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Association for Library Collections & Technical Services (ALCTS)

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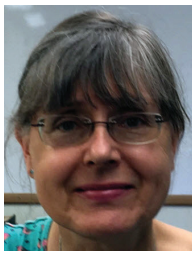
Guest Editorial: The Pivot to E



Michele Seikel

Michele Seikel (michele.seikel@okstate.edu) is Associate Professor and Serials Cataloger at the Edmon Low Library, Oklahoma State University, Stillwater, Oklahoma. Seikel served two terms as a member of the *Library Resources and Technical Services* editorial board, and I am pleased to provide her guest editorial to share her perspective on the evolving role of digital resources and its continued impact on technical services work.

In 2004, Deanna Marcum, associate librarian for library services at the Library of Congress (LC), gave an address titled "The Future of Cataloging" in which she detailed the many ways that the Internet had already changed research for students. She asked whether, in light of the increasing power of search engine indexing, digital resources should receive the same careful, detailed bibliographic description as printed materials. At that time, Google and several large research libraries were involved in the massive digitization project that became Google Books. Since then, other large digitization projects have combined to produce full-text digital versions of a great deal of the contents not under copyright of many research libraries.

The address drew an angry response from another LC librarian, Thomas Mann, who described Marcum's paradigm as "an inappropriate business model," asserting that scholars are the niche market that library cataloging is intended to satisfy, not students. Mann, a reference librarian, was particularly concerned with the idea of eliminating LC faceted subject headings from records.

In the years since, much has changed in the world of bibliographic description, and in a broader sense, library collections in general. Millions of records for digital materials have been added to OCLC WorldCat and to our local catalogs. In those local catalogs and databases, we routinely provide full-text links to government documents, books, and serials that were only available in print collections a few years ago. Many libraries that have access to those digitized materials are in the process of moving print collections to storage or weeding them. Fields, codes, and FAST subjects have been batch-added to millions of records in OCLC's enormous database. Our many e-resources have millions of mostly vendor-created records to describe them, which we batch-load into our catalogs and sometimes edit as best we can. In our pivot toward e-resources, we have tried not to throw all the babies out with the print bathwater.

But our bathtub has changed shape around us in response to our society's increasing dependence on Internet-ready devices, a development that cannot be ignored. The pivot to e-resources has necessitated cataloging, acquisitions, and collection management librarians to learn new skills and abandon old ones. Positions that focused on twentieth-century methods of acquiring, processing, and cataloging physical materials are vanishing. New staff are being hired to focus mostly on making online materials accessible. This is a massive, historic shift, disproportionately affecting technical services librarians and staff, and no one argues about whether it is good or bad anymore—we really do not have time.

Against this rapidly changing background, what are the concerns of those who still have the luxury of doing research and publishing it in peer-reviewed journals? Of the twenty-seven papers published in this journal since 2014, twenty-two addressed e-resources in some way. Some of the most common

topics have been digital preservation methods, metadata, and e-resource acquisitions. Our research choices illustrate our most pressing concerns.

This issue includes papers concerning BIBFRAME, name authorities, and migration to Alma. So then, what has not changed? Libraries continue to maintain local catalogs, and they still find name authority records useful for distinguishing similar names from each other. And, as more materials are digitized or created online, technical services work will continue. But, increasingly, it involves creating or acquiring access to those handy full-text links, making them findable, and maintaining them for our users.

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2. Thomas Mann, The Changing Nature of the Catalog and Its Integration with Other Discovery Tools, Final Report, March 17, 2006, Prepared for the Library of Congress by Karen Calhoun: A Critical Review, https://www.loc.gov/catdir/calhoun-report-final.pdf.

ALCTS Annual Report to ALA Council

Norm Medeiros, ALCTS President 2015–16

The Association for Library Collections and Technical Services (ALCTS), a division of the American Library Association, is the premier organization for professionals in acquisitions, collection management, cataloging and metadata, continuing resources, and preservation. Comprising more than three thousand members from throughout the United States and more than forty countries, ALCTS leads the development of principles, standards, and best practices for creating, collecting, organizing, delivering, and preserving information resources in all formats.

The ALCTS Community

The 2015–16 term was the first in which the new ALCTS Strategic Plan (www.ala.org/alcts/about/plans/stratplan#plan) was in force. Focused on areas where special attention is needed to strengthen and grow the association, the Strategic Plan places necessary emphasis on member recruitment and retention. These related goals were approached in several ways over the past year. During ALCTSfest, the Midwinter Meeting reception, we recorded members describing why they joined and continue to serve in ALCTS. The "Why ALCTS?" testimonials (www.ala.org/alctsnews/items/mw2016-why-alcts) featured twenty-four individuals of varying tenure and involvement within ALCTS telling their stories in two-minute video segments. These videos capture the essence of the ALCTS community, the most valuable of all member benefits.

The Advocacy and Policy Committee further fostered community this year by administering a contest to establish a new slogan for ALCTS. During spring 2016, ALA members were encouraged to submit slogan suggestions to be voted on by the ALCTS membership. More than fifty slogans were submitted. As of this writing, the final phase of voting is taking place, with the new slogan set to be unveiled at the ALCTS Membership Meeting and Awards Ceremony at the Annual Conference in Orlando. *(Editor's note: The winning entry was submitted by Mary Beth Weber. ALCTS's new slogan is "Creating the Future, Preserving the Past.")*

In consultation with the New Members Interest Group and coordinated by the Leadership Development Committee, ALCTS is developing a mentoring program to be implemented in the coming year. A new member benefit, the mentoring program will match individuals for a year-long mentoring relationship that encompasses professional and leadership skills rooted in ALCTS's functional areas. A distinctive feature of the program is that it will support mentees at various stages of their careers and thereby enable individuals to serve as both mentors and mentees. While ALCTS has placed great emphasis over the years on the needs of new members and early career professionals, this program seeks to serve the needs of members at all stages of their career. It is exciting to see the seeds of

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this program sown, as it has the potential to more fully foster and galvanize the ALCTS community.

At the 2016 ALA Annual Conference, ALCTS will implement its inaugural Preservation in Action initiative, a program that provides preservation expertise to a cultural heritage institution located near the conference venue. Administered by the Preservation and Reformatting Section (PARS), the Preservation in Action volunteers will visit the Orange County (FL) Historical Society for a daylong project to clean and properly house motion picture film. This initiative is characteristic of ALCTS's generous and community-minded spirit.

Sixty Years of ALCTS

ALCTS will celebrate its sixtieth anniversary in 2017. In anticipation of this diamond anniversary, the board of directors established two task groups to plan events in celebration of this milestone. The first task group will develop a multiday virtual forum to be held in spring 2017. This technology-rich event will bring together ALCTS members and nonmembers alike with programs that are forward-looking and inspirational. The second group, the 60th Anniversary Steering Group, will celebrate ALCTS's rich history and exciting future. The two groups will work with the board and ALCTS operational units to plan and execute a wide array of fun, informative, and nostalgic events. ALCTS is set for a memorable year in 2017.

Operations

With all the hoopla surrounding the new and returning member initiatives and sixtieth anniversary events, it is easy to forget that ALCTS is a complex organization that relies heavily on staff and member volunteers to keep its operations sound. During the past year, the board of directors and Budget and Finance Committee worked judiciously to adjust the FY16 budget and projections for FY17 to strengthen ALCTS's financial standing. ALCTS is not immune to the demographic shifts that are affecting membership across most of ALA's divisions. To offset declines in membership, we bolstered our other revenue sources. Publishing activities have been invigorated by new editors and fresh approaches to soliciting content. Our continuing education program had another banner year, with an impressive array of offerings and registrants. It is our hope that in the coming year our fundraising program can reach new levels, especially as we consider anniversary-year giving campaigns.

I would like to recognize the departure of Christine McConnell, who for more than ten years served in the ALCTS office as publications and membership specialist. While sad to leave ALCTS, Christine is happy to be back in her native Cleveland. We could not have done better than to hire Brooke Morris as Christine's replacement. Brooke began her ALCTS appointment just days before the ALA Midwinter Meeting, yet performed as a seasoned professional in Boston. She brings fresh ideas and enormous energy to her position, which is critical given the marketing and publishing efforts we have planned. Brooke joins Keri Cascio, executive director, and Julie Reese, continuing education and meetings manager, in forming an amazingly talented and dedicated ALCTS office staff.

Advocacy

ALCTS once again hosted Preservation Week, the annual national awareness campaign for preservation established in 2010. For this year's festivities, ALCTS offered free webinars on preserving your digital life and reformatting audiotapes, and timely advice from ALCTS member and preservation consultant, Donia Conn.

An unexpected advocacy campaign for ALCTS began with an ALA Council resolution at the 2016 Midwinter Meeting urging the Library of Congress (LC) to change its "Illegal aliens" subject heading. In March, LC proposed the more respectful replacement terms of "Noncitizens" for "Aliens" and "Noncitizens" or "Unauthorized immigration" for "Illegal aliens." When ALA's Washington Office discovered that a House of Representatives appropriations bill included language that would prevent LC from changing the current headings, ALCTS took action, jointly authoring with ALA a letter to Congress justifying the replacement of the headings. While the House appropriations subcommittee recently approved the appropriations bill with the mandate for LC to follow the language in US Code, ALA and ALCTS will continue their efforts as the funding bills move through both houses of Congress for final approval. Particular thanks go to CaMMS' Subject Analysis Committee for providing authoritative context to include in the ALA/ALCTS letter.

Transforming ALCTS

We speak endlessly about the changing nature of libraries, and how crucial it is to effectively adapt to these changes. The same advice holds true for library associations. Competition, demographics, communication, and member expectations are all vastly different from when I entered the profession twenty years ago. Over the years, I have seen ALCTS shift to accommodate these new realities, but I believe the change it is undergoing at this moment is more transformational.

The changes in ALCTS leadership, from committee chairs to the board of directors, are bringing into the organization fresh ideas and new ways of collaborating. Moreover, the orientation of many of the newer ALCTS members weaves among or extends beyond the traditional areas of collections, cataloging, and preservation. Providing a home in ALCTS for such individuals whose cross-divisional work may only be marginally related to these foundational functions provides a golden (or should I say, diamond?) recruiting opportunity. Further, these individuals could provide ALCTS a rich assortment of programming, publication, and continuing education opportunities. The 2016 Midwinter Symposium, "Re-envisioning Technical Services to Transform Libraries," so capably administered by October Ivins, envisioned an expansive, porous, and dynamic technical services future. I am confident that ALCTS will embrace this same exciting vision, leading to a future for the Association even brighter than its past.

Final Thoughts

As I told the board of directors upon receiving the gavel at the 2015 ALA Annual Conference, no president leads alone. While the president may be the face of the Association, the strength he or she garners is derived from the board, and especially the board's Executive Committee. I was blessed with a deeply dedicated and engaged set of board colleagues this year; I could not have asked for a more superb team. My fellow Executive Committee colleagues—Vicki Sipe (President-Elect), Mary Page (Past-President), Andy Hart (Division Councilor), and Keri Cascio (Executive Director)—served as weekly counsel, providing input and constructive criticism, helping me see matters in multiple dimensions and from diverse perspectives. I am immensely grateful for their support and overwhelming goodness.

It has been my privilege to serve as the 2015–16 ALCTS president, an experience I will never forget. I hope my service has contributed in some small way to the betterment of this community that I love.

BIBFRAME Transformation for Enhanced Discovery

Qiang Jin, Jim Hahn, and Gretchen Croll

With support from an internal innovation grant from the University of Illinois Library at Urbana-Champaign, researchers transformed and enriched nearly 300,000 e-book records in their library catalog from Machine-Readable Cataloging (MARC) records to Bibliographic Framework (BIBFRAME) linked data resources. Researchers indexed the BIBFRAME resources online, and created two search interfaces for the discovery of BIBFRAME linked data. One result of the grant was the incorporation of BIBFRAME resources within an experimental Bento view of the linked library data for e-books. The end goal of this project is to provide enhanced discovery of library data, bringing like sets of content together in contemporary and easy to understand views assisting users in locating sets of associated bibliographic metadata.

The BIBFRAME model, the potential successor to the MARC data model, is an effort to transition the MARC 21 format to linked data. It was first introduced in the Library of Congress (LC) report, "Bibliographic Framework as a Web of Data: Linked Data Model and Supporting Services" in 2012.[1] BIBRAME can be situated within the context of semantic technologies that make possible contextual and interlinked resources on the broader web. The development of BIBFRAME is a response to the effects of online networked information, leveraging search engines, their impact on discovery of library collections, and the need for standardization of bibliographic resources as those resources move into linked data environments.

Background on BIBFRAME Development

To understand the BIBFRAME model, one must first explore common information modeling terminology, particularly the fundamental entity-relationship (ER) model. The BIBFRAME model is based on the ER model developed by Peter Chen in 1976.[2] There are three basic elements in the ER model: entities, attributes, and relationships. According to Chen, an entity is a "thing" that can be distinctly identified. Entities are the "things" about which we seek information. A specific person, company, or event is an example of an entity. A relationship is an association between instances of entities. Attributes are the data that we collect about the entities. For example, attributes of a person entity may include a first name, last name, birth date, and title. Relationships illustrate how instances of entities are related to one another. These broad concepts make up the conceptual underpinnings of the BIBFRAME model. The LC project page introducing BIBFRAME gives the following motivation for the model: "BIBFAME provides

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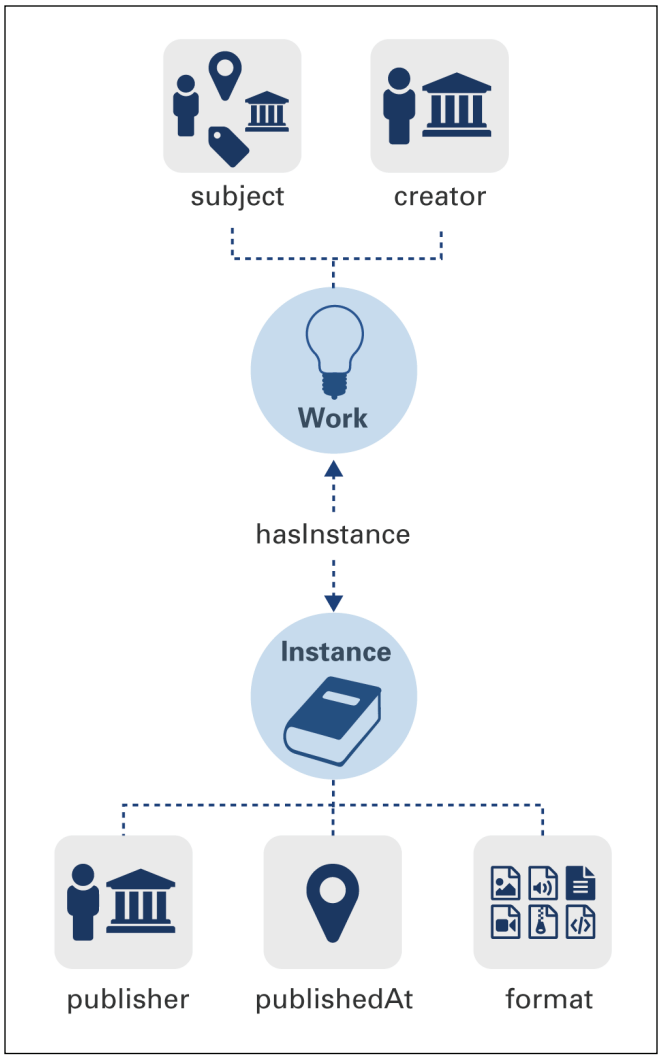

Figure 1. The BIBFRAME Model

a foundation for the future of bibliographic description, both on the web and in the broader networked world. BIBFRAME serves as a general model for expressing and connecting bibliographic data."[3] Figure 1 is an illustration of the BIBFRAME model.

The BIBFRAME data model descends from the Functional Requirements for Bibliographic Records (FRBR) conceptual model, but is not an exact implementation of that conceptual model. FRBR has four entity sets: work, expression, manifestation, and item. The FRBR entity sets work and expression are known in BIBFRAME as the entity *work*. FRBR entities manifestation and item are known in BIBFRAME as the entity *instance*.[4]

The BIBFRAME entity *work* is a resource reflecting the conceptual nature of the resource being cataloged. A BIBFRAME entity *instance* is a resource reflecting an individual, material embodiment of the work. The third BIBFRAME entity is *authority*. It includes FRBR group 2 entities for person, family, and corporate body, and FRBR group 3 entities for concept, object, event, and place. According to the report "Bibliographic Framework as a Web of Data," BIBFRAME authorities are not designed to replace existing authority efforts but rather provide a common abstraction layer over various different web based authority efforts to make them even more effective.[5] The fourth BIBFRAME entity is *annotation*. It is used to identify library holdings, cover art and reviews. BIBFRAME aims to publish and share library bibliographic and authority data via the web. It provides links to connect different pieces of information or resources and aspires to be a replacement for MARC. A key difference between MARC and BIBFRAME is that MARC presents bibliographic information as catalog records, which duplicates information across multiple records. As an example of this duplication, consider that many MARC records contain the same author's name, a repetition that is not a part of BIBFRAME since BIBFRAME emphasizes relationships between resources and can reference already existing links. Some of the relationships BIBFRAME holds include work-to-work relationships, work-to-instance relationships, instance-to-instance relationships, and work to authority relationships.

In 2013, LC issued a call encouraging libraries to test the BIBFRAME model. Inspired by a study testing the BIBFRAME model for audiovisual resources, the authors conducted an independent test focusing on e-books in the University of Illinois' online catalog.[6] Our hope was that we would be able to contribute to the revision of the BIBFRAME model for that specific format. It should be noted that at the time of this writing (late March 2016) there are now several proposed revisions to the BIBFRAME vocabulary, these draft documents are available as "BIBFRAME 2.0 Draft Specifications" on LC's BIBFRAME page.[7] Our project references the BIBFRAME specifications from 2014, and is one of fourteen projects registered at the LC BIBFRAME Implementation site as of March 2016.[8] The BIBFRAME implementation site includes projects from libraries in Cuba, England, Egypt, Germany, and the United States.

Innovation Grant Goals and Outcomes

The University of Illinois Library issues a biannual call for innovation proposals that will enable the library to explore new ways of working. Funding amounts vary, and have been supported up to $10,000. The funding source for the BIBFRAME grant provided graduate hourly student employees. The two graduate students who worked on this project were sourced from the Graduate School of Library and Information Science and the Department of Computer Science at the University of Illinois. Two professional tenured librarians led the investigation—first by way of manually derived

exploration of linked data transformation and enrichment, and after a model was developed for the e-book format within BIBFRAME, the transformation and enrichment was automated with original programming.

Objectives of the BIBFRAME innovation grant include the following:

- studying how to provide enhanced discovery of similar sets of content in the library system with the BIBFRAME model
- contributing a module of Bento-style search results in the BIBFRAME model[9]
- enriching the BIBFRAME model with linked data that connected to other open linked data projects
- writing a report on issues encountered and recommendations for e-book records in the BIBFRAME model.

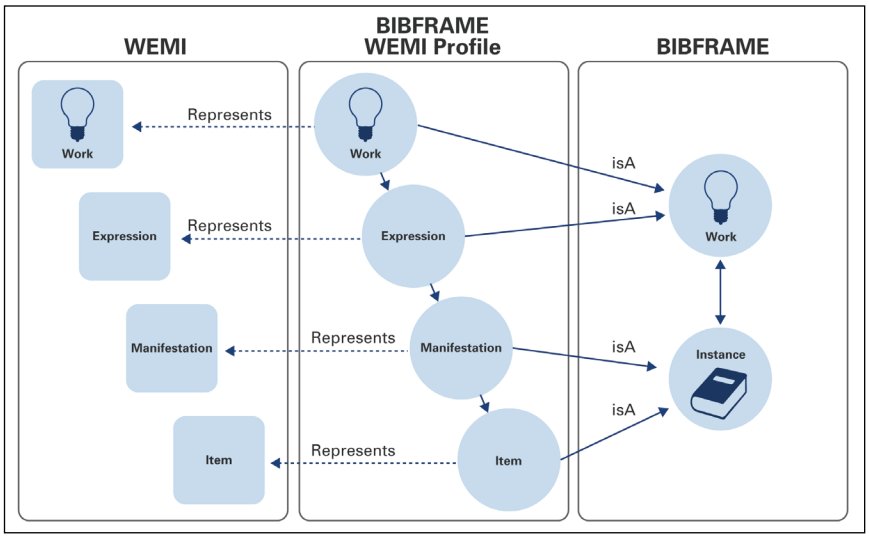

Figure 2. FRBR Work, Expression, Manifestation, and Instance mapped to BIBFRAME entities

By the conclusion of the innovation grant, the team transformed and enriched nearly 300,000 e-book records and has developed two prototype search interfaces. The two options for retrieval of linked data records include a Google Custom Search Engine that surfaces the structured data in the result list, and a Bento-style result layout for e-book search in addition to articles and other catalog data. The grant work is summarized on a project website.[10] The team has made the linked data enrichment code available through an online code repository.[11]

Literature Review

Enthusiasm for BIBFRAME has been high among several librarians whose work we review here, but since exemplars of large-scale implementations do not yet exist, the debate is still open as to whether BIBFRAME should be adopted. Among those reasons to pursue BIBFRAME projects is the concern that MARC may not be adequate to meet the demands of access and discovery on the World Wide Web and that a replacement is needed to leverage linked data like BIBFRAME. Kroeger provides an overview of literature leading to the BIBFRAME model.[12] She cites several sources including Tennant's 2002 paper "MARC Must Die."[13] In his paper, Tennant states that MARC has outlived its usefulness. MARC can no longer serve our users well. We reason however, that as the basis for a controlled identifier approach to sharing data, MARC has been instructive. Without adherence to standardization of controlled identifiers—of which MARC has been a leading exemplar—research such as the transformation and enrichment project described here would not be possible. The 2008 report "On the Record by the LC Working Group on the Future of Bibliographic Control," written by a group of well-known experts, argues that the library community needs to recognize that the World Wide Web is our technology platform and the appropriate platform for the delivery of our standards.[14] Since many e-book users primarily locate information resources through web searches, and not library discovery systems, we theorized that e-books are a natural target for BIBFRAME transformation and indexing on the web. Dean's paper indicates that we live in the age of Google, and our catalogs should reflect the information-seeking behavior of today's user, not the user of one hundred years ago.[15] Rollitt states in her paper that BIBFRAME might change libraries in a profound way.[16] It will link bibliographic data and will move bibliographic data to the web for access and management, which could generate new types of library services. Consider one library service available as a result of BIBFRAME transformation: locating e-books from your home library primarily from a search engine. This would be a welcome service of which users would seamlessly take advantage.

Pilot projects with BIBFRAME transformation are few, but among those early adopters and small prototypes, results have generally been favorable. Therani designed a project data model based on BIBFRAME, and transformed existing bibliographic data to BIBFRAME using relevant BIBFRAME vocabulary to implement linked data for a small collection at Harvard University library.[17] Therani's results indicated that BIBFRAME offers superior navigation control and access points for users to dynamically interact

with bibliographic data and concluded that users can find more information when bibliographic data are linked. The authors attempt in our Bento-style search result page of BIBFRAME data to assist users in finding sets of like items that are related to their initial search.

The University of Washington evaluated BIBFRAME and the Resource Description Framework (RDF) as carriers for RDA cataloging.[18] They mapped RDA core elements to BIBFRAME, and concluded that both RDA/RDF and BIBFRAME can represent library metadata as linked data. While comparing RDA/RDF with BIBFRAME, they discovered that RDA/RDF is stronger in series, notes, technical details of a resource, and inverse properties, while BIBFRAME is stronger in administrative metadata, identifiers, subject headings, holdings information, support for both transcription (literals), and Uniform Resource Identifiers (URIs). Note, however, that RDA is a content standard for resource description and access. Catalogers have been creating MARC records based on RDA for the last several years. BIBFRAME is a structural framework. RDA and RDF are connected by FRBR to define the primary entities and relationships. FRBR has been extended to a name authority model (FRAD, Functional Requirements for Authority Data), and a subject authority model (FRSAD, Functional Requirements for Subject Authority Data). RDA supports FRBR, FRAD, and FRSAD.

Related Projects

Schema.org is an initiative launched in 2011 by Bing, Google, and Yahoo to create, maintain, and support a common set of schemas for structured data markup on web pages, and beyond (see https://schema.org). Ronallo in his seminal piece "HTML5 Microdata and Schema.org" explained the history of Schema.org and its different usages for search engines and libraries.[19] Schema.org provides a simple way for libraries, archives, and museums to expose liked data using microdata encoded in HTML5. For our BIBFRAME HTML display pages, we utilized Schema.org microdata. Clark's presentation at the American Library Association Annual Conference in 2014 about Schema.org markup demonstrates how Schema.org metadata can be used in library settings, noting that there are some descriptors like library holdings that lack one to one mapping.[20] Recently, however, new work developed by the World Wide Web Consortium's (WW3C) Schema Bib Extend Community Group addresses several of these needed mappings. Results of their work are available at the bib.schema.org webpage.[21] Before the availability of the bib.schema.org work we utilized the schema.org property *brand* to reference an e-book publisher, when we would have preferred the more library focused property *publishedBy*.

According Godby (OCLC) and Denenberg (LC), "the coverage of Schema.org is necessarily broad but shallow because library resources must compete with creative works offered by many other communities in the information landscape. Conversely, the coverage of BIBFRAME is deep because it contains the vocabulary required of the next-generation standard for describing library collections."[22] There are at least three high-level differences between LC's BIBFRAME and the Schema.org model adopted by OCLC. First, work and instances are defined in BIBFRAME, while work is defined in Schema.org, but not instance. Second, BIBFRAME defines an authority entity, but not Schema.org. Third, BIBFRAME defines the annotation entity, and Schema.org model does not.

The BIBFLOW project at the University of California Davis Library is an Institute of Museum and Library Services-funded initiative to examine workflows, systems, and processes necessary to move libraries into BIBFRAME. The grant includes partnership with Zepheira. The researchers hypothesize that,

> while these new standards and technologies are sorely needed to help the library community leverage the benefits and efficiencies that the Web has afforded other industries, we cannot adopt them in an environment constrained by complex workflows and interdependencies on a large ecosystem of data, software and service providers that are change resistant and motivated to continue with the current library standards (e.g. Anglo-American Cataloguing Rules (or AACR) and MARC. Research is required on how research libraries should adapt our practices, workflows, software systems and partnerships to support our evolution to new standards and technologies.[23]

Their work dovetails with the BIBFRAME project described in this research paper; we describe how transformed BIBFRAME data will be surfaced in a discovery view and also demonstrate how library systems can be modularly designed to mitigate some of the complexity inherent within the traditional Integrated Library System (ILS).

To summarize the three strands of disagreement regarding the potential usefulness of BIBFRAME implementation and the transition from MARC—one strand of thought leaders is looking to optimize discovery of resources that favor Schema.org metadata for MARC transformation. As we described above, Schema.org metadata without extensions lacks several library specific descriptors, however several researchers have found extensions to Schema.org to be sufficient.[24] There is a second somewhat cautionary thought that suggests that discarding MARC in favor of BIBFRAME is premature.[25] Most libraries will tread this path early on. While yet a third group of leaders are sympathetic

to projects like BIBFRAME and suggest that modeling the richness of MARC is an important component of transitioning library description into linked data.[26] Our approach was to use both BIBFRAME and Schema.org for enhanced discovery. We noted the extensions to Schema.org and find value in making use of microformats encoded in HTML. BIBFRAME was chosen as the library specific vocabulary for description encoded in RDF/XML, whereas Schema.org is utilized in our project when indexing HTML pages for a Custom Google Search Engine.

BIBFRAME Transformation and the Linked Data Enrichment Process

There are several ways the BIBFRAME model can be expressed using markup languages. In information modeling within the Library and Information Science community and digital librarianship specifically, it is common to express an information model in XML—the XML standard (more accurately a "meta-markup language") has proven to be a powerful tool for metadata transformation since many tools exist for traversing and transforming XML elements programmatically.[27] Due to XML's versatility, we chose to use RDF/XML encoding to model BIBFRAME resources. There are other ways to encode BIBFRAME, however, these other markup standards are highly specific to linked data in general and the Semantic Web in particular.[28] The modern use of XML for encoding MARC is exemplified in MARCXML, which is the starting point of the MARC records used in our experiment.[29]

RDF is a metadata model developed by the World Wide Web Consortium (W3C), which is implemented in Semantic Web resources and applications.[30] Many researchers have found RDF to be the de facto markup language for linked data, and many expected RDF to become the backbone of the Semantic Web. One challenge in working with RDF/XML is that while it is a standard markup for linked data applications, it is not easily readable and it serializes poorly. The reason for this poor serialization is that RDF/XML was meant as a data exchange format. The conceptual underpinning of RDF is quite basic: statements are made about resources using a subject, predicate, and object.[31] The implementation of this basic model in RDF/XML is the backdrop for our work.

As we note in our introduction, the BIBFRAME model focuses on four main classes: work, instance, authority, and annotation. However, on closer inspection by other thought leaders concerning the model's construction, there are basically two entities: work and instance. According to Coyle, "The BIBFRAME Work Represents the content portion of the bibliographic description, and the instance describes the carrier."[32]

The URI plays a profound role within BIBFRAME. A URI is a string of characters to uniquely identify a resource. It is also the basis for interlinking and providing context to resources. As an example of how URIs are foundational to linked data, consider our example of a MARC record with repeating data with BIBFRAME data are not repeated in this way since there is not a record in the classic catalog sense, rather data are simply referenced with URIs within BIBFRAME resources. These references can then be utilized by multiple BIBFRAME resources, and thus provide the interlinking and contextual reference point that provides the "meaning," of resources within the context of the Semantic Web.

Our BIBFRAME transformation process was iterative and exploratory. The BIBFRAME RDF that we began enriching with URIs was created using the MARCXML to BIBFRAME transformation tools available on LC's GitHub software repository page.[33] Enrichment of URIs was required since after transformation the resulting BIBFRAME RDF included multiple placeholders for URIs. In effect the transformation process was complete, but enrichment was necessary to create a valuable BIBFRAME resource that referenced other linked data URIs. Our first research efforts were to manually develop a model of BIBFRAME with enriched URIs. In practice this meant examining the output of LC's transformation code and manually enriching several hundred resources with relevant URIs.

We curated the RDF down to four files for each of the core classes of work, instance, authority and annotation. In the second phase of our project, the results of manual modeling were automated so that the nearly 300,000 e-book records were transformed through programmatic methods. We considered modifying the LC codebase for MARCXML to BIBFRAME so that it would include enrichment while it transformed MARCXML, but because of the complexity of the codebase, we instead chose to automate enrichment after BIBFRAME RDF transformation was complete. The model shown in figure 3 was utilized to map MARC records to BIBFRAME for the project.

Authority Modeling

The Authority class of a BIBFRAME resource is defined as a "representation of a key concept or thing. Works and Instances, for example, have defined relationships to these concepts and things."[34] Project researchers first focused on BIBFRAME's authority section, replacing blank URI nodes, the example.org links in the RDF, with open linked data authority URIs for creators and subject headings. Each library transitioning to BIBFRAME makes an implementation decision whether to represent a BIBFRAME authority as a blank node or reusable resource. Some libraries may use local identifiers that then associate with equivalency tags

to open URIs. This two-step process gives the library local control over URIs should they decide to alter or add to existing URIs.

For names, the researchers chose to link to VIAF, which combines over thirty name authority files worldwide. Researchers eliminated LC Name Authority File (NAF) links as the main links in the RDF, and replaced the example.org URI with the VIAF URI. This was done because VIAF has authority records for most authors/creators listed in the e-books. Additionally, the LC NAF is part of VIAF.

An example of a personal name linked to VIAF is shown below.

```
<bf:Person rdf:about= "http://viaf
.org/viaf/253339409">
<bf:label>Pivert, Olivier</
bf:label>
<bf:authorizedAccessPoint>Pivert,
Olivier</bf:authorizedAccessPoint>
<bf:hasAuthority>
<madsrdf:Authority>
<madsrdf:authoritativeLabel>Pivert, Olivier</
madsrdf:authoritativeLabel>
</madsrdf:Authority>
</bf:hasAuthority>
</bf:Person>
```

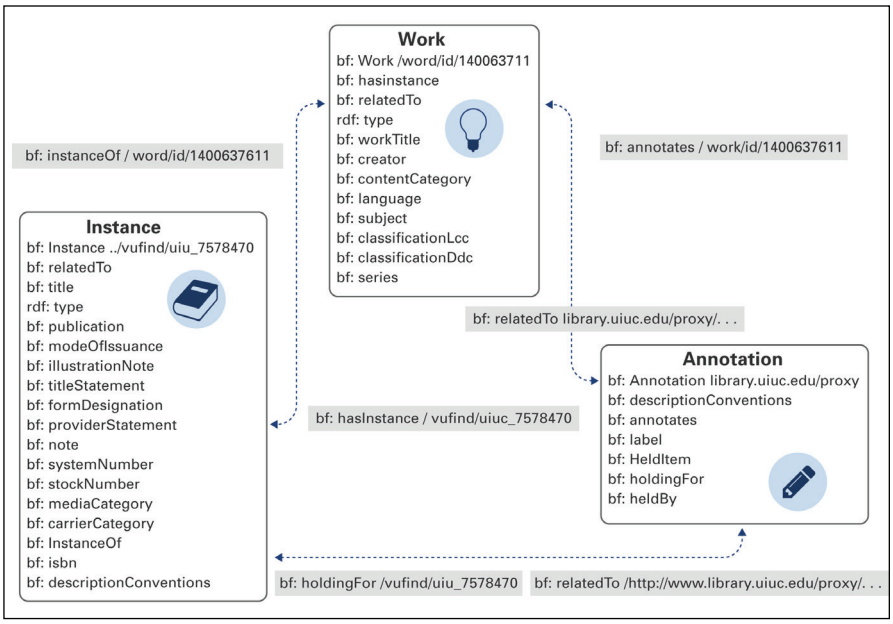

Figure 3. BIBFRAME ER Model utilized in project mapping

When the authors were unable to find names in VIAF, they linked them to WorldCat Identities, which has every name in WorldCat (over thirty million names), including named people, organizations, and fictitious characters. We also viewed WorldCat Identities as a reliable source for authority data.

Our first choice for subjects is to link to id.loc.gov. This database provides URIs for a large number of LC Subject Headings (LCSH) in our e-book bibliographic data among other authority files. An example linking a complex subject heading to id.loc.gov is provided below:

```
<madsrdf:isMemberOfMADSScheme
rdf:resource= "http://id.loc.gov/authorities/sub
jects"/>
</madsrdf:Authority>
</bf:hasAuthority>
</bf:Topic>
<bf:Topic rdf:about= "http://id.loc.gov/authorities/
subjects/sh85022943">
<bf:authorizedAccessPoint>Chemical plants—
Waste disposal</bf:authorizedAccessPoint>
<bf:label>Chemical plants—Waste disposal</
bf:label>
<bf:hasAuthority>
<madsrdf:Authority>
<rdf:type rdf:resource= "http://www.loc.gov/mads/
rdf/v1#ComplexSubject"/>
<madsrdf:authoritativeLabel>Chemical plants—
Waste disposal</madsrdf:authoritativeLabel>
```

While linking subject headings to id.loc.gov, the authors encountered challenges with subject headings not found in the database, or cases where only parts of complex subject headings are found. In the case that a subject heading could not be located in id.loc.gov, they then chose Faceted Application Subject Terminology (FAST), which is based on LCSH, but uses a simplified syntax.

An example linking to the FAST database:

```
<bf:Topic rdf:about= "http://experimental.world
cat.org/fast/1059826/">
<bf:authorizedAccessPoint>Petroleum refiner-
ies—Waste disposal</bf:authorizedAccessPoint>
<bf:label>Petroleum refineries—Waste disposal</
bf:label>
<bf:hasAuthority>
<madsrdf:Authority>
<rdf:type rdf:resource= "http://www.loc.gov/mads/
rdf/v1#ComplexSubject"/>
<madsrdf:authoritativeLabel>Petroleum refiner-
ies—Waste disposal</madsrdf:authoritativeLabel>
```

After those two searches were exhausted, the authors checked headings for medicine and health to see if URIs existed within Medical Subject Headings (MeSH), the National Library of Medicine's controlled vocabulary thesaurus. MeSH provides identifiers for main subject headings and their subdivisions. Both FAST and MeSH are reliable open linked data sources.

An example linking to MeSH:

```
</bf:Topic>
<bf:Topic rdf:about= "">
<bf:authorizedAccessPoint>Blood
Substitutes—adverse effects-Congresses</
bf:authorizedAccessPoint>
<bf:label>Blood Substitutes—adverse effects—
Congresses</bf:label>
<bf:hasAuthority>
<madsrdf:Authority>
<rdf:type rdf:resource="http://www.loc.gov/mads/
rdf/v1#ComplexSubject"/>
<madsrdf:authoritativeLabel>Blood
Substitutes—adverse effects—Congresses</
madsrdf:authoritativeLabel>
<madsrdf:isMemberOfMADSScheme
rdf:resource= "http://id.loc.gov/vocabulary/sub
jectSchemes/mesh"/>
</madsrdf:Authority>
</bf:hasAuthority>
```

Work Modeling

BIBFRAME's Work class is defined as a "Resource reflecting a conceptual essence of the cataloging resource."[35] To locate a proper WorkID for these e-books, the researchers considered several sources of "work identifier" information. OpenLibrary, the Internet Archive, and ebrary were each considered. The first two are open source resources that are similar to WorldCat. Ebrary, however, is a site that operates for profit. The WorldCat.org Work Identifier was chosen because it is part of a vast online database connecting libraries around the world. This service was still experimental at the time but was regarded by the authors to be a tentative best option.

An example link to a WorldCat Work Identifier:

```
<bf:Work rdf:about= "http://worldcat.org/entity/
work/id/1379076301">
```

Instance Modeling

BIBFRAME's Instance class is defined as a "resource reflecting an individual, material embodiment of the Work."[36] The authors chose the University of Illinois's VuFind link as an instance identifier. VuFind is our local online catalog.

```
<bf:hasInstance rdf:resource= "http://vufind.carli
.illinois.edu/vf-uiu/Record/uiu_7187480/
Description"/>
```

In our implementation, we linked our BIBFRAME work and instance by relationships expressed via the properties bf:hasInstance and bf:instanceOf.[37] A Work can have many Instances, and many Instances can point to one Work. Coyle has previously noted that in BIBFRAME, "instance is analogous to the FRBR manifestation. Item-level information is not treated as one of the primary bibliographic entities in BIBFRAME."[38] E-books are not tangible resources in the sense that there is an actual "item." Therefore, the folding of FRBR entity sets manifestation and item illustrated in figure 2 does not initially cause issues or necessitate additional workflows for e-book resource transformation for Work to Instance relationships in this round of data transformation. We note in the annotation model areas where item level data could be recorded as needed.

Annotation Modeling

BIBFRAME's Annotation class is defined as a "resource that asserts additional information about other BIBFRAME resource."[39] We investigated annotation modeling last because it is the model's most abstract part, though we found it useful for describing the item level information about a resource, as needed. As an example, within the "Annotation: about," we included a link to a site where we can access the e-book described in BIBFRAME data. The following link leads to the electronic access of the e-book.

```
<bf:relatedTo rdf:resource= "http://www
.library.uiuc.edu/proxy/go.php?url=http://
www.oxfordreference.com/view/10.1093/
acref/9780199738878.001.0001/acref
-9780199738878"/>
```

HTML model

The BIBFRAME RDF/XML was then hosted within a HTML page for the resource. Within that HTML, the project researchers included display elements for Access, Item Description, Subject Terms/Creators, and BIBFRAME RDF—where links to the individual pages of each RDF/XML section are linked (see figure 4). This enables our work to be reviewed and critiqued by others in the field and also allows others to observe our finalized model when creating their own BIBFRAME resources.

The researchers decided to include both the LCC number for the e-book and a short description of the item for which the record is created. The LCC number is taken from the RDF, as are the "notes" except for a few occasions when the notes are not available. While the authors believe that call numbers are important in linked data, yet for a few records, the RDF from e-books do not include a LCC number, which is problematic. Most of the records lacking a LCC number also lack a "Held Item" field in the RDF, and the authors searched WorldCat for a LCC number. If no number was found in WorldCat, the LCC number was not included in the HTML. Some of the records without "Held Item" portions are the proceedings from a meeting or conference.

Since the HTML records are web resources, several of the open linked data elements included in the BIBFRAME resources are also embedded in the HTML as Schema.org structured data. The project researchers used Google's Structured Data Testing Tool to properly enrich the HTML with linked data from the Schema.org vocabulary.[40] Including Schema.org markup in the HTML records allow a Google Custom Search engine to surface the linked data that are included in the BIBFRAME RDF. The Schema.org types utilized include Person, Book, Brand, URL, and Thing.

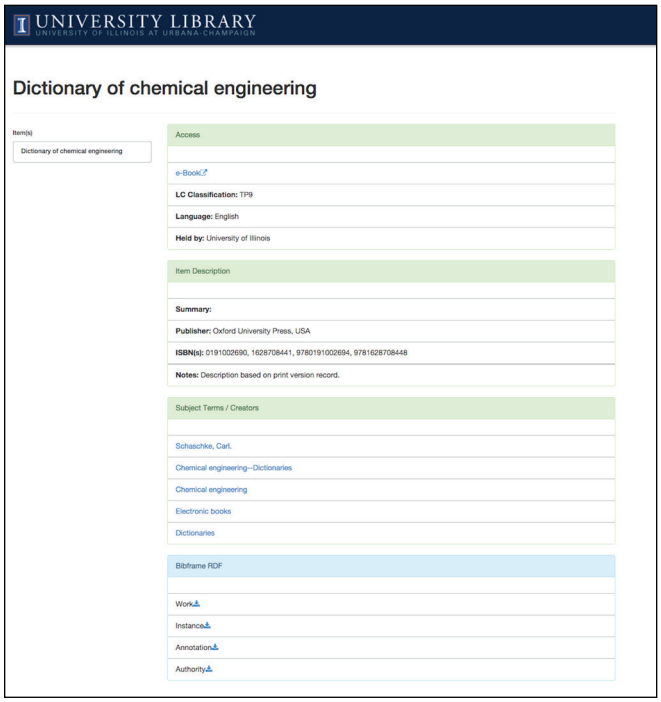

Figure 4. BIBFRAME HTML page

Process for Automated Transformation and Discovery

For each of the models described above, researchers developed a corresponding URI enrichment code written in Python. Python is a commonly used programming language for batch MARC data transformation and enrichment.[41] Several Python programs were developed to generate the enrichments for BIBFRAME elements programmatically using the master BIBFRME RDF/XML file.[42] It should be noted that the authors' BIBFRME RDF/XML file was generated from code available from LC. LC's code repository utilized a software language known as XQuery, which is a standard software tool employed for traversing and transforming XML.

Web-based Application Programming Interfaces (APIs), concise, specifically formatted data produced by programs to be consumed by other programs, were used to enrich the transformed RDF with linked open data. The Python programs take the transformed BIBFRAME RDF record from the marc2bibframe XQuery code and generate an Annotation, Instance, Work, and Authority RDF file with enriched linked data as an output. By enriching the records with linked data, we have a complete record that lacks blank nodes. Local nodes that pointed only to local resources are also avoided in the automation process. Target open data links are reviewed below.

Authority APIs against which the authors programmed included:

- VIAF Corporate Names:
  - https://viaf.org/viaf/search?query=local.corporateNames+all
- VIAF Personal Names:
  - https://viaf.org/viaf/search?query=local.personalNames+all+
- MeSH Linked Data:
  - http://id.nlm.nih.gov/mesh/servlet/query?query
- Library of Congress Linked Data Service
  - http://id.loc.gov/search/?q=
- FAST Heading
  - http://experimental.worldcat.org/fast/search?query=cql.any+all+

Annotation APIs:

- WorldCat XISBN Service (for Work id)
- http://xisbn.worldcat.org/webservices/xid/oclcnum/
- UIUC VuFind (Held item)
- http://vufind.carli.illinois.edu/vf-uiu/Record/uiu_

Instance APIs:

- WorldCat XISBN Service (for Work id)
- http://xisbn.worldcat.org/webservices/xid/oclcnum/

Work APIs:

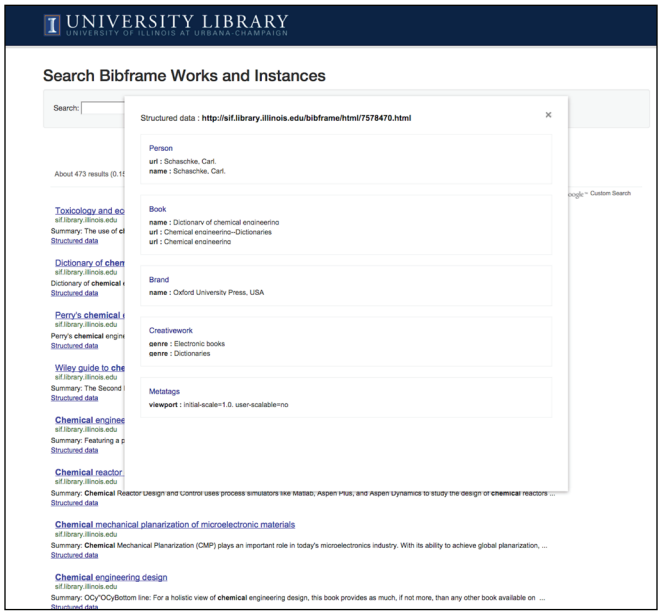

Figure 5. Structured data in Google Custom Search

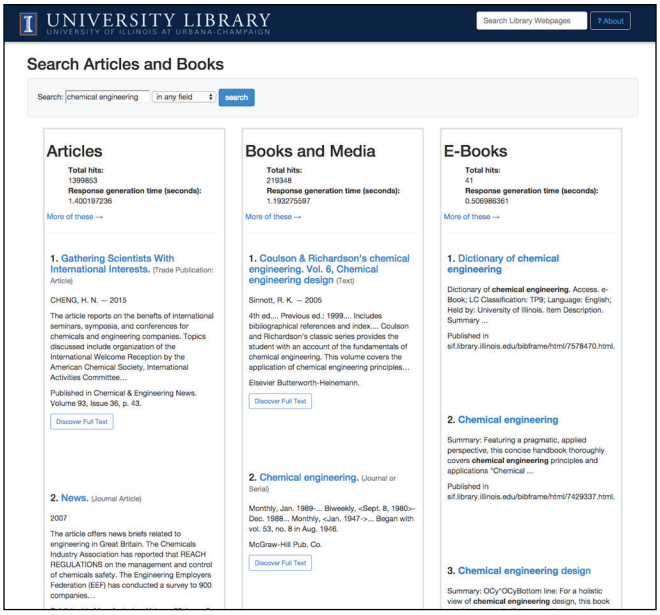

Figure 6. Bento-style discovery view with e-book search results

- WorldCat XISBN Service (for Work id)
- http://xisbn.worldcat.org/webservices/xid/oclcnum/
- VIAF Corporate Names:
- https://viaf.org/viaf/search?query=local.corporateNames+all
- VIAF Personal Names:
- https://viaf.org/viaf/search?query=local.personalNames+all+
- MeSH Linked Data:
- http://id.nlm.nih.gov/mesh/servlet/query?query
- Library of Congress Linked Data Service
- http://id.loc.gov/search/?q=
- Fast Heading
- http://experimental.worldcat.org/fast/search?query=cql.any+all+

After developing the automation code for the four BIBFRAME RDF/XML files and HTML page, the team transformed and enriched nearly 300,000 e-book records and has developed two prototype search interfaces.

We constructed an indexing program that would create sitemaps for 10,000 sets of records, which resulted in twenty-nine sitemaps that include URLs to 272,117 HTML BIBFRAME pages. The two options for retrieval of linked data records include a Google Custom Search Engine that surfaces the structured data in the result list (see figure 5), and Bento-style search (see figure 6) for e-book search simultaneously with articles and other catalog data. Google Custom Search provides results with structured data when retrieving BIBFRAME resources.[43]

Each HTML file (a BIBFRAME resource) incorporates BIBFRAME RDF/XML for a BIBFRAME Work, Instance, Authority, and Annotation. The BIBFRAME HTML also incorporates Schema.org structured data.

Discussion

There are several lessons learned from undertaking the BIBFRAME transformation and open linked data enrichment process.

The Transformation Process

Our strategy involved connecting to remote APIs to enrich records with linked data. Several times our Python scripts stopped retrieving data because of a "broken pipe" error. These errors are a result of one of the APIs not returning data. An API may stop returning data because it is programmed to stop responding, or cannot respond because of resource limits and will begin to drop responses during a high data load. We completed 272,117 HTML records for indexing, each of these pages has four RDF files linked for a total of 1,088,468 possible links. We identified 2,627 RDF links (a Work, Instance, Annotation or Authority RDF file) that are not transformed partly because of errors resulting from overloaded APIs. Since this is an experimental project, we are working to develop a process that runs a smaller number of records through the above referenced APIs. Currently, the project uses a folder input of 10,000 records,

but this could be reduced to as few as 100 and run with a queuing program. Smaller numbers of records being transformed may help to reduce the load on APIs, but may result in a more prolonged transformation process. Another option is to investigate alternatives to web-based APIs, and to use alternative data sources, such as static XML data stores where available.

As noted in our manual investigation, there are authority data that do not yet exist as linked data, and we may be left with blank links. Though OCLC makes available many Work IDs, the service was experimental at the time of this research, and did not yet include Work IDs for every resource required.

Searching and Indexing (Google Custom Search)

Earlier in the research process, we considered using Blacklight as an index for the transformed records.[44] It looked promising initially since it was developed for library data indexing and searching, and provides an API that we could have used to build a Bento-style search view. However, we later realized that Blacklight is optimized for indexing MARC records. We explored other indexing options for linked data and found that Google Custom Search provides indexing of structured data.

After testing the indexing of our HTML files within a Google Custom Search, we decided that this would be appropriate for the BIBFRAME search. Several digital library projects have also used search engine optimization for retrieval, including a recent project at Montana State University that used Schema.org markup to make better book viewers.[45]

Limitations

There are limits to what we could model in this project. Our current transformations model Work to Instance, and Instance to Work relationships. This is the output that is available from the marc2bibframe code. Since the BIBFRAME model can also incorporate several additional relationships, interlinking among all BIBFRAME relationships has not yet been fully realized in this project. According to the BIBFRAME documentation, "there are four types of relationships: Work to Work, Work to Instance, Instance to Work, Instance to Instance."[46]

It may be possible to leverage other APIs for this modeling. Specifically, OCLC makes available an xISBN web service that, when sent a string, will return a list of related ISBNs.[47] Such a tool can partially inform the finding of all manifestations. This may be helpful to complete instance-to-instance relationships. The xISBN web service is built from research at OCLC, notably, the FRBR Work-Set Algorithm.[48]

There are limitations of sustainability in any grant. To transform the University of Illinois' e-book MARC records to BIBFRAME resources, the researchers developed a prototype workflow, but there is currently no ongoing maintenance plan. To summarize, this is a discrete innovation funded grant. Project staff developed SQL queries to gather bibliographic identifiers for e-books that are then used to extract the MARC records as MARCXML. Next, we used XQuery from LC's *marc2bib* project to transform the BIBFRAME RDF and then enrich the BIBFRAME RDF with linked open data using Python. Finally, the data load included development of sitemaps for indexing Schema.org metadata by a Google Custom Search engine. Over time, additional e-books will be added to the catalog that are not captured by this process. The researchers will likely pursue an internal funding source to establish periodic updates to the corpus of e-books. Targeting newer bibliographic records will require altering our SQL queries to include titles that have been added since the previous cut-off date.

Conclusion

Because of our project, we have contributed an evaluation of the BIBFRAME model related to e-books. We have learned a great deal about the BIBFRAME model through converting the nearly 300,000 MARC records for e-books to BIBFRAME, developing an ER model for e-books, and creating two search interfaces for discovery of BIBFRAME linked data.

One challenging part of working with e-books using the BIBFRAME model is in choosing work identifiers. After much discussion, we decided on linking works to OCLC work identifiers. Another challenging part is to link people, families, corporate bodies, and works in bibliographic records to authority files. LC's linked data service is our top choice for this purpose. As a secondary source of authority linked data for people, families, corporate bodies, and works, we chose both the MeSH linked data service and the FAST linked data service to fill in these gaps. Unlike printed books, when a newer version of an e-book is imported to our catalog, the bibliographic record for the older version is deleted. This means we need to do more maintenance work for e-books. Serial resources may have similar issues since they are resources that may change over time because of possible title changes or interruptions and adjustments over time with regard to frequency of publication.

We believe our work in enriching data is particularly instructive for future projects in the University of Illinois Library, and applies to library data work across institutions. With the Python code developed for this grant, we can help to programmatically address other components of the catalog for enrichment. We envision that we will still need to do

local transformations even if OCLC eventually transforms all of their existing bibliographic records into linked data in the future. Institutions will need to transform the data themselves to be part of the OCLC community.

One of the key issues for our users to find library resources is to provide consistency in the form of access points used to identify people, families, corporate bodies, and works. The next phase this project will be to work with 7 million MARC records in our online catalog to address those limitations with BIBFRAME relationships between Work to Work, and Instance to Instance, which were not part of the initial innovation project.

The cataloging world is in transition. BIBFRAME is a profound step for the library community. It uses linked data to make discoverable library bibliographic and authority data on the web. Libraries considering piloting BIBFRAME transformations will be taking a leap forward in helping their users discover library resources across the web—and beyond the classic catalog paradigm.

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Disambiguating the Departed

Using the Genealogist's Tools to Uniquely Identify the Long Dead and Little Known

Chris Evin Long

The need to uniquely identify people with the same name will be as important in a linked data environment as it is in traditional library catalogs. Although older cataloging rules allowed multiple identities to share space in an authority record, the current rules are more stringent, requiring that all authorized access points for people to be disambiguated. While this task has been made much easier in recent years because of the amount of biographical material on the web, deceased and obscure people can pose a complex challenge. This is especially true for special collections materials, which are being given greater attention but which often deal with people who are long dead and little known. This paper builds on previous research in the use of online resources to perform authority work by providing an in-depth analysis of the genealogist's toolkit and examining how freely available online genealogical sources can be used to find the types of distinctive information needed to create unique access points for people.

The author suspects that many catalogers harbor a dirty little secret—authority work is their favorite part of cataloging! Their reluctance to admit it is understandable. Although its value to bibliographic control has been recognized for more than a century, authority work is seldom seen as the most attractive part of the metadata creation realm. It can be a time-consuming task and its benefit-cost ratio has sometimes been called into question. But catalogers are puzzle solvers at their core, and it is by creating authority records that their latent desire to play the detective is most fully satisfied.

As cataloging moves toward a linked data environment, authority work promises to take on renewed importance. Semantic ambiguity poses a challenge for computers, so the necessity of uniquely identifying people with the same name, recording the various forms of name that a person has used, connecting different bibliographic identities that a person has assumed, and collocating all of the resources related to that person is just as important in the Semantic Web as it is in traditional library catalogs. Personal name authority files like the Library of Congress (LC) Authority File fulfill this need and therefore will be key factors in linked data applications.

The research necessary to create authority records for people has become much easier over the last two decades because of the wealth of biographical material available on the web. This is particularly true for living people, for whom

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publishers' data, email, personal and organizational websites, and social media provide many avenues for discovering the information needed to create an authorized access point that distinctively identifies the individual. Deceased people, in contrast, often pose a more difficult challenge. Although information about nationally prominent people from bygone days can be readily found in a host of sources, the cataloger must frequently rely on other strategies to uncover the evidence needed to uniquely identify the long dead and little known.

A convergence of circumstances in recent years has made finding facts to uniquely identify deceased people a more crucial task for catalogers. Libraries are striving to make their hidden collections more discoverable. Catalogers of all stripes, not just rare book specialists, are being tasked with making these resources accessible.[1] Many of the items in these hidden collections are older and local, and the people associated with these items are often obscure. In some instances they share a name with other people in the authority file. Under former cataloging guidelines, this did not pose an insurmountable problem. Undifferentiated personal name records were constructed to represent different people with the same name; multiple people could be described on the same authority record. However, in November 2013, LC and the Program for Cooperative Cataloging (PCC) agreed to no longer allow the creation of new undifferentiated personal name authority records or to add identities to existing ones. This change was precipitated by the recognition that the intermingling of identities on a single record precludes the population of new MARC fields that contain information specific to individual people, such as birth and death dates, gender, associated places and organizations, and occupations, and interferes with potential linked data uses of the authority records, such as their inclusion in the Virtual International Authority File (VIAF) and other Semantic web applications.[2] Now, catalogers who participate in the PCC Name Authority Cooperative Program (NACO) must create unique authorized access points for each person being established. So where can catalogers turn to find distinctive information about hard-to-find individuals, such as their birth or death dates, fuller forms of their name, and their occupations or professions?

Genealogists are constantly vexed with the same basic problem, and the tools on which they rely can also assist the cataloger. This paper will examine the types of information available in online genealogical sources that can aid in solving the name ambiguity problem for individuals who are not included in standard reference sources. The focus is restricted to personal names, the geographical scope is limited to the United States, and because catalogers increasingly work in an environment of diminishing resources, online resources that are freely available are emphasized.

Literature Review

Numerous studies have documented the role that authority control has played in the bibliographic world over many decades. Although Charles Ammi Cutter did not use the term in his *Rules for a Printed Dictionary Catalog* in 1876, the concept of authority control is clearly there in his objects of enabling users to find a book by a known author and showing what the library has by a given author using the means of author-entry and attendant references.[3] In the late nineteenth century, LC began creating authority cards that contained many of the primary elements used today, including the preferred form of name and variant usages of it. While authority control was not explicitly discussed in the 1961 International Conference on Cataloguing Principles, various working groups examined ways to effectively collocate the works of an author by choosing a uniform heading that tied together all the variant forms of names.[4] Interest in the topic continued into the 1970s, during which many international authority control initiatives were pursued as national libraries and international organizations sought ways to reduce the work's expense by sharing the load.[5]

As card catalogs began to give way to their online counterparts in the 1980s and 1990s, the enhanced retrieval capabilities of the new catalogs exposed gaps in authority control as differences in headings became more noticeable to users.[6] As most librarians saw a continuing need for authority control in an automated environment, some called it into question. Kilgour opined that future catalog design would obviate the need for authority control.[7] Koel and Taylor questioned whether the expense of implementing certain aspects of authority control outweighed the benefits.[8] Even in the more evolved online catalogs that are currently available, Ayres claims that authority control, while theoretically still valuable, does not work effectively because the reference structure in authority records is not supported or is underutilized.[9] As catalogers anticipate how our work will change in the imminent linked data environment, other experts see a continuing need for the basic principle of collocation that authority control provides, even if the mechanisms we use to produce it change drastically.[10]

The emerging importance of special collections to the library's research mission and reputation is well chronicled. At a time when the relevancy of libraries is being questioned, Dooley and Luce note that "special collections and archives are increasingly seen as elements of distinction that serve to differentiate an academic or research library from its peers."[11] Yet access to these materials has been a longstanding concern. In its 1998 survey of special collections, the Association of Research Libraries (ARL) identified the backlog of uncataloged and unprocessed materials in special collections as one of the most serious challenges facing the profession. Libraries reported that significant portions

of their special collections had not been processed, even though staffing levels for special collections had increased or at least remained stable for the previous ten years.[12] Jones and Panitch estimated in 2004 that at the present rate it would take hundreds of years to make these hidden collections accessible.[13]

Hubbard and Myers' 2010 survey of rare books catalogers found that 97.8 percent of the respondents still reported a backlog at their institutions, and although Dooley and Luce's report of that same year found backlogs for some types of materials had decreased at more than half of the institutions surveyed, the size of the collections continues to grow.[14] While this situation presents challenges for library staff, the real harm is to users. Under-cataloged collections result in inadequate intellectual access to those resources, particularly hindering the research efforts of some of libraries' most vulnerable users who lack the financial means to travel to other institutions, such as undergraduates, graduate students, and junior faculty.[15] To tackle this problem, Mandel emphasized the importance of not only integrating technical services with special collections, but also having technical services assume the primary responsibility for cataloging special collections items, especially now that technical services staff are typically handling fewer standard materials.[16] Research by Russell and Lundy showed that this has been happening, as more staff responsible for cataloging special collections material report to a cataloging department than to other units within the library.[17]

Dealing with special collections materials, though, is not for the faint-hearted, regardless of the cataloger's background. Even agreeing on a definition of what the term "special collections" means has proved challenging. Although a strict definition limits its usage to rare books, more often the phrase encompasses manuscripts, art, photographs, cartographic resources, and even microforms and audiovisual materials. Catalogers therefore must be prepared to deal with a diverse array of formats. Furthermore, these collections are often replete with unique, local materials that are unpublished or are ephemeral, and within which reside a host of personal names—authors of local histories, diaries, letters, manuscripts, etc., whose obscurity renders them no less valuable to researchers.[18]

Indeed, studies have shown that names of people and organizations found in archival and special collections materials are of great interest to scholars, particularly those in the humanities. Duff and Johnson found that historians collect names to aid their navigation of archival collections, relying heavily on them to identify relevant collections and to locate pertinent information within those collections. They highlight the importance of names to researchers by stating, "Collecting names may be a fundamental practice in historical research since the past is often interpreted through the activities of individuals or organizations."[19] Wiberley further found that the uniqueness of a name is of prime importance to scholars. His study of subject access in the humanities showed that singular proper terms (i.e., the names of unique entities such as people) are the most precise terms used by humanists and are therefore central to their work, emphasizing the value of distinguishing two or more people who share the same words in their names by their dates and places of birth and death.[20] Given the humanists' reliance on unique names, Wiberley concluded that nonexistent or inadequate authority control is a great disservice to them and "will impede humanists from access to the full range of sources relevant to their research."[21]

Providing this level of authority control for less well-known people as may be found in local special collections presents its own set of challenges. Catalogers have come to rely on the collective efforts of other libraries to assist them in uniquely identifying individuals, but Mandel points out that the uniqueness of materials in special collections, and by inference the people associated with them, makes it less likely that the cataloger can benefit from the cooperative efforts of others.[22] This opinion is reiterated by Bradshaw and Wagner, who emphasized that the subject and name access delivered by large-scale cataloging cooperation may be inadequate for local needs such as these.[23] Catalogers creating authority records for the lesser-known, then, must rely on other means.

Fortunately, the Internet offers an abundance of sources of biographical information that can be used to create unique access points for people. Catalogers early on recognized the value of online resources to their work, particularly in the area of authority control. A brief survey conducted by Long in 1997, at the advent of the Internet's incorporation into the work of librarians, found that catalogers were using resources such as online phone books, email directories, and other libraries' online catalogs to resolve name conflicts and clarify ambiguous headings.[24] The Internet, though, did not prove to be a problem-free panacea for catalogers, as the impermanence of the web and the suspect nature of some of the information found there became increasingly apparent. In 2001, Russell and Spillane's examination of how catalogers were using online resources for name authority work showed that little had changed since Long's survey. The Internet was being used essentially the same way as before and although it had the potential to make authority work more productive and efficient, catalogers were often frustrated by the dubious reliability of certain websites and the limited amount of the information available to them (often just contact information), especially for older material.[25]

The next year, though, Ellero demonstrated a way that web resources could be used in special collections authority work. Relying mainly on United States government websites, a team in the Claude Moore Health Science Library created a controlled list of 1,692 unique name entries for people

associated with their Philip S. Hench Walter Reed Yellow Fever Collection, an archive of books, articles, correspondence, photographs, and artifacts from the Yellow Fever Commission of 1900. While the names of well-known individuals were often easily found and standardized, the project showed that the web's reach could also extend to lesser-known people. The list remained a local one, as the team did not feel it fell within the scope of LC's Name Authority File's mission.[26] However, Ellero predicted, "As more and more institutions (i.e., libraries, archives, and museums) in the United States and around the world process special collections of unpublished materials on an analytic level and make these resources available on the Web, an enhanced and global system for authority records will become essential." She was also prescient in her observation that professions should be used as qualifiers to better identify individuals.[27]

As the Internet matured, so did catalogers' employment of it. Marshall's 2012 article offered more sophisticated strategies for using the Internet to discover birth and death dates of lesser-known people, focusing on the utilization of online genealogical tools to accomplish this task. She examined many general genealogical websites and also delved into more specialized sources such as death indexes, tombstone inscription sites, family trees, obituaries, and local histories.[28] Marshall concentrated on finding birth and death dates with the goal of making them more useful to library users, but genealogical resources can provide a wider variety of information about individuals as well, information that can be invaluable to catalogers working under the current imperative to not create undifferentiated access points.[29] This paper covers some of the same ground as Marshall and others, and builds on their work by providing a more in-depth analysis of the genealogist's toolbox and examines how free online genealogical resources can be used to find not only birth and death dates, but also other prescribed types of distinctive information.

Resource Description and Access (RDA) 9.19.1.3–9.19.1.8 instructs catalogers about the attributes used to distinguish one authorized access point from another. They are

- date of birth and/or death (9.19.1.3);
- fuller form of name (9.19.1.4);
- period of activity of the person (9.19.1.5);
- profession or occupation (9.19.1.6);
- title of the person, including terms of rank, honor, or office (9.19.1.7); and
- other designation associated with the person (9.19.1.8).

Birth and death dates are given preeminence because the other attributes are to be used only if these dates are unavailable. While the meaning of categories such as fuller form of name and profession or occupation is self-evident, others may need further explanation. "Period of activity" is a date or range of dates indicative of the period in which a person was active in his or her field of endeavor. "Other term of rank, honour, or office" can include terms associated with people of religious vocation, military ranks, or academic degrees. "Other designation" is a catchall category for attributes not covered by the other options and can include associations with other people, corporate bodies, and places. As will be shown, although genealogical tools are obvious choices for ascertaining a person's vital information such as birth and death dates, full name, and occupation, they also provide abundant material for discovering these other attributes as well when the vital information proves elusive.

Genealogical Sources Useful to Catalogers

Genealogical researchers employ a vast array of tools to search for facts about people's lives. *The Source: A Guidebook to American Genealogy* provides a comprehensive overview of the types of records genealogists use in their research, and this section summarizes each category of records listed in the book.[30] Not every resource, though, is a practical candidate for a time-strapped cataloger's attention. Lack of widespread availability, inconsistent data entry, and a paucity of the kind of information needed to disambiguate people disqualify some types of sources from consideration because the time spent searching outweighs the potential benefit. The focus, therefore, will be on the types of records that are most likely to aid catalogers in their quest for the information needed to create unique access points.

Vital records that document key life events such as birth, death, and marriage are likely the first place that catalogers will want to start searching. Birth and death records are obviously useful because they contain birth and death dates, the paramount attributes used to distinguish people, and they are often also sources of an individual's full name. Records in online death indexes such as the Social Security Death Index (SSDI) and the Online Searchable Death Indexes and Records website (www.deathindexes.com) also contain birth and death dates, but may have limitations in availability and time span coverage. Less obvious sources such as cemetery records, tombstone transcriptions, funeral home records, and church records also merit attention. These sources may contain not only birth, death, and name data, but sometimes occupational information as well. Marriage records in general are unreliable options because of lack of availability, occasionally falsified information, and clerical errors, with the possible exception of marriage licenses, which often contain useful personal information such as full name, birth date, and occupation. Court records, while often providing fascinating insights into a person's life, are largely also not of much assistance to the cataloger, with

the singular exception of probate records, which are likely to include a person's death date.

Censuses are among the most frequently used records by genealogists because of the importance of the information they contain, and are also likely candidates for the sleuthing cataloger. Early US censuses included relatively few details about individuals, but in 1850, census takers started gathering more information about age, sex, color, occupation, and birthplace. Although the questions asked varied from census to census, names, ages, and occupations were consistently collected, only the 1900 census asked for the month and year of birth. Consequently, census information can often provide fuller forms of names, occupations, and at least an approximate year of birth. Since US censuses are not released to the general public until seventy-two years after the census was originally taken, the latest one available is the 1940 census. The mortality schedules created using data collected in the 1850–85 censuses can also be used to determine month and year of death and occupation.

Newspapers are another abundant source of biographical information for the cataloger. Obituaries are the obvious initial step in newspaper research because they are often the only biography written about most people. Furthermore, for those born before the early twentieth century, obituaries fill in the gaps left by the spotty availability of official US government vital records. While birth and death dates are their primary attraction, obituaries often include full names and occupations. Birth, death, and funeral announcements do not afford the same breadth of evidence as obituaries, yet still typically include the birth and death dates that catalogers seek. It was also not uncommon for small town newspapers in earlier times to publish brief biographical sketches of prominent or newly arrived citizens.

Military records can be rich sources of information for the cataloger, especially for birth and death dates. Military pension records for the Revolutionary War and later wars usually provide this information, as do burial registers and lists at national cemeteries and military post cemeteries. World War I and World War II draft registration cards offer the added benefit of full names and occupations, although privacy laws restrict access to most WWII cards.

Immigration and naturalization records provide fascinating information for genealogists, but offer only a modicum of help to the cataloger. Still, they are worth searching if other approaches fail. Official US government passenger-arrival lists of immigrants are available from 1820 through the 1950s for most of the ports of the United States with customs houses. The amount of information collected on these lists varies greatly and they are relatively unreliable for names and ages, but the lists often include the person's occupation. Naturalization records also vary in the amount of personal data recorded, and often provide the added benefit of a date of birth.

Local and family histories and family trees can also be ripe with documentation for catalogers. In the nineteenth century, many communities published local histories and biographical sketches of area residents. In cases where official vital records of this period may not be extant, these local publications may be the only source of information of birth, death, and occupational information to help catalogers create distinctive access points. Family histories have long been a staple of genealogical research and are rich sources of biographical material, as are the ever-growing number of online family trees.

Business and organization records can be another source of useful information. In this category, occupational records are particularly noteworthy. Many occupational groups, especially clergy, legal professionals, physicians, and trade associations, created directories and biographical sketch books of their members that, in addition to indicating their profession, frequently included birth and death dates and full names. Occupational registries were often compiled by cities interested in a particular vocation and include similar information. Because they may indicate a term of rank or office (such as Reverend or PhD), or include associations with corporate bodies, occupational records can also offer suggestions for the final two categories of RDA attributes, "title of the person" and "other designation associated with the person." Similarly, city directories may list occupations and, beginning in the twentieth century, might also list a date of death for an individual who had died since the last directory had been compiled.

Finally, records for cultural groups should be considered when pertinent. Whereas information about individuals belonging to specific cultural groups can be found in vital records, censuses, military records, and other sources previously discussed, there are some group-specific resources worth noting. For African Americans, records of the Freedman's Savings and Trust Company (a.k.a. the Freedman's Bank) can deliver valuable evidence. The Freedman's Bank was created as a way for soldiers and ex-slaves to invest their money, and eventually included numerous branches in various parts of the country. While lacking important information like birth dates, the signature registers that were required to open an account typically included the person's occupation and place of residence. Native American ancestry research can be difficult, but there are resources that can help. From 1885 to 1940, agents or superintendents of Native American reservations were required to submit annual census rolls, although there is not a yearly census roll for every tribe. The rolls typically included the age or date of birth, and later rolls additionally recorded place of residence. Individuals who wanted to be classified as official members of a tribe had to complete an enrollment process, and these tribal enrollment records often contain fuller forms of names and death dates when applicable. The Jewish

community is very active in genealogy, and the JewishGen website (www.jewishgen.org) has databases of family trees, burial registers, and Holocaust victims and survivors.

Strategic Use of Genealogical Tools

Armed with knowledge of the types of records likely to be useful in creating unique access points for people, catalogers can then consider where to find them. Fortunately, such information is readily at hand. *GenealogyInTime Magazine* compiles an annual list of the top one hundred most popular genealogical websites, and the list shows the wide variety of online resources available to genealogists to assist them in their research. This list can also serve as a useful foundation for catalogers' name authority research.[31] Broadly speaking, the websites fall into two different categories—free versus pay sites, and those offering a comprehensive array of records versus those concentrating in a specialized area. As stated in the introduction, this paper's focus is on freely available resources, but even after removing the for-pay options from the list, a multitude of both comprehensive and specialized sites remain. With so many options, catalogers may have difficulty determining which sources to try first. The remainder of the paper, therefore, will discuss practical strategies that time-starved catalogers can use to glean the most useful information in the least amount of time.

Tombstone Inscription Sites

Since birth and death dates are obvious ways to uniquely identify people and are given favored status in RDA, tools providing that information are logical places to start. Certain types of sources, though, can offer more expedient solutions than others. For individuals who died in 1961 or later, the SSDI (discussed below) is a good starting point, but for people living in an earlier era, tombstone transcription sites are often the best place for catalogers to begin their research. They usually include photographs of gravesites or transcriptions of gravestones from which birth and death dates can be harvested, and some sites also include obituaries. The ease of searching and the span of eras covered are major advantages of these sites, but their reliance on volunteers to contribute information limits their comprehensiveness and sometimes yields illegible photographs of markers. There is undoubtedly much overlap between the sites, and the cataloger may have to search multiple locations to find data on the individual in questions. Furthermore, databases of this size naturally pose some searching challenges. Individuals with rather unique names like the author's father Halleck Long do not require much effort to find, while those with more common names like his grandfather Samuel Long can prove more difficult. Furthermore, the information found may not be enough for the cataloger to adequately confirm that it relates to the person being researched. Despite these obstacles, tombstone transcription sites are often a quick and easy way to locate birth and death dates. A review of the most useful ones follows.

Findagrave (www.findagrave.com)

Volunteer contributors have added 138 million grave records to this site. Gravestone photographs and transcriptions are the most common items found here, but obituaries and links to other family members are also sometimes added. The basic search interface is easy to use, covers locations both within and outside of the United States, and the option to limit by the state where the cemetery is located ameliorates the problem of searching for people with common names. Although Findagrave information is also part of the more comprehensive FamilySearch website discussed later, researchers must often navigate a dizzying array of search results in Family Search to find the subject. Findagrave's narrow focus, the size of its database, and the inclusion of obituaries combine to make this the cataloger's best initial option for simple birth and death information. Findagrave is also integrated into some of the more comprehensive websites described below, but those sites often house billions of records, so coming here first can avert the prospect of wading through a mass of irrelevant material.

Billion Graves (http://billiongraves.com)

Although this site does not in fact contain a billion records, it does check in at about 15 million. Free registration is required, but records for some individuals are only available to paid subscribers. The information on the site is mainly limited to tombstone photographs and transcriptions, and the number of available records makes this a good second option.

Interment (http://interment.net)

Whereas it does not contain as many records as Findagrave and Billion Graves, this site is a viable alternative if searches in the other two fail. The search interface is simple and covers the entire United States, and searchers have the option of browsing by state. Although links to state vital records and obituaries are available, they ultimately lead to subscription-based sites.

USGenWeb Tombstone Transcription Project (http://usgwtombstones.org)

This site's arrangement and limited search capability hinders its effectiveness for catalogers. It is arranged by state and county, and because there is no way to search across state

projects, the searcher must know where the individual was buried. The number of available records is also much smaller than other sites, likely making this the cataloger's last option in this category.

Death Indexes

If an individual cannot be found using the tombstone transcription sites, online death indexes are another option for quickly finding birth and death dates. The two major resources in this category are the SSDI and the Online Searchable Death Indexes and Records website. The SSDI offers the ability to do a nationwide search for basic birth and death information, but only for a very specific period. The Online Searchable Death Indexes and Records site contains a wider variety of resources and encompasses a much broader time span, but its arrangement of resources by state makes searching more challenging if the cataloger does not know the location of the person's death.

SSDI

The SSDI currently contains information about more than 94 million people who lived in the United States and had a Social Security number. Although the database officially goes back to 1934, virtually all of the people in it died after 1961, rendering it useful only for researching individuals who were alive in the mid-twentieth century and later. The information of primary interest to catalogers contained therein is names, complete birth dates, and the month and year of death. The SSDI is freely available from two main sources, FamilySearch (https://familysearch.org/search/collection/1202535) and GenealogyBank (www.genealogybank.com/gbnk/ssdi?kbid=9064&m=9), although the GenealogyBank site requires free registration. Both have user-friendly interfaces and allow searching and filtering by first and last name, approximate birth and death year, and geographic location. GenealogyBank offers more initial search options, and is only current through March 2011 as of the date of this writing. The FamilySearch site, in comparison, is current through February 28, 2014, and is therefore the better choice if the individual being researched is likely to have died recently. While the SSDI sometimes yields very quick results, searching for individuals with common names can be arduous if the cataloger does not know the state, county, or city of last residence.

Online Searchable Death Indexes and Records (www.deathindexes.com)

This site is a collection of links to websites containing death-related information such as death records, death certificate indexes, death notices and registers, obituaries, wills and probate records, and cemetery burials. It is arranged by state and county, making it imperative that the cataloger know something about the subject's residence. Its primary appeal is that it provides one-stop shopping for a diverse set of resources that cover a broad swath of time, sometimes dating back as far as the early nineteenth century. The site includes links to numerous locally compiled obituary indexes that are not available in the more comprehensive genealogical sites. Even though coverage is hit-or-miss, this benefit is not to be overlooked given the paucity of freely available online obituaries. Since it is a collection of links instead of a database, its major drawbacks are the lack of inclusive searching capability and the intermingling of free and fee-based sources. Nevertheless, while not likely to be one of the quicker birth or death date options available, searching the Online Searchable Death Indexes and Records website is a worthwhile venture before pursuing other possibilities.

Obituaries and Newspapers

There are numerous sites where online newspapers and obituaries can be searched for free, but many of these charge fees to retrieve the article or obituary. There are also hundreds of state and county online newspaper collections, often covering brief ranges of times. Furthermore, whereas many sites provide access to recent obituaries, there are fewer in which the cataloger can find historical ones. Since the researcher could spend many hours locating and scouring collections separately, this section concentrates on sites that provide compiled national lists of free online newspapers and emphasizes those where obituary information can be actually retrieved, not simply searched.

Chronicling America (http://chroniclingamerica.loc.gov)

Almost seven million digitized historic American newspapers can be researched on this site. The collection includes papers from 1836 to 1922; those published after December 23, 1922, are not available due to copyright restrictions. The site offers a simple search box, and the advanced option that allows users to limit by state, newspaper, and date range and perform Boolean-like word searches is the better choice. The number of accessible sources, search options, and time span covered make this an ideal first choice for the cataloger searching for people living in the mid-nineteenth and early twentieth centuries.

Google News Archive (www.news.google.com/newspapers)

Once the premier online newspaper site, Google News Archive was shut down for many years because of complaints and threats from newspaper publishers. This recently

resurrected site contains about 2,000 scanned newspapers and while not as extensive as Chronicling America's inventory, it includes some newspapers dating back to the 1700s and many small town newspapers. Newspapers are listed alphabetically but cannot be searched individually; the site provides only the option to browse the entire collection. It offers no advanced search features, and users cannot restrict by location or date. The archive search tends to retrieve older articles more reliably than the more general web search option. Faulty optical character recognition and poor scan quality further hinder the researcher, making names and events sometimes unfindable and the newspaper articles themselves difficult to read. Still, Google News Archive covers a broader time span for some papers than Chronicling America and can be a good second choice when the latter yields no results.

Ancestor Hunt Newspapers! Page (www.theancestorhunt.com/newspapers.html)

This site is a gathering of links to collections containing over 12,000 historical US papers arranged by state, then by city or county. Since the site is a list of collections rather than a collection per se, there is no way to comprehensively search all of the newspapers represented within it, nor even to search all those within a state, although some counties have compiled obituary indexes for all the papers within their area. Links to other projects like Chronicling America and SmallTownPapers are often available. Although useful as a means to discover the availability of online newspapers in a given state, the variegated nature of the listed sites provides little uniformity in either search capabilities or coverage. Another major drawback for the cataloger is the frequent inclusion of sites that allow free searching but which demand payment to retrieve the obituary.

New York Times Archives (http://query.nytimes.com/search/query?srchst=p)

Although the *New York Times* is a local paper, its scope is also national, including its obituaries. The archives from 1851 to 1922 and 1987 to present are free, but the intervening years are not. If the person being researched is famous enough to have an obituary published in the *New York Times*, it is likely that the cataloger can readily find information in other places. Nevertheless, it could prove to be a useful site.

SmallTownPapers (www.smalltownpapers.com)

This site contains more than 250 small town newspapers, some dating back to the mid-1800s. Users can browse by title or by state and can search within individual newspapers. Chronological coverage varies greatly, but SmallTownPapers does contain newspapers for locales not included in the larger sites.

Obituary Central (www.obitcentral.com)

Although the obituary listings in this site are arranged by state and county, a statewide obituary index search is available for all states. Most obituaries are from the late 1990s until present, though, so Obituary Central may only be useful for recently deceased individuals.

Obit Finder (www.legacy.com/Obituaries.asp?Page=ObitFinder&CoBrand=Legacy)

This site contains obituaries for more than 1,000 US and Canadian newspapers, but since its coverage extends back only to the early 2000s, it has little utility when searching for people living in earlier times.

Local Histories

Local histories became popular in the later nineteenth century, in part spurred on by the 1876 centennial. In addition to historical information about the county, city, or town, they usually contained a biographical section that profiled area residents and frequently included genealogical information such as birth and death dates, place of birth, and occupations. Despite claiming to contain an egalitarian mix of the local citizenry, inclusion in the historical account was often dependent on the willingness to pay a subscription fee, and the genealogical information gathered from subscribers was seldom verified. Consequently, the accuracy of the facts found in these local histories can be called into question. Furthermore, it is necessary for the researcher to know the subject's place of residence to effectively locate a relevant history. Nevertheless, these sources can capture information about people who for whatever reason cannot be found in the other types of records already examined.

There has been a tremendous push in recent years to digitize local histories. These are scattered across the web, but some of the best places to do a more concentrated search for them are the Internet Archive (https://archive.org/index.php), Google Books (https://books.google.com), and Online County Histories, Biographies and Indexes (www.genealogybranches.com/countyhistories.html). The Internet Archive has the advantage of containing only freely available resources, but since it includes a wide variety of media formats, searches should be limited to text to effectively navigate the site for local histories. Once a book is found, there are numerous versions that can be full-text searched to find the person in question. Searches in Google Books, on the other hand, must be limited to free Google e-books to

efficiently wade through the morass of unavailable content. Online county histories, biographies, and indexes is a state-by-state guide to local histories and biographical indexes, some of which are online, but its reach does not extend nearly as far as the other two sites.

Family Tree Websites

Websites that host online family trees can be another overlooked source of information for the cataloger. Contributors submit the results of their genealogical research to these sites, and a successful search can yield at minimum birth or death dates. Three of the top free sites are WikiTree (www.wikitree.com), FamilyTreeNow (www.familytreenow.com), and Crestleaf (http://crestleaf.com). Of these, however, only WikiTree is a viable tool for catalogers. It contains information on more than 11 million people. Name searches are the only option and although the user is allowed to match by date, there is no way to limit by geographic area, which is a major drawback for a database of this size. Furthermore, information for some individuals is marked as private and is not viewable. Family tree information in FamilyTreeNow and Crestleaf, on the other hand, is often buried amid other types of records (census, birth, death, marriage, divorce, etc.). These additional sources are no doubt helpful to the budding genealogist, and are more easily searched in other applications and obscure any unique family tree content that might exist, making these sites bad bets for the cataloger.

Genealogical Warehouses

The increased interest in genealogical research by professionals and amateurs alike has driven the creation of many websites that house enormous quantities of genealogy information. The dizzying array of records stored in these warehouses, sometimes numbering in the billions, provides a one-stop shopping experience accompanied by easy-to-use search interfaces. Unfortunately, most of these sites are hidden behind paywalls. The free options discussed below, however, are all highly ranked sites and should be part of the sleuthing cataloger's arsenal.

FamilySearch (https://familysearch.org)

FamilySearch is sponsored by the Church of Jesus Christ of Latter-day Saints. The site requires free registration and contains more than 4 billion names from all over the world. Researchers can search records, genealogies, and family history books. In the records section, name queries can be connected with geographic areas and life events such as birth, marriage, residence, and death. Searches can also be restricted by record type, including birth, marriage, death, census and residence, immigration and naturalization, military, probate, and others. Findagrave data are also incorporated into the search results. The historical record collections included here extend back to pre-1700, although the vast majority covers the year 1800 onwards. The section on genealogies has listings for hundreds of millions of people containing information drawn from user-submitted genealogies and the church's International Genealogical Index. The Family History Books section contains more than 200,000 publications that are contributed by several partner institutions; these resources must be searched separately by institution. Because of the comprehensive search capability across many types of records combined with the ability to limit searches by numerous facets, FamilySearch could easily serve as the cataloger's first research option.

USGenWeb Archives (http://usgwarchives.net/search/searcharchives.html)

This online archive is part of the larger USGenWeb Project (http://usgenweb.org), the work of volunteers striving to provide free genealogical research sources for every state and county in the US. Each state has a separate page and is organized by county. As might be expected of a volunteer-based work, the type, quality, and quantity of information available in the project varies widely from state to state. The project's major drawback is the lack of a national search option; queries must be conducted at the county level, requiring knowledge of the subject's residence that the cataloger may lack. Enter the Archives, created in recognition of the fact that much genealogy data cannot be limited to a single county or state. The Archives' primary advantage is its national search engine, which can be limited by state and document type to more narrowly focus the search. Again, the types of available records differ depending on the state, but the researcher might expect to find data from a host of sources including vital records, biographies, family histories and Bibles, obituaries, tombstone inscriptions, and census, church, court, immigration, land, military and occupational records. Although FamilySearch is a superior option, the presence of unique resources like family histories and Bibles in USGenWeb Archives makes it a viable alternative should the former prove unhelpful.

ArchiveGrid (https://beta.worldcat.org/archivegrid)

ArchiveGrid is a free beta site developed by OCLC that includes more than 4 million records describing archival materials gathered from more than 1,000 cultural heritage institutions. Most ArchiveGrid records are culled from MARC records in the OCLC database, although some are drawn from finding aids contributed by participating agencies. Many of the records contain biographical information, not only about the primary subject of the collection but also

of people associated with him or her. While the amount and kind of information varies greatly, birth and death dates, fuller forms of names, occupations, and places of residence are common. ArchiveGrid continues to grow, and because many archival and special collections deal with people who are only locally known, it has the potential to become a great discovery tool for catalogers.

Ancestry.com (www.ancestrylibrary.com)

Despite the earlier declaration that only freely available resources would be examined, this fee-based site is worthy of discussion because it is often included in libraries' ProQuest subscriptions, sometimes unknowingly even to the librarians themselves. Ancestry.com consistently ranks as the top genealogical website, and with good reason. Its scope is enormous, containing 15 billion resources from almost 10,000 record collections that span the globe and extend coverage back to the 1600s, making it by far the largest genealogical resource. There are more than 3,000 US collections and a complete listing of all available collections is provided. The offerings run the usual gamut of

- census and voter lists;
- birth, marriage, and death records;
- military records;
- immigration and travel records;
- newspapers and publications;
- family histories;
- court records; and
- city directories, organizational directories, and church histories.

Even with its billions of records, though, Ancestry.com cannot claim to deliver universal coverage of genealogical data. For example, information about the author's father Halleck Long can be found in FamilySearch's 1940 census and the GenealogyBank Obituaries that is not retrieved in Ancestry.com, even though the two databases contain essentially the same records. This discrepancy might be the result of differing algorithms.[32] Nevertheless, the unparalleled robustness of Ancestry.com's sources should prompt wise cataloger-detectives to scour their ProQuest offerings to see if they have access and consider it as a first option in their quest.

Conclusion

Catalogers are on the precipice of, as Schreuer calls it, a "transformative revolution" in the way we describe resources.[33] Whether we are teetering or standing firm, it is hard to say. The work of catalogers in a linked data environment will evolve in ways not clearly perceived at the moment, but it will undoubtedly involve a continuing need to uniquely identify people, whether they are the creators, contributors, or subjects of the works associated with them. Recent research has shown how the web has made the cataloger's task of discovering biographical information much easier for living or well-known people. Under the current cataloging rules, though, all authorized access points for people must be disambiguated, whether the individuals are living or dead, famous or little known. It can be a particularly difficult chore in cataloging special collections materials, which is often the realm of the obscure. This paper has shown how genealogists have paved the way to success for the cataloger-detective through a variety of freely available online research tools. Although personal name authorized access points dominate authority files, people are not the only agents that need to be uniquely identified. Further investigation therefore is needed to explore ways in which distinctive information about organizations, families, meetings, and jurisdictions can be uncovered.

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Appendix. List of Genealogical Websites Reviewed

Comprehensive Genealogical Websites

FamilySearch (https://familysearch.org)
USGenWeb Archives (http://usgwarchives.net/search/searcharchives.html)
ArchiveGrid (https://beta.worldcat.org/archivegrid)
Ancestry.com (www.ancestrylibrary.com): may be included in a ProQuest subscription

Tombstone Inscription Sites

Findagrave (www.findagrave.com)
Billion Graves (http://billiongraves.com)
Interment (http://interment.net)
USGenWeb Tombstone Transcription Project (http://usgwtombstones.org)

Death Indexes

SSDI: available through FamilySearch (https://familysearch.org/search/collection/1202535) or GenealogyBank (www.genealogybank.com/gbnk/ssdi?kbid=9064&m=9)
Online Searchable Death Indexes and Records (www.deathindexes.com)

Obituaries and Newspapers

Chronicling America (http://chroniclingamerica.loc.gov)
Google News Archive (www.news.google.com/newspapers)
Ancestor Hunt Newspapers! Page (www.theancestorhunt.com/newspapers.html)
New York Times Archives (http://query.nytimes.com/search/query?srchst=p)
SmallTownPapers (www.smalltownpapers.com)
Obituary Central (www.obitcentral.com)
Obit Finder (www.legacy.com/Obituaries.asp?Page=ObitFinder&CoBrand=Legacy)

Local Histories

Internet Archive (https://archive.org/index.php)
Google Books (https://books.google.com)
Online County Histories, Biographies and Indexes (www.genealogybranches.com/countyhistories.html)

Family Tree Websites

WikiTree (www.wikitree.com)
FamilyTreeNow (www.familytreenow.com)
Crestleaf (http://crestleaf.com)

Trends in Library Collection Circulation in Spanish Universities

The Case of the University of León

Blanca Rodríguez-Bravo and Francisco Rodríguez-Sedano

This research analyzes the circulation of materials at the University of León Library to determine the evolution of the circulation data, identify the main users of the collection, to determine the periods of greater and lesser usage of the collection, and to identify the document types that are most often borrowed. To do so, circulation statistics from the library's Innopac Millennium ILS from the 2011–12 to the 2013–14 academic year were studied. The results show that the use of print collections is decreasing due to the abundance of electronic content to which the university library subscribes.

Evaluating academic library collection usage is an ongoing concern. Despite this, very few studies analyze collections on a large scale and exploit the usage data available in checkout or download figures. The analysis of collection usage has been fostered by the automation of library procedures and by the integration of electronic content into traditional collections. The greater data availability constitutes unquestionable progress and its subsequent analysis allows for informed decision making concerning the development of the collections.

It is easier to obtain usage data for electronic formats than for print collections. Statistics on electronic content sessions, views, and downloads have enabled a more refined approximation of user needs and priorities. This data has been used to develop a type of analysis that has come to be known as usage bibliometrics, the greatest exponent of which has been the CIBER group led by Nicholas.[1]

Download statistics, citation analyses, log files, and surveys have demonstrated the progressive migration from paper to electronic format. Brady, McCord and Galbraith indicated that 94 percent of all journals are used in digital format.[2] In a research report from the University of Barcelona prepared by Borrego, Barrios and García, based on surveys of researchers at Catalan universities, 91 percent of those surveyed stated they exclusively (31 percent) or mainly (60 percent) used electronic journals (e-journals).[3]

The development of the electronic book (e-book) sector has not affected the usage of print monograph collections as much as predicted, although university libraries have increasingly included e-book collections in their offerings, as observed throughout Spain.[4] In general, circulation studies of monographic collections at university libraries conducted in recent years make it clear that the usage of print collections drops as university libraries increase their investments in the acquisition of e-resources.[5]

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Previous research completed by the University of León's (ULE) CONDOR (Organization and Use of Digital Contents) Research Group focused on the usage, behavior, preferences and satisfaction levels of the academic communities at universities in northwestern Spain and Portugal with respect to e-journals.[6] Their findings confirm that e-journals are mostly used for research-related tasks, a common trend observed in much of the literature.

Also exemplifying this phenomenon is the work of Tenopir and King, which indicates that 75 percent of users prefer e-journals for research purposes versus the 41 percent who prefer using them for teaching.[7] According to Dilek-Kayaoglu, 67.5 percent of users favor e-journals for research purposes.[8] The aforementioned report from the University of Barcelona states that 68 percent of those surveyed consult journals primarily for research purposes, whereas the remaining 31 percent cite a balance between research and teaching purposes.[9]

We believe it is time to complement these approximations of the usage of electronic collections with an analysis of circulation or borrowing data for tangible documents. It is our belief that these documents, mainly books, are still used extensively for teaching and research purposes. These are the sources most often used by students, the largest group in the academic university community.

We have found that books are the dominant resources included on the reading lists for the subjects comprising eleven University of León degree programs analyzed for the 2013–14 and 2014–15 academic years. The data may be extrapolated from other universities given that the situations at the University Carlos III in Madrid and the University of Salamanca have been verified as similar. The percentage of electronic resources on the reading lists provided on course syllabi is still very low, and remains below 5 percent of the total at all three of these universities.[10]

Based on responses from 499 American university library directors, the 2013 Ithaka report shows a change in library priorities with the focus now on students' training in information skills rather than supporting faculty research.[11] In 2013, 97 percent of university library directors stated that offering information skills training was a priority. Only 68 percent believed supporting research was "very important," while in 2010, 85 percent considered it a priority. The report argues that university libraries are becoming more aligned with students' education and that this change may be reflected in the rest of their functions. The studies conducted by the CONDOR group focused on the use of e-resources, mainly journals, which are aimed more at researchers than students.

The intent of this work is to identify the main trends in collection usage. The study was done by compiling data from the University of León Library's circulation module to determine the critical factors that affect the actual usage of the content available for borrowing: how the borrowing service is evolving in view of the competition offered by electronic formats, identifying the main users, determining the types of documents they use, and determining the periods during which the borrowing service is used the most and the least. These data are contrasted with those available from downloads of the collection of e-resources, e-books, and e-journals to which the University of León subscribes.

Much of the professional literature published to date regarding circulation consists of case studies that are meaningful if done in a systematic and longitudinal way as valid conclusions may be drawn from them. Studies of a broader scope have been conducted in recent years. Such is the case of the study commissioned in 2010 by the Cornell University Library to analyze the use of the library's print monographs.[12]

More recently and in the context of the OhioLINK consortium, Gammon and O'Neill and O'Neill and Gammon analyzed borrowing data from the eighty-nine university libraries in the consortium, which serves more than 600,000 users.[13] The results show how borrowing rates vary depending on the subject, language, institution, and age of the materials. The results of the analysis also demonstrate an extraordinary checkout concentration. Specifically, 80 percent of all checkouts were from about 6 percent of the collection.

The high usage of certain journal titles, the differences in the number of downloads at the respective institutions, and the disparity of scientists' behavior in various disciplines have been recorded in studies of e-journal usage statistics from the main Big Deals for various universities in the Spanish northwest and the previously mentioned surveys conducted at Spanish and Portuguese universities by the CONDOR Research Group. For future work, we would like to further investigate these aspects regarding the components of the owned and/or accessible collection at the University of León. As Bullis and Smith point out, libraries have been primarily concerned with digital resources use in recent years, but library collections still contain many other materials whose use must be also assessed.[14]

Objectives and Methods

The general objective of this research is to determine the circulation of the materials available in ULE libraries.

The specific objectives are

- to establish trends in circulation data and determine whether borrowing has been affected by the availability of e-resources in the collection;
- to identify the main users of the resource collection available for borrowing;

- to determine the periods of greater and lesser use of the circulating collection;
- to identify the resource types most often circulated; and
- to ascertain the preferences of various user groups (students, faculty, and administrative and services staff).

Circulation files were obtained from the Innopac Millennium ILS for the academic years 2011–12 to 2013–14. Monthly checkout files were organized

- by user type, taking into consideration the three main groups comprising the university community (students, faculty, and administrative and services staff); and
- by material type, distinguishing between textbooks and recommended reading, monographs, theses and end-of-degree projects, journals, special formats (CDs, audio, video), reference works, cartographic materials, and special collection materials.

The volume of circulation was correlated with the academic community member statistics obtained from the Castilla y León Basic Data on the University System for the 2013–14 academic year.[15] Also included in the data are download statistics for subscription e-resources. The intent was to provide an overall view of the University of León community's needs. Download and borrowing data were correlated with the total figures for the available and/or accessible collection to determine a first approximation of the relative circulation volume at the University of León library.

The data were extracted from the Rebiun statistical annuals.[16] Rebiun is the Spanish University Library Network. Rebiun comprises the libraries of seventy-six universities (fifty public and twenty-six private) and the Spanish Higher Council for Scientific Research (CSIC). Its mission is to lead, coordinate, and provide guidelines to university and scientific libraries to foster cooperation and joint projects.

Rebiun compiles a statistical annual report of the most significant data on the activities of Spanish university libraries and publishes them on its website. The most recent report available is for 2012. To find the download data for e-resources in 2013 and 2014, the researchers used the reports prepared in 2014 and 2015 by the University Library's Electronic Resources Unit.[17]

The researchers compared the data with those extracted from the analysis of the reading lists found on the syllabi of subjects comprising a significant sample of the degree programs offered at the University of León: Bachelor's in Business Management; Law; Economics; Information Science; Electrical Engineering; Electronic, Industrial and Automation Engineering; Energy Engineering; Computer Engineering; Mechanical Engineering; Labor Relations and Human Resources; and Veterinary Science.[18]

Results and Discussion

The University of León Collection

The University of León is a public university founded in 1979–80.[19] It is a medium-size university that offers mainly social sciences and technical sciences studies. These degree programs have the largest enrollments. However, the natural and health sciences departments have more faculty members and the most active research.

The authors began their analysis with the library collection data contained in the 2012 *Rebiun Annual*, which was the most recent edition available when this paper was written. See table 1 for an illustration of how all the university library resources are itemized.

The *Rebiun Annual* reveals that resource expenditures dropped 15 percent between 2010 and 2012, a trend that has continued and is related to the decrease in the total library and university budgets. As shown in table 1, 85.75 percent of the available collection in 2012 was composed of print monographs. All Spanish universities have in common a high percentage of print monographs.

However, monographic expenditures decreased from 34 percent in 2010 to 23 percent in 2012. The number of newly acquired print monographs was 14,731 in 2011 and 11,562 in 2012, which accounts for an increase of 3.11 percent and 2.44 percent respect to 2010. Purchases of audiovisual resources increased in 2012 by 5.03 percent versus the 7.65 percent recorded in 2011.

In 2010, the *Rebiun Annual* reported 486,028 monographic items in Spanish university libraries. This total, compared to the total number of monographs in 2012, shows how the collection has decreased. The same circumstances apply to print journals. In 2010, the current journals collection totaled 3,998 titles. There were 3,533 in 2011 and 3,343 in 2012. It is worth noting the progressive decline in the journals collection, a drop that is the result of contracting the main Big Deals by the ULE, a process that began a decade ago. The University of León maintains its subscriptions to various e-resources packages. The main packages are Big Deals offered by Elsevier (ScienceDirect), and Springer (SpringerLink). Both provide access to e-journals and e-book collections.

The e-journal offerings are complemented by content found in the Wiley Online Library. This vendor provided access to e-books during the first semester of 2014. Likewise, contracts have been signed for Emerald and JSTOR packages. Until 2014, there was also a subscription to IEEExplorer, but this package was eliminated because of recent budget cuts.

Table 1. 2012 University Library collection data

Collection	Total	Percent
Print monograph titles	484,093	85.75
Audiovisual monograph titles	9,953	1.76
Print journals titles	11,167	1.98
Non-book materials	23,637	4.19
Documents prior to 1900	3,629	0.64
Paid or licensed electronic monographs	10,280	1.82
Paid or licensed journals	19,840	3.51
Own electronic open-access resources	1,940	0.34
Total	564,539	100.00

Other e-resources packages available include ABI/inform, Annual Reviews, American Society for Microbiology, Iustel, Periodical Archives Online, and Sportdiscus. With respect to the e-book collections, the offering is limited to some collections from Netbiblo and Literature on Line. In addition to this content are those available through the Buleria institutional repository, which is listed in the last row of table 1. According to Rebiun, Spanish university libraries are spending approximately 50 percent of their budgets on e-resources, and this situation was observed for the University of León.

The 2013 Ithaka Report also noted a drop in expenditures for print journals subscriptions and an increase in subscriptions to e-journals and databases.[20] The librarians surveyed believe that this trend will continue, as the electronic format is well adapted to users' need to obtain content as soon as possible. Regarding e-books, it seems that academics value them more than librarians. More than half of the faculty surveyed stated that e-books play a significant role in research and teaching. However, just over 20 percent of librarians share this opinion.

Borrowing and User Data by Academic Year

Data provided by the regional government of Castilla y León in relation to the University of León Academic Community, which can be observed in table 2, show that there has been a significant drop in the number of workers over the last few academic years. However, there was an increase in student enrollment during the 2014–15 academic year, which increased the total user data (see figure 1).

Total borrowing activity shown in the figure demonstrates that most of the circulation activity is from students, followed by faculty, and lastly administrative and services staff. The total number of student checkouts is ten times greater than those by faculty.

Table 3 shows there was a significant drop in borrowing between the first semester of 2011 and the last semester

Table 2. University of León academic community data

	2011–12	2012–13	2013–14	2014–15
Students	13,755	13,106	12,895	13,411
Faculty	936	930	854	854
Administrative and Services Staff	543	526	514	499
Total	15,234	14,562	14,263	14,764

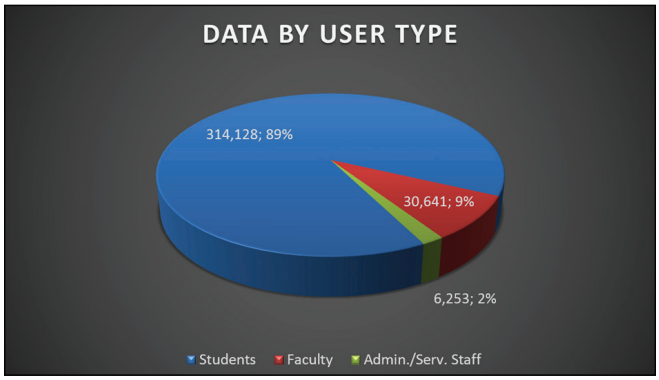

Figure 1. Circulation data by user type

of 2014, with a decrease of more than 10,000 transactions. The sharpest drop is observed between the first and second semesters of the 2011–12 academic year. The authors believe it is worth analyzing the relative use by determining the borrowing ratios of users in the three groups that comprise the university community.

Table 4 shows that faculty use the borrowing services most and administrative and services staff use them least. The teaching and research work of academics explains their above-average position in each of the semesters analyzed. However, the ratios seem to be rather moderate, which may be explained by the abundant availability of e-resources.

Student circulation ratios are small and support the faculty's opinion that their students do not actively use their reading lists. This is despite the fact that the European Higher Education Area (EHEA) system (also known as the Bologna system) fosters ongoing assessment and reading, research, etc., and has placed an emphasis on providing students with tools for independent learning. Circulation activity in the first semester is higher than in the second semester with the single exception of student checkout data in the 2013–14 academic year (see tables 3 and 4). Before concluding this section, we believe it is appropriate to present electronic collection usage data that reflect the trend in information usage by the University of León academic community.

Since 2012, the number of e-books accessible from the library has slightly increased to 11,903 volumes in 2014,

Table 3. Circulation data by user type

	2011–12		2012–13		2013–14	
	1st Semester	2nd Semester	1st Semester	2nd Semester	1st Semester	2nd Semester
Students	58,421	51,805	52,132	51,389	50,074	50,307
Faculty	6,190	4,988	4,866	4,731	5,013	4,853
Admin/Serv. Staff	1,832	963	1,115	992	749	602
Total	66,443	57,756	58,113	57,112	55,836	55,762

Table 4. Circulation/user ratios

	2011–12		2012–13		2013–14	
	1st Semester	2nd Semester	1st Semester	2nd Semester	1st Semester	2nd Semester
Students	4.24	3.76	3.97	3.92	3.88	3.90
Faculty	6.61	5.32	5.23	5.08	5.87	5.68
Admin/Serv. Staff	3.37	1.77	2.11	1.88	1.45	1.17
Average	4.36	3.79	3.99	3.92	3.91	3.90

Table 5. Download of electronic resources and user/rates

	2011	%	2012	%	2013	%	2014	%
E-books chapters	-	-	-	-	15,550	1.09	256,792	17.39
E-journals	-	-	-	-	90,117	6.31	160,783	10.89
Total	105,709	6.93	135,553	9.30	105,567	7.40	417,575	28.28

according to the report drafted by the University of León Electronic Resources Unit.[21] The availability of Springer e-books in 2014 largely explains this increase. In contrast, the volume of e-journal subscriptions has decreased slightly to a total of 12,050 titles in 2014. This drop is primarily the result of the 2014 IEEExplorer cancellation. The library has no separate e-book and e-journal download data for 2011 or 2012. The authors also examined the download ratios by user (see table 5).

There was a significant increase in the use of e-resources in 2014 as compared with the previous years, which may be partly because of the significant increase in the number of students in the 2014–15 academic year. The greatest increase is observed in the use of book chapters and e-books, which are the resources used most by students, the largest category of users within the university community. The expansion of the collection in 2014 was also a factor in increased use. Moreover, we believe that the current collection better suits the university community's interests and needs, and that the library staff has done considerable work in the last year to promote the available e-resources, which has stimulated interest in using them. The download ratio for the e-resources shown in table 5 substantially exceeds the circulation ratios for traditional documents.

A report prepared by the University of León Electronic Resources Unit in May 2014 offers data on the access by user type in 2013: students (70.01 percent), faculty (26 percent), and administrative and services staff (3.99 percent). Given that the number of students was between fourteen and fifteen times higher than the number of faculty during the 2013–14 and 2014–15 academic years, the data confirm that the latter use e-resources most extensively, as is the case for other types of library resources.

Total Monthly Borrowing Data by User Type and the Relationship with the Figures for Each Group

Figures 2–7 show the monthly borrowing distribution by user type. The number of students was reduced to enable a joint comparison of the three strata. The graphic representation by semesters shows the usage trends of the borrowing service by users and displays significant differences between the groups. August was not considered given the limited activity during this period when university schools and libraries remain closed for fifteen days. In contrast, the data for February were used in both semesters as it is a period of transition between the end of the first semester and the beginning of the second.

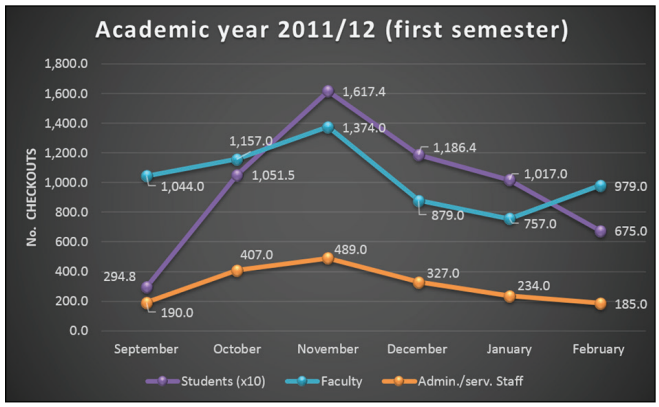

Figure 2. Data from the first semester of the 2011/12 academic year, by user type

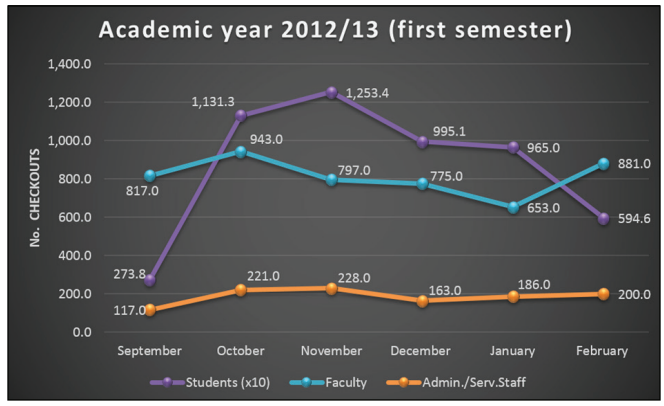

Figure 3. Data from the first semester of the 2012/13 academic year, by user type

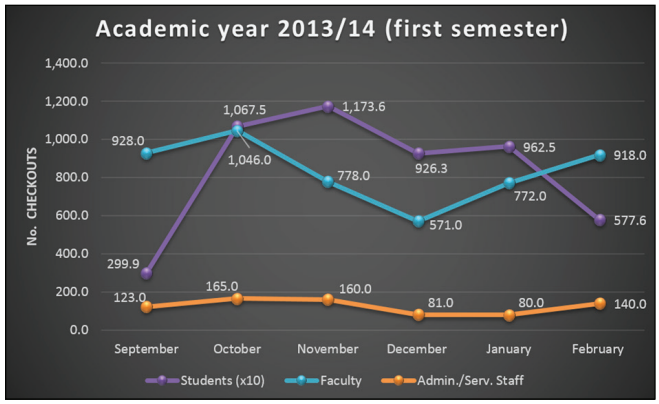

Figure 4. Data from the first semester of the 2013/14 academic year, by user type

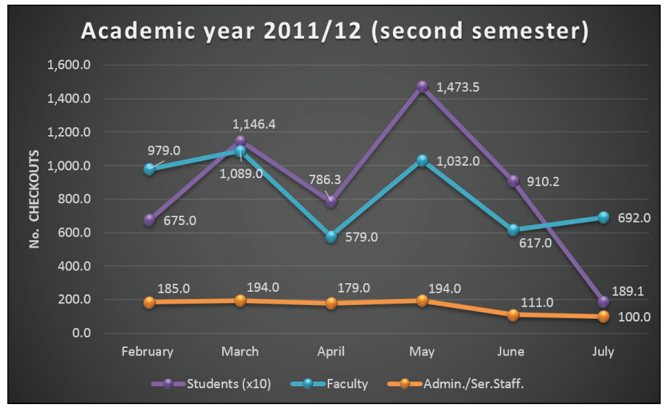

Figure 5. Data from the second semester of the 2011/12 academic year, by user type

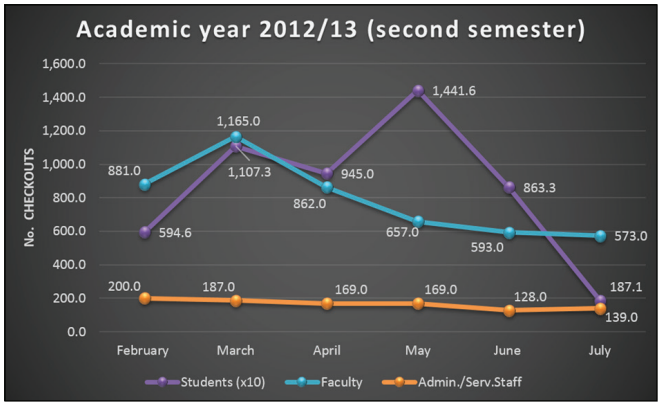

Figure 6. Data from the second semester of the 2012/13 academic year, by user type

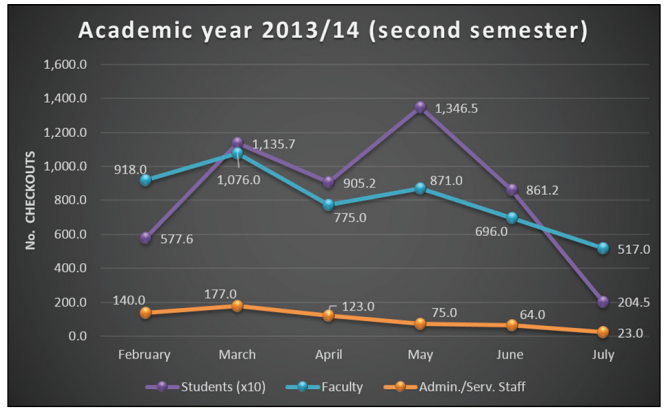

Figure 7. Data from the second semester of the 2013/14 academic year, by user type

Regarding the first semester, the authors observed that the most intense period of use is in October and November. For faculty, October is when the borrowing service is most often used and corresponds to the start of the academic year.

November is the period of greatest activity for students. This is when they must begin the work assigned from the

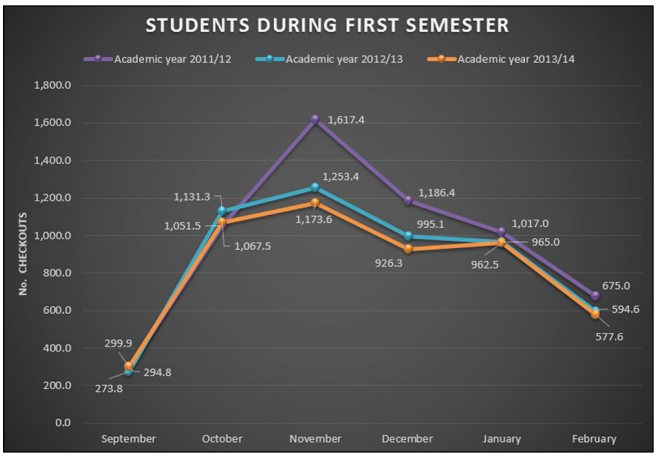

Figure 8. Data on students during the first semester of all academic years

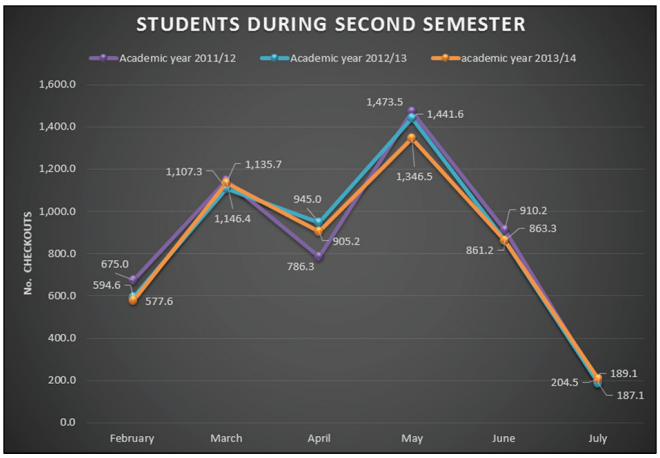

Figure 9. Data on students during the second semester of all academic years

start of the course in September and begin studying for final exams, the first session of which is held in January and the second in February.

The month with the least activity is December, a time of rest and when the University has closed its facilities in recent years. The schools and library were closed for approximately fifteen days between December 19–22 and January 7–8.

The information for faculty in the figures shows an increase during the months of January and February, which the authors believe is related to the preparation of instructional materials for the second term and a period of greater research activity considering that there are four weeks of no teaching activity during January and February.

The information in the figures that corresponds to administrative and services staff also shows higher borrowing activity during the first few months of the semester. This is especially true during October and November. The end of the summer holiday often coincides with an initial study phase and greater activity in general.

Figures 5–7 and 9 showing checkout activity during the second semester demonstrate significant parallels between student and faculty usage during the first and last academic years analyzed. A considerable increase was observed during March and a notable peak during May, when it is time to prepare second term exams, the ordinary session for which is held in the month of June. The decreased activity recorded during April is related to the inactivity during the Holy Week break period which often falls during this month.

There is a sharper drop in borrowing by students after June. In comparison, the decline is not as steep for faculty. With the implementation of the EHEA system, the academic year has been extended to include most of July, which is when the second exam session for the second semester takes place. Borrowing by administrative and services staff are higher during the first few months of the semester. This did not strike the authors as odd, given the well-known fact that students begin each year with good intentions. The total number of checkouts by students during the three academic years analyzed, distributed by semesters appear, are provided in figures 8 and 9.

Observing the distribution of checkouts for the academic years studied shows that there are months of considerable activity that correspond to exam preparation periods. The parallel usage by month during the years analyzed is remarkable in both semesters with greater activity during the 2011–12 academic year than in the two following years. The authors believe this is related to the growth of the e-resource collection and a progressive drop in the number of students during the years analyzed. However, this circumstance is more noteworthy in the first semester than in the second.

Borrowing Data by Material Type

The circulation figures broken down by material type make it possible to establish which resources can be considered essential for learning, teaching, and research (see table 6 and figure 10).

The authors note that the taxonomy used to classify the materials is not the most adequate. Reference materials were combined with textbooks and are mostly comprised of monographs that are, however, considered in a separate section.

When considering the borrowing trends by material type, the predominance of textbooks and monographs is notable. However, it must be taken into account that some of the resources recorded in other categories have not traditionally circulated; rather, their use has been limited to reading rooms, as is the case for theses and end-of-degree projects, reference works, cartographic material, special

Table 6. Overall data by material type

	2011–12 Academic Year	2012–13 Academic Year	2013–14 Academic Year
Textbooks and reference reading	35,185	34,904	33,447
Monographs	15,880	16,154	16,573
Special mat. (CDs, audio, video)	398	314	733
Theses, End-of-degree projects	5,181	4,573	3,499
Reference	627	586	554
Cartographic material	82	45	31
Journals	3,401	2,851	2,880
Special collections	30	27	21

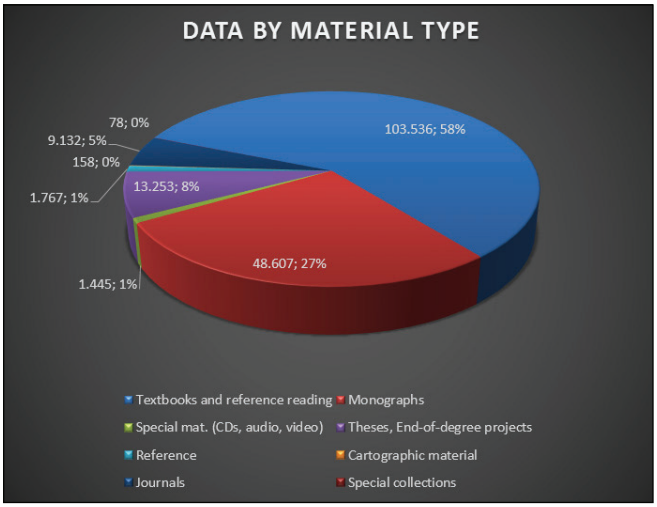

Figure 10. Overall data by material type

collections, and print journals.

Analysis of the basic and supplementary reading lists shows that faculty recommend that their students consult textbooks, monographs, and reference works, mainly in print (as opposed to electronic), and other documents such as journal articles, book chapters, and research papers. The authors report that books constitute more than 70 percent of the total references suggested in each of the degree programs, exceeding 90 percent in four of the degree programs analyzed, revealing considerable homogeneity in the selection of resources. This does not prevent faculty from recommending more specific reading throughout the course during classes.

Circulation data for the different document types by user type is presented below. It was not possible to provide the figures for the 2011–12 academic year as these data are not available in the Millennium circulation module. The data are not presented by semesters because the differences in those years are not significant. As can be observed in tables 7 and 8, nine user types were differentiated in the circulation module. The three sectors of the academic community—faculty, students, and administrative and services staff—are the primary collection users. The section labelled "external users" includes former students who are preparing to take government employment exams. Tables 7 and 8 show how textbooks, monographs, theses, and other academic papers, journals, music, and film and reference works are the resource types most commonly checked out by the academic community.

Students typically borrow textbooks and monographs, which are the resources most recommended on class syllabi. In addition, students in doctoral programs or who are finishing their master's and bachelor's degrees also use doctoral theses and end-of-degree master's and bachelor's papers. Journals, reference works, and audiovisual materials are also well represented among these users' checkouts. There was an increase in the number of checkouts for audiovisual resources during the 2013–14 academic year and a decrease in the use of academic works. These data suggest that faculty mostly borrow monographs followed by textbooks, journals, and reference works. The data for both academic years are quite similar.

Administrative and services staff also prefer monographs and textbooks. The checkout data for these two resource categories were higher in the 2012–13 academic year than in the 2013–14 academic year. Journals were the third-most borrowed resource during the first of these academic years whereas audiovisual materials, music, and films were borrowed most during the following academic year.

Conclusion

The number of resources available in relation to the number of potential users seems adequate. The ratio is 37.05 resources per user during 2011–12 and 38.76 during 2012–13. The collection of traditional materials has scarcely increased in recent years due to the University of León's reduced budget.

Table 7. Data by user and material type during the academic year 2012–13

User Type	Textbooks and Reference Reading	Monogr.	Special Mat. (CDs, audio, video)	Theses, End-of-Degree Projects	Refere.	Cartogra. Material	Journals	Special Collections
Students	31,532	11,745	177	4,441	412	42	1,700	1
Library	142	170	7	20	0	1	11	1
Inquiry Room	3	8	0	57	0	0	2	0
My Millennium	0	8	5	0	0	0	0	0
Admin./Serv. Staff	382	566	15	21	21	0	77	1
Faculty	2,485	3,072	67	19	152	0	965	22
Interlibrary Loan	11	139	2	5	0	2	29	2
External Users	338	377	40	10	0	0	67	0
Temporal Users	11	69	1	0	1	0	0	0
Total	34,904	16,154	314	4,573	586	45	2,851	27

Table 8. Data by user and material type during the academic year 2013/2014

User Type	Textbooks and Reference Reading	Monogr.	Special Mat. (CDs, audio, video)	Theses, End-of-Degree Projects	Refere.	Cartogra. Material	Journals	Special Collections
Students	30,064	12,026	476	3,317	396	30	1,606	7
Library	104	217	19	30	0	0	62	0
Inquiry Room	4	2	0	26	0	0	4	0
My Millennium	240	268	18	23	9	1	50	0
Admin./Serv. Staff	166	164	152	14	6	0	18	0
Faculty	2,528	3,074	32	47	140	0	1,043	14
Interlibrary Loan	11	281	7	4	0	0	22	0
External Users	317	532	28	38	3	0	73	0
Temporal Users	13	9	1	0	0	0	2	0
Total	33,447	16,573		3,499	554	31	2,880	21

It is worth noting that print subscriptions are being cancelled because of the abundance of content available through the electronic subscriptions that the university libraries have made available for a decade. In 2012, the University of León canceled 7,824 of its 11,167 print journal subscriptions, and only 3,343 remain. The decrease in the print collection has been offset by e-journal subscriptions.

Collection circulation does not seem high. Faculty borrow the greatest number of resources. The Fesabid report, coordinated by Gómez Yáñez, states that the number of checkouts per user in academic libraries was 9.7 in 2010.[22] This figure is higher than the one found in the current study, which ranges between 3.79 and 4.36.

The greatest period of activity is during October and November, in the first semester, and March and May, in the

second semester. Data on student borrowing reveals that students use the library uniformly throughout the academic year, which the authors believe is related to the fact that the learning system is not limited to evaluations based solely on three final exams a year. Ongoing assessment plays an important role and occurs throughout the academic year. For print collections, checkouts are dominated by books, both textbooks and monographs, which continue to make up the core of the basic reference reading list recommended to students for their courses.

The university community appears to use e-resources in a way that more accurately reflects the university libraries' expenditures on digital content. More intensive use of e-resources than print has been observed. The authors believe the recent e-book package subscriptions from Elsevier and Springer have been a factor in the increase in downloads seen in 2014. Further, evidence does not suggest that e-books are used for teaching purposes given that they are rarely listed on course syllabi.[23] The main use of e-journals is linked to research by the faculty and master's and doctoral students.

Future work will focus on determining circulation by subject and the degree of dispersion and concentration of use. The ultimate goal is to determine the extent to which the collection adequately meets the university community's needs. Further studies may focus on the collection coverage to detect gaps by analyzing the over-use of some materials and interlibrary loan requests. It would be useful to identify items or materials that receive little or no use so they can be transferred to storage because of low use.

These data support the preparation of guidelines for grounded purchase decision-making, which is in line with each institution's needs and the group of universities in the region. These studies may be of interest at other universities to facilitate cooperative collection development, mainly for those institutions comprising the BUCLE Consortium.[24] BUCLE, the Consortium of University Libraries of the Castilla y León Region, consists of the university libraries in Burgos, León, Salamanca, and Valladolid. Its purpose is to establish cooperative agreements for the joint acquisition and development of the collections, technological updates, and other organizational activities. One of the main results of this cooperation is that ideally all academic libraries in the region will have similar subscriptions to e-collections.

The Fesabid report noted that Spanish librarians are critical of the investment made in library budgets and believe that many information resources and costly subscriptions were contracted during the first decade of the twenty-first century—a period of economic abundance—without any prior analysis of their potential use by researchers.[25] E-resource collections are too expensive to be acquired without a prior thorough evaluation. Likewise, investment in print materials and other types of resources should be shared by libraries in a regional or national basis.

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Notes on Operations Breaking Ground

Consortial Migration to a Next-Generation ILS and Its Impact on Acquisitions Workflows

Morag Stewart and Cheryl Aine Morrison

From June 2013 to January 2015 the Orbis Cascade Alliance (OCA), a consortium of thirty-seven public and private academic institutions, migrated to a new shared Integrated Library System (ILS), Ex Libris' Alma, with Primo as the discovery component. The consortium wanted to cultivate an environment that would better support collaboration and sharing, particularly in the realms of collection development and technical services. This paper examines the immediate impact of the migration on acquisitions workflows, mainly of the largest consortium member, and the short-term and long-term goals following the completed migration. Lessons learned and suggestions for managing a consortial migration are offered, plus a discussion of what it is like to work in the cloud.

The Orbis Cascade Alliance (OCA), comprised of thirty-seven diverse academic libraries at the time of migration, moved from three different locally hosted Integrated Library Systems (ILSs) and four different discovery platforms, into a single cloud-based shared ILS (SILS).[1] While there is discussion in the library literature regarding the reasons for the migration, plus the process of migrating data, there has thus far been limited examination of the effects of the transition on technical services workflows across the consortium. Understandably, it was difficult to fully grasp the immediate and longer-term implications on daily workflows and collaborative activities until all OCA members had migrated. With the migration complete in January 2015, and June 2015 marking the end of the first biennium of working in the new system, there has been sufficient time to enable one of the first libraries that migrated to reflect on the experience, with an emphasis on acquisitions workflows and the impact on staff.

As one of the first OCA libraries, and also the largest, to migrate, the University of Washington Libraries (UW Libraries) got an early start with the Alma transition. The size and complexity of the data and workflows involved necessitated considerable time to examine processes and determine how to proceed following implementation. Since the completion of the migration, the Acquisitions and Rapid Cataloging Services (ARCS) unit within the UW Libraries has moved beyond the initial shock of adapting to a new system to evaluating new workflows and considering what the future in the new system will look like.

Over a year after the completion of the migration, OCA members continue to learn how to function and adapt as the new system changes. It is now possible to begin to answer questions about what it is like to work in the cloud, what benefits have been gained through the migration, and what OCA is striving toward with

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regard to cooperative acquisitions and collective workflows and collection building with the new system.

Literature Review

For much of the 1990s and early 2000s, it seemed that the main focus of the professional literature was on the future of technical services (paralleling the millennial question of the survival of the library as an institution), followed in the late 2000s by an emphasis on the next generation ILS, and primarily library management systems (LMSs). The introduction of the cloud, the interest in consortium level work, the push for the new ILS to include improved handling of electronic resources (e-resources), and the search for more advanced discovery systems has fueled a rapid change in design and concept. While much has been predicted about both the future of the ILS and technical services in general, it may be prudent now to take a closer look at what opportunities and capabilities these new systems offer technical services units, and the adaptations and adjustments required of staff going forward.

Twenty years ago, Hamilton provided a lengthy discussion of what acquisitions librarians should consider when investigating and choosing a system vendor and what to expect during migration and following implementation.[2] While much has changed about the technology in subsequent years, the overall points about making sure one's contract is clear regarding both vendor and library responsibilities, the adjustment period for using a new system, and the importance of maintaining vendor relations are as important now as they were in years past.

The constantly changing work environment and trend toward reorganizing acquisitions structures noted more than two decades ago was greatly influenced by a change in library systems.[3] A different system necessitates new workflows and procedures. However, as noted by Stamm and more recently Green, it can take a year or more to fully realize all of the changes that may be required both organizationally and within individual workflows.[4] It is a careful balancing act to determine how much downtime may be needed during a migration, the time required to start working in the new system, and designating an appropriate amount of time to evaluate long-term process and structural changes prompted by the migration. New ILS structures call for greater integration of staff processes and promise greater capabilities, especially when working with electronic resources, but just what implications do these new capabilities have for designing workflows?

Consider what is meant by next-generation library systems. In 2007, Breeding stated the need to reconsider backend library technology, not just the discovery services, as he foresaw the separation of discovery from the ILS proper.[5] He lamented the lack of integration in the systems available during that time: having each component as a separate piece of software to be added and maintained creates extra work and greater likelihood of problems.[6] Wang and Dawes provided a brief synopsis of ILS development of the preceding two decades and detailed several traits they anticipated in new library systems (format agnostic resource management, platforms based on Service-Oriented Architecture (SOA), flexibility to accommodate modern workflows, and new discovery systems).[7] They focused on two particular examples of how the future may look, specifically the Kuali Open Library Environment (OLE) and Ex Libris' Alma. In describing OCLC's WorldShare Management Services (WMS), Gutierrez and Givens also recognized the need for more effective management of e-resources and highlighted the capabilities of a knowledge base built-in to facilitate discovery that "moves at the speed of Google and offers vetted content."[8] Bahr's query about next generation systems reveals further suggestions, including the desire for application program interfaces (APIs) and the ability to communicate with other systems such as Human Resources and Accounts Payable.[9] Yang outlined the many features of new systems and some downsides such as greater dependency on the Internet and the fact that how these systems will interact with other academic campus systems is a significant unknown.[10] In fact, as development and implementation of next generation systems continues, Breeding has offered up the moniker "library services platform" to describe the new capabilities of these systems that consolidate functionality.[11]

Machovec explored positive and negative factors of a shared ILS (SILS). He noted that continued funding difficulties in higher education made possible cost savings and staff efficiencies attractive to institutions investigating the possibility of adopting new systems; nevertheless, there are concerns about security as cloud based ILSs will not be behind local firewalls, and a greater risk of event failure resulting from consolidating services with a single vendor.[12] Bordeianu and Kohl mentioned this as well and stated "in this new system any problem becomes a shared problem—if the system goes down, every single WMS library goes down."[13] Another issue of concern is the time required to migrate. Holbert's assessment of the absurdity of trying to migrate to a new ILS in four months is echoed by Zhu and Spidal, who discussed the decision to migrate the thirty-seven members of the Orbis Cascade Alliance in four cohorts, allowing four to six months per group.[14] Much can be accomplished in a short span of time, though it is also worth asking what could be accomplished with more prep time.

What impact do new systems have on workflow development and staffing? Fu and Fitzgerald explored how they will impact staffing from a systems librarian perspective, but apart from their paper, there is little in recent literature that discusses how other technical services staff will be

affected.[15] A systematic study of technical services staffing would be welcome, but with a particular focus not just on the number of positions affected or complexity of work, but also whether changes in technology have really improved efficiency. The ILS, as with much else in the library world, is oriented to serve the library's patrons; however, Alma and other next generation systems are the backend support, not the discovery tools that patrons actually see. It follows that the ILS should be developed with a different audience in mind—librarians and library staff, particularly those in technical services since it is in essence an inventory control system. Yet the limited discussion of acquisitions and other technical services personnel as a user group leads one to question for whom these systems are really being developed.

Another focus in the development of new systems has been on promoting greater collaboration. Collaboration has been an important aspect of the profession in American libraries since the late 1800s. Weber detailed how the early focus on cooperative and standardized cataloging, the creation of interlibrary loan (ILL), and the establishment of national and regional catalogs all helped to create a strong foundation of cooperation and collaboration in American librarianship.[16] Kopp notes that the driving force behind library cooperation and collaboration has been the desire to effectively serve patrons. Furthermore, technological advances have an impact on the formation of consortia, and advances in library automation, along with fiscal and organizational factors, are creating an environment best suited for their existence.[17]

In their 2015 book on library consortia, Horton and Pronevitz discuss the current high interest in collaborative work and note that "the tool that librarians most often use to launch and manage collaborative projects is the library consortium."[18] This interest in progressively more collaborative work, along with the development of the cloud-based ILS, is fueling an exploration of shared ILSs among consortium members. Budget costs remain a large concern and, as Breeding notes, the continued pressures on budgets will make this the norm rather than the exception.[19] The growing popularity of a shared ILS and a desire to make electronic formats accessible to patrons consortially has encouraged vendors to experiment. One result, beginning in 2013, was OCA's migration to the Ex Libris LMS, Alma, with the goal of creating a shared electronic collection for all thirty-seven members and an eventual sharing of technical services to serve the entire alliance.[20]

As detailed by Breeding, OCA has had previous experience with collective technology ventures before Alma migration, beginning with the use of Innovative's INN-Reach system to create a union catalog that would facilitate ILL.[21] When it was time to consider migrating to a new system, as described by Cornish, Jost, and Arch and a shared working environment that a cloud system could provide, the chance to be truly innovative presented itself.[22] Now with a new shared system in place, OCA strives to create greater collaboration in collection development and explore a collective technical services structure.[23]

Furthermore, it is enlightening to consider how different OCA institutions prepared for the migration, the issues they encountered, and the impact the migration had across the consortium. OCA's Request for Proposal (RFP) and selection process leading to the selection of Ex Libris products is described by Jost et al.[24] Zhu and Spidal detail the process of preparing for and accomplishing the data migration to Alma in 2013 at Washington State University (WSU), a member of the second migration cohort.[25] Fu and Carmen have also written a case study of Central Washington's migration to Alma (in the fourth and last OCA cohort), adding background information about their three-phase migration process and highlighting the importance of systems and e-resources librarians to that process.[26] It is easy to get lost in migration matters as it was a two-year process, however, moving to the new ILS was just a first step in fulfilling OCA's vision of a truly collaborative consortium. Even as the migration progressed, member institutions were considering next steps. Spring et al. describe the complications that arose from the need for policies to standardize how everyone across the consortium would work in the new ILS, even though not everybody had yet migrated.[27] The impact on acquisitions and other technical services staff through the balancing of the consortium's needs (and mandates) as a whole with local policies and practice is perhaps best illustrated by an example.

Leading the Pack: The University of Washington Libraries Migration Story

As the largest OCA member, with three campuses, sixteen branches, and more than eight million volumes, the UW Libraries was one of the first OCA institutions to migrate, transitioning from Innovative's Millennium ILS and OCLC's WorldCat Local to Alma and Primo in the first of four cohorts in June 2013. At the time of migration UW Libraries' Acquisitions and Rapid Cataloging Services (ARCS) division had already undergone several significant changes. For example, in spring 2012, catalogers and acquisitions staff who performed rapid cataloging began training for Resource Description and Access (RDA) implementation. A few months later, in the summer of 2012, following reviews and efficiency recommendations related to licensing and acquisitions, some of the technical services units were realigned by function. Previously, ordering, receiving, and cataloging were divided by format into the Monographic and Serials Services divisions. ARCS was formed by merging the monographic and serials acquisitions portions of the two

divisions, and Cataloging and Metadata Services (CAMS) was formed by combining the monographic and serials catalogers into a single unit. This reorganization required relocation of almost all the staff in the new units. By the time the physical relocation of staff was complete in December 2012, preparations for the system migration were in progress.

The situation was further complicated by the fact that ARCS was not the only acquisitions unit within the library system. The International Studies unit and the East Asia Library maintain their own acquisitions staff. In addition, UW Libraries and the University of Washington's Law Library, while historically existing as separate entities, would now be considered a single library system in OCA's Alma implementation. This required a merger of UW Libraries' and Law's bibliographic record files upon migration and increased standardization of record coding and other practices between the previously separate acquisitions operations.[28] The migration presented challenges in terms of harmonizing vendor files, ordering practices, and tracking statistics, but it has also presented opportunities for increased communication between units and greater standardization of procedures.

Coinciding with these challenges were personnel changes at UW that impacted the transition to Alma and the goal of consortial harmonization. The head of the UW Libraries' Information Technology Services (ITS) unit, who spearheaded much of the preparation before migration and wrote the script that enabled Financial Services to begin automated payment of electronic (Electronic Data Interchange (EDI)) invoices, planned to retire once the migration was complete and the system was running smoothly. He stayed until May 2014, at which point most regular operations were running and the ARCS receiving and cataloging backlog was declining. Additionally, the Electronic Resources Librarian retired in the summer of 2013 shortly after migration, though she returned on a part-time basis through May 2015 to help train transitional coverage of licensing responsibilities. These changes in leadership added an additional layer of uncertainty to the post-migration process with regard to system vendor communications and the development of policies and procedures for the licensing and management of e-resources.

System Migration

When OCA initiated the RFP process, there was no fully developed next generation ILS that could provide the functionality needed for OCA to reach its goals.[29] This required the vendor to develop the system needed on a very tight timeline, which meant that some aspects of the new ILS, such as the Acquisitions functional area and the Network Zone (NZ) containing OCA's shared catalog, were just completed or being finished as the first cohort migrated. Subsequently, there was no time to update training materials, or for a fully functioning sandbox with the NZ component, to be developed and deployed by the vendor before the first migration (see table 1). This was a major challenge for Cohort 1 staff who had a very short window to learn how Alma worked before the go-live date. When UW Libraries went live in 2013, staff had to learn how to navigate and create new workflows in the live shared catalog that functioned differently than the training environment. On the positive side, the entire migration was implemented in stages, over a period of two years. This allowed the early implementers to work with the vendor to correct problems and allowed for needed functionality development to occur without having all OCA members learn the system on the fly at the same time.[30] Nevertheless, the dynamic nature of this situation made it difficult to provide adequate documentation and training to prepare everyone for an environment that was, and still is, changing.

Before discussing the complications that were experienced with the creation of acquisitions workflows in the new system, it is necessary to explain how OCA's Alma implementation differs from a stand-alone institution's version. One issue in creating OCA's envisioned SILS was the need for a shared bibliographic database environment while allowing member institutions to retain some local control and to provide a place for local order and holdings records. To accomplish this, Ex Libris created a three-layer system consisting of a local, a consortial, and a community record repository space. The first layer, the Institution Zone (IZ), houses local holdings, inventory, and order records. Each OCA member institution has its own IZ. The key element is the middle layer, the Network Zone (NZ), which houses the bibliographic records of OCA's member libraries, separate but linked to the local/institutional repository (IZ) for each OCA member. Complementing these two layers is the third, called the Community Zone (CZ), composed of e-resource records, the Alma Knowledge Base (KB), available to all Alma users, not just OCA members. Compared to the single layer of the traditional ILS catalog, it was an adjustment to learn to work across multiple zones, and to understand how they are linked.

Alma was originally designed with just the IZ and the CZ. To accommodate and further OCA's needs, Ex Libris added the NZ to the system already in place. The intent was for the NZ to function like the IZ. However, patching in a new component does not always produce the expected results. Initially, parts of the system did not work as anticipated. For example, loading bibliographic records presented several issues, including the system timing out before full record sets could load and in some cases loading multiple copies of records into the NZ. Even after migration completion, several unanswered questions face OCA, such as how to handle bad data created in the first several

Table 1. Timeline of Migration

OCA Events	UW Libraries Events	Date
Request for proposal issued		January 2012
Vendor demonstrations		April 2012
Contract with Ex Libris announced	ARCS created by merger of Monographic and Serials Acquisitions units	July 2012
Contract signed		September 2012
Official Shared ILS implementation kick-off		January 2013
Training the Cohort 1 trainers	Training the Cohort 1 trainers	February–April 2013
	ARCS training in sandbox begins	May 2013
	Data migration	June 3–5, 2013
	Bibliographic and holdings input freeze	June 7–24, 2013
	[UL] goes live in Alma/Primo; Millennium ILS available in view-only mode	June 25, 2013
Ex Libris Certification training	Ex Libris Certification training	July 2013
	ARCS first approval books processed using updated local receiving system	August 2013
	First EDI invoice fully processed in Alma for payment	November 2013
Cohort 2 begins migration		December 2013
Cohort 3 begins migration		June 2014
	Millennium ILS permanently turned off	October 2014
Cohort 4 begins migration		November 2014
OCA announces completion of migration to shared ILS		January 8, 2015

months of migration and how to resolve record load and merger issues.

In addition, the nature of permissions, or "role" assignment in Alma terms, created some unique challenges when determining who could do what and when. For example, as bibliographic records are created and merged in OCLC, or as mismatches occur between vendor-supplied records and OCLC record exports in the ILS, it is often necessary to move orders from one bibliographic record to another. In the legacy catalog, overlaying bibliographic records was routine and had been performed by both acquisitions and cataloging staff. In the multi-layer Alma consortial environment, where multiple institutions have holdings on a bibliographic record, this is no longer an option. Instead, staff import the desired OCLC record, create a brief record, or find the desired record already in the NZ to which they want to move orders and/or holdings, then use Alma's Relink process to transfer the order/inventory from one bibliographic record to another.

At UW, this is an Alma function that ARCS staff can perform but CAMS cataloging staff cannot. The broad permissions assigned to the Acquisitions operator role in Alma allow a person to see and alter most order records. The local decision was to assign such a role only to necessary (i.e., ARCS) staff. The legacy system was more flexible in how permissions could be assigned, permitting cataloging staff sufficient acquisitions permissions to complete a similar task, but which would not allow them to edit order records. Since this is not possible in Alma, a system has been established for CAMS staff to notify ARCS via a web form when they need to have an order moved to a new bibliographic record. This is an example of a local workflow that did not exist before migration, but its creation was necessitated as much by local decisions and policy as Alma's structure. This workaround also requires quite a bit of interdepartmental communication, cooperation, and time.

OCA is not alone in this challenge regarding role assignment, as it seems to be a function of other next generation ILSs. Bordeianu shares that the University of New Mexico experienced similar issues in their migration to OCLC's WMS. In their case, it was cataloging permissions that allowed non-catalogers to modify bibliographic and holdings records.[31]

Another challenge presented by the new SILS is the granularity of order records, or Purchase Order Lines (POLs). In the UW Libraries' previous system, Millennium, there was a single type of order record that could be used for all purchases. Most fields could be edited and the system allowed the creation of macros to enhance efficiency and reduce errors in repetitive data input processes. Templates could be created for specific kinds of orders or material formats and could include note fields. Conversely, Alma has a great number of order types, and one must be chosen and cannot be changed once the order record is created. Templates can be saved, but data must be present in four required fields (material supplier, price, fund, and acquisition method), with the exception of orders using the acquisition methods of Gift or Technical (fund and price are not required then). Thus, if one wants to use a template

for purchases from a particular fund but with variations in vendor, for example, one must manually delete the incorrect value and input the correct vendor information after using the template to create each order, partially defeating the point of using a template and increasing the potential for operator error. Alma templates also do not currently retain note field text, necessitating manual keying of information.

While the granularity of order types in Alma might seem quite desirable, it has not proven to be as beneficial as hoped. The POL type chosen at the beginning of the order creation process determines what fields are available in the order records and what kind of inventory is created. In the legacy ILS, inventory was neither automatically created at the point of order nor linked directly to order records. It took time for ordering staff to familiarize themselves with all of the POL types and to know when it was appropriate to use which one, resulting in many orders placed using the wrong order type shortly after migration. Since the order type cannot be changed, these mistakes necessitated canceling and/or deleting incorrect orders and creating new ones.

One example of the difficulties encountered in creating order workflows in Alma involves mixed media orders. As previously mentioned, order records in Millennium were flexible and allowed the creation of single order records for multipart or mixed media items. Alma's more granular nature forces strict boundaries on the items being ordered. This is most obvious in the differences between physical and electronic orders. Items with a multimedia component, such as a DVD with a streaming file that requires a license, are becoming more prevalent. To order this in Alma, ARCS must create multiple orders, one for each media type. As long as one of the orders is for an electronic format, a license record may be linked to that order to track licensing information and provide a note that displays to public users regarding usage rights.

A similar concern occurs as more orders involve individual vendors that may require licensing agreements for physical items. In the previous system, any order or type of inventory could be linked to the electronic resource management (ERM) module, but in Alma, which does not at the time of this writing accommodate attaching or linking license records to nonelectronic order records or inventory, it has become a topic of discussion regarding how to create the best workflow for ordering and license documentation.

Lack of an ERM Module

For all of the emphasis on the necessary inclusion of ERM in new library systems, perhaps one of the more disorienting aspects of Alma has been the seeming absence of an ERM module.[32] Behind the scenes, one can find many of the components of such a tool distributed across the Alma functional areas of Acquisitions and Resource Management (cataloging). Within the Acquisitions functional area, connections between the vendor file and the licensing section allow for documenting and tracking licenses. Despite an initial delay in UW Libraries' use of Alma's licensing features because of instability, by June 2014 improvements had been made, enabling the part-time Electronic Resources Librarian to develop procedures for recording license information and to train ARCS and other relevant staff. While this was significant, it did not change the fact that not all ERM data migrated. Millennium license records migrated but Millennium vendor contact and resource records did not. Effort has been made to input necessary data into the Alma vendor file; however, access to legacy resource records is only available via text files exported during migration and stored on a local server.

Alma's licensing landscape is also complicated by the zone environment. Currently, locally licensed materials are tracked using license and vendor records in the IZ. However, OCA is also exploring how to manage e-resources and licenses for consortially owned or subscribed materials. This involves putting license records in the NZ. Considering the initial issues faced when determining how bibliographic records are linked between the NZ and IZ, it will be interesting to see how licenses and e-resources management continue to evolve.

Within ARCS, e-resources staff discussed best practices and procedures using Alma's functionality for local e-resource management. There are advantages to the new system's management of activation, which can be done at the point of order, but the placement of this functionality under Alma's Resource Management (cataloging) functional area has led to questions as to who should perform what tasks. Local historic practice has led to a divided handling of e-journals and e-books complicated by the division of serials and monograph processing. Presently at UW Libraries, e-journals and e-book packages may be activated by ARCS staff finding a CZ record and activating its portfolio. In contrast individual e-books, though also ordered by ARCS, are cataloged using existing NZ records or OCLC records imported into the NZ, and are handled by CAMS staff in a workflow that generally follows the one used before migration.

Local Configuration

Unique to ARCS' migration experience was the need to reconfigure not only ordering and cataloging workflows, but also a locally developed automated receiving system utilizing Microsoft Access. This homegrown system allows fewer staff to handle an increasing volume of physical items, especially during the second half of a biennium when an increased amount of ordering and receiving occurs. Historically, the Access process used with Millennium called

for incoming groups of material to be received in batches. Multiple files of bibliographic, order and/or item data were exported (necessitated by the limit on the number of fields allowed per export file) from the system and joined into a single spreadsheet, which was then input into Access. Queries ran against the data to evaluate cataloging quality and results output in printed report slips. These slips categorized each item and routed them to ARCS student employees to process, to ARCS staff for additional checks or minor editing, or to CAMS catalogers for more extensive work or original cataloging in OCLC. In contrast, Alma's infrastructure does not allow batch receipt, requiring a reconsideration of workflow to allow for item-by-item receipt. To limit the number of times individual items are handled, it was decided to combine receipt and student cataloging functions as much as possible. These and other changes required the complete reconfiguration of the Access system and the attendant workflows. It took about a month to complete the first modified Access process for approval books, as data extraction was sometimes problematic and unstable. It took an additional two months to complete the other Access workflows for firm orders and other materials before staff could begin to process those backlogs.

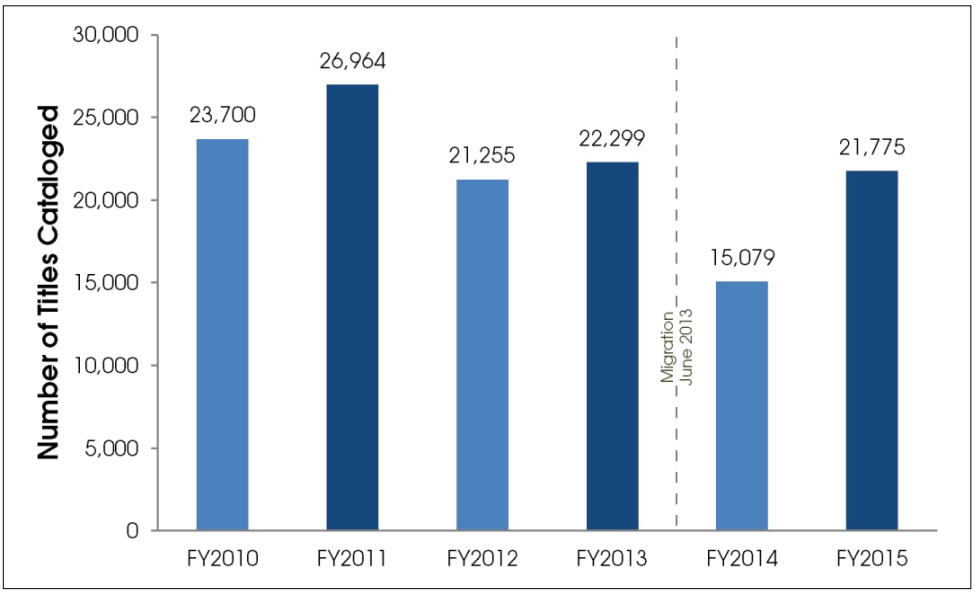

Figure 1. Total Monographs Cataloged in ARCS by Fiscal Year (FY)

Adapting Workflows to a New System

As suggested by ARCS' overall cataloging statistics by fiscal year (see figure 1), the first year in Alma saw a decline in cataloging production while the second year in the new system shows productivity close to the level of the year immediately preceding migration. Direct comparison of these numbers, however, is difficult. Before migration, ARCS staff were involved with various data cleanup projects that took time away from cataloging activities. As this was also the end of a biennial cycle, effort was placed on receiving and processing the invoices for as much material as possible to ease the transition to the new system rather than cataloging. Reconfiguration of the Access process after migration allowed for more efficient processing than in the weeks immediately following go-live, but Alma's inability to batch receive means certain efficiencies of the old system have not been realized in the new.

An added difficulty, which will be ongoing, is that Alma is a constantly changing environment, receiving monthly updates. These changes prompted ARCS in the summer of 2015 to reexamine some of the Access workflows created shortly after migration and to reconfigure them again. This process will likely need to be repeated as the system continues to evolve.

The challenges of adapting workflows to the new system were heightened by terminology changes, which many have found to be confusing. In Millennium, an order was often referred to as a Purchase Order (PO). Alma accounting terminology differs slightly in that an Alma PO is composed of one or multiple Purchase Order Lines (POLs), or individual orders. Further adding to the confusion was the fact that when order data from Millennium migrated, it was split between the PO and the POL in Alma, necessitating one to look in both to find historical information. A particularly troublesome aspect of the new terminology, as pointed out by another OCA institution staff member, was that not knowing what functions were named made it extremely difficult to find answers in the online help manual.[33] This continues to be an issue, but will hopefully get easier with time. Another terminology quirk is the inconsistent naming of navigation links. Some pages within a workflow have "Cancel" buttons to navigate back to a previous page, whereas others have a "Back" button. Staff have become accustomed to what buttons are displayed on which pages, but in a system that is seemingly always being updated, these kinds of bugs are still the cause of occasional consternation and amusement.

Learning to Work in the Cloud

Becoming used to terminology changes is not uncommon during migrations, especially when transferring to a new vendor. This is exacerbated by cloud-based systems, which are conceptually different from the ILS of the past. The significantly different structure and work environment brings with it much new terminology that requires staff to become conversant with the underlying concepts and learn to perceive their work in a new fashion. The University of New Mexico experienced such issues when migrating to WMS.[34] This can be difficult, especially if the new concepts require the reconfiguration of a workflow and duty assignment. The University of Wolverhampton put it best by stating "more than a change of systems, this has been a change of working cultures."[35]

The rolling migration in four cohorts was also of tremendous value. Although the first cohort had to pave the way and perform the initial troubleshooting, they were able to help smooth the transition for the cohorts that followed by providing feedback and problem solving with Ex Libris, helping to train cohorts three and four, and acting as a resource throughout the migration process. Other vendors, such as OCLC, have experimented with this cohort migration model and have found that often the most useful answers to questions that arose came from other members who migrated to the same system, or were in the same cohort.[36] This sentiment was echoed by a staff member at an institution in the fourth and final OCA cohort. She reported that vendor training was intense but difficult to follow because of the unfamiliar nature of the new system and limited time to practice with the sandbox before training commenced. The shared nature of the system also created difficulties, and since it was so new, vendor training videos did not address the reasons why functions did not operate in the ways covered in training. She found communication with designated OCA members to be the most helpful.[37]

In addition to being a major factor involved in preparing for migration and training, time is also a primary concern when considering system usability. One point of contention for personnel across OCA is the amount of mousing, clicks, and steps required to perform any function within the new system.[38] This is especially frustrating for repeated actions and fields that do not self-populate as one types. It essentially takes longer to complete many tasks. Added to this is the nature of a cloud-based system requiring each action or update to be transmitted to the cloud before the operator can proceed. While Internet connectivity has improved to amazing speeds, there is still a few seconds lag time that is not seen on local intranet systems. What used to take only a few seconds can now take as long as several minutes as each area of a record is completed and updated. If there is a network disruption or a slow-down in service, it becomes even more time-consuming.

In contrast, one of the advantages of a web-based interface is the ability to work remotely, allowing for flexibility in when and where one does one's work. It is difficult, however, to create a system that looks and functions identically across a wide variety of web browsers, resulting in varying levels of functionality and stability across platforms. In acquisitions and cataloging work, it is often necessary to open multiple order and/or bibliographic records and compare them with one another side-by-side, something the legacy ILS supported. This is not the case in Alma's web-based environment, which does not enable the operator to have multiple records open at the same time. To work around this, if one opens multiple sessions of Alma in the same browser window, or on multiple windows of the same browser, the system becomes unstable, unless one uses private browsing mode. Another option is to open Alma in different browser programs, one session in Firefox, another in Internet Explorer or Chrome, for example. However, depending on one's comfort and familiarity with multiple browser programs, this is not an optimal solution.

Migrating to and working in a new SILS has been challenging, but OCA's journey is just beginning and will require a lot of hard work and patience. One area where this has become apparent is working in the NZ. Sharing master bibliographic records consortially is definitely a challenge. For efficiency for both patrons and OCA members, duplication of OCLC records must be kept to a minimum, which requires members to agree on cataloging standards as well as (potentially) best practices for record loader configuration and performing record loads. For such a large nonhomogenous group, a lot of thought and participation by all members is vital. Unfortunately, since there are so many duplicate records in the system, attempting to correct and resolve the migrated data and consolidate previous holdings on a record-by-record basis is not a practical solution. A certain amount of record duplication is inevitable, and the goal is to minimize this as much as possible. This is proving difficult because of factors such as data, often electronic record sets, migrating only to the IZ, differences among OCA members as to whether to use CZ or NZ records for ordering and cataloging e-resources, OCLC merging records after the bibliographic records are already in the NZ, and problems with the loaders matching incoming records to less than ideal bibliographic records already in the system.

This was further complicated by the two-year migration plan, which called for all member institutions' bibliographic records to be loaded into the NZ in June 2013 and holdings added as the institutions completed migration. For almost two years, there were many records in the NZ that lacked holdings. It was difficult to determine whether these were true duplications or ghost records created by the problematic loads. Now that migration is complete, OCA is exploring policies to handle records in the NZ that do not appear to

have holdings. This will likely be a moving target, however, as OCA membership grows and the records of new members are added upon their migration to the system. Presently, one librarian from UW Libraries is the point person for deleting records from the NZ and OCA members contact her to delete excess records as they are found.

Although some of the migration problems have been resolved, the issue of OCA-wide policy and procedures, as evidenced by the NZ record cleanup question, looms large. An additional area that needs attention is ordering. There are several different methods for ordering books from large vendors such as YBP, but no preferred method or best practice has been implemented. This gives individual OCA members autonomy, but makes working together in the NZ more difficult. At the time of this writing, there is also no standard record loader set-up, increasing the likelihood of bad record matches. This has been seen in the past with an ISBN match that disregards a subfield z, allowing print materials to be placed on e-resource bibliographic records, and requiring cleanup later. While OCA has templates for the creation of brief bibliographic records and best practice mandates in place, there is much ground to cover in establishing policies to standardize or harmonize practices across the consortium.

Conclusion

When considering a consortial system migration project, many questions are asked, including where does one want to go and by what means and route does one get there. There are presently many different routes to take, not all with the same destination in mind. The journey has certainly been an adventure, but the OCA and the UW Libraries are fortunate to have many talented and dedicated staff who were able to aid in navigating the challenges presented. As stated in the literature on the future of the ILS and libraries, technology continues to evolve and many institutions will need to evolve with it. The next generation ILSs offer libraries the potential to serve their patrons in ways only dreamed about a few years ago. As these systems become more stable and as libraries and ILS developers work together to make them more accommodating to what is needed, the benefits will outweigh the challenges experienced in migration and afterward.

Nevertheless, given the capabilities of new library management systems, human intervention is still necessary to accomplish technical services work and will continue to be so into the future. Migrating into this developing environment and learning to design workflows in coordination with other consortium members in a constantly changing system can be an unsettling experience. This holds true for both electronic and print materials processing. What has changed are the skills needed, as was suggested in years past by Ruschoff and further specified by Fu.[39] Revision of workflows following migration is standard practice, but the integrated work between consortium members now adds a new dimension to the puzzle.

Locally, several issues became apparent after migration as ARCS staff became accustomed to the new work environment. From initial processes such as ordering directly through Alma, setting import profiles for bibliographic records, overlaying records and relinking during cataloging, to loading and paying EDI invoices, nearly all functional areas presented some initial difficulty in transitioning to the new system. While some solutions required filing support cases with the system vendor, others came more directly from staff learning the "Alma way" of performing a process. Much work was accomplished collaboratively by colleagues sharing tips and tricks such as suggesting what web browser worked best to see specific record characteristics. In addition to collaboration overall, it is also worth noting that to accomplish certain tasks, a broad understanding across functional areas of the system and physical departments within one's institution is helpful. However, such knowledge does not always eliminate the hurdles presented by departmental divisions, especially in larger institutions with more distinct divisions, when trying to design efficient workflows.

ARCS continues to adjust to the new system, having reevaluated the local Access receiving system in the past year, hoping to gain more efficiency now that the system is more stable than it was three years ago. The ripple effect on workflows from the "Alma way" of doing things highlights divisions between staff alignment and responsibilities and that of operations delineated by Alma roles and system architecture. This serves as a reminder that library organizational structure may need to change just as intra- and interdepartmental processes change to work more efficiently with the new system.

No system migration is easy; however, there are particular complications of which to be aware when migrating as part of a consortium into a shared system. The UW Libraries and the OCA take pride in being leaders in library technology. This has very real practical implications when migrating to a system so new that not all of the pieces of the system are in place when preparing to migrate. UW Libraries and the other members of the first migration cohort were not the first libraries to transition to Alma; however, there was much that was new for OCA with its Network Zone configuration, a component that non-consortial early adopters lacked. Given the size of the consortium and the variety of individual libraries needing to migrate, the two-year project cycle seems, in hindsight, exceptionally ambitious, particularly to allow the libraries in the first cohort time to familiarize themselves with the new system and prepare data for migration.

Working in the cloud has its own set of advantages and disadvantages. There is freedom from local servers, but requires dependence upon the Internet, which individual institutions do not control. As was observed during the first year of using Alma at UW, server issues still affect work, but it is now on a larger scale than one single institution.

Moving forward from the completion of migration in January 2015, the shift in focus from migration to integration, proceeding with the vision of shared consortial technical services, began in earnest at the summer 2015 Alliance Summit meeting. To address geographic barriers and begin more collaborative work, new working groups have begun to schedule regular conference calls to discuss various functions, such as discovery and delivery, technical services, etc. These calls are open to all OCA members, and allow for information exchange and will hopefully foster a sense of community.

There is no doubt that being a member of a consortium carries many benefits, but it is also true that there can be drawbacks and friction. Where once individual institutions could determine their own cataloging and acquisitions policies, there needs to be agreement between OCA members in many areas; time to reach these agreements and make other OCA decisions must be weighed against getting work done locally.[40] In a heterogeneous consortium with a great variety in institutional size and funding capacity, it is important to recognize and address potential areas of friction, such as sharing of resources, cost allocations, and methods of contribution. One way to do this is to keep communication lines open. Encourage discussion and collaboration. Encourage staff to approach this new venture with a willingness to be flexible and open-minded.

Whether contemplating making a system change in the future, or looking back on the process after the fact, there are many variables to consider when evaluating such a change. No system is right for all institutions and even the needs and wants of individual members of a consortium will vary. New systems such as Alma have much to offer in the handling of multiple formats of material, but there are decided trade-offs in functionality as well. In the case of the OCA, continuing to use a multitude of ILSs and discovery systems was not an option and a change was necessary to reach the consortium's goals. While there are many usability and other enhancements that one could suggest for Alma and other newer LMSs, the interim goal of bringing consortium members closer together and fostering a new working environment has been, at least on some levels, successful. Nevertheless, further work remains to achieve consortial goals regarding collaborative technical services, especially as new members join the consortium and as the system continues to change. Bearing these ideas in mind, the UW Libraries and OCA continue to move forward and break new collaborative ground.

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Notes on Operations Classifying African Literary Authors

Marilyn A. Green and Susan Rathbun-Grubb

This paper reviews the literature on the inadequacies of the Library of Congress Classification (LCC) schedules for African literary authors and describes a modified practice that collocates African literature and facilitates patron browsing. Current LCC practice scatters African literature across the multiple European language classifications of former colonial powers. Future strategies could place individual authors more accurately in the context of their country, region, culture, and languages of authorship. The authors renew the call for a formal international effort to revisit the literature schedules and create new classification practices for African literature.

> "who can imagine an effective cataloger who exalts means over ends and cataloging rules over library service?"[1]

The objective of this paper is to share a classification decision and practice, devised by one of the authors for use at her academic library that could be adopted by other libraries with similar needs and concerns. Specifically, it addresses the classification of African literary authors—the historical classification practices in the context of world history and future practices aimed at consistently applying cataloging principles and improving service to library patrons. The International Federation of Library Associations' (IFLA) Statement of International Cataloguing Principles states that the needs of library users must always take precedence: "at the beginning of the 21st century, an effort has been made by IFLA to produce a new statement of principles. . . . The first principle is to serve the convenience of catalogue users."[2] This paper is also an international call to action by library governing bodies to study and act upon recommendations suggested by the profession for the past forty. The following narrative defines the problem and describes a resolution.

Background

According to its *Classification and Shelflisting Manual (CSM)*, the Library of Congress (LC) classifies individual literary authors first by language, with subsequent arrangement by the author's national origin and the timeframe in which the author was prolific (see rule F632).[3] The rule provides the option for a cataloger to classify an author by country first where LC has made accommodation for a range of numbers representing geography within that area of classification by language. LC recognizes that this becomes problematic when "literatures . . . have no geographic development [and] may be only partially expanded (such as the literature of former colonies)."[4]

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The CSM also instructs catalogers to use previously established numbers for authors, resulting in items shelved in physical locations that LC or a Subject Authority Cooperative Program (SACO) library has predetermined. For authors who write in multiple languages, the cataloger must establish a classification number for the author in each language and should "not attempt to keep all the works of the author together."[5] Although these instructions make sense to a cataloger within the confines of an overall classification system, and the items can be found easily by call number when the author or title is known, the practical result of these instructions is a physical scattering of authors and literatures. This "scatter effect" thwarts browsing and discovery of common literatures by library patrons who are unaware of the system's idiosyncrasies or do not know an author or title for which to search. Thomas Mann concludes from his experience as a reference librarian at the Library of Congress and his analysis of recent academic library user surveys that

> the majority of faculty and students recognize from their own direct experience . . . that focused *depth searching* of the contents of most of the copyrighted books on a particular topic cannot be realistically done in any way other than the systematic browsing of subject-classified bookstacks . . . and . . . serendipitous discovery by *recognition-browsing* within carefully defined segments of library book collections is crucial to many research projects because it enables researchers to find relevant sources whose keywords they cannot specify in advance . . . [6] [emphasis by Mann]

The inadequacies of LCC's by language model become apparent when we look at African authors and literatures. The infamous 1914 publication of a map of Africa (see figure 1) illustrates how various European countries agreed to divide Africa after multiple attempts to colonize the continent.[7] Long after each African country established its independence in the 1950s and 60s, those geographical and linguistic divisions are still being used by libraries to determine the location of African literature in their collection. Libraries classify African literature based on which European country colonized a particular country and imposed a foreign language upon the colonized: (e.g., PQ if colonized by the French, PR if colonized by the English, PT if colonized by the Dutch, etc.). The result is that African literature is scattered throughout the P Classification. The scatter effect creates a dilemma for browsers. Users cannot expect to browse one section of the P Classification Scheme to find literature from Africa as he would expect to browse the PR section for English authors or the PQ section for French authors. This scatter effect also presents a false

Figure 1. Partition of Africa, 1914

picture of the literary efforts of African writers by giving the impression that no legitimate literature comes from Africa unless it is under the auspices of a European nation and in the language of the colonizer. The classification rules dictate to library catalogers that the 1914 map referenced above is still legitimate; however, the practice of basing classification decisions on a century-old political map stifles inquiry in a manner that is embarrassing to the profession.

Historical Attempts to Reclassify African Literary Authors

Research literature as early as 1973 indicates that several attempts have been made by catalogers to bring attention to classification issues regarding African literary authors. Mowery in *The Classification of African Literature by the Library of Congress* is one of the first to openly acknowledge that unlike other countries, literature from African countries is scattered throughout the P classification scheme.[8] He describes the three different patterns to this scattering which further contributes to the inconsistency in the treatment of African literature. Asanga's critical review of Soyinka's *Myth, Literature and the African World* carefully summarizes the prevailing attitudes of universities regarding the naming and classification of African literature.[9] Soyinka's work argues against the emphasis placed by Europeans on language as the most important criteria for classifying literature and advocates, instead, that "culture" be the more important determinant.[10]

Amaeshi proposed adding a new subclass to the P Classification Scheme (i.e., PV), which would include all African literature (general literature, African literature in European languages and African literature in native languages).[11] Iwuji addressed the frustrations surrounding the entire LCC scheme for African subjects (religion, history, ethnography, social science and government) including language and literature; he observed that it would take a radical effort to correct the injustices to African literature, and he reintroduced the idea of a new addition to the P Classification Scheme (i.e., PU).[12] He credited an earlier library researcher (Nwamefor) for this idea and also agreed with its unavoidable sub-arrangement: African literature in the native languages of Africa (the PL section of today's LC classification) and African literature in foreign languages ("to be sub-arranged alphabetically by country").[13]

Aderibigbe and Udoh point to the inadequacies of LC's current PL subclassification for African languages and their literatures.[14] All native African languages and their literatures are crowded into the very narrow PL8000–8844 section of the scheme: "A continent larger than China, Europe and the United States together . . . [with] fifty-three countries, a billion people and over a thousand ethnic groups" is lumped together into a tiny subclass.[15] The authors demonstrate that this is not the case for European countries (using French literature as a specific example). They also warn of the consequences of not reclassifying African languages and literature (specifically, individual libraries devising schemes of their own so that their collections make sense to their users). Like Amaeshi and Iwuji, they propose that a new subclass be assigned (i.e., PI or PO).

The classification and cataloging of all things Africana is part of the larger treatment of a special theme issue of *Cataloguing & Classification Quarterly* (2002). This multipart issue looks at individual countries and regions, and devotes an article to the entire continent of Africa and the unique challenges catalogers face. Mutula and Tsvakai, who believe in one unified international classification scheme, call for African catalogers and librarians to create their own standards and tools rather than rely on or wait for the West, and "to solve this problem at the continent level through participatory action before it can be taken to the international level."[16]

Similarly, another author calls for African libraries to act first in resolving the classification problem and only then take it to the international scene. Ndakatsu proposes that since the profession has already been made aware of the problem, that a continental [African] bureau be established to liaise with such organizations as IFLA and LC so that African proposals and viable solutions are created for a system in which Africa would not "move itself away from the mainstream of world librarianship."[17] Once again, the need for a unified international classification scheme is emphasized.

While each of the authors above cites slightly different proposals for resolving the problem of classifying African literature, they all agree that the need for a responsible library body to act is urgent. There is also a general consensus that it is not just an "African problem," but an international one. The inescapable conclusion to draw is that the proliferation of literature from the continent and an international need for consistent application of library standards and policies justifies change at a global level.

It will take an organization with the political and financial resources of IFLA to initiate a final resolution to this classification problem. The issue has been well-defined by the profession for over forty years but no leadership has emerged at the top-most level to resolve it. This leaves libraries no choice except to make their own local arrangements. Aderibigbe and Udo have indicated that while this is not the best of solutions, doing nothing is much worse for library users.[18]

Inconsistent Application of Rules by LC

In some cases, the rules related to classification by language of a literary author outlined in the *Classification and Shelflisting Manual* are inconsistently applied. For example, Wiesel, author of *Night*, first wrote and published his Holocaust memoirs in Yiddish.[19] The manuscript was not translated into French until two years after its initial publication; yet, it is classified in the French literature subclass of PQ (specifically, PQ2683.I32) because he was living in France when the manuscript was translated into French. The language-before-country rule appears to be ignored in this case. Ironically, Yiddish is an "Oriental" language whose literature would be found in the PJ section—specifically PJ5191-5192 and by author at PJ5129.A-Z, even when it is translated into other languages.[20] Alternatively, PJ5120.7.H64 is for Yiddish literature about the Holocaust. Perhaps the first copy of Weisel's work received by LC was the French translation, and would explain this choice of call number. Nevertheless, decisions such as classifying Weisel's work as French rather than Yiddish gives the impression that our cataloging decisions are still embedded in a biased framework that gives preference to Western European languages.

A further example that LCC is not consistently applied is in the classification of Egyptian literature. Egypt is in Africa, yet the classification of Egyptian literary authors (i.e., African literary authors) does not follow the rule of language of the colonizer as is the case for all of the rest of Africa (Ethiopia and Liberia are the only African countries not colonized by Europeans). Instead, Egyptian literary authors are classed under PJ ("Oriental languages and literature") along with languages such as Hebrew (i.e., Yiddish) and Arabic. These inconsistencies demonstrate a need for the

profession to discontinue Eurocentric practices in the classification of non-European literature. Until this is done, it will be impossible for the international community of libraries and librarians to create a consistent system of classifying world literature.

African Book Production and Literary Output

When contemplating a reclassification project or the redesign of a classification schedule, a library should consider the size of the collection that will be impacted, its past and potential rates of growth, and usage or circulation statistics. Before the reclassification project described in this paper, the authors investigated the rate at which African literature might be added to the collection by studying publication statistics. Several reliable sources point to the stagnant statistics regarding the exportation of fiction and nonfiction from the African continent.[21] The data are primarily reported as "rate of production," meaning that it is comparative data. However, when examining raw data reported by individual African countries across successive years, there is indeed an increase in the number of volumes of fiction and nonfiction being exported from the country.[22] Despite the inconsistency in which countries reported such data—Zell describes it as "bewildering"—there is enough data for Zell to question the stagnant rates of production which he sees cited (i.e., "between 2–3% of the world's publishing output") for the past two or more decades.[23]

From the earliest years of publishing international surveys, UNESCO acknowledged the difficulty in defining its Literature category; while countries employ different definitions of what constitutes Literature, a "common denominator however appears to be the *'creative aspect'* which is attached to this class."[24] In the interest of clarity and for the purposes of this paper, the Literature category is for fiction titles (novels, plays, poems, etc.). There was a steady increase in total African book production from 1955 to 1969 with the last three years showing 2,347 total titles in the category of Literature. Twenty-nine years later, a total of 12,416 titles came from reporting African countries in this same category.[25] While the comparative data (rate of production) gives the impression that little is changing or happening in the area of literary output from the continent, the actual numbers have been on the rise. Additionally, there is evidence that the continent has the ability to produce even more literature: in 2008 there were 116 independent African publishing houses from nineteen different countries using the distribution house African Books Collective.[26] By 2015, there were 149 independent publishers from twenty-four different countries using that same distributor.[27] Twenty-nine of the approximately 150 new titles distributed by African Books Collective in 2015 were fiction titles, an increase from twenty-five in 2014.[28] This data certainly demonstrates an increase in the available African literature for purchase by libraries worldwide, yet the numbers are still manageable without a complete redesign of the LC literature classification schedules.

Libraries Can Respond to the Classification Challenge

The following recommendation will work for academic libraries with collections of fewer than 100,000 items that use LCC to shelve and arrange their collection. Small collections (even if adjusted for potential growth in an e-book era) can accommodate African literature under a small range of classification numbers. Rather than see the creation of a new subclass of the P scheme as proposed by others, we propose that a subclass already being used for African literature be further explored, namely PL8000—PL8844.[29]

Despite inadequacies with the PL8000—PL8844 subclass, it is the most viable solution for a small collection.[30] It is the only subclass that specifically addresses literature from the African continent, without quantifying the literature as *other* or *outside*. While the subclass has not been well developed for expansion like the other P subclasses, and is largely intended for literature written in native African languages, the micro-range of PL8010—PL8014.A-Z can accommodate collections of African literature and individual African literary authors. This is possible because the PL8010—PL8013 section is for history and criticism of various works, forms, collections, and translations; whereas the PL8014.A-Z section is arranged by country or region and can be used to refine classification of individual authors. The popular practice has been to use this entire micro-range for collections of African literature.[31] For example, titles such as *Twelve African Writers* by Moore, *Drama for a New South Africa: Seven Plays* by Graver, and *Art, Ideology, and Social Commitment in African Poetry: A Discourse* by Udenta can all be found in OCLC Worldcat and LC's catalog classed in this area.

The proposal outlined here is to use the micro-range of PL8010—PL8014.A-Z to relocate African literature to a single subclass (e.g., PL classification), since it has become an effective practice at Midlands Technical College's library.[32] The geographic emphasis of a portion of this range prescribes that in the reclassified scheme, literary authors from a specific country or region have the same first cutter number. For example, all Nigerian literary authors would have a call number that begins with PL8014.N6; all South African literary authors would have a call number that begins with PL8014.S6.

The major dilemma for using the PL8010—PL8014 range occurs when applying the standard practice of using

a maximum of two cutter numbers in a call number—in this case, the first cutter for the country or region and the second for the author. To reflect a specific title, literary criticism, or biography, a third cutter is required. Otherwise, it is not possible to accommodate a range of call numbers a collection needs for literary authors. The aforementioned library is handling this situation as described below, and an appendix illustrating reclassification is included at the end of this paper.

The reclassification process starts with PL8010—PL8010.6, which covers *History and Criticism* for general works, collective biographies, and special forms of literature such as poetry, drama, and fiction. The PL8011 section remains reserved for *Collections of Works*, such as anthologies, and PL8013 remains for *Translations*. The standard two-cutter system works fine for works appropriate for the PL8010—PL8013 range and inherently includes criticism of collections of works.

The three-cutter reclassification begins at PL8014.A-Z. Works by an author are the first to appear in the shelflist. The first cutter reflects the African country or region with which the author is most often associated. For example, works by Nigerian authors will begin with PL8014.N6, and works by South African authors will begin with PL8014.S6. The second cutter reflects the specific author; for instance, works by the Nigerian author, Achebe, will begin at PL8014.N6 A3, and works by South Africa's Gordimer will begin at PL8014.S6 G67. A third cutter is then added for the title of the work, resulting in the call number PL8014.N6 A3 T51958 for Achebe's *Things Fall Apart* and PL8014.S6 P38 C791948 for South African Alan Paton's *Cry, the Beloved Country*.

Literary criticism and biography follow works by the author using a Z cutter. Biographies are assigned Z46, and critical works are assigned a cutter in the range Z5-Z999, based on the title of the work treated by the criticism. Thus, a 2001 biography of Achebe would be assigned PL8014.N6 A3 Z462001, while a 1990 volume of literary criticism about his novel *Things Fall Apart* would be assigned PL8014.N6 A3 Z8841990. The usual practice of adding numbers to any cutter to distinguish one title from another and maintain logical shelflist order would be necessary. While this reclassification disrupts the standard practice of using two cutters, there are precedents in LCC for a three-cutter system, such as the classification schedules for Music (M), Agriculture (S), and cartographic materials (G). Furthermore, academic libraries such as Yale University Library and Penn State University Libraries have established policies for the use of a third cutter when "deemed necessary."[33]

The authors recognize that the solution described above may not resolve the problem for libraries with very large special collections, such as Yale's or LC's Africana collections, and adopting this reclassification scheme might be impractical for libraries with collections greater than 100,000 volumes; however, it is worthwhile for a library to examine the number of items that would be affected by a reclassification project and the projected rate of collection growth given the institution's level of support for the study of African literature. The suggested range of numbers and use of a third cutter number is useful for general academic collections, but is simply not as well-developed or nuanced to accommodate comprehensive special collections. Not only is the scatter effect more troublesome, but the issue of where and how to classify works by multilingual authors becomes more complicated.

For example, South African writer Andre´ Brink writes in multiple languages. Brink's works are found in the PR subclass when he writes in English and in the PT subclass when he writes in Afrikaans. The small classification range of the PL subclass and its alphabetic arrangement precludes use by larger collections of African literature because they would quickly "run out" of call numbers. Additionally, their ability to cutter for biographies and literary criticism may be far more compromised. It may be worth considering a change in how libraries currently classify authors who write in multiple languages. Rather than scatter the author's work, the cataloger could re-classify all works by an author under one class so that the reader can find all works by and about that author in one physical space. For clarity, the cataloger would then make reference to the language in which the author is writing within the MARC record itself via a 650 field or a 500 notes field; perhaps the adoption of BIBFRAME as a MARC replacement will leverage linked data to provide this type of reference material associated with multilingual authors.

Conclusion

The origin of the reclassification process described above began after one of the authors of this paper (Green) encountered a student struggling to locate materials to support a project for her African literature course. As a cataloger who also spends time helping patrons at the reference desk, she saw firsthand the unintended negative consequences of unquestioned classification practice on access services. We argue that the core competencies of the professional librarian include the ability to recognize the *blurred* demarcation between technical and public services, to leverage the discourse between often-underserved library user and librarian to inform decision making, and to make logical adaptations in local practice that improve user access to materials and services.[34]

A reconsideration of these classification practices has resulted in two primary benefits. First, this improved shelving practice facilitates browsing and serendipitous discovery

by library users interested in African literature and criticism. When helping patrons who are unsure about a specific author or title of interest, public service librarians can easily direct them to a manageable call number range where they can peruse their options, find literary collections, and discover new authors. Shelving African literary authors together in closer proximity helps library staff meet the needs of student researchers who are just beginning their study of African literature in special topics courses or independent research. Second, further exploration into the rationale behind the classification schedule has inspired us to remind the field about the crucial, but unresolved, work begun over a decade ago about the worldview underlying the P schedules. The authors cited throughout this paper advocate for an international solution to the long-term dilemma of classifying the writings of African literary authors. They would agree to consistency in applying our professional skills. While the standard practice has been to continue as we always have, the "we've always done it that way" mentality conveys a negative connotation. Society has found it useful to challenge standard practices that discriminate. It is just as useful to challenge standard practices that are inherently inconsistent at best and illogical at worst. The library profession's classification system may not be a perfect tool but there are workable solutions to address and improve some of its defects, namely for this paper's purpose, how African literary works are classified. Will it require a lot of work? Yes. But if we continue to delay a solution, it will only perpetuate the problem as more African writers and literature are published.

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Appendix: Excerpt of African Literary Authors Conversion Table (3-Cutter Rule)

This table illustrates a portion of the reclassification document maintained by the cataloging department as a special shelflist for reference.

Title (245)	Author (100)	Original Call # (050)	New Call #	Notes
The companion to African literatures		PR9340.C65 2000	PL8010 .C65 2000	
The Columbia guide to East African literature in English since 1945	Gikandi	PR9340.G55 2007	PL8010 .E2 G55 2007	
Motherlands : Black women's writing from Africa, the Caribbean, and South Asia		PR9340.5.M67 1992	PL8010 .M67 1992	
A dance of masks : Senghor, Achebe, Soyinka	Peters	PR9340.5.P47X 1978	PL8010 .P47 1978	
Cambridge History of South African Literature		PL8014.S6 C36 2011	PL8010 .S6 C36 2011	(Should be PL8010: (Africa> Literature> History and criticism
African Voices		PR9346.S4 1973	PL8011 .A37 1973	
Echoes of the sunbird : an anthology of contemporary African poetry		PR9346.E27 1993	PL8011 .E34 1993	
Granta Book of the African Short Story		PR9348.G72 2011	PL8011 .G72 2011	
The collector of treasures : and other Botswana village tales	Head	PR9369.3 .H4 C6 1992	PL8014 .B67 H43 C65 1992	Botswana
Critical essays on Bessie Head		PR9369.3.H4 Z63 2003	PL8014 .B67 H43 Z567 2003	Botswana
Bessie Head : thunder behind her ears	Eilersen	PR9369.H4 Z64 1996	PL8014.B67 H43 Z585 1996	Botswana
No sweetness here and other stories	Aidoo	PR9379.9.A35 N6 1970	PL8014.G4 A33 N6 1970	Ghana
The art of Ama Ata Aidoo	Odamtten	PR9379.9.A35 Z8 1994	PL8014.G4 A33 Z783 1994	Ghana
Weep not, child	Ngũgũ	PR9381.9.N45 W44 1964	PL8014.K4 N48 W44 1964	Kenya
Napolo and the python : selected poetry	Chimombo	PR9385.9.C448 N37 1994	PL8014.M32 C455 N37 1994	Malawi
Anthills of the savannah	Achebe	PR9387.9. A3 A83 1987	PL8014.N6 A3 A5 1987	Nigeria
Collected poems	Achebe	PR9387.9.A3 A17 2004	PL8014.N6 A3 C6 2004	Nigeria
Girls at war and other stories	Achebe	PR9387.9. A3 G57 1991	PL8014.N6 A3 G5 1991	Nigeria
No longer at ease	Achebe	PR9387.9. A3 N6 1994	PL8014.N6 A3 N6 1994	Nigeria
Things Fall Apart	Achebe	PR9387.9.A3 1986	PL8014.N6 A3 T5 1986	Nigeria
The Chinua Achebe encyclopedia		PR9387.9.A3 Z459 2003	PL8014.N6 A3 Z459 2003	Nigeria
Chinua Achebe : a biography	Ezemwa-Ohaeto	PR9387.9.A3 Z66 1997	PL8014.N6 A3 Z46 1997	Nigeria
Home and exile	Achebe	PR9387.9.A3 Z467 2000	PL8014.N6 A3 Z46 2000	Nigeria
Chinua Achebe : a celebration		PR9387.9.A3 Z88 1991	PL8014.N6 A3 Z564 1991	Nigeria
So Long a Letter	Ba, Mariama	PQ3989.2.B23 S513 1981	PL8014.S46 B3 S65 1989	Sengal
Ah, But Your land is Beautiful	Paton	PR9369.3.P37 A73 1983	PL8014.S6 P38 A33 1983	South Africa
Understanding Cry, the Beloved Country : a student casebook…		PR9369.3.P37 C736 2007	PL8014.S6 P38 Z554 2007	South Africa
Nervous conditions : a novel	Dangarembga	PR9390.9.D36 N47 1989	PL8014.Z55 D36 N47 1988	Zimbabwean
Beyond Survival		PL8010.B48 1999		No change needed
Undergraduates Companion to African Writers and their Websites	Conteh-Morgan	PL8010.C63 2005		No change needed
Essays on African Writing		PL8010.E85 1993 (v.2)		No change needed

Book Reviews

Elyssa M. Gould

Rethinking Technical Services: New Frameworks, New Skill Sets, New Tools, New Roles. Edited by Bradford Lee Eden. Lanham: Rowman & Littlefield, 2016.130 p. $45.00 paperback (ISBN 978-1-4422-5789-4). Creating the 21st-Century Academic Library Series, Volume 6.

This book, the sixth volume in a series on the twenty-first century academic library, joins other books on the present and future of technical services, including *Rethinking Library Technical Services* (2015) and the much older *Technical Services: Today and Tomorrow* (1998); it presents a mixture of theory and praxis and includes surveys of the state of the profession, case studies, and think pieces. Unlike the other two volumes mentioned, it does not have chapters specifically devoted to acquisitions or to electronic resources management; metadata creation is the only division discussed in detail. However, it does include two sections aimed at technical services managers, a demographic not often treated separately.

Several chapters offer an overview of the present of technical services: Christine Korytnyk Dulaney focuses on technical services in the networked environment; Joelen Pastva, Gwen Gregory, and Violet Fox give a picture of the "new normal" in technical services and strategies for coping; and Barry Gray and Anthony McMullen call for drastic changes in priorities. The authors offer different solutions to the problems they raise. Dulaney advocates using a model developed by management consultant Peter Senge to reframe change as an opportunity for constant learning, while Pastva, Gregory, and Fox suggest following the lead of the archival profession and taking a "more product, less process" approach (38). Gray and McMullen recommend an approach that focuses heavily on the management of electronic resources and the curation of rare print materials. The authors agree on multiple points: the importance of what Dulaney calls the "network" (1) and Pastva, Gregory, and Fox call the "collective intelligence" (31), that is, the increased connection and cooperation in library development and access; the advantages of abandoning traditional categories (acquisitions, cataloging, serials, systems) in favor of a less structured, less hierarchical approach; and the importance of using metadata to reveal what Gray and McMullen dub "hidden collections" (68). They do, however, differ on some points. Dulaney and Pastva, Gregory, and Fox see Linked Data as a new realm of possibility for access and call for a new approach to access points, while McMullen and Gray describe a technical services department in which subject access points are no longer assigned as part of original cataloging and authority control processes are outsourced to focus more staff time on the management of electronic resources.

New skill sets are required to perform metadata functions effectively now and in the future. Jennifer Eustis discusses how digital projects change traditional job descriptions and responsibilities for cataloging staff, using examples of three initiatives at her institution. In her view, as metadata becomes more and more an essential step in nonlibrary institutional and scholarly workflows, catalogers will serve a reference and instruction function, acting as trainer, advisors, and consultants. Eustis acknowledges that this is a major transition for members of a traditionally invisible profession and notes that two processes in particular are key: changing the image of the cataloging and metadata services unit, both in the minds of the users and in the minds of the staff themselves, and making the move to users' environments, both physically and intellectually, so that services can be customized to individual needs.

Roman Panchyshyn continues the discussion about necessary skills for technical services workers, but focuses more on the specific knowledge professional and paraprofessional catalogers will require. In addition to Resource: Description and Access (RDA) and other content standards required for bibliographic description and authority work, Panchyshyn recommends that all metadata staff be familiar with batch processes for metadata and tools for batch editing; that they have knowledge of at least one scripting language, such as RegEx or PHP; and that they have enough comfort with Extended Markup Language (XML) and the Resource Description Framework (RDF) to be prepared for the advent of the Bibliographic Framework Initiative (BIBFRAME). Panchyshyn points out that project management skills are increasingly necessary for effective performance of technical services functions, and suggests training in those as well.

Two chapters by managers address the questions of managing a technical services department in more depth. Charles Sicignano encourages technical services managers to embrace change while acknowledging that this can be difficult in academic settings. He offers a "theoretical framework of what technical services will look like as the position of manager continues to become more about working with administrators inside and outside the library" (51). Like Panchyshyn, he recommends using the language and techniques of project management to describe the responsibilities of a technical services manager; he also suggests that technical

services managers find leadership opportunities in consortial partnerships and negotiations and in assessment initiatives. Hildur Hanna describes another kind of leadership opportunity; a mass resignation of staff at the John F. Schaefer Law Library meant that a host of new hires with new skills had to be made. Hanna and the new head of technical services, K. Brooke Moynihan, describe the processes that led to some unorthodox hiring decisions and the results thereof.

Two think pieces about discovery in the twenty-first century round out the collection. Karen A. Nuckolls surveys the current state of the Library of Congress Subject Headings (LCSH), Faceted Application of Subject Terminology (FAST), and legal terms in the Library of Congress Genre/Form Terms (LCGFT). She discusses the evolution of the LCSH over the years on subject headings having to do with people, especially African Americans and people with disabilities, and notes some headings she considers still problematic (e.g., *Older people* rather than *Senior citizens* and *Mental retardation* rather than *Intellectual disabilities*). Nuckolls makes valid points about the need to be mindful about vocabularies in library and nonlibrary contexts (she cites voice assistants and social media sites as examples); however, her attempts at humor are ill-advised. Amanda Melcher discusses discovery layers as tools, both as they should ideally work and as they often work in practice; while she acknowledges that the implementation of a discovery tool can be difficult and states that "after having discovery for three years [at her library], there continue to be display problems, dead links, and configuration issues nearly every week" (26), Melcher still argues for the potential of the discovery layer. Her article focuses more on the effects on information-literacy instruction than on technical services processes.

The repeated evocations of a "brave new world" in the titles of the articles may seem alarming, but the authors have more of Shakespeare's Miranda's wonder than Huxley's irony; the pieces in this collection portray twenty-first century technical services as a land of opportunity rather than a dystopia. There are some lacunae: while there are frequent references to BIBFRAME and Linked Data, there are no articles specifically articulating a vision of that environment; and there are no articles that focus on collaborations with public services, systems, or archives and special collections departments, although all are glancingly mentioned. Those interested in the evolution of metadata creation and creators should find this book useful.—*Catherine Oliver (coliver@nmu.edu), Northern Michigan University, Marquette, Michigan*

Academic E-Books: Publishers, Librarians, and Users. Eds. Suzanne M. Ward, Robert S. Freeman, and Judith M. Nixon. West Lafayette, IN: Purdue University Press, 2016. 360 p. $29.95 softcover (ISBN 978-1-55753-727-0)

In their introduction to *Academic E-Books: Publishers, Librarians and Users*, editors Ward, Freeman and Nixon list the potential promises of e-books to libraries: they cannot be lost or damaged, they do not require staffing to check-in and out and shelf, they take up no space, they can be purchased on demand, they can be checked out by multiple users, and they are often searchable. These promises are particularly enticing when so much scholarship is done through online journal databases and when library service models are shifting from a focus on physical collections to an emphasis on creating spaces for collaborative scholarship. However, e-books also present challenges that the editors summarize in two statements: "1) lack of sufficient content and 2) users' stated preference for print books in many cases" (2). The *Academic E-Books* contributors flesh out these issues through specific examples from the publishing industry, libraries, user experience and case studies. They also demonstrate how libraries are combatting challenges to successfully integrate, and in some cases replace print with, e-book collections.

In "An Industry Perspective: Publishing in the Digital Age," Vassallo summarizes the publishing industry as it stood in the United States in 2013. Physical book sales accounted for the majority of publishers' revenue. However, e-books showed promise in the consumer publishing sector as recreational readers shifted their purchases of mass-market paperbacks to the electronic format. In scholarly publishing, where the major market is academic libraries, e-book sales are complicated. Libraries must sift through issues such as perpetual versus subscription access, consortial purchasing, and demand driven acquisitions, which slows e-book sales. In many cases publishers' e-book offerings are inadequate to meet libraries collections needs. Sanfilippo explains the lack of adequate content from the university press perspective in "Production, Marketing, and Legal Challenges: The University Press Perspective on E-Books in Libraries." The tools traditionally used to produce print books do not translate to e-books, and the labor involved in digital file creation and submission adds costs. Digitizing back list titles—works that are crucial to the sustainability of university presses—is further complicated by securing permissions, copyright and author contracts.

E-book aggregators have somewhat simplified e-book integration into libraries. They offer flexibility through pricing tiers and choice between perpetual access and annual subscription. Many libraries adopted Patron Driven Acquisitions (PDA) or Demand Driven Acquisitions (DDA) programs. Predictably, unmediated patron use of titles fuels librarians' fears of uncontrolled spending. As demonstrated by the University of Iowa in "Patron-Driven Acquisitions: Assessing and Sustaining a Long-Term PDA E-Book Program," successful programs manage costs by constantly evaluating the titles available and removing titles that are unused. Short-term loan models also moderate spending as loan fees are set at a percentage of the title's list price. PDA

aligns with contemporary attitudes toward collection development that acknowledge patrons are the best at choosing what titles other patrons will use, not librarians. In other words, e-books that are used enough to reach auto-purchase are usually titles that will receive additional use and justify their cost.

Traditionally libraries have been supplemented gaps in their collections and met patron demands through interlibrary loan (ILL). Though e-books are not easily adaptable to this service, pioneering libraries are developing creative solutions to ILL's limitations. Orbis Cascade Alliance, written about by Carlisle Fountain in "E-Books Across the Consortium: Reflections and Lessons From a Three-Year DDA Experiment at the Orbis Cascade Alliance," uses a DDA program for e-books with the stated goal of increasing consortial ownership of titles deemed useful by patrons as demonstrated by high use. Members contribute to a central fund, and the auto-purchase trigger is easily adjusted to accommodate different budgets. Occam's Reader, a collaborative project described by Litsey et al. in "The Simplest Explanation: Occam's Reader and the Future of Interlibrary Loan and E-Books," enables the lending of e-book content through protected file sharing and is easily integrated into the standard ILL workflow.

From the user perspective, there is general consensus around the value of e-books: they are great for searching, discovery and quick reference but are less ideal for sustained scholarly use. As Clark states in "A Social Scientist Uses E-Books for Research and in the Classroom," many people think print books are just a better "cognitive fit" (202). Technical issues and inconsistency across platforms endemic to e-books frustrate users that expect them to have the same conveniences as electronic journal articles. "Some of the drawbacks are practical issues that are likely to diminish as e-book technology adapts to suit the humans who use it. For now, humans must adapt to e-books to use them effectively" (195). A general lack of awareness of e-books is an additional barrier to use, and here the onus falls on librarians to promote e-book collections and ensure that they are properly integrated into discovery systems. Thomas and Chilton emphasize this point in "Library E-Book Platforms Are Broken: Let's Fix Them," writing "when libraries purchase content encased in poor interfaces and behind artificial barriers, it is a form of censorship" (261).

The case studies concluding the anthology demonstrate that in most cases, a shift to digital-only acquisitions will not fully satisfy user preferences and needs. Through "access acquisition," Harvard's Widener Library often acquires the same material in both print and electronic formats. In "Of Euripeded and E-Books: The Digital Future and Our Hybrid Present," Uziel, Esser, and Connor Sullivan write "print and e-book preferences can overlap depending on a user's research activities, and how e-book collections supplement rather than supplant print ones. This is particularly important for traveling scholars and institutions with research centers or libraries elsewhere" (284). Additionally, publishers need to make a larger percentage of scholarly titles available as e-books for an all-electronic acquisition program to ever work. This is imperative with the rise in distance education programs. In "E-Books and a Distance Education Program: A Library's Failure Rate in Supplying Course Readings for One Program," Nixon shows that her library was unable to meet students demand for course readings with their electronic holding because more than half the books needed were not even available for purchase in the digital format.

Academic E-Books is a solid introduction to the history and evolution of e-books in academic libraries. It is well organized and the different perspectives of publishers, libraries and users give a holistic picture of the challenges and opportunities e-books present. Though the anthology was published in 2016, many of the papers are older and describe technologies that have likely evolved to be more responsive. Regardless, practitioners will relate to many of the contributors' findings and will be inspired by their questioning and creative problem-solving.—*Anna Pinks (anna.pinks@greensboro.edu), Greensboro College, Greensboro, North Carolina*

Project Management for Information Professionals. Margot Note. Waltham, MA: Chandos Publishing, 2016. 212p. $78.95 print book (ISBN 978-0-08-100127-1); $78.95 e-book (ISBN 978-0-08-100133-2).

In a rapidly changing information environment, where resources are also scarce, increasingly memory institutions meet strategic goals by means of project-based work. *Project Management for Information Professionals* reaches out to accidental project managers working in libraries, archives, or museums (LAMs)—people who are asked to lead projects without formal project management training due to their competence, experience, and ability to win others over to their cause. For those tasked with leading critical projects, such as installation of compact shelving or a large-scale collaborative digitization effort, Note distills project management techniques more common in the for-profit industry but just as relevant in a cultural heritage context into a pithy handbook accessible to information professionals.

Throughout the book, Note emphasizes that project management techniques are not "burdensome techniques to be performed because some projects require it," but instead "a way of thinking, communicating, and executing" (xx). She situates principles of project management within actions that are roughly sequential, from inception through implementation to conclusion. Chapters are organized by skills that are demanded of project managers throughout the life of a project: selection and prioritization, leading and

managing teams, planning and scheduling, budgeting and performance, and communication and review. As the organization of chapters suggests, in addition to technical skills and a modicum of subject expertise, project managers possess considerable soft skills. In her conclusion, Note observes with characteristic concision that "project managers bring chaos to order and blurred vision to clear reality." (167)

A book whose primary goals are summary and translation of project management methodologies from industry to memory institutions, *Project Management for Information Professionals* squarely achieves its objectives. Terms often expressed as acronyms in the business world (IRR, SMART, MoSCoW) are spelled out literally and conceptually (internal rate of return; specific, measurable, accurate, realistic, and timebound; must, should, could, will not). A thorough glossary also helps readers to grasp and retain unfamiliar terminology.

Clearly delineated contrasts also aid the work of translating project management into a cultural heritage context. Whereas in the for-profit world, project managers are known by that title, in LAMs many people lead projects that draw on their expertise but take place outside of their daily responsibilities—for example, a director of technical services leading a task force to identify and implement a new ILS. Another common difference between project management in the business world and in the cultural heritage world is a project's motivation: rather than generating revenue, the purpose of project in a library, archive, or museum is more likely to be improving services or reducing costs, outcomes that require different metrics to demonstrate. Note deftly draws these distinctions while underscoring the applicability of project management techniques to industry and cultural heritage, large and small projects alike.

The book does not necessitate linear reading to derive value from the reading experience. Each chapter is preceded by apt epigrams ranging from lyric to comic. For example, Chapter 6 on "Communication and Documentation," opens with the observations that "much unhappiness has come into the world becomes of bewilderment and things left unsaid" (Dostoevsky) and that "The single biggest problem in communication is the illusion that it has taken place" (George Bernard Shaw). These delightful epigrams invite readers to follow their curiosity, finding a starting place wherever their attention is captured. By the same token, trenchant figures that summarize crucial concepts, and appendixes that articulate key questions and provide document templates, facilitate quick reference in the midst of a project.

Throughout, project management concepts or techniques are often illustrated using a LAM example. For instance, Note points to installing shelving before shifting collections as an example of a mandatory dependency (81). However, these illustrations tend to be parenthetical.

More vivid, in-depth explorations of project management principles at work in LAM contexts would bolster her case that individuals and organizations ought to adopt a project management approach. For example, in addition to enumerating elicitation techniques, Section 2.4 on "Gathering Requirements" might also have provided sample responses to structured stakeholder interviews, drawn from Note's extensive experience, and paired these responses with a discussion of how what was elicited reframed project goals and better positioned the project to succeed. Without impact stories punctuating deep summary of project management methodologies, even the crispest prose becomes difficult to penetrate, except to search for the answer to a specific question.

Though dry on occasion, as a whole *Project Management for Information Professionals* is clearly envisioned and executed as a handbook for librarians, archivists, and curators who find themselves leading project-based work. By empowering individual information professionals to manage projects more effectively, this work may play a part in shifting the organizational culture of memory institutions: from taking a defensive stance within an information environment in constant flux, to embracing project-based work as a way for libraries, archives, and museums to learn and grow and vitally engage the communities they serve.

Note is the consummate project manager, and it shows in her handbook of project management for information professionals. This book knows what it is, and what it is not; it remains true to its project scope. It achieves its objectives, and delivers what it promises to its readers. Novice project managers will keep it close at hand; more experienced project managers will consult it when they feel themselves becoming stuck and will look back at past projects with a sharper eye for what they might do better.—*Chelcie Juliet Rowell (rowellcj@wfu.edu), Wake Forest University, Winston-Salem, North Carolina*

Maximizing Electronic Resources Management in Libraries: Applying Business Process Management. By Lenore A. England and Stephen D. Miller. Amsterdam: Chandos, 2016. 139p. $68.00 softcover (ISBN 978-1-84334-747-7); $68.00 e-book (ISBN 978-1-78063-428-9).

One of the themes emphasized throughout *Maximizing Electronic Resources Management in Libraries* is that Electronic Resource Management (ERM) is a form of knowledge work that is complex, patchworked and often does not lend itself to routine. Expertise in the subject is gained over time and through the experience of grappling with different issues and solving a variety of problems. The other theme is effective organization of electronic resources is critical to the success of libraries and to the institutions of which they are a part (1, 9).

These concepts may not seem like breaking news, but it is nice to see them in print—clear and unambiguous. More

importantly, the concepts are easy to remember the next time one encounters a person who believes that everything on the Internet is free, credible, and easy to find. Or an administrator who does not understand why library costs are ever increasing when there is so much free stuff available for the taking, no work needed. Maybe in reply to the question, "What does an E-Resources Librarian do?" this reviewer will channel the words of England and Miller. Both have established records of scholarship and creative leadership in ERM and related subjects. England received the 2012 Association of Library Collections and Technical Services/ Collection Management Section Coutts Award for Innovation in ERM.

The authors describe their initial situation as that of a small staff struggling with an overload of work at the University of Maryland University College (UMUC) and with a need to manage it before it became overwhelming. Determined to develop a system focused on users' needs, they began to distill down the best of the proven management theories to use with ERM work, and ultimately chose to apply business process management (BPM) principles. The authors both come from a business management background and each holds an MBA degree and an MS in Library Science. This background is likely what influenced them to consider applying management theories to ERM in libraries and to then offer that idea to libraries of all types and sizes.

The book begins with a brief overview of ERM and what it does. The discussion of ERM as a form of knowledge work that is vital to the infrastructure of libraries and institutions is expanded upon. Care is taken to not only provide an operational point of view, but also the perspective of library users with continuously evolving expectations. However, the focus of the book is not on the various ERM systems that are available and are likely to be set up differently for each library, but on the organizational tools that BPM can offer. The idea is to think outside of ERM systems to provide what the user wants: simple access to needed information sources in a way that is familiar and functional.

The authors explain that workflow analysis is a critical component of BPM. England and Miller emphasize that organization is critical to successful ERM. Within the constantly changing environment for electronic resources, lack of an organized structure may cause staff to replicate work, develop strategies that do not coordinate efficiently and unintentionally create workflow silos that suppress creativity and innovative thinking. Organizational changes will affect areas such as collection development, acquisitions, training needs and technical requirements, so it is important to maintain a wide view when examining workflows and implementing changes (23). In addition to structural analysis and reorganization, mapping ERM personnel, systems, and tools to the organizational structure provides an understanding of where staff and tools are distributed in the workflow process: who is responsible for each functional area and what tools are utilized (24). The text includes graphics that illustrate the distinct components and issues of ERM, as well as a clear example of mapping an ERM organizational structure to related workflows.

The authors then discuss the history and evolution of BPM and the various management theories of the nineteenth and twentieth centuries. At this point the reader might be tempted to skip ahead, but fear not. The review is interesting; traveling from the Efficiency Movement of the late 1800s, stopping off at Henry Ford's system of assembly line Mass Production, and then briefly examining how the contributions of W. Edwards Deming, the Japanese Production System, TQM, Lean Production and Six Sigma led to the development of BPM as a discipline. The authors stress that it is "important to understand the background and development of these systems as they relate to developing and improving the quality of business processes in order to better achieve organizational goals. BPM and improvement is . . . fundamentally intertwined and critical to all each [sic] of these management methods" (42–43). The overview of management theories gives a sense of history and context to the reader and makes it clear that England and Miller have built their "approach to the application of BPM to ERM on the shoulders of the giants of management theories and principles" (7).

Chapter 5 provides an overview of the use of BPM within libraries in general before specifically discussing the application of BPM to ERM. The authors assert that although examples of applying BPM to other areas of library work exist, the actual practice of applying BPM to ERM itself has not previously been done. Detailed descriptions and images are provided to explain the stages (define, measure, analyze, improve, and control) of the BPM process. England and Miller formulate a plan to extend the management of ERM processes across the university organization to other departments that purchase electronic resources. They describe this as "creating a consortium within the university" (82) and theorize that coordinating with other departments will result in a reduction of costs in terms of pricing and maintenance while leveraging the library's expanded knowledge of license agreements and procurement processes and procedures.

Attention is given to the concepts of systems thinking, process mapping, and their implications for ERM. Understanding and accounting for the complex and inter-related processes that constitute ERM, and mapping out each workflow into its constituent parts leads to the ability to visualize the components and the relationships between them. This in turn leads to the ability to further envisage and creatively design future desired outcomes (i.e., greater efficiencies, effectiveness, and flexibility in the face of continuous change). Many techniques for capturing workflows are

presented and different types of charts and documentation are shown as examples.

The final chapters provide additional BPM approaches that can be applied to ERM and that offer ERM librarians different and innovative ways to think about their work and the processes and systems that they manage. These areas are considered to have potential for future exploration within the field of ERM. Other aspects were discussed and analyzed, such as the financial benefits of applying BPM to ERM, ways in which BPM ideas can be applied to specific ERM processes, and the future of BPM to ERM.

It is obvious that careful consideration was given to providing ERM librarians with a practical skillset and a clear way to apply BPM principles to ERM in a variety of libraries. The book is organized in a methodical manner that allows the reader to move easily from one concept to the next. Each chapter begins with an abstract and keywords, is subdivided into well-defined sections, and ends with extensive references. Regretfully, the book appears to have not received careful copy-editing. Errors and typos occur frequently enough to disrupt the flow of reading and sometimes obscure the authors' intended meaning. While this does not detract from the value of the content, it does affect readability. Despite this drawback, *Maximizing Electronic Resources Management in Libraries* offers solid ideas for ERM librarians who are looking for a way to organize ERM systems and processes in any size or type of library.—*Marie Seymour-Green (seymour@udel.edu), University of Delaware, Newark, Delaware*

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