Managing Archival Collections in an Automated Environment: The Joys of Barcoding
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ABSTRACT. In a desire for automated collection control, archival repositories are adopting barcoding from their library and records center colleagues. This article discusses the planning, design, and implementation phases of barcoding. The authors focus on reasons for barcoding, security benefits, in-room circulation tracking, potential for gathering statistics, collection control, and timeline development. They discuss the implementation of one university's barcoding project, addressing issues involving database reports, physical barcoding issues, the problems encountered with different kinds of inaccuracies, and the pitfalls to avoid for a successful outcome. doi:10.1300/J201v04n03_02 [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2006 by The Haworth Press, Inc. All rights reserved.]

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INTRODUCTION

Libraries have been barcoding books since the 1980s. Records managers adopted the system to track the thousands of boxes on hundreds of shelves in their storage areas. Archivists, however, have been slower to embrace barcoding, most likely because of the complicated decision making required in determining what to barcode and at what level of container, as well as needing to have a computerized catalog or database in which to record the bibliographic and barcode information. In a profession that is moving away from describing collections based on the container in favor of the intellectual content supported by Encoded Archival Description, to ask archivists to rethink about containers for barcoding forces them into a precarious position.

The barcoding of archival record boxes, manuscript files, and nontextual (photographic, cartographic, and audiovisual) items links together many of the custodial, descriptive, and cataloging tasks performed by an archives and special collections staff. Barcoding is an efficient mechanism to enhance security and regulate the internal circulation of archival and manuscript materials among patrons. Barcodes, affixed to collection containers, manuscript folders, cartographic material, and audiovisual items, facilitate the physical and inventory control of collections thereby improving access and enabling the easy retrieval of materials from their proper shelf and container locations.

Barcoding permits the compilation and generation of important reference statistical information for internal and external reporting purposes. Such data as the frequency and patterns of patron use of special collections material are useful in determining collection management and cataloging priorities, and allocating storage space for collections. Reference statistical information culled from the barcoding and scanning of archival and manuscript material can be incorporated into Association of Research Libraries, peer institution, and consortium reports.

The necessary preliminary steps involved in barcoding material—preparing full-level catalog records for processed collections or core-level minimally descriptive records for uncataloged collections, updating record group and manuscript numbers for collections, and establishing the correct collection name—contribute to the workflow entailed in completing accurate descriptive information for incorporation into cataloging records for downloading into various online bibliographic utilities. Providing core-level catalog records for all archival and manuscript collections will expand and enhance public access to the holdings in special collections.
This article will address whether an archives or manuscripts repository should consider barcoding its collections, discuss the importance of planning, enumerate lessons learned from a barcode project, and offer recommendations for best practices.

**BRIEF HISTORY OF BARCODES**

David J. Collins invented barcodes in 1960 to scan serial numbers on passing railroad freight cars; by 1969 a tight laser beam could focus on small labels, and three years later barcode printers arrived. Once grocery manufacturers and retailers adopted the Universal Product Code (UPC) in 1973 and the Department of Defense required UPCs on all supplies in 1981, the ubiquitous barcode was here to stay.¹

Barcodes render numbers as ones and zeroes—binary digits—which can be read by a light-sensitive scanner, wand, or pen to transfer the number to a database that links the number to its corresponding bibliographic item. There are two types of barcodes—smart and dumb labels—that a repository can choose to use. The smart labels come preprinted with the barcode number plus a call number (or accession number, record group number, manuscript collection number, etc.) derived from, and linked directly to, a bibliographic record tape supplied to the barcode vendor in call number order. This assumes that everything is cataloged. In the absence of this perfect world in which archivists do not live, the dumb label is the alternative choice. Containing only the Arabic number and barcode—and perhaps the repository name if so desired—this label needs to be electronically linked to the bibliographic record manually by staff either through typing the number or wand the barcode (preferably, for eliminating typographical errors).

**LITERATURE REVIEW**

The library literature focuses mostly on massive retrospective book barcoding projects and individual solutions to tricky problems. Janet Strong discusses how two-person teams at Boise State University used smart barcodes to label their books.² In a 1986 Association of Research Libraries survey of member libraries, one respondent cautioned that “there is more to barcoding than just labeling—it is a commitment to some degree of physical inventory as well.”³ Helen H. Spalding recommends clearly delineating objectives before embarking on a barcoding
project; she asks if one objective might be to barcode "non-circulating materials for the purposes of inventory control." Northern Illinois University Libraries used barcoding as a tool for collection use analysis for in-house-use-only collections to make collection development and maintenance decisions. Jennifer Smith's article on barcoding audiovisual and other nonbook materials offers the closest theory relevant to barcoding archival and manuscript collections. She raises an important point about deciding if there are items or collections (vertical files, picture files, clipping files, etc.) that will never receive a formal catalog record and corresponding barcode, and, if these will remain out of the automation loop, will a repository maintain a manual checkout system for these exceptions. She also suggests planning in advance for the standardized placement of barcodes on items by format, and then asks, "How do you barcode a puppet?" Mimi Crowley solved the puppet problem by throwing away the barcode and writing the number on the puppet with a permanent marker, a solution that works for non-archival circulating items. However, for repositories with historic artifacts such as furniture, clothing, paintings, campaign buttons, and weapons, if the item cannot be boxed, then archivists need to consult with their museum peers for comparable solutions. René Jordan suggests that wherever a repository decides to place the barcodes, be consistent. For financially strapped institutions, one article recommends printing barcodes in-house rather than purchasing them from a vendor.

THE BARCODING PROJECT

The Special Collections Library at The Pennsylvania State University undertook a barcoding project beginning with the planning in 2001. The initial impetus appeared benign enough: to gain inventory control of the archival and manuscript collections, to electronically generate statistics on usage patterns, and to augment security measures by "checking out" containers to patrons for in-room use. The book collections are barcoded during cataloging so it only seemed natural to implement one more step in the manuscripts cataloging process to include barcoding of the container. Retrospective barcoding required a detailed plan to account for the variety in inventory control and differences in how collections are housed. The plan also needed to address how to develop a workflow that ensured a systematic approach to the project. What seemed to be a straightforward project led to a complete overhaul of the
database, drafting of a processing manual for standardized procedures, fuller descriptions of collections, purging the database of extraneous information and placeholders from the move into new quarters, and better identification of collections.

Planning

Two faculty librarians and a staff member discussed the workflow issues and timeline, and prepared a report for the Head of the Special Collections Library with an overview of the objectives and action plan for implementation. The issues confronted included staffing, costs, and logistics. Staffing meant who would actually affix barcodes to containers, what level of staff in Special Collections would have access to the Sirsi WorkFlows cataloging module in the online public access catalog (OPAC) to add the holdings, whether new staff would be hired for the project or if existing staff would incorporate the process into their jobs, who would train and supervise new project staff, and what authority would the staff have to change or correct a perceived error in the catalog record or rectify a discrepancy between the number of containers on a shelf and the number reported in the catalog record. Costs entailed salaries for new project staff, purchasing barcodes and their checkout equipment, and the hidden costs of existing staff dedicating time away from processing collections to supervise the project staff. Logistics included deciding to organize the work into three phases—processed collections with catalog records in the first phase (on the assumption that these would be the easiest to do), followed by unprocessed or collections with preliminary finding aids for which the cataloger would prepare core-level records for the local OPAC only until the collections are processed and the catalog record is upgraded to full level, and, lastly, the nontextual (e.g., videotapes, photographs, audiocassettes, and artifacts) collections would be dealt with at the end.

The necessary preliminary steps involved in barcoding material—preparing core-level descriptive records for uncataloged collections, updating record group and manuscript numbers for collections, and establishing the correct collection name—contribute to the workflow entailed in completing accurate descriptive information for incorporation into cataloging records for downloading into various online bibliographic utilities. Providing core-level catalog records for all archival and manuscript collections will expand and enhance public access to the holdings in Special Collections. Collection priority focused on starting with the 6,000 containers of already cataloged collections in the OPAC
that were not barcoded, then the 20,000 containers of collections in the Microsoft Access database that were not already cataloged. The University Archives' 5,000 biographical vertical files and 60,000 nontextual collections and items would be left to the end of the project.

The project action plan called for one major activity, database design and database information, with three components in phase one from June 30 to November 15, 2001. Until Spring 2005, the three units in the Special Collections Library—Historical Collections and Labor Archives (HCLA), Rare Books and Manuscripts (RBM), and the Penn State University Archives (PSUA)—maintained separate Access databases for their collections, using some of the same fields but not necessarily entering the same data in the field or in the same order (inverted name vs. natural language, an alphabetization and searching issue). During the first phase of the project the staff would identify which collections had already been cataloged, and which collections were in the Access database that had, or had not, been cataloged. Staff would determine the correct catalog record and manuscript/record group numbers in the database and cross-check with the online catalog to ensure a one-to-one match. This included updating record group (RGN), manuscript group (MGN), and accession numbers (all used as call numbers in the catalog) in the Access database and the OPAC. Container numbers would be updated to identify how many barcodes would be required. Personal and corporate names would be verified in the Library of Congress Name Authority File to use established forms of the name and these versions would be inserted in the appropriate Access database field.

To provide a mechanism for creating core-level catalog records from descriptive information contained in the database, the table design for collection and container tables needed to be updated in all three databases to include required fields for cataloging. To update the Access databases, staff needed to normalize the field-by-field data to conform to a proper catalog record from exiting database fields and/or from research in the collection to extract the information. Inverted titles of collections needed to be retyped or cut-and-pasted into natural language form (e.g., "Spanish, Department of" becomes "Dept. of Spanish," following AACR2 rules for establishing names). These fields would correspond one-to-one to MARC fields and would be exported to a Microsoft Word document for cutting and pasting into the Sirsi WorkFlows cataloging module to create a catalog record. These preliminary records will reside only in the local OPAC until upgraded to full-level records for export to the national online catalog OCLC.
A core-level record is essential to barcode each container. The team designed a Collection Barcode Report form generated from the Access database (see Appendix A). When a staff member checks the "cataloged" box in the collection record, the report prints the MGN/RGN/accession number, collection name, and container numbers and their physical location, leaving a space to attach a barcode for a permanent file record. These report forms would be used to create the "call/copy" portion of the catalog record in which the barcode number resides. The forms would then be incorporated into each collection's control folder.

Primary attention would be given to enhancing the database design for migrating descriptive information from the Access database into the appropriate information fields required for the creation of a core-level catalog record in the OPAC. The core-level record consists of a call number (RGN/MGN/accession number), creator, title of collection, date range of collection, size of collection in cubic feet, summary description note, biographical/agency history note, and at least one subject heading (see Appendix B).

The second phase, planned for November 15, 2001 to June 30, 2002, would begin the actual barcoding. The staff decided that barcoding would occur at the highest container level. For example, a one-cubic-foot record carton may contain 20 folders but the carton will be barcoded, not the individual folders. A manuscript collection of three folders will have each folder barcoded (or, if possible, bundled into an expandable folder which is barcoded instead), and a collection of 20 reels of microfilm will have each reel barcoded. A half-drawer filing cabinet of folders for one collection must be boxed. The drawer cannot be barcoded and retrieved for a patron and to barcode each folder clutters the OPAC record. Individually cataloged scrapbooks housed together in one box will have an acid-free flyer (with the barcode affixed to the top of one side) inserted in them for inventory control.

The third phase, projected for July 1, 2002 to June 30, 2003, would entail creating and barcoding core-level records for the 20,000 uncataloged collections, while the fourth and last phase, July 1, 2003 to December 31, 2004, would deal with the 60,000 nontextual materials and uncataloged collections not in Access.

The report recommended hiring a part-time (20-25 hours per week) project staff assistant to do the database input, to barcode, and to create core-level catalog records in the OPAC; and student assistants (20 hours per week) to physically barcode and do database input. Of the existing faculty and staff, the Manuscripts Cataloging Librarian would devote 20 percent of her time to reviewing database information for conformity
to AACR2, the Library of Congress Name Authority File, and Library of Congress Subject Headings rules; supply subject and name authority headings; supervise the creation of catalog records for uncataloged collections; and train staff in cataloging and barcoding procedures. A Library Assistant would contribute 25 percent of his/her time to create, maintain, and update database design and structure; review database information for consistency; provide information for database fields; and supervise student assistants and part-time project staff. Other Special Collections staff would spend 20 hours per week physically barcoding and inputting collection information into the database.

Anticipated equipment needs included two barcode scanners (one for staff for input, and one for reference room use after implementation) and another computer dedicated to the project. Supplies included dumb barcodes, computer paper to print the reports, LaserJet cartridges, and legal folders for creating the control folders. But the best-laid plans, as they say, go awry.

Implementation

In April 2002, the Head of Special Collections Library asked the Associate Archivist for Historical Collections and Labor Archives to spearhead the barcoding project within a few days of her hire. The Department Head warned the new archivist that the project had a steep learning curve, and would require staff buy-in and cooperation. The archivist reviewed the team’s plan. The Head of the Barcoding Project would need to work one-on-one with Special Collections staff members to pinpoint “barcodable” collections, review and streamline processing workflows, devise and implement processing standards, and correct processing errors. The project undoubtedly would unearth archival and manuscript collections that colleagues had considered processed, but only were preliminarily organized and described, and/or contained organizational and descriptive errors. As a relatively young, non-tenure track archivist in a competitive, tenure-track academic library system, bringing these problems to light would prove much more challenging than initially anticipated.

After reviewing the team’s plan and conferring with team members about varying aspects of the project, the Head of the Barcoding Project drafted, circulated, and implemented guidelines for describing archival and manuscript collections, from listing Special Collections’ finding aid types, collection locations, and format categories, to researching and devising an authoritative list of container measurements in cubic feet to
minimize measurement errors (see Appendix C). The purpose of the guidelines was to streamline organizational and descriptive efforts, and gain consistency both between and among units. What one Special Collections staff member considered 1.33 cubic feet, for example, another recorded as 1.45 cubic feet. This lack of agreement was a symptom of a larger problem plaguing the department: the separate units applied very different approaches to processing special collections, and often used different terms to define the same concept. Moreover, staff members within the units applied different approaches to describing collections, containers, and items in the database. Inconsistencies and discrepancies within and among the units abounded.

The Standards for Description Guideline (see Appendix D) outlined how to collect, interpret, and enter collection-descriptive information in the database. This resource clearly and briefly describes the key pieces of information required to properly describe archival and manuscript collections. The guidelines include examples of each major component of description, including Title, Date Range, Title in Natural Language, Creator/Author, Collection Type (M for manuscripts and A for archival records), Accession Number, Special Collections Unit (HCLA, PSUA, or RBM), Group Number (RGN for record group and MGN for manuscript group), Accession Number, Finding Aid Type (Preliminary Inventory, Processed, Cataloged, and Encoded [for Encoded Archival Description], etc.), Contains Special Formats (nontextual formats like photographs and videos), Restrictions, Catalog Record/Catalog Core Record, Quantity in cubic feet or number of items, Summary Note, Biography/Agency History Note, Subject Headings, and Comments. The guide includes MARC tag numbers for each descriptive component.

Before implementation, the Barcoding Project Head created step-by-step directions for entering barcoding data into Sirsi WorkFlows and the Special Collections Access database. She also posted a query on the Archives and Archivists Listserv, asking whether other archival organizations had launched barcoding projects. Johns Hopkins University, Stanford University, the University of Arizona, the University of Virginia’s Special Collections Department, Cornell University’s Division of Rare Books and Manuscript Collections, and the Delaware Public Archives had implemented barcoding projects with varying degrees of success. Using considerable resources and many staff members, some organizations had completed barcoding their special collections, whereas others had only just begun.

In May 2002, the Project Head began the process of hiring a barcoding assistant. This person would physically barcode archival and manuscript
collection containers, enter data, print reports, pinpoint descriptive discrepancies, and report errors to the Project Head to resolve. The Project Head formed a hiring committee comprising the Manuscripts Cataloging Librarian, a support staff member from each of the three units, and the Project Head. The project required an assistant who would be observant, meticulous, and consistent. Finding the right person for this position proved even more challenging when Human Resources assigned a very low wage to the position. Securing a barcoding assistant took longer than anticipated, which caused delays in implementation. The hiring committee did not secure a barcoding assistant until the end of the summer, in August 2002.

During the few months that elapsed between project assignment and the Barcoding Assistant’s hire, the Project Head formed the Barcoding Committee, represented by unit heads and some support staff members from PSUA and HCLA, the Manuscripts Cataloging Librarian (who also represented RBM), and the Project Head. The Committee met on a monthly basis. Agenda items included database redesign, terminology changes, data entry in WorkFlows and Microsoft Access, MARC records review, and the impact of Special Collections’ impending migration from the Access database to Oracle on the Project. Forming the Barcoding Committee validated the project, bringing it to the forefront of the minds of staff members and forcing them to resolve and attempt to rectify a wide variety of challenging issues. Cooperation was imperative. The monthly meetings gave each committee member an opportunity to voice opinions, objections, concerns, and suggestions.

During these meetings the Project Head circulated and discussed guidelines and resources to implement descriptive standards that would facilitate consistency and mitigate discrepancies among units. The Project Head circulated and reviewed the Standards of Description Guideline to reinforce the importance of adhering to standards across units. Maximizing intellectual and physical control over collections would improve access and reference service to all collections. However, building consensus among seasoned information professionals representing the three different units was challenging. Two major issues—taking orders from a young archivist and preferring to work as individual units—posed challenges.

Why did the units that comprise the Special Collections Library tend to work separately? For several years, the three units were situated in separate locations in the University Libraries. After only a few years of coexisting under one roof, Special Collections’ staff members were trying to find a way to peacefully coexist and work together as a department.
Coming together changed every aspect of operations for the individual units, from reference service and collections management to publicizing and displaying collections. Attempting to barcode the department’s collection seemed premature to some staff members. However, ascertaining and streamlining the different approaches to processing that the units had subscribed to for many years, which in turn would improve access to the collections, was one of the major goals of the project.

Descriptive inconsistencies became vividly clear after reviewing and comparing several collection descriptions in the database, catalog, and on the physical containers. Each unit’s staff members, from professional staff—librarians, curators, and archivists—to support staff, had applied varying approaches to formatting and entering descriptive information over the course of several years. Moreover, members of the same unit inconsistently entered information. For example, some collection container listings included location numbers with forward slashes (/) to separate the building, room, range, section, and slot, such as Paterno/GST/C04.40, whereas others used periods, such as Paterno.GST.C04.40. The database therefore did not group the two together. Some collections were properly named with correct titles in the database, whereas other collection titles constituted a combination of the creator and true title. What was listed in the Libraries’ online catalog therefore differed from the listing in the database. This lack of consistency negatively affected retrieval and access, making reformatting and cleaning up the database a top priority.

The Head of the Barcoding Project arranged to meet with each unit head and the support staff member who maintained the database to reorganize and rename the fields included at the collection level. These working groups added key descriptive components, such as MARC tag numbers and date range, to the database, and removed extraneous fields, such as “special notes.” They also purged several redundant and hopelessly flawed records, and started anew. This work and the summer came to an end at the same time. In August 2002, the hiring committee reopened the Barcoding Assistant position, anticipating a good pool of candidates with the start of a new school year. This second time around the committee secured a meticulous, diligent Barcoding Assistant who would spend twenty hours per week barcoding the collections.

The Barcoding Assistant spent her first few days reviewing archival literature, including *Introduction to Archival Organization and Description*. With the Project Head’s guidance, the assistant acquainted herself with collections descriptions at the collection-, container-, and item-level in the database; compared database records with their corresponding catalog records; surveyed collection containers; and read
project overviews and reports. The Project Head also arranged Work-
flows training for the assistant, and directed her to meet with the Manu-
scripts Cataloging Librarian to learn about the relationship between
processing and cataloging. The assistant next converted inverted titles
into natural language in the database, printed barcoding collection re-
ports for all three units' processed and cataloged collections, and spent
some time barcoding rare books to get acquainted with the barcoding
process.

In fall 2002, the assistant began barcoding in earnest. Since the
HCLA database had crashed over the summer, the barcoding assistant
initially barcoded RBM and PSUA collections until the technology
team stabilized the HCLA database. As determined by the team in 2001,
the assistant began barcoding processed and cataloged collections—the
seemingly "easy" collections. However, barcoding these collections,
particularly the extensive archival collections, was not so easy. The
University Archives collections, which tend to evolve over time, proved
more difficult to barcode than the RBM collections. The team encoun-
tered far more descriptive discrepancies than they had anticipated, de-
monstrating the need for training. Allowing staff to process collections
without adequate training, permitting too many people to process one col-
lection, lack of communication between archivist and cataloger, and call-
ing collections with preliminary inventories processed can be hazardous
to the health of any archives.

What sort of problems did the barcoding team encounter, and more
importantly, how did the team fix them? The team dealt with a wide
variety of issues, from minor, for example, correcting misspellings, to
major challenges requiring the head of the department to intervene. The
team discovered duplicate call numbers for different collections in the
catalog, duplicate container numbers, containers number in out of se-
quence, and incorrect group numbers, titles, and location numbers on
barcoding collection reports. The actual number of containers that com-
prised a collection often conflicted with the number of containers listed
in the catalog record as a result of staff members adding containers to a
collection without notifying the cataloger, who needed to update the
catalog record. The team also frequently encountered processed collec-
tions with vague database descriptions; missing collection containers;
conflicting information in the database, catalog record, and container
labels; collections marked as processed and cataloged that were not yet
cataloged; and many cataloged collections erroneously listed in the
uncataloged collections query.
The team also discovered that many PSUA collection containers did not have labels with the collection name and box number, which created uncertainty. To make sure that the containers listed in a particular barcoding collection report belonged to the collection in question, the team had to physically open and review the contents of several containers. Upon opening the boxes, the team discovered that some collections described as processed merely had been inventoried. The boxes contained original folders with labels from the university office that had generated them, and they were in no discernable order. Given the numbering and descriptive discrepancies that the team had come across already, the team could not be certain that the title listed on the barcode collection report corresponded with the materials in an unlabeled box.

Conflicting titles for the same collection in the online catalog and database, the search tool that staff members used to pinpoint and retrieve relevant collections containers for patrons, was the most commonly encountered discrepancy. Other critical components of description that differed in the database and catalog record include creator/author, date range, quantity, summary, and subject headings. For example, one PSUA collection title was listed as “Events/Wars” in the database, and “Penn State during World War II and Civil Defense Records” in the catalog record. Another PSUA collection title was listed as “Military Department” in the database, and “SATC/ROTC Program Records” in the catalog. If a patron asked for the SATC/ROTC Program Records, a title search in the database would yield zero results, denying patrons access to records owned by the Libraries. To remedy the problem, the Project Head had to obtain approval from the appropriate unit head and consult with the Manuscripts Cataloging Librarian to change the title in the database at the collection, container, and item levels; reprint the barcoding collections report; and print new labels for the collection containers.

Barcoding the PSUA vertical files, including Author Biographical Vertical Files (ABVF)s, Manuscript Vertical Files (MSVF)s, and General Vertical Files (GVF)s posed its own unique set of challenges. Barcoding GVF$s proved especially cumbersome. A heavily used ready-reference collection, each GVF file, organized according to major categories, such as agriculture, academics and research, and business administration, only should have consisted of one folder. However, over the years, many single folder titles had ballooned into two and sometimes numerous folders. Yet, the barcoding collection report only allowed space for one barcode. Each unique collection title and its corresponding container could only have one barcode in WorkFlows.
Attempting to barcode the PSUA vertical files brought the situation to light. The barcoding team consulted with the unit head, who directed her staff to review, weed, and eliminate multiple file folders with the same title from the GVF collection. However, a few GVF titles could not be condensed and required two folders. The Barcoding Committee initially recommended bundling these files together with archival linen tape; however, preservation and access issues caused the Committee to rethink the decision. The Department Head suggested using the terms “Folder 1” and “Folder 2” to differentiate between two GVF folders with the same title in the database and Workflows. The Committee accepted this alternative, which worked well, improving the content of the collection in addition to access.

The barcoding team also discovered GVF titles with inconsistent cross-references, file folders on the shelf but not listed in the GVF barcoding collection reports, file folder titles listed on the report but not on the shelf, and multiple file folders with the same exact title. The Project Head directed the Assistant to document the problems in Word, and submit the report to her. Upon reviewing the reports and the collections in question, the Project Head submitted the report with recommendations to the unit head to review and rectify. To account for titles on the shelves but not listed in the report because the information was not entered in Access, the appropriate staff members added the titles to the database, which allowed the team to create addendum barcode collection reports in the database. File folder titles listed on the report but not on the shelf simply no longer existed. To remedy this problem, PSUA staff simply removed the nonexistent titles from the database.

Because of the high number of discrepancies, the Project Head adjusted the barcoding workflow initially established by the planning team. Instead of affixing barcodes to the barcoding collection reports and then physically barcoding the containers, the Barcoding Assistant first compared the barcoding collection report with the catalog record to make sure there were no discrepancies. Next, the Assistant barcoded the physical containers and corresponding container listings on the barcoding collection report. Finally, the Assistant entered the barcode numbers at the container level in Access and Workflows. If, however, the Assistant found discrepancies, she halted work on that collection, reported the problem, and met with the Project Head once a week to rectify accumulated collection discrepancies.

Although the planning teams had created workflows on who should do what, when, and where, many necessary tasks went undone, creating confusion and errors. Lack of communication and adherence to
implemented workflows hampered the project. After several meetings with the Manuscripts Cataloging Librarian and unit heads, the Project Head realized that the high volume of descriptive discrepancies resulted from unit heads not reviewing MARC records that the Manuscripts Cataloging Librarian had created for processed collections, and submitted to the unit heads for review before uploading to the Libraries' online catalog. To rectify this, the Barcoding Project head created collection discrepancy reports, submitted them to the appropriate unit head and Manuscripts Cataloging Librarian for review, and arranged to meet with the Manuscripts Cataloging Librarian and appropriate unit head to come to a consensus. During the meetings the unit head and cataloger discussed the descriptive discrepancies and agreed on how to describe the collection to maximize access and conform to the Library of Congress Name Authority File. The Cataloger and Project Head gently reminded the unit heads to closely review the MARC records during these meetings.

Over time, staff members began to cooperate, devising creative ways to gain physical and intellectual control over special collections. For example, staff members suggested assigning prefixes to categories, such as AG for agriculture, to properly describe General Vertical Files in WorkFlow. Staff devised a way to differentiate between multiple, but unique collections represented by one accession, by assigning a letter suffix to manuscript vertical file accession numbers. This solution effectively differentiated distinct collections that share the same accession number, for example, MSVF 1998-0002U became MSVF 1998-0002Ua, MSVF 1998-0002Ub, and MSVF 1998-0002Uc. Despite progress, however, staff members continued to define processing very differently, and communication never reached one hundred percent.

In May 2003, the Barcoding Assistant resigned to return to graduate school full time, causing the project to temporarily halt. (Hiring another Barcoding Assistant would prove as difficult as securing the first one.) However, the team did make some headway during that first year. Eighty percent (1,211 containers) of the University Archives' cataloged collection containers were barcoded, and 69 percent (363 containers) of Rare Books and Manuscripts cataloged collection containers were barcoded, for a total of 1,574 containers barcoded. But with a whopping 25,000 collection containers to barcode and only 6 percent of the collections barcoded in one year's time, the team had a long way to go. (The total number of Special Collections Library collection containers—25,000—does not include the hundreds of vertical files housed in Special Collections, many of which the Assistant barcoded.)
Upon announcing the Barcoding Assistant's resignation, the Head of Special Collections requested some feedback about the project. Highlights of the Assistant's feedback include: the communication across units and among individuals within the department needs to improve, all staff members must make the project a priority and cooperate with the Barcoder, staff members need to focus on resolving and preventing discrepancies, and staff members need to properly label all containers.

In May 2003 the project took a different direction. The Head of Special Collections asked the Barcoding Project Head to take over the processing manual project to write an authoritative, step-by-step departmental processing manual. The goal of this project was twofold: to streamline workflows and properly train staff members to process and maintain special collections. Writing the manual would become a time-consuming project, requiring intensive research, deciding upon an approach, setting deadlines, and writing multiple drafts of each chapter. The approximately 100-page manual, complete with appendices and index, would include a mission statement and organizational overview, and chapters covering every aspect of archival processing, from appraisal, acquisitions, accessioning, and preservation, to cataloging, encoding, and barcoding.

Reference

At the outset, one of the anticipated outcomes from barcoding the archival and manuscript collections was to automate the in-room circulation of these materials. When the three units were preparing to physically merge in the new library space, one area of consolidation was the patron registration and materials request form. While the rest of the university library automated patron registration, the Special Collections Library continued to use and retain paper forms. A researcher had to complete the same registration form every week (rather than every day) since the statistics are compiled on a weekly basis—by hand. Using the barcoding system, the staff had high hopes that some of this manual labor could be eliminated for both the patron and staff.

In addition to the learning curve going on behind the scenes, the staff at the reference desk needed to learn how to checkout and check in materials—a circulation function not used before in Special Collections. Several problems arose with this new system. In order to "checkout" anything to a patron, that person had to be registered in the main library system. That's all well and good for faculty, staff, and students, but many of the users of Special Collections' materials are non-university-affiliated
people—faculty from other universities, researchers from out of state or other countries, townspeople, or high school students doing class projects. Special Collections needed a way to register these visitors in the system that would not conflict with the security authentication protocols in place in the rest of the library. The Special Collections' Public Service and Outreach staff worked with the library's Access Services staff to devise a solution to this problem.

Once the patron registration issues coalesced into a standard policy, staff at the reference desk could begin to “checkout” all barcoded materials, including books, for room use. Although patrons still had to fill out the paper registration and materials request form, staff members now had to scan the barcoded items. Staff almost immediately had to deal with the system malfunctioning and fining patrons for overdue materials that had been returned the same day. Patrons could not checkout other library materials until they paid an overdue fine that they really didn't owe. Because this created some public relations ill will, Special Collections stopped using the system to circulate materials until the problem could be resolved. Months later, with the system fixed and more collections barcoded, the staff resumed the dual service—paper request forms for non-barcoded materials and scanning into the system the barcoded ones (and, most importantly, discharging them upon return). To avoid forgetting to scan the items upon their return, staff resorted to charging and discharging before delivering the materials to patrons thus negating the security function. The added steps necessary for dealing with the barcoded items superimposed on top of the manual procedure created a new, not always welcome, workflow for the reference staff. Until everything in Special Collections is barcoded, this split process will remain in place.

Statistics Gathering

The duality of recordkeeping also affects statistics gathering. One staff member of the Public Service and Outreach unit takes responsibility for compiling the usage statistics weekly. Until the summer of 2005, the only electronic reports she received monthly from Access Services contained raw, meaningless numbers disconnected to anything remotely recognizable as a type of material, format, or even departmental unit. The Manuscripts Cataloging Librarian, interested in pursuing the gathering of information on the use of the barcoded collections pursuant to writing this article, convened a meeting of the Public Service and Outreach staff and the reports expert from Access Services to determine what parameters
Workflows needed to produce a meaningful report. One test run produced a report listing all collections circulated (including call number, author, title, number of circulations, and date last used) for all special collections, and a second run separated the results by each of the three units. Further analysis of the data and refinement of the parameters that will separate manuscript and archival materials from books and serials will provide a more granular look at collections used by patrons. In the meantime, and into the foreseeable future, public services and outreach will continue aggregating the usage statistics by hand until everything is barcoded. Information on type of patron will still need to be gathered manually from the registration forms.

Recommendations

Get organized! Determine the project scope, gather statistics, draft a timeline, determine who is qualified (and who desires) to work on this project, and pinpoint technological and supply needs. If your goal is to barcode each collection in your repository, you will need to hire or allocate many staff members who will devote considerable time to the project. If your goal is to build consensus gradually among many professionals and support staff in a dynamic environment, expect the project to take a long time, especially if only a few staff members are assigned to work on the project for limited periods of time. Form a departmental committee to get input from representatives of each unit, division, and/or specialty. Create step-by-step instructions, and meet regularly with the individuals charged with physically barcoding the collections, and ask them to report on all irregularities and discrepancies. Solicit feedback from external colleagues to determine who is barcoding, why, where, and whether it’s worth it. Finally, be prepared for the consequences of implementing a barcoding project, which inevitably will air your colleagues’ dirty laundry.

Conclusions

What at first seemed to be a straightforward project to barcode boxes evolved into rectifying complicated, time-consuming collections-processing challenges. The project uncovered conflicting processing and descriptive practices. Launching the project forced staff to define what constitutes a processed collection. To some staff, creating a container list and bare-bones description of the collection is “processed,” while
others argue that a processed collection has series-level descriptions in an EAD finding aid. The project revealed how lack of proper training, staff resistance, disagreement on archival standards, and noncommunication negatively affect the operations of any organization, wasting time, resources, and money. On a positive note, implementing the bar coding project facilitated the discovery and correction of minor and major processing errors, which improved description of and access and reference service to collections in Special Collections Library. Archival and manuscript collections are inherently challenging to organize, describe, and provide access to, making barcoding difficult. The following three components are key to successfully barcoding special collections: sufficient staffing and resources, sound workflows, and staff buy-in. Consider the initial team’s timeline. The team projected that between July 1, 2002 and June 30, 2003, all 25,000 uncataloged collections would be bar-coded. With one full-time archivist devoting about 30 percent of her time to the barcoding project, a cataloging librarian investing 25 percent of her time in the project, and an assistant bar-coding on a part-time basis, this goal would prove impossible to reach. However, the main goal of the project was to uncover and correct processing errors and streamline processing among units. Although there’s always room for improvement, the project did exactly that, and as such, was a success.

NOTES

10. The Special Collections Library faculty and staff designed a new database structure that merged the three databases into one database on an Oracle server. For the first time, it will have a public interface, anticipated to be available in 2007.

doi:10.1300/J201v04n03_02

APPENDIX A

**COLLECTION BARCODE REPORT**

M 385 Goodwin, Charles Stewart Football Programs, 1905-1993

<table>
<thead>
<tr>
<th>Container No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PATERNO/GST/AL/04.24</td>
</tr>
<tr>
<td>2</td>
<td>PATERNO/GST/AL/05.08</td>
</tr>
<tr>
<td>3</td>
<td>PATERNO/GST/AL/04.23</td>
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<tr>
<td>4</td>
<td>PATERNO/GST/AL/05.01</td>
</tr>
<tr>
<td>5</td>
<td>PATERNO/GST/AL/03.06</td>
</tr>
</tbody>
</table>

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APPENDIX B

**CORE LEVEL RECORD**

099-Call Number  1975-0156R
100/110-Creator/Author  Goedcke, Karl
245-Title in Natural Language  Karl Goedcke papers  (Laurel Book Service)

245, $1-Date Range  1932-1978
300-Quantity Cu. Ft.  8  No. Items

520-Summary Note  The Karl Goedcke Papers are the business records of the specialty book dealer Karl Goedcke. Principally these are the records of the Laurel Book Service, a mail-order business owned and operated by Goedcke and his wife Katherine from 1932 to 1975. The Goedckes
specialized in rare and out-of-print books, especially those about or printed in Pennsylvania, but they also sold more generally available titles and maintained a conventional retail book store in Hazleton, Pennsylvania. Also included are Karl Goedcke's continued book dealings from 1975 to 1978, after his wife died and he closed up LBS. Goedcke acted as the sole distributor for a number of locally produced books, and occasionally did appraisals. Documents concerning these activities are among the papers. The greatest part of the collection consists of the institutional customer files (5½ cubic feet out of 8), which are mostly correspondence offering titles for sale and placing and confirming orders. Over 300 customers are represented. There are also check stubs, purchase orders, and some ephemera produced by the customers.

545—Biographical/Agency History Note Karl E. Goedcke (1902-1979) was a book dealer based in Hazleton (eastern), Pennsylvania. He and his wife Katherine Lubrecht Goedcke (1902-1975) owned and operated the Laurel Book Service from 1932 to 1975 (name first used circa 1935).

650—Subject Heading Booksellers and bookselling

APPENDIX C

MEASUREMENTS IN CUBIC FEET

<table>
<thead>
<tr>
<th>Container</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Record Carton</strong> (15 x 12.5 x 10)</td>
<td>1.00 cf</td>
</tr>
<tr>
<td><strong>Document Case</strong></td>
<td></td>
</tr>
<tr>
<td>Document Case (Legal) (15.25 x 10.25 x 5)</td>
<td>0.45 cf</td>
</tr>
<tr>
<td>Document Case (Letter) (12.25 x 10.25 x 5)</td>
<td>0.35 cf</td>
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<tr>
<td>Half-Width Document Case (Legal) (15.5 x 10.5 x 2.5)</td>
<td>0.24 cf</td>
</tr>
<tr>
<td>Half-Width Document Case (Letter) 12 x 10 x 2.5</td>
<td>0.17 cf</td>
</tr>
<tr>
<td>Oversized Document Case (Legal) (15.5 x 12.75 x 5)</td>
<td>0.57 cf</td>
</tr>
<tr>
<td><strong>Scrapbook Box</strong></td>
<td></td>
</tr>
<tr>
<td>Clamshell (15 x 10 x 3)</td>
<td>0.25 cf</td>
</tr>
</tbody>
</table>
Clamshell (17.5 × 12 × 3.25) 0.39 cf
Newspaper Box (31 × 23 × 3) 1.24 cf
Newspaper Box (25 × 19 × 2.5) 0.68 cf
Newspaper Box (24.5 × 20.5 × 3) 0.87 cf
Newspaper Box (23 × 17 × 3) 0.67 cf
Newspaper Box (22 × 15 × 2) 0.38 cf
Newspaper Box (18 × 13 × 3) 0.40 cf
Mxp Box (25 × 21 × 3) 0.91 cf
Dropfront Photo Box (15.5 × 12 × 3) 0.32 cf
Dropfront Scrapbook Box (21 × 17 × 3) 0.62 cf
Dropfront Scrapbook Box (19 × 15 × 3) 0.49 cf
Lidded Flat Box (18 × 12 × 3.5) 0.44 cf
Shallow broadside box (20.75 × 16.5 × 1.5) 0.30 cf
Mxp Drawer (43 × 30.5 × 1.75) 1.33 cf

Photo Box
Photo Box (5.5 × 4.5 × 4.5) 0.06 cf
Photo Box (13 × 10 × 3) 0.23 cf
Photo Box (6 × 5 × 2.5) 0.04 cf
Shoebox (12 × 6.5 × 4.5) 0.20 cf
Lantern slide box (6.25 × 4.25 × 4.25) 0.06 cf

Other
Slide Storage Box (11 × 2.5 × 2.375) 0.03 cf
Microfilm Storage Box (3.75 × 3.75 × 1.5625) 0.01 cf
Max/Print Roll Storage Box (60 × 10 × 8) 2.77 cf
Mini Document Cases (4 × 2.75 × 1.75) 0.01 cf

*Formula: To obtain volume, multiply height × width × depth (in inches) and divide by 1728, the number of cubic inches in a cubic foot.

Updated 19 July 2005
SPECIAL COLLECTIONS LIBRARY STANDARDS
FOR DESCRIPTION

Created by Jane Charles, 2002

Briefly survey the collection. If the collection has little to no descriptive information in Access, conduct a preliminary inventory of the material. In Access, go to the HCLA Access Database Collections Management System and enter the descriptive information at the Collection Level. The information you add here automatically will route to the Cataloged and Uncataloged reports within the Barcoding Project Database.

1. **Title**: Enter the collection title. Confer with Sue regarding how to name a collection to make the title reflect the authority record.
2. **Date Range**: Enter the full range of dates covered as well as bulk dates.
3. **Title in Natural Language**: Reconfigure the title to reflect natural language. For example, “Ayoub, Ed Papers” in natural language is Ed Ayoub Papers. Most archival collections won’t require adjustment, but we do need to make certain that each collection is titled appropriately according to type of materials it contains. Titles generally include papers, collection, or records.
4. **Creator/Author**: Who created or received the records? Sometimes the name of the collection and the collection creator correspond (are one and the same), but not always. Remember that some collections are created artificially.
5. **Collection Type**: Enter “M” for manuscript and “A” for archival records.
6. **Accession Number**: Copy and paste the accession number, for example, 2000-0325-H, from the Accessions Database.
7. **Special Collections Department**: Enter HCLA.
8. **Group Number**: Enter the group number assigned to the collection. Refer to the Staff Resources form in the HCLA Access Database.
9. **Finding Aid Type**: Refer to the Finding Aid Types List.
10. **Processing Priority**: Skip this field.
11. **Contains Special Formats:** Check this field if the collection contains any nontextual formats.

12. **Restrictions:** Check this field if the collection is restricted either completely or partially.

13. **Catalog Record/Catalog Core Record:** Sue will check one of these boxes once she has cataloged the collection.

14. (i) **Quantity:** Measure the quantity of the collection in cubic feet if you must measure at least one box or multiple boxes. Or (ii) **Quantity:** Measure the quantity in number of items if the collection consists of single documents, folders, and/or nontextual items such as audiotapes, microform, videos, etc. Choose one or the other (**never both**) depending upon the size of the collection.

15. **Summary Note:** This is essentially the scope and content note, which entails a brief summary of the contents of the collection, including a listing of major subgroups and series.

16. **Biographical/Agency History Note:** Briefly describe the record creator, whether an individual or organization.

17. **Subject Heading:** Sue will supply the LC class subject headings for the catalog record, which we will incorporate into our finding aids in all formats.

18. **Description Finished:** Check this box once you have completed the description in Access.

19. **Comments:** Extrapolate the information for the Summary Note; Creator/Author; and Biographical/Agency History Note fields from the Comments field. Note the form and genre of nontextual formats, such as artifacts, material objects, cartographic and/or architectural materials, photographic materials, moving images, audio, microforms, computer-assisted materials, and music, included in the collection. Also note whether the collection has any general preservation issues.