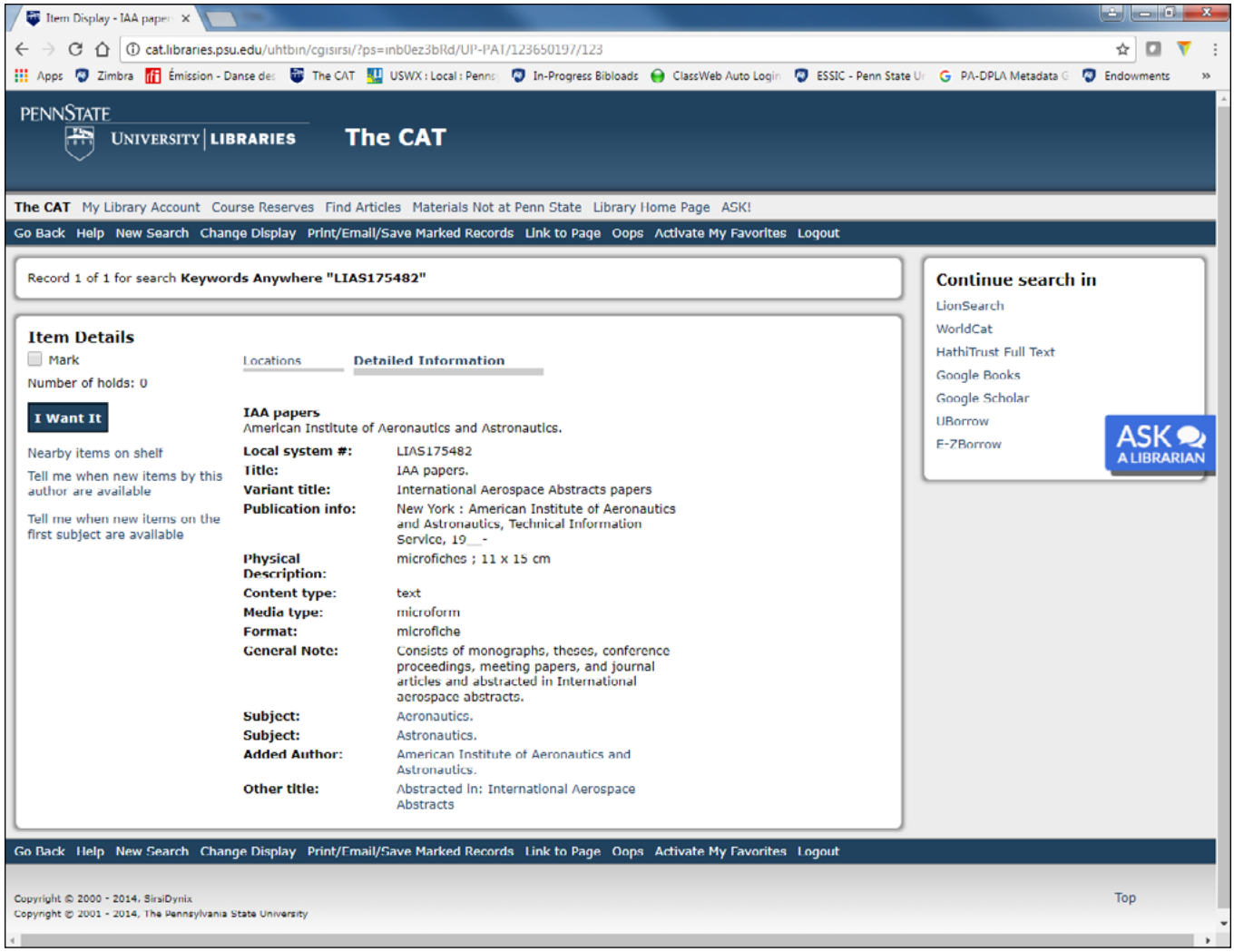

Figure 1. Local Collection-Level Cataloging Record of IAA Papers.

hemispheres. Additionally, this allowed the cataloging to occur in a timely manner because each title did not need to be closely examined to assign subject headings. Similarly, the fiche are filed in drawers based on accession number, and it was decided that a base call number using Library of Congress Classification, TL500.I572, would be assigned to correlate with the print indexes. The accession number was appended to the base call number (e.g. TL500.I572 no.A68-17730).

In the interest of project management and quality assurance, metadata creation was undertaken in batches corresponding to year of issuance. The collection covers materials issued 1967–71, with a few titles from 1973. A spreadsheet was created for each year, and the metadata was entered: English transcription of the title and name of the principal author as it appeared on the fiche, accession number, language of the text, etc. When cataloging for a year was complete, the data was transformed into MARC, loaded into the test version of the local catalog for review, and the metadata capture was refined to make the process as efficient as possible. For example, the authors realized that any boilerplate data (e.g., the year of publication because all items in a spreadsheet dated from the same year, or base call number information) could be added during manipulation of the record with MarcEdit and did not need to be entered during metadata capture. Several iterations of these processes were necessary to ensure that the records met local standards and accurately reflected the items they describe. As a final step for quality control, dozens of records were manually spot-checked against the ProQuest Aerospace Engineering Database to ensure that accession numbers matched authors and titles.

MarcEdit allowed the following enhancements for each record:

- Unique record IDs were created to facilitate metadata management (e.g., iaa00000045482). This will enable the authors to batch delete or overwrite records as necessary in the future.
- Publication year was copied from MARC subfield 260 $c and written to MARC field 008 because many library systems, including PSU Libraries, use the 008 as a source for date for display and sorting of search results in the public catalog. The authors note that they chose to use the MARC field 260, and not 264, since records new to their catalog are sent monthly to Backstage Library Works for both authorities and RDA processing, which means that 264 fields would be generated automatically as part of this ongoing workflow.
- Like most scientific literature, titles in the IAA papers collection frequently had multiple authors. For pragmatic reasons, a decision was made to transcribe only the first author, assumed to be the primary or corresponding author. The qualifier "$ecorresponding author" was added to all MARC 100 fields (Personal author) to alert users to the fact that the name in the 100 field was not necessarily the only author.
- The RDA MARC fields 336, 337, and 338 were added to make clear the nature and medium of the resources (textual resources on microfiche).
- A note was added to make clear that the full text of the papers is abstracted in IAA, which is available online, to help researchers determine whether the material is of enough interest to consult the microfiche.
- The accession number (e.g., A70-32094) was written to a keyword-searchable MARC 500 field to ensure that researchers could find the fiche by accession number alone.
- Notes specifying the source (usually a journal or conference proceedings) of the reproduction were included when available on the fiche.
- A MARC 533 reproduction note was added to make it clear that the materials are microfiche reproductions of print.
- The language of the text was provided in a MARC 546 field (e.g., "In Russian"). The rationale was that the titles on the fiche are provided in English, even when the texts are in languages other than English. The authors lacked the time or the expertise to transcribe the titles in the original languages, which appear only in the text of the fiche, and not on the header, where the English transcriptions and indication of full-text language appear, visible without the use of a fiche reader. Additionally, the language of the text was converted to a language code (e.g., "rus" for Russian) and written to positions 35–37 of MARC field 008 to facilitate limiting search results by language. Writing language codes to 008 allows users to conduct a search of "all IAA papers in Russian," for example.
- A corporate author entry (MARC 710) for "American Institute of Aeronautics and Astronautics, Technical Information Service" was added because they originally issued the microfiche.
- The authors included a local title collection field (MARC 793) for "IAA papers" to facilitate batch retrieval of records for the entire collection.
- As previously noted, a class-together Library of Congress call number followed by accession number (e.g. TL500.I572 no.A70-3209) was assigned to ensure the materials would be easily findable in the drawers and would electronically shelf list with other materials about aeronautics and aeronautical engineering.

Finally, two additional cataloging-related questions were addressed: should the MARC records be shared with OCLC for inclusion in WorldCat, and should the MARC records be sent to Backstage Library Works for authority control processing? After consulting with the authority control librarian and members of the Bibliographic Services Council—the group charged with making policy decisions related to cataloging—the authors opted not to send the records to WorldCat. This decision was made primarily because, despite the enhancements made using MarcEdit, the records fall short of OCLC's standards for even minimal-level good metadata. For example, the titles are provided in English despite the language of the text being in another language. However, the authors opted to send the records to Backstage for authority control processing on the chance that some of the personal author names might benefit from authorities processing. All these steps ensure that the microfiche is now discoverable in the library's catalog and will help users locate information in this unique collection.

Processing the Physical Collection

Once the collection was cataloged, the physical microfiche pieces needed to be processed to ensure that they could be located and to address any preservation problems. The easiest step was to relabel the cabinets with "IAA" instead of "R1-R4." Next, it was determined that the current microfiche envelopes were acidic, so all sixty thousand pieces were transferred to new envelopes to ensure better archival storage. While changing envelopes, some papers were discovered that required multiple microfiche cards. To ensure ease of access by users, papers with multiple microfiche cards were consolidated into one envelope. Finally, each

envelope was stamped with the base call number to provide a consistent method for refilling after use.

Conclusion

This project took just over one year to complete and was coordinated by the engineering librarian. The initial stage to convert indexes' checkmarks to editable spreadsheet format and gather header information from the microfiche took five staff members from various library locations three months to complete. Afterward, the engineering librarian manipulated the data, adding subject headings and call numbers. Because of other responsibilities, this was a month-long process. In the following month, the digital access coordinator and a cataloger with programing knowledge developed the process to convert the spreadsheet data into MarcEdit. Finally, the records were loaded into the library's catalog and spot-checked by librarians. This took an additional month, as there was some data cleanup necessary to ensure all the records were consistent. During preparations for physically processing the collection, it was discovered that a cabinet drawer of fiche published in 1970 was skipped in the data-capturing stage. The process that was in place to catalog these materials made it easy to do a supplementary load of these seventeen thousand titles. One staff member took approximately two months to convert the metadata into a spreadsheet and then manipulate and load it into the catalog. The consolidating and transferring to new fiche envelopes took three to four staff members approximately three months, in additional to their regular responsibilities. Once the collection was cataloged, a user request was placed, something that was impossible before this project was completed. The engineering librarian plans to promote this collection to interested researchers beginning in the fall 2017 semester to increase collection usage.

The authors gained valuable information about cataloging microfiche collections and plan to use this process as a template for additional hidden microformat collections at PSU Libraries. Time permitting, they would like to include additional metadata, including detailed subject headings, multiple authors, and cross-references to other publication sources.

The library literature and this case study have demonstrated that hidden collections are used by researchers almost immediately after they become discoverable. Furthermore, in a time of tightening library budgets, librarians should be leveraging all their collections, not just those that are the most convenient to access. Moreover, in some cases, significant personnel and monetary resources were expended to acquire these microformat collections, and most of the collections provide access to valuable information not available elsewhere. Libraries should ensure that this information is accessible to users. Before a microformat collection can be cataloged, one should determine the extent of the library's entire microformat collection and determine what subjects have been overlooked. This allows a librarian to investigate the significance of these collections and what benefits improved access could have for users. Access can be improved through the creation of finding aids, collection-level catalog records, or title-level catalog records. Recent technological advances have made creating title-level catalog records easier using tools such as MarcEdit. The desire to improve access needs to be balanced against the time commitment involved for cataloging librarians. All these factors demonstrate that microfiche collections deserve attention from librarians and will provide users with access to unique materials.

References

1. Jeffrey Heynen, *Microform Sets in U.S. and Canadian Libraries: Report of a Survey on the Bibliographic Control of Microform Sets Conducted by the Association of Research Libraries Microform Project* (Washington, DC: Association of Research Libraries, 1984), appendix D.
2. Elizabeth J. Weisbrod and Paula Duffy, "Keeping Your Online Catalog from Degenerating into a Finding Aid: Considerations for Loading Microformat Records into the Online Catalog," *Technical Services Quarterly* 11, no. 1 (1993): 29–42.
3. Dana M. Caudle, Cecilia M. Schmitz, and Elizabeth J. Weisbrod, "Microform–Not Extinct Yet: Results of a Long-Term Microform Use Study in the Digital Age," *Library Collections, Acquisition & Technical Services* 37, no. 1–2 (2013): 2–12, https://doi.org/10.1016/j.lcats.2013.02.001.
4. Paula Duffy and Elizabeth J. Weisbrod, "More Thoughts on Bibliographic Access and Microformat Records," *Microform Review* 24, no. 2 (1995): 55–57.
5. Debora Cheney, "Dinosaurs in a Jetson World: A Dozen Ways to Revitalize Your Microforms Collection," *Library Collections, Acquisition & Technical Services* 34, no. 2–3 (2010): 66–73, https://doi.org/10.1016/j.lcats.2010.05.001.
6. Steven A. Knowlton et al., "Microforms in a Linked World: Using OPACs and Other Web Applications to Improve Access to Content in Microform," *Microform & Imaging Review* 36, no. 3 (2008): 121–26.
7. Elizabeth L. Patterson, "Hidden Treasures: Bibliographic Control of Microforms, a Public Services Perspective," *Microform Review* 19, no. 2 (1990): 78.
8. Kyle Banerjee, "Taking Advantage of Outsourcing Options:

Using Purchased Record Sets to Maximize Cataloging Effectiveness," *Cataloging & Classification Quarterly* 32, no. 1 (2001): 55–64.
9. Patterson, "Hidden Treasures," 78.
10. Patrick Wilson, *Two Kinds of Power: An Essay on Bibliographical Control* (Berkeley: University of California Press, 1968).
11. Felix Reichmann and Josephine M. Tharpe, *Bibliographic Control of Microforms* (Westport, CT: Greenwood, 1972).
12. Heynen, *Microform Sets in U.S. and Canadian Libraries.*
13. Jan Nelson Lucas, "OCLC's Major Microfroms Project," *Microform Review* 13, no. 4 (1984): 232–33.
14. Martin D. Joachim, "Recent Development in the Bibliographic Control of Microforms," *Microform Review* 15, no. 2 (1986): 74–76.
15. James F. Jones, "Online Catalog Access to the Titles in Major Microform Sets," *Advances in Library Automation & Networking* 3 (1989): 123–44; Janet Dodd, "Integrated Endeavours: Cooperative Efforts in Selection and Implementation of Tape Loads for Major Microforms Sets," *Microform Review* 24, no. 2 (1995): 58–60.
16. Florence Myers, "Cataloging the Slavery Pamphlets Collection: An OCLC Major Microforms Project," *Microform & Imaging Review* 27, no. 2 (1998): 43–45; William W. Toombs, "Nineteenth-Century Legal Treatises Microfiche Collection: A Major Microforms Cataloging Project," *Show-Me Libraries* 39 (1988): 26–28.
17. Donna L. Davey, "Uncovering Hidden Collections of Alternative Serials on Microfilm," *Serials Librarian* 57, no. 3 (2009): 223–32, https://doi.org/10.1080/03615260902876912; Knowlton et al., "Microforms in a Linked World"; Rebecca L. Mugridge and Jeff Edmunds, "Using Batchloading to Improve Access to Electronic and Microform Collections," *Library Resources & Technical Services* 53, no. 1 (2009): 53–61; Myers, "Cataloging the Slavery Pamphlets Collection"; Nancy M. Poehlmann and Christian H. Poehlmann, "Involving Subject Librarians in Batchloading," *Technical Services Quarterly* 33, no. 3 (2016): 227–39, https://doi.org/10.1080/07317131.2016.1169777; Terry Reese, "Information Professionals Stay Free in the Marcedit Metadata Suite," *Computers in Libraries* 24, no. 8 (2004): 24–28; Weisbrod and Duffy, "Keeping Your Online Catalog from Degenerating into a Finding Aid."
18. Cheney, "Dinosaurs in a Jetson World"; Davey, "Uncovering Hidden Collections."
19. Weisbrod and Duffy, "Keeping Your Online Catalog from Degenerating into a Finding Aid."
20. Duffy and Weisbrod, "More Thoughts on Bibliographic Access and Microformat Records."
21. Caudle, Schmitz, and Weisbrod, "Microform–Not Extinct Yet"; Dodd, "Integrated Endeavours."
22. Knowlton et al., "Microforms in a Linked World."
23. Edward T. O'Neill, Lynn Silipigni Connaway, and Timothy J. Dickey, "Estimating the Audience Level for Library Resources," *Journal of the American Society for Information Science & Technology* 59, no. 13 (2008): 242–50, https://doi.org/10.1002/asi.20908.
24. Cheney, "Dinosaurs in a Jetson World."
25. Tony Aponte, "Microfiche? Macroheadache!," (presentation, ASEE Engineering Library Division Annual Conference & Exposition, New Orleans, 2016), http://depts.washington.edu/englib/eld/conf/2016/Tony Aponte ASEE ELD Lightning Talk 2016.pdf.
26. Cheney, "Dinosaurs in a Jetson World," 68.
27. Caudle, Schmitz, and Weisbrod, "Microform–Not Extinct Yet."
28. Roslyn Russell and Kylie Winkworth, *Significance 2.0: A Guide to Assessing the Significance of Collections* (Rundle Mall, Australia: Collections Council of Australia, 2009); Linda Young, "Significance Assessment: How Important Is the Material in Your Collection?" (paper, UNESCO Australian Memory of the World: Third International Conference, 2008), www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/mow/mow_3rd_international_conference_linda_young_en.pdf.
29. Robert A. Karlowich, *A Guide to Scholarly Resources on the Russian Empire and the Soviet Union in the New York Metropolitan Area* (Armonk, NY: M. E. Sharpe, 1990); Dolores B. Owen and Marguerite M. Hanchey, *Abstracts and Indexes in Science and Technology: A Descriptive Guide* (Metuchen, NJ: Scarecrow, 1974).
30. *Aeronautical Engineering: A Continuing Bibliography with Indexes* (Washington, DC: Scientific and Technical Information Branch, National Aeronautics and Space Administration, 1970–2000), https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19860001678.pdf.
31. "CPI Inflation Calculator," Bureau of Labor Statistics, accessed December 15, 2016, data.bls.gov/cgi-bin/cpicalc.pl.