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Association for Library Collections and Technical Services Annual Report 2014–15
Mary Page

Enhancing OPAC Records
M. Pilar Alonso Lifante and Francisco Javier Molero Madrid

"The Commitment Problem"
Robert M. Cleary

E-book Use and Value in the Humanities
Tina E. Chrzastowski and Lynn N. Wiley

What Makes an Effective Cataloging Course?
Karen Snow and Gretchen L. Hoffman

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For current news and reports on ALCTS activities, see the ALCTS News at www.ala.org/alctsnews.

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Cover image: "Benny Carter, 1999. His saxophone is now part of the historic instrument collection at the Institute of Jazz Studies, Rutgers University–Newark." Photograph by Ed Berger.

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Editorial

Mary Beth Weber

I recently returned from the ALA Annual Conference in San Francisco. My conference experience was a mix of informative programs that inspired me, required committee meetings (both as *LRTS* editor and as the head of Central Technical Services at Rutgers) where I heard important developments in technical services, and events such as "ALCTS 101" and the ALCTS awards ceremony. Attending a professional conference can be overwhelming, and it seems that all the programs of interest to me are at the same time as my main event, the *LRTS* editorial board meeting. Fortunately, the *ALCTS News* includes program reports plus reports from ALCTS committees and interest groups so that I can read about what I have missed. Being actively engaged in ALCTS is an important aspect of having a successful conference experience. My experience is more meaningful when I interact with others, share my expertise, and have immediate access to my professional colleagues.

My conference included organizing and moderating a well-attended program titled "Is Technical Services Dead?: Designing Our Future." I was joined by a panel of experts (Amy K. Weiss, Julie Renee Moore, Elyssa Gould, and Erin Boyd) who discussed various issues related to the future of technical services. It was my first experience planning and organizing a program. I owe a debt of gratitude to the Program Committee and my panelists. Their hard work concluded in a successful program that I hope benefited those who made the trip to Moscone Convention Center that Sunday morning.

The ALA Annual Conference also marks changes in composition of the *LRTS* editorial board; some members conclude their terms and are recognized for their service, while new members join and are welcomed. I thank the following outgoing board members for their excellent reviewing skills and thoughtful input: Barry Brown, David Banush, Steven Carrico, Steven Knowlton, Anne Sleeman, and Lori Terrill. I also welcome Jennifer Bazeley, Sylvia Hall-Ellis, Carol Ou, Chelcie Rowell, and Mary Van Ulen, and look forward to working with them. Four board members have been reappointed for a second term and will serve until 2017: Karen E. K. Brown, Lisa German, Ginger Williams, and Oksana Zavalina. Everett Allgood, David Banush, Christopher Cronin, Nadine Ellero, Forrest Link, Brian Quinn, Lori Robare, Michele Seikel, and Sherry Vellucci are continuing members. I am delighted to have the opportunity for continued collaboration with the reappointed and continuing members. Many of the papers submitted to *LRTS* have resulted from solicitations by board members.

A portion of the *LRTS* editorial board meetings are spent discussing ideas for papers and papers that are in progress. While *LRTS* covers traditional technical services topics such as acquisitions, collection management, continuing resources, preservation, and resource description, I also welcome papers on new and emerging topics such as perpetual access, linked data, or research data. A full list of topics, courtesy of the ALCTS Publications Committee, is available at www.ala.org/alcts/resources/info/topics. Consider submitting a paper to *LRTS* or one of the other ALCTS publications, or consider submitting a proposal for a monograph (Sudden Selector Guides, ALCTS Monographs, or acquisitions or

collections guides). ALCTS has a robust publishing program and a team of editors to guide you.

In closing, I want to highlight the contents of this issue of *LRTS*:

- In "Enhancing OPAC Records: Evaluating and Fitting Within Cataloguing Standards a New Proposal of Description Parameters for Historical Astronomical Resources," M. Pilar Alonso Lifante and Francisco Javier Molero Madrid outline deficiencies in some fields and elements of cataloging standards for description of historical astronomical resources, mainly star atlases and catalogs. They review their proposal of astronomical parameters for a better description and propose an approach for accommodating these parameters in the current criteria of MARC 21, the International Standard Bibliographic Description, and RDA.
- Robert M. Cleary addresses the difficulties libraries face when spending their collections budget efficiently in "'The Commitment Problem': Spending to Zero to Maximize the Efficiency of the Collections Budget." The diversity of a typical budget includes one-time and continuing funds that are used for resources that are both regular and irregular, further complicating the situation.
- Tina E. Chrzastowski and Lynn N. Wiley discuss a research project to study e-book adoption in the humanities at the University of Illinois at Urbana-Champaign in "E-book Use and Value in the Humanities: Scholars' Practices and Expectations." The study includes data collected from a demand-driven acquisition program in humanities disciplines that used short-term loans purchased via an e-book aggregator.
- In "What Makes an Effective Cataloging Course?: A Study of the Factors that Promote Learning," Karen Snow and Gretchen L. Hoffman present the results of a survey of library and information science master's degree holders who have taken beginning cataloging courses. Their results suggest that cataloging practice, instructor effectiveness, and cataloging within a real-world context all contribute to effective learning.

Association for Library Collections and Technical Services Annual Report 2014–15

Mary Page, 2014–15 ALCTS President

The Association for Library Collections and Technical Services, a division of the American Library Association, is the premier organization for professionals in collection development, cataloging and metadata, continuing resources, and preservation. Comprising nearly 3,000 members from the United States and more than forty countries, we lead the development of principles, standards, and best practices for creating, collecting, organizing, delivering, and preserving information resources in all formats.

Accomplishments

Perhaps the most significant event this year was the retirement of Charles Wilt, our beloved executive director, after a seventeen-year career at ALA. It was a bittersweet moment for ALCTS. However, we were very fortunate to hire Keri Cascio as our new executive director. Keri brings a wealth of experience in many different library settings—research, public, consortial—and she has long been active in the association. In fact, she was ALCTS' first Emerging Leader back in 2007, which gives her career thus far a lovely symmetry.

Led by the Planning Committee under chair Meg Mering, we developed a new strategic plan for ALCTS, which was informed by ALA's Strategic Directions. The three-year plan was approved in principle at the 2015 ALA Annual Conference in San Francisco. The new plan takes a high-level perspective and does not delve into the operational aspects of our work. Rather, it asks that all activities focus on a few overarching goals: generate awareness of ALCTS and participation in ALCTS activities, improve member recruitment and retention, and achieve financial stability. Committees and Sections will be expected to address how their work addresses these issues in their reports.

The Program Review Task Force, led by Betsy Simpson, was charged to examine ALCTS programming and make recommendations for strategic directions, structural and procedural improvements, and new approaches to meet member needs. The task force submitted its final report to the ALCTS board, and we approved most of its recommendations at the ALA Annual Conference. A key recommendation is to establish a Program Coordinating Group, which will be composed of the leaders (or designees) of the many groups involved in ALCTS

programming (e.g., Continuing Education and Program Committees, the interest group coordinator, etc.).

The Fundamentals of Cataloging web course was brought to fruition under the leadership of Vicki Sipe, and it is already a great success. Five sessions of the six-week online course have been scheduled in 2015, and four of those have sold out.

ALCTS 101, held each year at the ALA Annual Conference, is designed to inform new and potential ALCTS members about possible ways to become involved. This past spring, we held a virtual ALCTS 101 program that attracted more than 230 registrants. At the ALA Annual Conference, the in-person ALCTS 101 session drew more than 70 participants, and we inaugurated the first-ever ALCTS 101 After-Party. The Membership Committee and the ALCTS New Member Interest Group (ANMIG) reinvigorated communication with new and renewing members and spearheaded the launch of ALCTSCentral, a general electronic discussion list for all members.

Midwinter Symposium

ALCTS' Midwinter Symposium, *Collection Development Strategies in an Evolving Marketplace*, featured Lorcan Dempsey and Constance Malpas of OCLC Research. The well-received symposium attracted more than fifty-five attendees. Warm thanks to the President's Program Planning Committee led by chair Marilyn Geller for conceiving the program. Thanks as well to Michael Levine-Clark, who organized and hosted the daylong session and made this stellar event happen.

Fundraising

Under the leadership of Lenore England, the Fundraising Committee has worked hard to develop a culture of philanthropy within ALCTS, and it surpassed its goal of raising $20,000 for the year.

Publishing

We appointed a new ALCTS monographs editor, Susan E. Thomas, to begin her term in June 2015. Susan brings years of experience in writing and project management to this newly revised position, and we are eager to reinvigorate our publishing program. ALCTS Publishing released the *Guide to Ethics in Acquisitions* by Wyoma vanDuinkerken, Wendi Arant Kaspar, and Jeanne Harrell in early 2015. *The Critical Component: Standards in the Information Exchange Environment*, edited by Todd A. Carpenter, was published in June 2015. *Library Resources & Technical Services*, ALCTS' peer reviewed research journal, went online-only with the January 2015 issue. The AcqNet electronic discussion list is in the process of transferring to the Acquisitions Section in consideration of discussion list sustainability. CollDev, managed by an individual who retired this year, is in the process of being transferred to the Collection Management Section.

Resolutions

The ALCTS board passed resolutions to honor the memory of some of our most dedicated members. Julia Blixrud, Ruth C. Carter, Lois Mai Chan, Cynthia D. Clark, Judith Hopkins, and Mary Woodley were among the best of us. They are sadly missed.

In Closing . . .

I want to acknowledge ALCTS' wonderful Executive Committee: Past-President Genevieve Owens, President-Elect Norm Medeiros, and Councilor Andy Hart—dear friends and colleagues all. While I struggled through the formalities of parliamentary procedure or attempted to lead a difficult board discussion, they provided support, counsel, and good cheer. I was fortunate to have retired Executive Director Charles Wilt by my side during the first half of my presidency, and equally fortunate to have Keri Cascio with me for the home stretch. Both ALCTS executive directors have been a joy to work with, and I have learned so much about leadership by observing them. The ALCTS office staff, Christine McConnell and Julie Reese, were unfailingly helpful and reassuring while I learned the ropes. ALCTS is lucky to have them. The entire ALCTS board worked hard this year, and to a person, they contributed substantively to the work of the association. I am honored to know you and to have worked with you. I will end with a shout-out to the amazing ALCTS volunteers, who stand for office, donate their time and energy to sections and committees, and take on tasks large and small for the good of ALCTS and the profession. Thank you all.

Enhancing OPAC Records

Evaluating and Fitting Within Cataloguing Standards a New Proposal of Description Parameters for Historical Astronomical Resources

M. Pilar Alonso Lifante and Francisco Javier Molero Madrid

Enhancing content description of specialized resources, particularly astronomical resources, is a matter that is still unresolved in library and information science. In this paper, the authors outline deficiencies in some fields and elements of cataloging standards for description of historical astronomical resources, mainly star atlases and catalogs. Furthermore, they review their recent proposal of astronomical parameters for a better description and propose an approach for accommodating these parameters in the current criteria of MARC 21, the International Standard Bibliographic Description, and Resource Description and Access. Fourteen new parameters are considered, and recommendations are provided to standards developers for the addition of elements to accommodate attributes of celestial cartographic resources. This would improve bibliographic records for such resources in astronomical libraries' OPACs, which will have a beneficial effect on information retrieval.

M. Pilar Alonso Lifante is a doctor of astronomical information retrieval, and **Francisco Javier Molero Madrid** is a doctor of astrodynamics, Department of Applied Mathematics Faculty of Computer Science, University of Murcia in Murcia, Spain.

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Our research was accomplished thanks to funding from the Fundación Séneca (Science and Technology Regional Agency of Murcia, Spain). The authors are grateful to the *Library Resources and Technical Services* reviewers and the editor for their very helpful observations and feedback. We are also especially grateful to Mrs. Elena Escolano Rodríguez (head, Standardization Unit of the Publications and Cultural Heritage Subdirectorate-General, Defense Ministry of Spain), Mr. Luis Magallanes Pernas (technical director, Cartographic Archive, Spanish Army Geographic Center) and Dr. Carme Montaner García, (head, Map Library, Institut Cartogràfic de Catalunya, Barcelona, Spain) for their kind dedication in answering all our questions.

Information retrieval continues to be one the most challenging topics in the field of information and documentation. Many recent publications bear witness to this fact, including monographs by Baeza-Yates and Ribeiro-Neto, Raieli, or Sallaberry, and conference proceedings such as the 32nd European Conference on Information Retrieval Research in 2010 or the 7th Information Retrieval Facility Conference in 2014.[1] This challenge is compounded when the volume of information to be managed is very large and specialized, as is the case for astronomical information.

This information may be divided into two groups according to the physical medium. There is computerized data originating from modern electronic devices (telescopes, CCD cameras, etc.) that is stored in computer-accessible databases. There is also a huge amount of information stored in noncomputerized formats (photographic plates, printed star atlases and catalogs, astrophotography images) that are preserved in astronomical libraries and archives worldwide. The following sections of this paper are devoted to management of the noncomputerized information, in particular, printed star atlases and catalogs.

The Importance of the Astronomical Resources

Astronomical resources have played a key role throughout the history of science. Starting with the latest milestones, an example was the discovery of the Neptune's fourteenth moon, thanks to the analysis of "more than 150 archival Neptune photographs taken by Hubble from 2004 to 2009."[2] Another example relates to the impact probability on Earth of an asteroid discovered in 2004 (known as Apophis). With the help of some unpublished sky images, scientists could obtain the necessary data to better estimate the asteroid's orbit and rule out a higher impact probability at the next encounters in 2029 and 2036, as pointed out by Giorgini et al.[3]

Among older printed resources, star charts and star catalogs stand out for the following reasons. A star chart is a diagrammatic representation of the positions of the stars up to a specific magnitude from the whole or a bounded area of the celestial sphere (see figure 1). These charts have often been compiled in big atlases. The first star charts were documents where people could observe the night sky plus the path followed by planets and the Moon during the year. In the seventeenth century, navigation had become one of the most important reasons for printing celestial charts. By this time, as Perryman states, the Royal Greenwich Observatory had been founded in England "with the purpose of compiling detailed star maps for navigational purposes."[4] There was another important scientific reason behind the study of the heavens: to measure time to know the longitude coordinate when navigating, as noted by Whitfield and Sobel.[5] Currently, historical celestial cartographic resources are still used for research. In particular, Kilburn notes that "the discovery in the library of Manchester Astronomical Society of a first impression of John Bevis's *Uranographia Britannica* has led to a reappraisal of these early observations. In particular, his observations of Tycho's Star suggest a new interpretation of the supernovae responsible."[6]

According to the *Encyclopaedia Britannica*, a star catalog is a "list of stars, usually according to position and magnitude (brightness) and, in some cases, other properties (e.g., spectral type) as well" (see figure 2).[7] This information is usually shown in tables where rows contain the name of each observed star and columns represent the type of data recorded by the authors about the star. Chabás stated that these tables have "played a fundamental role in the transmission of scientific knowledge."[8] As Perryman shows, comparison of sets of data from different catalogs and different centuries has allowed us to discover previously unknown movements of the Earth and other important facts.[9] In another work, he commented that E. Halley discovered the now well-known "proper motion" of the stars when he compared their positions in contemporary observations (from the eighteenth century) with those that the Greek Hipparchus and others made in the second century CE.[10] More recently, some precision studies by Verbunt and van Gent regarding data from historical star catalogs have been published.[11] One of the goals is to enable new comparisons of this data with the most comprehensive and accurate achieved through new on-board satellite instruments used in recent and future space missions.

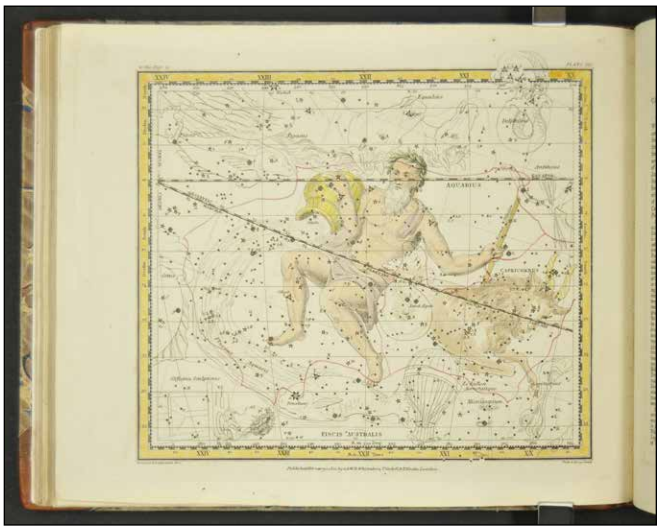
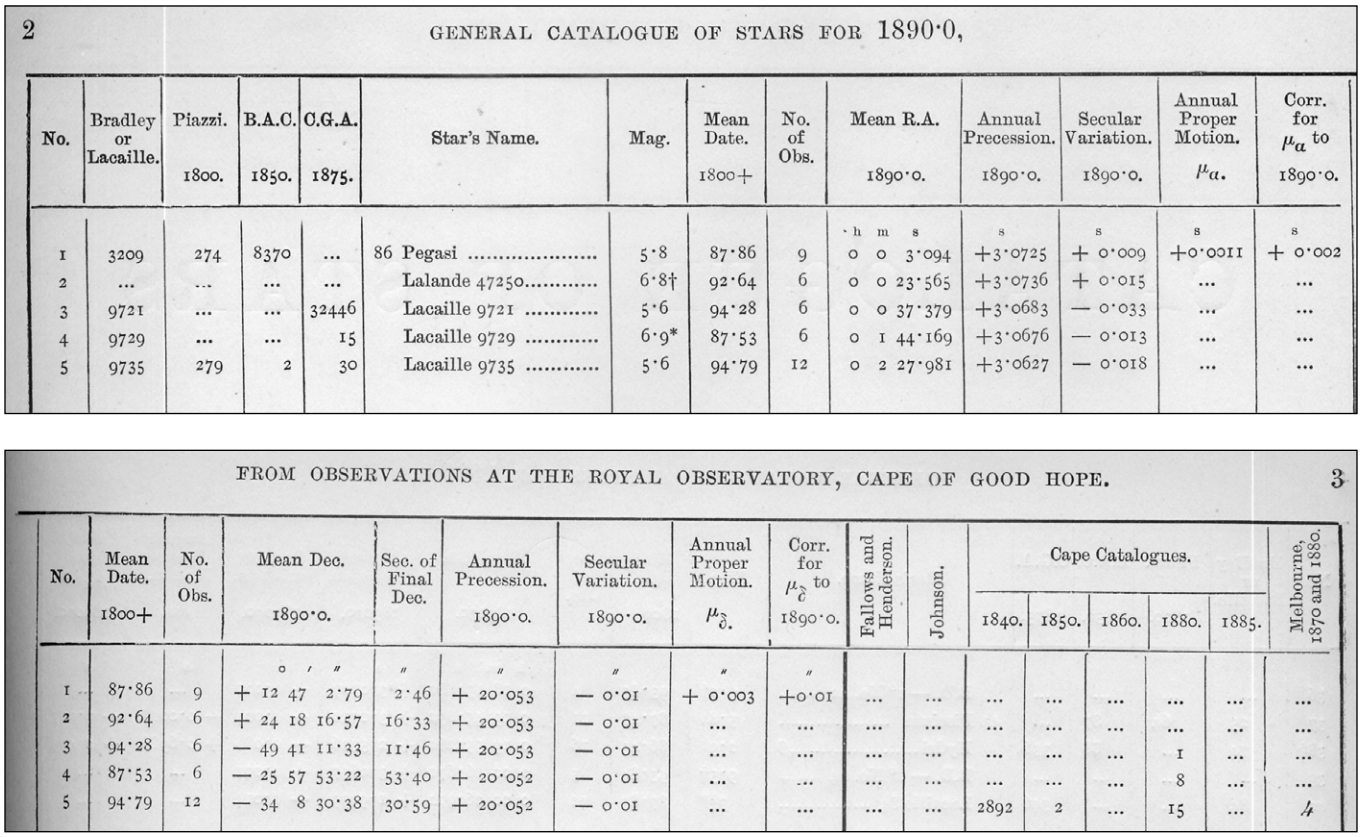


Figure 1. Example of a star chart from the Alexander Jamieson's atlas which highlights Aquarius and Capricornus constellations. Source: Alexander Jamieson, "Plate 21. Capricornus, Aquarius, Globus Aerostaticus, Pisces Austrinus, Microscopium, Corona Australis," in *A Celestial Atlas: Comprising a Systematic Display of the Heavens in a Series of Thirty Maps : Illustrated by Scientific Description of Their Contents and Accompanied by Catalogues of the Stars and Astronomical Exercises* (London: G. & W. B. Whittaker Ave Maria Lane, T. Cadell, Strand, and N. Hailes, Museum Piccadilly, 1822), accessed January 28, 2015, http://lhldigital.lindahall.org/cdm/compoundobject/collection/astro_atlas/id/2097.

Users' Information-Seeking Behavior

Astronomy is witnessing big changes in how users query specialized databases as these incorporate new functionalities focused on user needs and powerful online search engines, as indicated by Tosaka and Weng.[12] Therefore a quick way to identify the user's information-seeking behavior in these databases is to know as much as possible about their search interfaces.

Some examples of these large astronomical databases are SIMBAD (Set of Identifications Measurements and Bibliography for Astronomical Data), operated by the Strasbourg Astronomical Data Center in France and NED (NASA/IPAC Extragalactic Database) operated by the Jet Propulsion Laboratory, the California Institute of Technology, under contract with the National Aeronautics and Space Administration



2 GENERAL CATALOGUE OF STARS FOR 1890·0,

No.	Bradley or Lacaille.	Piazzi. 1800.	B.A.C. 1850.	C.G.A. 1875.	Star's Name.	Mag.	Mean Date. 1800+	No. of Obs.	Mean R.A. 1890·0.	Annual Precession. 1890·0.	Secular Variation. 1890·0.	Annual Proper Motion. μ_α.	Corr. for μ_α to 1890·0.
									h m s	s	s	s	s
1	3209	274	8370	...	86 Pegasi	5·8	87·86	9	0 0 3·094	+3·0725	+ 0·009	+0·0011	+ 0·002
2	...	...	...	...	Lalande 47250.....	6·8†	92·64	6	0 0 23·565	+3·0736	+ 0·015	...	...
3	9721	...	...	32446	Lacaille 9721	5·6	94·28	6	0 0 37·379	+3·0683	— 0·033	...	...
4	9729	...	...	15	Lacaille 9729	6·9*	87·53	6	0 1 44·169	+3·0676	— 0·013	...	...
5	9735	279	2	30	Lacaille 9735	5·6	94·79	12	0 2 27·981	+3·0627	— 0·018	...	...

FROM OBSERVATIONS AT THE ROYAL OBSERVATORY, CAPE OF GOOD HOPE. 3

No.	Mean Date. 1800+	No. of Obs.	Mean Dec. 1890·0.	Sec. of Final Dec.	Annual Precession. 1890·0.	Secular Variation. 1890·0.	Annual Proper Motion. μ_δ.	Corr. for μ_δ to 1890·0.	Fallows and Henderson.	Johnson.	Cape Catalogues. 1840.	1850.	1860.	1880.	1885.	Melbourne, 1870 and 1880.
			° ′ ″	″	″	″	″	″								
1	87·86	9	+ 12 47 2·79	2·46	+ 20·053	— 0·01	+ 0·003	+0·01	...	...	...	...	...	...	...	...
2	92·64	6	+ 24 18 16·57	16·33	+ 20·053	— 0·01	...	...	...	...	...	...	...	...	...	...
3	94·28	6	— 49 41 11·33	11·46	+ 20·053	— 0·01	...	...	...	...	...	...	...	1	...	...
4	87·53	6	— 25 57 53·22	53·40	+ 20·052	— 0·01	...	...	...	...	...	...	...	8	...	...
5	94·79	12	— 34 8 30·38	30·59	+ 20·052	— 0·01	...	...	...	...	2892	2	...	15	...	4

Figure 2. Example of the main table of the Gill's star catalog. Source: David Gill, *A Catalogue of 3007 Stars, for the Equinox 1890.0, from Observations Made at the Royal Observatory, Cape of Good Hope during the Years 1885 to 1895* (London: Darling & Son, 1898). Image from: The Library of the Royal Institute and Observatory of the Spanish Navy.

(NASA).[13] The authors have chosen these because both are linked by the software Google Sky (www.google.com/earth/explore/showcase/sky.html) to provide more information when searching for any celestial body. Google Sky is an integrated tool in Google Earth that allows users to explore the universe through stellar images and to navigate by following the motions of celestial bodies in time and space.

These databases' interfaces provide options for users to find what they need. For instance, it is possible to search an object or a list of objects directly by their coordinates or by distinct criteria ranging from coordinates to speeds, including combinations of all of them through specific search expressions. It is also possible to search by bibliographic references and even to retrieve information that users can add to the database through posts. Therefore users may now be interested not only in retrieving certain information about a celestial object but also, for example, obtaining information about all those objects that, moving at a certain velocity, are within a certain distance from the Earth.

A more direct way to understand user behavior is to ask database administrators to identify the most common types of searches performed. This gives objective information about researchers' needs. For instance, between the months of October 2011 and August 2012, the most performed query in SIMBAD was a combined search by different criteria (54 percent). Regarding NED, searches by parameters related to object names were preferred by users (26 percent). This behavior highlights a key aspect to consider: astronomers and astrophysicists are now more interested in the "data" than in the "document."[14]

Problem Statement

Numerous search options in astronomical databases allow users to retrieve almost any datum from thousands or even millions of resources. However, when these users want to query an astronomical library's OPAC in the same way, a major difficulty arises: the search interfaces do not allow specialized queries by well-known parameters such as coordinates, magnitudes of brightness, proper motions, etc. The problem lies, therefore, in the great difficulty of retrieving

those documents that contain the desired data. Indeed, users will find these documents only if catalogers have indicated the presence of the desired data in the bibliographic record for each document.

Prevailing cataloging standards (MARC 21, ISBD, ISAD(G), RDA, etc.), are general and do not provide the elements needed to create sufficiently specialized content descriptions. This is true despite the fact that bibliographic agencies have made some efforts to incorporate new elements for celestial cartographic resources. For example, in 2006, the Library of Congress (LC) staff who develop MARC 21 incorporated the subfield "Extraterrestrial area" (662 $h), to accommodate the names of celestial bodies other than the Earth.

Settlement Proposal

The authors identified two possible solutions for this problem. The first is Optical Character Recognition (OCR) digitization. This would allow users to search for any string inside the documents and get access to a digital copy of the document without the need to go to where the original item is preserved. This would be an ideal solution for very small archives. However, since there are astronomical libraries with tens of thousands of documents, each one with hundreds of pages, millions of pages would have to be digitized, which would be very expensive. This is one reason why very few atlases and catalogs have been digitized. Additionally, it is recognized that digitization itself is not the complete solution for better information retrieval.[15]

The second solution is to incorporate new descriptive metadata to create more complete and acceptable bibliographic records for the resources. Only in this way will users be able to retrieve those documents containing exactly the desired data. This would represent an essential improvement in the complex description process for highly specialized resources. Consequently, astronomers and astrophysicists will be able to perform searches in the OPAC similar to those executed in their databases.

These two solutions are not mutually exclusive. The ideal situation would be to describe resources using richer metadata and to scan them later. In addition, if technology such as linked data is used to declare metadata as part of an ontology, descriptions could be enriched to offer the opportunity to mark data within the digitized document. Marking and labeling the information within the document with the appropriate metadata will increase retrieval and improve semantic linkage with other related information, not only by humans but also by other agents.

There is another important consideration. As noted below, since there is information that cannot be recorded in the existing descriptive fields or elements of the prevailing bibliographic standards, it can only be recorded in note fields. Griffis and Ford pointed out in 2009 that

> these fields could be utilized for specific terms relating to database content not adequately covered by the Library of Congress Subject Headings (LCSH). Subject liaisons have specialized knowledge of which databases work best for unique content areas, class assignments, and information needs. This user-centric knowledge can be used to enhance database discovery if liaisons were to provide catalogers with information and descriptors to add to the record.[16]

However, if the OPAC interface is not designed to search for information in note fields, it will never emulate the functionalities of the specialized databases, and the cataloging effort will be fruitless. This situation unfortunately happens often, hence we favor creating new fields and elements to provide new technical information that would ensure higher rates of information retrieval. A solution might be to use fields such as the MARC 653, Index Term-Uncontrolled, which is indexed by default in most OPACs. However, the information we propose to record is more complex than simple terms and names, shown as examples for the MARC field 653 in the MARC 21 documentation.

Literature Review

Cataloging cartographic materials has been a topic in the literature for decades (see the 1982 monograph *Cartographic Materials: A Manual of Interpretation for AACR2* and its modern revision 2004).[17] However, as Gardner notes, "very few articles [have] addressed the unique concerns of cataloging and classification in public and special libraries."[18] The difficulties that arise from organizing and describing cartographic materials have been deeply considered by well-known authors such as Ehrenberg or Corsaro, and more recently by Larsgaard through several publications that the authors highlight: *Map Librarianship* (1998), *Maps and Related Cartographic Materials* (1999), *Cataloguing Electronic Cartographic Materials* (2006), *FRBR and Cartographic Materials* (2007), and *RDA and Cartographic* Resources (2015).[19]

It is important to note that not all astronomical resources are considered cartographic materials. Whereas star charts (and atlases as compilations of star charts) are purely cartographic resources, star catalogs are sets of alphanumeric data, not a graphical expression. Moreover, this data can be cartographic and noncartographic, another reason why these resources are not strictly considered cartographic materials.[20]

Though new encoding and cataloging standards have emerged over the last few decades, none provide perspectives to improve content descriptions for cartographic resources. A recent publication by Novotná, together with very recent works on RDA by Andrew, Moore, and Larsgaard support this fact.[21] None of the changes introduced by RDA provide better content descriptions through new fields or elements, but rather nuances and improvements have been incorporated into the existing ones, such as scale, projection or coordinates. The authors believe instead that the key to better information retrieval is to improve content description. This has been proven to produce additional benefits resulting from better quality records, which generates higher retrieval and circulation rates for libraries.[22]

In addition to these difficulties to enhance content descriptions, OPACs lack proper interfaces to perform specialized queries. Although OPAC designers have invested time and effort to enhance the search experience, as Moulaison and Zavalina note, Mi and Weng point out that "Internet search engines have become the preferred tool over the library online public access catalog (OPAC) for finding information."[23] This is one of the main reasons why users cannot deeply exploit the astronomical resources preserved in libraries and archives.

Significant efforts have been made in astronomy by astronomers and librarians to improve information management.[24] Increasing collaboration between these professionals is captured in a series of LISA (Library and Information Services in Astronomy) conferences.[25] In this regard, Corbin and Grothkopf published a work in which they "give an overview of the history of LISA meetings and describe their logistics."[26] Unfortunately, most actions undertaken have been devoted to electronic information. The authors have not yet found a similar initiative with the aim of enhancing retrieval of printed historical information in astronomy. However, this kind of research has been resolved by other groups such as the International Association of Music Libraries, Archives and Documentation Centres (IAML) whose members have successfully advocated for specialized elements in ISBD (Section 3.2 Music format statement (Notated music)) and RDA (Section 7.13.3 Form of Musical Notation) for music resources.[27]

Since there are many astronomical parameters of great interest for astronomers and astrophysicists that are not recorded by catalogers in the bibliographic descriptions, two studies on historical star atlases and catalogs were conducted to consider new descriptive fields and to demonstrate the importance of some fields for better bibliographic description of these resources.[28] The purpose was to identify the most frequently supplied scientific information and to develop a proposal of description parameters for star charts, atlases, and catalogs. Guidelines for easily identifying those parameters in astronomical resources are also given. However, the accommodation of this set of parameters in the aforementioned standards cannot easily be achieved. Starting with one of the most basic elements, the authorship of a star catalog cannot be attributed to a single person named on the title page as is the case for traditional monographs. It is therefore necessary to look inside the monograph to determine the group of astronomers, observers, and collaborators who make up the whole authorship of the catalog.

Objectives and Method

The goal of this paper is to propose incorporating new descriptive parameters for astronomical resources within existing encoding and cataloging standards. An initial proposal was developed in the aforementioned two previous works where a set of description parameters for star charts, atlases, and catalogs was outlined. The aim of this paper is to determine the most appropriate fields to fit these new parameters within cataloging standards.

Enhancing bibliographic description of any resource necessarily involves deep knowledge of its content. This requires a careful analysis of the resource to identify data of interest to researchers. The authors focused on resources from library of the Royal Institute and Observatory of the Spanish Navy, where a large volume of historical astronomical information is preserved. Specifically, the authors analyzed a set of twenty-two star atlases and twenty-eight star catalogs from different countries that were compiled between the eighteenth and twentieth centuries. Older resources were ruled out because their data are known to be less precise.

The search for resources was accomplished by querying both the Union Catalogue of Defence Library Network (commonly known as Bibliodef) and the printed catalog of the map collection.[29] Analysis of each resource consisted first of a comprehensive study of its content (title pages, table of contents, introduction, etc.) searching for the most frequently supplied information for star atlases and catalogs. Next, the authors wanted to demonstrate the importance of certain fields in cataloging standards that are not currently being widely used in bibliographic description. Because of this analysis, many parameters were determined.

After this process, three encoding and cataloging standards were analyzed: the MARC 21 Format for Bibliographic Data, the International Standard Bibliographic Description (ISBD) consolidated edition, and Resource Description and Access (RDA). This analysis does not suggest any comparison between content standards (ISBD, RDA) and the encoding standard MARC 21 because of the different purposes of the two types of standards. This new study was aimed at determining which fields could accommodate astronomical parameters. The entire set of parameters has been classified

into three groups: (1) those that are currently accommodated by specific description elements other than general note fields; (2) new parameters that could be recorded in descriptive elements; and (3) new parameters that could be recorded only in general note fields. The fourth section is dedicated to the presentation and treatment of each of these groups. In turn, a proposal on how to record the information provided by the identified astronomical parameters is provided in the fifth section.

Proposal for Description Parameters for Historical Star Charts, Atlases, and Catalogs

Parameters that can be Accommodated by Specific Description Elements in Cataloging Standards

Table 1 summarizes the areas of the cataloging standards that could accommodate the proposed parameters. Two of them are similar to those used in terrestrial cartography: projection and scale. Projection is the method used to make a two-dimensional representation (a chart or map) from a three-dimensional representation (a celestial globe). Many of these methods may be found in specialized books about classical and modern cartography.[30] The official name of the projection system is usually the item to be registered by the three standards. ISBD allows us to record "associated phrases related to the statement of projection . . . , phrases usually consist of statements pertaining to properties of the projection . . . and standard abbreviations."[31] RDA provides an option to record "phrases about meridians and/or parallels that are associated with the projection statement."[32] With respect to MARC 21, field 255 $b is used to record the entire projection statement. Instructions are provided for recording projection following the ISBD principles.

The concept of scale in celestial cartography is slightly different from the classical linear scales used for cartographic resources. In this case, the scale is angular and is usually recorded as linear distance per angular distance. ISBD indicates that the scale "is expressed as an angular scale in millimeters per degree."[33] MARC 21 also refers to "angular scale" in the 034 field, Coded Cartographic Mathematical Data, but neither standard provides instructions about how to record it or examples. In contrast, RDA uses the term "nonlinear scale" and provides an example showing how the angular scale is expressed as degree per centimeter. It is important to note that many resources include their statement of scale in a short statement that should be recorded as it appears without estimating, according to RDA.

The third parameter is commonly known as epoch or equinox. The epoch is a date that refers to astronomical observations, while equinoxes correspond to two special dates during the year.[34] This parameter is used exclusively for celestial cartography. The parameter "epoch" appears together with "equinox" in MARC 21 (034 $p and 255 $e) and ISBD (3.1.3.4), while RDA provides two separate instructions (7.5 Equinox and 7.6 Epoch). Both RDA and ISBD note that the equinox is expressed as a year, but neither standard explains how to record the epoch. RDA and ISBD point out only that epoch is recorded when it is known to differ from the equinox. Moreover, these two astronomical dates can be given as a Besselian or Julian year, hence these dates can appear accompanied by decimals. This peculiarity is considered by MARC 21 in the field 034, namely, "Equinox or epoch for a celestial chart. Usually recorded in the form yyyy (year) according to the Gregorian calendar, but may include a decimal including the month in the form yyyy.mm (year-month)."

The last parameter corresponds to one of the most frequently used bits of data used for cartographic materials: coordinates. Concerning celestial coordinates, it is important to note that only equatorial coordinates (right ascension and declination) can be recorded using the cataloging standards discussed here, hence when a different system of coordinates is used in astronomy, these standards do not accommodate it. This could become a serious problem when cataloging because astronomers typically use several systems of coordinates plus the equatorial. Therefore these new systems should be included in the cataloging standards or, perhaps, the field for recording coordinates should be generic, i.e., to provide the numerical values of the longitude and latitude together with another subfield so that catalogers can indicate the system of reference for those values.

New Potential Parameters for Current Description Fields

Apart from the previous set of parameters, there is a second set of parameters that do not belong in existing fields but could be recorded in some specific fields. These should be regarded as the most appropriate places to include each parameter in accordance to the definitions provided by the standards.

From our point of view, recording the constellation name shown in charts or maps is of great importance. Indeed, in the same way that the majority of landforms are recorded by catalogers who handle terrestrial maps, constellations are landforms associated with celestial maps, hence they should naturally be taken into account. Moreover, it is quite common for astronomers to provide constellation names when new celestial objects are discovered. Therefore this parameter enables the first recording of the location of those objects.

As shown in table 2, the parameter "constellation name" could be recorded in the MARC 21 662, Subject Added Entry—Hierarchical Place Name. Despite this field being used to record the "hierarchical form of a geographic name

Table 1. Parameters that Can be Accommodated by Specific Description Elements in Cataloging Standards

Parameters	Standards	Description fields
Coordinates	MARC 21	034—Coded cartographic mathematical data (R) $j—Declination—northern limit (NR) $k—Declination—southern limit (NR) $m—Right ascension—eastern limit (NR) $n—Right ascension—western limit (NR) 255—Cartographic mathematical data (R) $d—Statement of zone (NR)
	ISBD consolidated	3.1.3.3. Right ascension and declination
	RDA	7.4.4. Right Ascension and Declination
Epoch/ Equinox	MARC 21	034—Coded Cartographic Mathematical Data (R) $p—Equinox (NR) Equinox or epoch for a celestial chart. 255—Cartographic mathematical data (R) $e—Equinox. Statement of equinox or epoch.
	ISBD consolidated	3.1.3.4. Equinox The equinox is expressed as a year preceded by equinox [. . .] the epoch is designated by epoch.
	RDA	7.5. Equinox Equinox is one of two points of intersection of the ecliptic and the celestial equator, occupied by the sun when its declination is 0º. 7.6. Epoch Epoch is an arbitrary moment in time to which measurements of position for a body or orientation for an orbit are referred.
Projection	MARC 21	008—Maps (NR) 22–23—Projection (006/05–06) ##—Projection not specified 255- Cartographic mathematical data (R) $b—Statement of projection (NR)
	ISBD consolidated	3.1.2. Statement of projection
	RDA	7.26. Projection of cartographic content
Scale	MARC 21	034- Coded cartographic mathematical data (R) $h—Angular scale Scale, if known, for celestial charts. 255- Cartographic mathematical data (R) $a—Statement of scale Entire scale statement including any equivalency statements, vertical scales or vertical exaggeration statements for relief models and other three-dimensional items.
	ISBD consolidated	3.1.1.9. The scale for celestial charts is expressed as an angular scale in millimetres por degree.
	RDA	7.25.1.5. Nonlinear Scale Record a statement of scale for an image, map, etc., with a nonlinear scale (e.g., celestial charts; some maps of imaginary places) only if the information appears on the resource. If no scale statement appears on the resource, record Scale not given. Do not estimate a scale. 1º per 2 cm.

used as a subject added entry," it also includes the "name of any extraterrestrial entity or space." Constellations are probably the main extraterrestrial entities to be noted by astronomers. Another option is to use field 751 Added Entry-Geographic Name, subfield $a—Geographic name, but a constellation is not a geographic name but rather a celestial name. In other words, geography is a branch of science concerned with Earth landforms and astronomical geography is commonly known as cosmography. It is also possible to record it in field 754 Added Entry-Taxonomic Identification. Nevertheless, this astronomical parameter can only be recorded in note fields in the case of ISBD (section 7.10.1) and RDA (7.27).

Celestial hemisphere is an astronomical parameter closely related to the coordinates of celestial objects. As shown below, in astronomy there are several types of coordinates apart from the classical ecliptic and equatorial systems. Interpretation of the celestial hemisphere is trivial

Table 2. New Potential Parameters for Current Description Fields

Parameters	Standards	Description fields
Constellation name	MARC 21	662—Subject Added Entry-Hierarchical Place Name (R) $h—Extraterrestrial area Name of any extraterrestrial entity or space and includes solar systems, galaxies, star systems, and planets as well as geographic features of individual planets, etc. Subfield $h may be repeated for hierarchies when multiple levels are given, retaining the order highest-to-lowest. 662 ##$hMars$hValles Marineris.$2MARC code for Gazetteer of Planetary Nomenclature 751—Added Entry-Geographic Name (R) Added entry in which the entry element is a geographic name that is related to a particular attribute of the described item. $a—Geographic name (NR) 754—Added Entry-Taxonomic Identification (R) Added entry in which the entry element is the taxonomic name or category associated with the described item. $a—Taxonomic name (R) $c—Taxonomic category (R) $2—Source of taxonomic identification (NR)
	ISBD	7.10 Other notes 7.10.1 Any other notes that are particular to the specialized material or considered important to users of the catalogue may be given.
	RDA	7.27. Other details of cartographic content Other details of cartographic content include mathematical data and other features of the cartographic content of a resource not recorded in statements of scale, projection, and coordinates.
Celestial Hemisphere	MARC 21	034—Coded Cartographic Mathematical Data (R) $j—Declination—northern limit $k—Declination—southern limit $m—Right ascension—eastern limit $n—Right ascension—western limit Subfields $j, $k, $m, and $n are used with celestial charts or celestial charts in atlases and contain the limits of the declination and the right ascension. Subfields $j and $k are each eight characters in length and record the declination in the form hdddmmss (hemisphere-degrees-minutes-seconds). 0340 #abjN0300000$kN0300000$m021800$n021800 651—Subject Added Entry-Geographic Name (R) Subject added entry in which the entry element is a geographic name. 662—Subject Added Entry-Hierarchical Place Name (R) $a—Country or larger entity (R) Name of a country or a larger political jurisdiction. It also contains the names of geographical areas/entities such as continents or hemispheres at a country level or higher. 751—Added Entry-Geographic Name $a—Geographic name Geographic name that has a relationship with the described item.
	ISBD	3.1.3.3. Right ascension and declination The declination is desiganted by Decl. or its equivalent in another language, followed by the degrees (º) and, when necessary, minutes (‘) and seconds (“) of the sexagesimal system (360º circle), using a plus sign (+) for the northern celestial hemisphere and a minus sign (-) for the southern celestial hemisphere.
	RDA	7.4.4.3. Recording Right Ascension and Declination Designate the declination by Declination, followed by the degrees (º) and, when necessary, minutes (‘) and seconds (“) of the sexagesimal system (360º circle), using a plus sign (+) for the northern celestial hemisphere and a minus sign (-) for the southern celestial hemisphere. If the cartographic content is centered on a pole, record the declination limit.
Table of Contents	MARC 21	505—Formatted Contents Note (R) Titles of separate works or parts of an item or the table of contents.
	ISBD	7.7 Notes relating to the contents 7.7.1 Notes relating to the contents may include the list of contents and notes on other inclusions, such as indexes, inserts, bibliographies, discographies, etc.
	RDA	7.16. Supplementary content Supplementary content is content (e.g., an index, a bibliography, an appendix) designed to supplement the primary content of a resource.

Table 2. New Potential Parameters for Current Description Fields (cont.)

Parameters	Standards	Description fields
Magnitude	MARC 21	500—General Note (R) General information for which a specialized 5XX note field has not been defined.
	ISBD	7.3 Notes on the material or type of resource specific area 7.3.1 Mathematical data (cartographic resources) 7.3.1.1 For celestial charts, the first note related to the mathematical data area is the note on magnitude. The term limiting magnitude or its equivalent in another language is followed by a number that may reach a maximum of 22.
	RDA	7.27.1.3. Recording other details of cartographic content For celestial cartographic content, record the magnitude of the cartographic content.
Observation period	MARC 21	033—Date/Time and Place of an Event (R) Formatted date/time and/or coded place of creation, capture, recording, filming, execution, or broadcast associated with an event or the finding of a naturally occurring object. This information in textual form is contained in field 518 (Date/Time and Place of an Event Note). First Indicator—Type of date in subfield $a Type of date information contained in subfield $a. 2—Range of dates Used, for example, when the period of capture, execution, etc., spanned more than two consecutive days, and the individual dates are unknown or too numerous to be specified. Second Indicator—Type of event Specifies the type of event information found in the field. 0—Capture Pertains to the recording of sound, the filming of visual images, the making or producing of an item, or other form of creation of an item. $a—Formatted date/time Seventeen characters, recorded in the pattern yyyymmddhhmm+-hmm, that indicate the actual or approximate date (yyyymmdd)/time (hhmm) of capture, finding, or broadcast and Time Differential Factor (+-hhmm) information. A hyphen (-) is used for unknown digits in the year/month/day segment. Within each segment, the data are right justified and any unused position contains a zero. The first eight characters yyyymmdd (4 for the year, 2 for the month, and 2 for the day) represent the date and are mandatory if the subfield is used. The following four characters, hhmm (2 for the hour, 2 for the minute), represent the time as hour and minute. The last 5 character positions +hhmm give the Time Differential Factor information. The Time Differential Factor (TDF) is preceded by a plus (+) or minus (-) sign, indicating the hours and minutes the local time is ahead of or behind Universal Time (Greenwich Mean Time), respectively. Local times throughout the world vary from Universal Time by as much as -1200 (west of the Greenwich Meridian) and by as much as +1300 hours (east of the Greenwich Meridian). 518—Date/Time and Place of an Event Note (R) Note on the date/time and/or place of creation, capture, recording, filming, execution, or broadcast associated with an event or the finding of a naturally occurring object. Field 033 (Date/Time and Place of an Event) contains the same information in coded form. Date/time and place of an event note information may be encoded as a note in subfield $a or parsed into specific subfields $d—Date of event Date/time of event. May be in a controlled or uncontrolled form. $o—Other event information Other information that is related to the date or place of event.
	ISBD	7.4. Notes on the publication, production, distribution, etc. area 7.4.1. Notes on the publication, production, distribution, etc., [. . .]; and additional dates.
	RDA	7.11.3. Date of Capture Date of capture is a date or range of dates associated with the capture (i.e. recording, filming, etc.) of the content of a resource. Record the place of capture, giving the year, month, day and time, as applicable.

Table 2. New Potential Parameters for Current Description Fields (cont.)

Parameters	Standards	Description fields
Observation place	MARC 21	033—Date/Time and Place of an Event (R) Formatted date/time and/or coded place of creation, capture, recording, filming, execution, or broadcast associated with an event or the finding of a naturally occurring object. This information in textual form is contained in field 518 (Date/Time and Place of an Event Note). $p—Place of event Place of event. May be in a controlled or uncontrolled form. 518—Date/Time and Place of an Event Note (R) Note on the date/time and/or place of creation, capture, recording, filming, execution, or broadcast associated with an event or the finding of a naturally occurring object. Field 033 (Date/Time and Place of an Event) contains the same information in coded form. Date/time and place of an event note information may be encoded as a note in subfield $a or parsed into specific subfields. $p—Place of event (R) Place of event. May be in a controlled or uncontrolled form. Record the place of capture, naming the specific studio, concert hall, etc., if applicable, in addition to the name of the city, etc.
	ISBD	7.10 Other notes 7.10.1 Any other notes that are particular to the specialized material or considered important to users of the catalog may be given.
	RDA	7.11.2. Place of Capture Place of capture is the place associated with the capture (i.e. recording, filming, etc.) of the content of a resource.
Related document	MARC 21	510—Citation/References Note (R) Citations or references to published bibliographic descriptions, reviews, abstracts, or indexes of the content of the described item. 786—Data Source Entry (R) Information pertaining to a data source to which the described item is related. It may contain information about other files, printed sources, or collection procedures. 787—Other Relationship Entry (R) Information concerning the work related to the target item when the relationship does not fit any of those defined in fields 760–785.
	ISBD	7.2.4.6 Other relationships Notes on other relationships between the resource being described and other resources may be given, provided that the nature of the relationship, the titles or the key titles and ISSNs of the other resource or resources specified.
	RDA	7.16. Supplementary content Supplementary content is content (e.g., an index, a bibliography, an appendix) designed to supplement the primary content of a resource.

from equatorial coordinates, that is, positive declinations are immediately associated with the northern hemisphere and vice-versa. However, if the coordinate system differs from the equatorial, positive latitudes do not always correspond to the northern celestial hemisphere. Figure 3 shows an example of a record of the galaxy M31 from the SIMBAD Astronomical Database in which a negative galactic latitude (-21.5733) corresponds to a positive declination (+4116 07.50), meaning that M31 is located in a northern hemisphere. Since some of these new systems of coordinates have developed within the last few decades and their correspondence to the classical celestial hemispheres is not straightforward, including the field hemisphere in the cataloging process could be essential for fast and precise information identification and retrieval.

Further, we believe that the parameter "celestial hemisphere" should have its own field or subfield, and that this parameter can currently be reflected by the existing cataloguing rules. In particular, MARC 21, ISBD, and RDA allow us only to register equatorial coordinates of any extraterrestrial entity, plus record the celestial hemisphere as long as the declination is indicated (see table 2). More specifically, according to MARC 21, catalogers may record "N" (northern) or "S" (southern) to precede coordinates (which is the declination) in the MARC 034 field. This parameter could be included as a "geographic name" in the MARC 651 field, Subject Added Entry—Geographic Name or as a "hierarchical place name" in the MARC 662 field, where the hemisphere may be indicated within $a "Country or larger entity." Another option is to use the

subfield $a—Geographic name of the field 751—Added Entry-Geographic Name. In ISBD and RDA, these standards use the sign (+) or (-) followed by the degrees (°) for declination to show the northern or southern celestial hemisphere respectively. In short, determination of the celestial hemisphere depends on the system of coordinates for resources that should be recorded as commented above.

Another important parameter to consider is table of contents. Indeed, in library and information science literature, several studies such as those by Cochrane and Markey, Calhoun et al., and Dinkins and Kirkland have demonstrated that the descriptive quality of a bibliographic record is enhanced when its table of contents is included in the record.[35] In the case of star catalogs, tables of content provide interesting and detailed information for astronomers, namely previous works by other astronomers, instruments involved in observations, corrections applied to measurements, etc. Additionally, tables of contents of star atlases sometimes supply constellation names that users will find inside the atlas together with further information such as hemisphere, coordinates, projection, magnitude, etc.

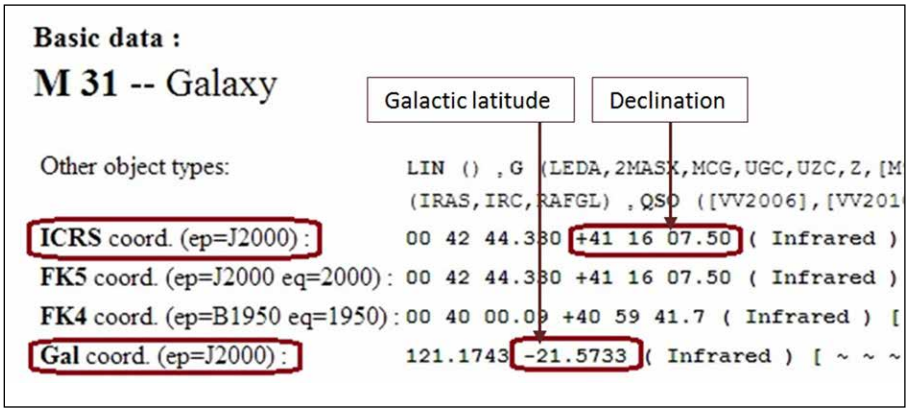


Figure 3. Example of a record of the galaxy M31 from SIMBAD database. Source: SIMBAD Astronomical Database (object name M31; accessed May 18, 2014), http://simbad.u-strasbg.fr/simbad/sim-basic?Ident=m31&submit=SIMBAD+search.

Despite the obvious benefits of recording the "table of contents," this information is often not included in bibliographic records for star atlases and catalogs, as demonstrated by Alonso-Lifante et al.[36] This parameter may be added using specified note fields in MARC 21, ISBD and RDA. ISBD allows catalogers to include the list of a resource's contents (Section 7.7). When using MARC 21 and RDA, catalogers can indicate the presence of a table of contents (MARC 21 field 505 or RDA 7.16) (see table 2).

The "magnitude" of a star is an astronomical parameter that measures a star's brightness for different purposes. According to Evans, "The stellar magnitude scale is one of the oldest scientific standards of measurement still in use, dating back to observations by Hipparchus in 130 BC and the publication of a stellar magnitude reference table in Ptolemy's Almagest almost three hundred years later."[37] Therefore this parameter is of great relevance for astronomers and astrophysicists since, among other applications, some important physical quantities can be derived from it. Concerning "magnitude," none of the three standards provide guidance on where and how to record this information. MARC 21 does not consider this parameter, hence magnitude can only be recorded in the MARC 500 general note field. In turn, ISBD and RDA mention the magnitude in note fields (ISBD 7.3.1.1 RDA 7.27).

The next parameter is "observation period," the period during which the astronomical observations were carried out. This parameter is always relevant for astronomers because these dates enable them to know the state of the sky at the time of those observations. As shown in table 2, this parameter could be included in "$a Formatted date/time" of the MARC 21 033 field or in "$a Date of event" of MARC 21 518 field ("$o Other event information" of MARC 21 518 field could also be used). Using ISBD, this parameter could be included in the note section 7.4.1 where "additional dates" are recorded. RDA allows catalogers to describe the "observation period" in "Date of Capture" (RDA 7.11.3).

The "observation period" is often provided with the "observation place," which is typically an astronomical observatory. Both parameters are essential to know the spatiotemporal window of observations. Considering MARC 21 (see table 2), this parameter could be recorded in the MARC fields 033 Date/Time and Place of an Event or 518 Date/Time and Place of an Event Note, since both indicate the "place of an event," in this case an astronomical observation. RDA 7.11.3 is aimed at recording a "place of capture," which is, in this case, the observatory where observations were made. We note that the ISBD is not equipped to record this information in the sense that there is no specific section for it, and this parameter would need to be recorded using the general note section 7.10.

The last parameter to be considered is "related document." It is common in astronomy to specify that contemporary star catalogs were compiled from previous ones, or that contemporary star atlases were designed using content from previous catalogs. Moreover, both types of documents (previous atlas or catalogs) sometimes include citations to scientific works published separately from the main catalog or atlas, which could provide useful information for astronomers. These citations could therefore be included in the

Table 3. List of General Note Fields of Each Cataloguing Standard

Standards	Description fields
MARC 21	500—General Note (R) General information for which a specialized 5XX note field has not been defined.
ISBD consolidated	7.10 Other notes 7.10.1 Any other notes that are particular to the specialized material or considered important to users of the catalogue may be given.
RDA	7.27. Other details of cartographic content Other details of cartographic content include mathematical data and other features of the cartographic content of a resource not recorded in statements of scale, projection, and coordinates.

records either as a traditional bibliographic reference or as a link to the corresponding resource. ISBD and RDA (see table 2) allow catalogers to record "supplementary content" (RDA) or "related resources" if the relationship between the resources is provided (ISBD). In MARC 21, this information could be included in the 510 Citation/References Note field or in both 786 Data Source Entry and 787 Other Relationship Entry.

New Parameters to Record in Note Fields

As noted at the beginning of this section, there is a final set of parameters that cannot be recorded using the existing cataloging standards because of their specialized nature. This is why these parameters can be recorded only in the general note fields given in table 3.

The parameter "instruments" concerns those tools used to make observations and to take the corresponding measurements, such as telescopes, micrometers, etc. Only when the tools are known can their precision be calculated, thus assuring the precision of the data taken by these instruments. This information is absolutely crucial for new research and developments when comparing old data with new data from recent space missions. Therefore recording the type of instruments used during the observations will allow users to filter those catalogs whose data was taken by certain instruments whose performance provides the desired precision. Since these instruments have been present throughout the history of cartography, it is difficult to understand why cataloguing standards have not yet incorporated them. On the contrary, catalogers may record them only in general note fields as shown in table 3.

The following parameter is of paramount importance when providing an accurate description of a star catalog. The most important information provided by a star catalog is given in its "main table" (see again figure 2).[38] A star catalog contains many tables with several purposes, ranging from corrections of measurements to providing useful information about the set of stars covered by the observations. This last piece of information is usually provided in tables where each row corresponds to a star and the columns convey different data about those stars. These data are, in fact, the most important information that could be recorded about the resource. Since these columns are commonly headed by a short name, which is frequently explained elsewhere in the catalog, in our view, although there is no specific field for this information, it should at least be recorded in a general note field.

Other important parameters considered in the description of astronomical resources are "type of coordinates" and "type of magnitude." The former is related to coordinates as explained above. Many catalogs and atlases provide star coordinates that are based on reference frames that differ from the classical equatorial, but when this happens, catalogers cannot indicate them. Since such information is crucial for astronomers, it should be recorded, at least in a note to give consistency to the information recorded. With respect to the type of magnitude, it is important to note that several types of magnitudes exist in astronomy and the specific type offered by each resource should also be recorded.[39]

It is worth mentioning the importance of recording the captions corresponding to tables, apart from the main table of a star catalog, giving extra information about corrections, errors, instruments, etc. These captions indicate the existence of very important information about data contained in the resources. The presence of information about interesting celestial objects such as supernovas or comets is often overlooked. This results in the loss of valuable information that is not retrieved by astronomers through their specialized queries. It is notable that many newer celestial charts and maps have been captured out of the visible range of electromagnetic spectrum, and the wavelength (or frequency) of such captures is also important information. "Perspective," which is related to the shape of constellations, is another important aspect to record. From a geocentric perspective, constellation images are considered to be left-to-right reversed with respect to the opposite perspective commonly known as external. Finally, when a resource offers limited information, recording whether it has constellation images is not petty, since the presence of such images provides useful historical information, including their star nomenclature.

Table 4. Examples of How to Record the Cartographic Parameters

Parameters	Standards	Examples
Coordinates	Example	A star chart whose declination goes to 0º to 20º and whose right ascension ranges from 0h 56' to 2h and 4.' This is a real star chart from "Atlas des Nördlichen Gestirnten Himmels für den anfang des jahres 1855" by Dr. E. Schönfeld and Dr. A. Krueger published in 1863.
	MARC 21	0340 ##abjN0200000$kN0000000$m005600$n020400 255 ##$d(RA 0h 56 min to 2h 4 min/Decl. 0º to 20º)
	ISBD	(RA 0h 56 min to 2h 4 min/Decl. 0º to 20º)
	RDA	Right ascension 0 hr. 56 min. to 2 hr. 4 min./Declination 0º to 20º
Type of coordinates	Example	A star catalogue titled "Catalogue of galaxies and clusters of galaxies" by F. Zwicky, E. Herzog and P. Wild, which shows a table with galactic coordinates.
	MARC 21	500 ##$aType of coordinates: Galactic
	ISBD	.- Type of coordinates: Galactic
	RDA	Type of coordinates: Galactic
Projection	Example	A star chart from "Nouvel Atlas Céleste" by Richard A. Proctor, published in 1886, which is made in stereographic projection.
	MARC 21	008/22–23 af 255 ##$bStereographic proj.
	ISBD	; proj. stéréographique
	RDA	Projection Stéréographique
Scale	Example	A star chart from "Charts of the constellations from the North Pole to between 35 and 40 degrees of south declination" by A. Cottam, published in 1889, which shows the scale in the Preface by this sentence: "The scale is one-third of an inch to a degree of a great circle." The calculation: 1 inch =2.54 cm (2.54/3)*10 =8.466666 mm 8.466666/10 =0.846 cm
	MARC 21	0341#$hScale 8.46 mm per 1º 255 ##$aScale 8.46 mm per 1º
	ISBD	.-Scale 8.46 mm per 1º
	RDA	1º per 0.846 cm
Perspective	Example	A star chart from "Uranographia" by J.E. Bode, published in 1801, where the perspective can be deduced. In this case, the perspective is geocentric.
	MARC 21	500 ##$aPerspective: Geocentric
	ISBD	.- Perspective: Geocentric
	RDA	Perspective: Geocentric

Proposal to Record Identified Astronomical Parameters using Current Cataloging Standards: MARC21, ISBD and RDA

The previous sections address the fields that could be used to record our suggested set of parameters. This section proposes how to record them. Examples of these parameters have been taken from historical star atlases and catalogs, as shown in three tables according to the new following classification: cartographic parameters (table 4), astronomical parameters (table 5) and other important parameters (table 6). These tables have three columns where the first column indicates the name of each parameter; the second column shows, for each parameter, groups with four rows labelled "Example," "MARC 21," "ISBD," and "RDA," whose corresponding content is provided in the third column. The row "Example" contains a piece of information from an astronomical resource used as an example to illustrate the existence of that parameter. In turn, the rows of the third column corresponding to the three cataloging standards show how we advocate that each parameter should be recorded using MARC 21, ISBD, and RDA.

Regarding cartographic parameters, the most important parameter to be highlighted is "type of coordinates." Note in table 4 that the coordinate system is essential to mention. The numerical value of the coordinates is useless unless

Table 5. Examples of How to Record the Astronomical Parameters

Parameters	Standards	Examples
Epoch	Example	A star chart from "Charts of the constellations from the North Pole to between 35 and 40 degrees of south declination" by A. Cottam, published in 1889, which shows the epoch within the own star chart. The epoch is 1890.
	MARC 21	0341 #$p1890 255 ##$e1890
	ISBD	; epoch 1890
	RDA	Epoch: 1890
Equinox	Example	A star chart from "Celestial charts for the equinox 1860.0 made at the Lichfield Observatory of Hamilton College" by C. H. F. Peters, published en 1882, which shows the equinox within the own star chart. The equinox is 1860.0.
	MARC 21	0341 #$p1860.0 255 ##$eEq. 1860.0
	ISBD	; equinox 1860.0
	RDA	Equinox: 1860.0
Magnitude	Example	A star chart from "Cordoba Durchmusterung" by J. M. Thome, published in 1893, which shows the scale of magnitudes. In this case the scale ranges from 1 to 10.
	MARC 21	500 ##$aRange of magnitudes: from 1 to 10
	ISBD	.-Limiting magnitude 10.
	RDA	Range of magnitudes: from 1 to 10
Type of magnitude	Example	A star catalogue titled "Catalogue of double stars from observations made at the Royal Observatory, Greenwich with the 28-inch refractor during the years 1893–1919" by F. W. Dyson, published in 1921, contains in its main table two specific columns namely: apparent magnitude and absolute magnitude.
	MARC 21	500 ##$aType of magnitude: apparent and absolute.
	ISBD	.- Type of magnitude: apparent and absolute.
	RDA	Type of magnitude: apparent and absolute.
Celestial Hemisphere	Example	A star chart from "Charts of the constellations from the North Pole to between 35 and 40 degrees of south declination" by A. Cottam, published in 1889, whose celestial hemisphere can be deduced from the title page information (north pole). In this case, it is the Northern Hemisphere.
	MARC 21	0340 #abjN0200000$kN0000000 662 ##$aCelestial hemisphere: Northern 651 # $aCelestial hemisphere: Northern
	ISBD	.- Celestial hemisphere: Northern (RA 0h 56 min to 2h 4 min/Decl. +0º to +20º)
	RDA	Celestial hemisphere: Northern Right ascension 0 hr. 56 min. to 2 hr. 4 min./Declination +0º to +20º
Observation period	Example	A star catalogue titled "A catalogue of 606 principal fixed stars in the Southern Hemisphere" by M. J. Johnson, published in 1835, whose observation period ranges from November 1829 to April 1833 which it shows on the title page.
	MARC 21	03320$a182911183304 518 ##$d1829 November to 1833 April
	ISBD	.-Observation period ranges from November 1829 to April 1833
	RDA	1829 November to 1833 April
Observation place	Example	A star catalogue titled "A catalogue of 606 principal fixed stars in the Southern Hemisphere" by M. J. Johnson, published in 1835, whose observations made at The Observatory, St. Helena which it shows on the title page.
	MARC 21	033 ##$pSt. Helena Observatory, United Kingdom 518 ##$p St. Helena Observatory, United Kingdom
	ISBD	.- St. Helena Observatory, United Kingdom
	RDA	St. Helena Observatory, United Kingdom

Table 5. Examples of How to Record the Astronomical Parameters (cont.)

Parameters	Standards	Examples
Constellation name	Example	A star chart from "Charts of the constellations from the North Pole to between 35 and 40 degrees of south declination" by A. Cottam, published in 1889, whose constellations names are shown within the own star chart.
	MARC 21	662 ##$hCygnus$hCepheus$hCamelopardus$hLyra$hHercules $hBootes$hUrsa Major
	ISBD	.-Constellation names: Cygnus, Cepheus, Camelopardus, Lyra, Hercules, Bootes and Ursa Major.
	RDA	Constellation names: Cygnus, Cepheus, Camelopardus, Lyra, Hercules, Bootes and Ursa Major.
Instruments	Example	A star catalog titled "A catalog of 606 principal fixed stars in the Southern Hemisphere" by M. J. Johnson, published in 1835, which shows within the introduction the instruments used.
	MARC 21	500##$aInstruments: the transit instrument and the mural circle
	ISBD	.- Instruments: the transit instrument and the mural circle
	RDA	Instruments: the transit instrument and the mural circle
Astronomic naming conventions	Example	A star chart from "Atlas Coelestis" by J. Flamsteed, published in 1729, contains Bayer's nomenclature.
	MARC 21	500 ##$aAstronomic naming convention: Bayer's letters.
	ISBD	.- Star nomenclature: Bayer's letters.
	RDA	Star nomenclature: Bayer's letters.
Wavelength	Example	A star chart from "Catalog of stars in the Nothern Milky Way having H-Alpha in emission. Part 2 (charts)" by L. Kohoutek and R. Wehmeyer, published in 1997, which shows the wavelength on the title page.
	MARC 21	500##$aWavelength: H-Alpha in emission
	ISBD	.- Wavelength: H-Alpha in emission
	RDA	Wavelength: H-Alpha in emission
Celestial objects of special interest	Example	A star chart from "Celestial charts for the equinox 1860.0 made at the Lichfield Observatory of Hamilton College" by C. H. F. Peters, published en 1882, which shows some stars with their associated name, number and nomenclature along with the date in what was discovered.
	MARC 21	500##$aInteresting objects: Electra (130) discovered 1873 Feb. 17 and Una (160) discovered 1876. Febr. 20.
	ISBD	.-Interesting objects: Electra (130) discovered 1873 Feb. 17 and Una (160) discovered 1876. Febr. 20.
	RDA	Interesting objects: Electra (130) discovered 1873 Feb. 17 and Una (160) discovered 1876. Febr. 20.
Constellation images	Example	A star chart from "Uranographia sive astrorum description viginti tabulis ceneis incise ex recentissimis et absolutissimis astronomorum observationibus" by J.E. Bode, published in 1801, which shows constellation images.
	MARC 21	500##$aConstellation images: Yes.
	ISBD	.- Constellation images: Yes.
	RDA	Constellation images: Yes.

users know which system is used. Note also how we give the calculation process from the statement of the scale to get the corresponding numerical value.

With respect to astronomical parameters, we want to emphasize the parameters "magnitude" and "type of magnitude" in table 5. Concerning the magnitude, we record in the MARC 21 field 500 the range of magnitudes, that is, the magnitude of the brightest star (1) and the magnitude of the faintest star (10). We also provide two examples for ISBD and RDA. Concerning the type of magnitude, it is relevant to convey that two types of magnitudes are given in the catalog. The parameters "wavelength" and "instruments" are very important to consider when describing a celestial cartographic resource.

The authors pay special attention in table 6 to the parameter "Names of the astronomical parameters included in the main table." For astronomers and astrophysicists, the names of the columns of a star catalog represent those technical data that they will find in each catalog. This is therefore the most important information from this resource to be recorded by catalogers.

Finally, table 7 shows an example of a complete MARC 21 record of the Gill's star catalog according to the proposal outlined in this paper.[40] Fields in black correspond to LC's original record. Note, for instance, that the equinox, although given in the catalog's title, has not been included in neither the MARC 034 nor 255. Note also that most of the parameters must be accommodated in general note

Table 6. Examples of how to Record Other Important Parameters

Parameters	Standards	Examples
Table of Contents	Example	A star atlas titled "Star Atlas of Reference Stars and Nonstellar Objects" by Smithsonian Astrophysical Observatory published in 1969, which contains an index.
	MARC 21	500 ##$a Table of contents: Foreword, Joseph Ashbrook.—1. General—2. Sources Other than the SAO Star Catalog—3. Projection System—4. Indices—5. Magnitudes—6. Interpolation Reseaux—7. Scale Factors 8. Star Names—9. Acknowledgments—10. Bibliography—Table 1—Table 2—Table 3—Figure 1—Figure 2a—Figure 2b. 504 ##$a Includes index
	ISBD	.-Contents: Foreword, Joseph Ashbrook.—1. General—2. Sources Other than the SAO Star Catalog—3. Projection System—4. Indices—5. Magnitudes—6. Interpolation Reseaux—7. Scale Factors 8. Star Names—9. Acknowledgments—10. Bibliography—Table 1—Table 2—Table 3—Figure 1—Figure 2a—Figure 2b.
	RDA	Include table of contents.
Related document	Example	A star catalogue titled "Allgemeine beschreibung und nachwersung der gestinne nebst verzeichniss" by J. E. Bode, published in 1801, shows on the title page a related document: "Uranographie" (Bode's star atlas).
	MARC 21	5100 #$a Uranographie
	ISBD	.- Related document: Uranographie (Bode's star atlas).
	RDA	Related document: Uranographie (Bode's star atlas).
Names of the astronomical parameters included in the main table	Example	Main table from a star catalogue titled "A catalogue of 3007 stars, for the equinox 1890.0, from observations made at the Royal Observatory, Cape of Good Hope during the years 1885 to 1895" by D. Gill, D., published in 1898.
	MARC 21	500 ##$a The columns represent: the rotation number (col. 1), Bradley or Lacaille (col. 2), Piazzi. 1800 (col. 3), B.A.C. 1850 (col. 4), C.G.A. 1875 (col. 5), star name (col. 6), magnitude (col. 7), mean date 1800+ (col. 8), number of observations in Right Ascension (col. 9), mean R.A. 1890.0 (col. 10), annual precession 1890.0 (col. 11), secular variation 1890.0 (col. 12), annual proper motion $\mu\alpha$. (col. 13); and corrections for $\mu\alpha$ to 1890.0 (col. 14).
	ISBD	.- The columns represent: the rotation number (col. 1), Bradley or Lacaille (col. 2), Piazzi. 1800 (col. 3), B.A.C. 1850 (col. 4), C.G.A. 1875 (col. 5), star name (col. 6), magnitude (col. 7), mean date 1800+ (col. 8), number of observations in Right Ascension (col. 9), mean R.A. 1890.0 (col. 10), annual precession 1890.0 (col. 11), secular variation 1890.0 (col. 12), annual proper motion $\mu\alpha$. (col. 13); and corrections for $\mu\alpha$ to 1890.0 (col. 14).
	RDA	The columns represent: the rotation number (col. 1), Bradley or Lacaille (col. 2), Piazzi. 1800 (col. 3), B.A.C. 1850 (col. 4), C.G.A. 1875 (col. 5), star name (col. 6), magnitude (col. 7), mean date 1800+ (col. 8), number of observations in Right Ascension (col. 9), mean R.A. 1890.0 (col. 10), annual precession 1890.0 (col. 11), secular variation 1890.0 (col. 12), annual proper motion $\mu\alpha$. (col. 13); and corrections for $\mu\alpha$ to 1890.0 (col. 14).
Captions of other tables giving extra-information about corrections, instruments, etc.	Example	A star catalogue "Catalogue of double stars from observations made at the Royal Observatory, Greenwich with the 28-inch refractor during the years 1893–1919" by F. W. Dyson, published 1921, which shows several tables that give extra information.
	MARC 21	500 ##$a Hypothetical Parallaxes of Double Stars. (Stars whose Orbits have been completely determined)
	ISBD	.- Hypothetical Parallaxes of Double Stars. (Stars whose Orbits have been completely determined)
	RDA	Hypothetical Parallaxes of Double Stars. (Stars whose Orbits have been completely determined)

fields, and that is not the best solution but currently the only option.

Conclusion

Despite the general nature of MARC 21, ISBD, and RDA, we can conclude that the new proposal for description parameters may be accommodated within their fields and elements with some limitations. Nevertheless, catalogers who wish to enrich the content of bibliographic descriptions of their historical astronomical resources can do so by following the guidelines discussed in this paper. It is also important to state that, since some parameters can be included only in note fields, and these may not be indexed by libraries' and archives' information retrieval systems, it would be necessary to create new descriptive fields or subfields to achieve optimal information retrieval. With respect to the remaining parameters, their suggested inclusion in existing fields would require updating and modification in some cases to include essential information for astronomers and astrophysicists.

Table 7. Example of a Complete MARC 21 Record of Gill's Celestial Catalog (1898) Following the Given Proposal

000		01389cam a220025314500
001		4525150
005		20040506101643.0
008		870305s1898 enka f0000 eng
034	0#	$pEq. 1890•0
035	__	|9 (DLC)01005452
906	__	|a 7 |b cbc |c orignew |d u |e ocip |f 19 |g y-gencatlg
010	__	|a 01005452
040	__	|a DLC/ICU |c ICU |d DLC
050	00	|a QB6 |b .C21890
051	__	|a QB6 |b .C21890 Copy 2 |c Copy 2.
110	2_	|a Royal Observatory, Cape of Good Hope.
245	12	|a A catalogue of 3007 stars, for the equinox 1890·0, |b from observations made at the Royal observatory, Cape of Good Hope, during the years 1885 to 1895: |c under the direction of David Gill . . . With appendices:—I.—Comparison with other catalogues. II.—Meridian observations of [alpha] Canis majoris, [alpha] Canis minoris, [beta] Centauri, [alpha] ¹ & [alpha] ² Centauri. III.—Positions of southern circumpolar stars. Published by order of the lords commissioners of the Admiralty, in obedience to Her Majesty's command.
255	##	$eEq. 1890•0
260	__	|a London, |b Printed for H.M. Stationery off., by Darling & son, ltd., |c 1898.
300	__	|a xliv, 263 p. |b tables. |c 33 x 26 cm.
500	__	|a Binder's lettering: Cape catalogue 1885–1895.
500	##	$aRange of magnitudes: from 0 to 9.
500	##	$aType of magnitude: apparent.
500	##	$aSentences on magnitude: For Stars North of Declination—30° the magnitudes (unmarked) are taken from the Harvard Photometry, and South of that Declination from the Southern Meridian Photometry. Magnitudes marked * are taken form the C.G.A. or C.Z., those marked † from B.D., and those marked ‡ from other authorities which are quoted in the notes at the foot of the right-hand page. Where doubt exists whether the "mass" or a component of a Double Star was observed, an asterisk is inserted of the magnitude. The particulars respecting Variable Stars are from Chandler's Catalogue (Astron. Journal, No. 379), unless otherwise stated.
500	##	$aInstruments: Cape Transit-Circle
500	##	$aAstronomical naming convention: For Stars contained in Auwers' Bradley the nomenclature of that work has been retained, only substituting Argûs or Puppis for Navis. For Stars not in Auwers' Bradley the nomenclature of the Fundamental lists (Ast. Nach. 2890 and Monthly Notices R.A.S., Vol. XLVII., p. 455) was adopted. For all other Stars between the South Pole and Declination—23°, the nomenclature of the Argentine General Catalogue was employed, and for Stars North of Declination—23° that of the British Association Catalogue. The only exceptions to these rules are a very few close Circumpolar Stars which are designated by letters long in use at the Cape.
500	##	$aWavelength: visible spectrum
500	##	$aInteresting objects: 7m•0,11m •53"•044° 1891•70 Brighter star observed.
500	##	$aThe columns of the main table of the catalogue: the rotation number (col. 1), Bradley or Lacaille (col. 2), Piazzi. 1800 (col. 3), B.A.C. 1850 (col. 4), C.G.A. 1875 (col. 5), star name (col. 6), magnitude (col. 7), mean date 1800+ (col. 8), number of observations in Right Ascension (col. 9), mean R.A. 1890.0 (col. 10), annual precession 1890.0 (col. 11), secular variation 1890.0 (col. 12), annual proper motion μα. (col. 13); corrections for μα to 1890.0 (col. 14); the rotation number (col. 15); mean date of observation in declination (col. 16); number of observations in declination (col. 17); mean declination 1890.0 (col. 18); seconds of final declination (col. 19); annual precession 1890.0 (col. 20); secular variation 1890.0 (col. 21); annual proper motion (col. 22); corrections of proper motion to the declination (col. 23); Fallows and Henderson (col. 24); Johnson (col. 25); Cape Catalogues 1840,1850,1860,1880,1885 (col. 26); and Melbourne, 1870 and 1880 (col. 27).
500	##	$aCaptions of other tables: Table I. Right Ascensions of the Clock-Stars; Table II. Observations of Circumpolar Stars for Latitude; Table III. Corrections to N.P.D. for variation of latitude, 1885–1895 (Communicated by Dr. Albrecht); Table IV. Corrections to the colums «Mean Dec. 1890•0», on account of error of latitude and refraction; Table V. Comparison of direct and reflex observations.
500	##	$aRange of coordinates not given
500	##	$aType of coordinates: Right ascension and Declination (equatorial coordinates).

Table 7. Example of a Complete MARC 21 Record of Gill's Celestial Catalog (1898) Following the Given Proposal (cont.)

505	0#	$aIndex: Errata—General Plan of Catalogue—Explanations of the Separate Columns of the Printed Catalogue—RIGHT ASCENSIONS—Fundamental Clock-Stars—Formation of the Right Ascensions—Personal Equation—Use of the Reversing Prism—Relative Weights of Upper and Lower Transits—DECLINATIONS—Division-Errors—Error of the micrometer-Screws—Basis of the Annual Catalogues—Horizontal Flexure—Discussion of the Latitude from observations of Circumpolar Stars—Discussion of the Latitude without corrections for errors of Bessel's Refractions or Variation of Latitude—Discussion of the Latitude with corrections to Bessel's Refractions and daily corrections for change of Latitude—Formation of the Definitive Declinations—Comparison of Direct and Reflex observations—COMPARISON WITH OTHER CATALOGUES—Catalogues used—Mean results in order of Right Ascension—Mean Results in order of Declination—Systematic Corrections—Magnitude-personality—Observers, &c.—Catalogue of 3007 stars—APPENDIX I.—Comparison with other catalogues—APPENDIX II.—Meridian Observations of α Canis Majoris, α Canis Minoris, β, α1 and α2 Centauri—APPENDIX III.—Mean R.A. and Dec. of 24 Southern Circumpolar Stars—Introduction—Observations reduced to 1900•0—Mean Places 1875–1920.
510	1#	$aGreenwich Five-Year Catalogue, 1890: Auwers' Fundamental Catalogue (B.J.)$c Appendix I
510	1#	$aCape Catalogue of 12,441 Stars for 1880•0$c Appendix I
510	1#	$aMelbourne Catalogue of 1,211 Stars for 1880•0$c Appendix I
510	1#	$aGreenwich Catalogue of 4,059 Stars for 1880•0$c Appendix I
510	1#	$aCape Catalogue of 1,713 Stars for 1885•0$c Appendix I
510	1#	$aRadcliffe Catalogue of 6,424 Stars for 1890•0$c Appendix I
518	##	$pObservation Place: Royal Observatory, Cape of Good Hope.
518	##	$dObservation Period: 1885 to 1895.
650	_0	|a Stars |x Catalogs.
651	#4	$aCelestial hemisphere: Southern
700	1_	|a Gill, David, |c Sir, |d 1843–1914.
710	1_	|a Great Britain. |b Admiralty.
991	__	|b c-GenColl |h QB6 |i .C21890 |t Copy 1 |w BOOKS
991	__	|b c-GenColl |h QB6 |i .C21890 |t Copy 2 |w BOOKS

Table 8. Recommendations to Standards Developers Regarding the Proposed Addition of Elements to Accommodate Attributes of Celestial Cartography Material

Parameters	Standards	Recommendations
Coordinates / Type of coordinates	MARC 21	—Create a new subfield entitled Statement of type of coordinates in 255. —Make clearer that $d—Statement of zone (Used for celestial charts) is used to register the classical celestial equatorial coordinates (Right Ascension and Declination).
	ISBD	Include this element in section 3.1.3.
	RDA	Include this element in a new section 7.4.5.
Projection	MARC 21	-
	ISBD	-
	RDA	-
Scale	MARC 21	Provide catalogers with some technical instruction and some examples about the inclusion of this datum in 034 according to ISBD principles.
	ISBD	-
	RDA	Provide catalogers with some technical instruction about the inclusion of this datum in element 7.25.1.5.
Perspective	MARC 21	Create a new subfield entitled Perspective in 034 and 255.
	ISBD	Include a sentence and some examples in section 3.1.2.2
	RDA	Include a sentence and some examples in section 7.26.

Table 8. Recommendations to Standards Developers Regarding the Proposed Addition of Elements to Accommodate Attributes of Celestial Cartography Material (cont.)

Parameters	Standards	Recommendations
Equinox / Epoch	MARC 21	Use separate subfields for Epoch and Equinox in 034 and 255. For instance, create a new subfield entitled Epoch and maintain $p—Equinox in 034. Create a new subfield entitled Epoch and maintain $e—Statement of equinox in 255.
	ISBD	—Use also separate elements for Epoch and Equinox. For instance, create an element 3.1.3.5 for Epoch. —Indicate that these dates might not be only an integer number, but may include a decimal.
	RDA	Although an example is provided for the Epoch, indicate also that these dates might not be only an integer number, but may include a decimal.
Magnitude and Type of magnitude	MARC 21	Include this parameter as a new subfield in 034 and 255 together with a definition and some examples. The brightest and faintest magnitude of the objects of a resource must be given.
	ISBD	This parameter is already considered, but need to be defined. The concept "limiting magnitude" is set to be 22 and currently must be set to be 30.
	RDA	Idem as with ISBD.
Celestial Hemisphere	MARC 21	Include a sentence indicating the celestial hemisphere and some examples in 662—Subject Added Entry-Hierarchical Place Name (R) ; $a—Country or larger entity (R).
	ISBD	Idem in section 3.1.3.
	RDA	Idem in section 7.3 or 7.4.4.
Observation period	MARC 21	Include a sentence indicating the observation period and some examples in: 033—Date/Time and Place of an Event (R) $a—Formatted date/time 518—Date/Time and Place of an Event Note (R) $d—Date of event
	ISBD	Idem in section 7.4.1.
	RDA	Idem in section 7.11.3.
Observation place	MARC 21	Include a sentence indicating the observation period and some examples in: 033—Date/Time and Place of an Event (R) $p—Place of event 518—Date/Time and Place of an Event Note (R) $p—Place of event
	ISBD	Idem in section 7.4.1.
	RDA	Idem in section 7.11.2.
Constellation name	MARC 21	Include a sentence to add this information and some examples in 662—Subject Added Entry-Hierarchical Place Name (R), $h—Extraterrestrial area.
	ISBD	Idem in section 7.10.
	RDA	Idem in section 7.27
Observation and measurement instruments	MARC 21	Include a sentence and some examples in 500
	ISBD	Idem in section 7.10.
	RDA	Idem in section 7.27.
Astronomical naming convention	MARC 21	Include a sentence and some examples in 500.
	ISBD	Idem in section 7.10.
	RDA	Idem in section 7.27.
Wavelength	MARC 21	Include it in 255—Cartographic Mathematical Data
	ISBD	Include it in 3.1.3 or in 7.3.
	RDA	Include it in section 7.

Table 8. Recommendations to Standards Developers Regarding the Proposed Addition of Elements to Accommodate Attributes of Celestial Cartography Material (cont.)

Parameters	Standards	Recommendations
Celestial objects of special interest	MARC 21	Include this information in 500.
	ISBD	Idem in section 7.10.
	RDA	Idem in section 7.27.
Constellation Images	MARC 21	Include a sentence and some examples in 5XX.
	ISBD	Idem in section 7.5.1.
	RDA	Idem in section 7.27.
Table of Contents	MARC 21	-
	ISBD	-
	RDA	-
Related document	MARC 21	Include some sentence indicating that related documents for the case of celestial cartographic resources are also given when available in 510.
	ISBD	Idem in section 7.2.4.6.
	RDA	Idem in section 7.16
Name of the astronomical parameters included in the main table	MARC 21	Include this information in the subfield $g—Miscellaneous information of 505—Formatted Contents Note.
	ISBD	Idem in section 7.10.
	RDA	Idem in section 7.16.
Captions of other tables giving extra-information	MARC 21	Include this information in the subfield $g—Miscellaneous information of 505—Formatted Contents Note.
	ISBD	Idem in section 7.7.3.
	RDA	Idem in section 7.16.

To ease the work of catalogers, we provide in table 8 a list of proposed fields/subfields/elements and some recommendations to standards developers regarding the addition of subfields to existing fields and elements to accommodate the attributes of celestial cartographic materials. A dash in this table means that a recommendation is not necessary. Note that, in particular, fourteen new parameters are considered: type of coordinates, perspective, type of magnitude, celestial hemisphere, observation period, observation place, constellation names, observation and measurement instruments, astronomical naming convention, wavelength, celestial objects of special interest, constellation images, name of the astronomical parameters included in the main table of a star catalog and captions of other tables giving extra information of the star catalog.

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"The Commitment Problem"

Spending to Zero to Maximize the Efficiency of the Collections Budget

Robert M. Cleary

The difficulty for a library to spend their collections budget efficiently is a timeless problem. The diversity of a typical budget, with its mix of one-time and continuing funds, for an array of resources that have both regular and sometimes irregular frequencies, provides great challenges. Approval plans, usually expending one-time funds, generate expenditures that contain high variability on a weekly basis. Standing orders for serials fall into the same category. With some effort, it is possible to expend all continuing funds. But it is the commitments that do not result in expenditures, with funds remaining in cash balances that can determine what university administrators call "efficient results." Acquisitions personnel must take an aggressive approach to commitments with the goal of turning as many possible into expenditures. New expenditures will compensate for the orders that remain committed. Based on the assumption that efficient spending focuses on a library budget's final cash balance, this article presents a method to consistently achieve a zero or negative cash balance.

Most historically underfunded libraries pursue additional funding for their collection development budgets. During this process, university administrators may question why collection funds are not spent by a seemingly high percentage. They may reject the standard response to the question about the level of carryover, or cash balance, which identifies unpaid firm orders as the problem. Unless the library records commitments in the same system that is used by university budget personnel, they will appear as unspent cash. The resulting carryover largely represents outstanding orders, plus excess cash, and illustrates that acquisitions processes are not necessarily clear cut. This paper explores a method to achieve a less-than-zero cash balance, a requirement that one library budget manager called "unlikely."[1] Librarians responsible for collections funds can apply these methods to any size budget. Depending on the particular situation, the net result of the close attention paid to commitments (encumbrances) and cash balance will be the maximum efficient use of funds.[2] The methods the author describes were developed following nine years of meeting the goal to spend the collections budget as close to zero as possible. Results have varied, but it is possible to achieve a zero-percent cash balance (rounded), even with a negative final balance.

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Literature Review

The literature on this topic focuses on the allocation process, but rarely outlines how to obtain efficient expenditure goals or attempts to define the nature of an efficient goal. Statements such as "allocations should present a realistic plan for expenditures" appear to be goal neutral, or caution against over-expenditure by a large amount.[3] Carpenter suggested using overencumbrance and established cut-off dates for firm orders, and proposed using deposit accounts to expend excess cash.[4] Gammon and Ficken believe that few budgets allow carryover and stress the need to "stretch" limited dollars, and focus on the reconciliation of ledgers between the library and university accounts.[5] Gibbs discussed the problem of receiving more money in the budget, yet her library was only required to commit, not expend, the funds by the end of the fiscal year.[6] Martin, in a sample budget, considered that 91 percent expended and 9 percent committed was an example of meeting a reasonable goal for cash expenditures.[7] Miller cautioned against excessive deficits or commitments carried over and was aware of the problems of predicting expenditures for continuations, but offered little advice on how to achieve the "success" mentioned in the title of his article.[8] McGinnis and Faust defined spending goals as effective and timely, and stressed the need to monitor cash balances regularly, but did not define how to meet a cash balance goal.[9] Clendenning, Martin, and McKenzie focused on the problem of unexpended commitments, and provided sound advice to reduce balances, but did not examine the consequences for the overall cash balance.[10] None of these authors tackled the difficulty of meeting a progressively efficient cash balance goal. It is likely that many libraries have developed a locally defined goal for an acceptable final cash balance, including an acceptable level of commitments.

The predictability of collection budget expenditures is highly variable and can be categorized by levels of degree of predictability. The ability to project and control the effects of a diverse group of library materials provides challenges. While it is common to divide a ledger into one-time and continuing expenditure funds, the only truly unobligated fund is likely to be contingency or reserve funds. If the percentage of reserve funds is low, predictability becomes an important factor.

Predictability: One-Time Funds: Firm Orders, DDA, Approvals, Prepayments, and Deposit Accounts

Commitments may not reflect actual prices, but should be close. By instituting a policy of suspension of new, non-rush or reserve, firm orders no later than a determined date, along with other measures, it is possible to reduce a final commitment level to .04 percent to .25 percent of one's total expenditures.[11] A focus on commitments, starting in February (or the eighth month) or sooner, will reveal duplicate orders, orders that are highly unlikely to result in expenditures that may be cancelled. Corresponding with vendors regarding materials received but not invoiced, or materials neither received nor invoiced, will provide the best result—a completed firm order. Concentrated efforts on order maintenance help the general goal to provide financial clarity: to determine whether there are sufficient funds to purchase new and possibly expensive resources. German proposed that allowing commitments to be increased by 10 to 30 percent is a method to spend available cash, but only if staff are not available to claim or cancel older orders.[12] While this method may work for part of the fiscal year, employing it in the latter half will quickly prove to be unmanageable. There is no substitute for substantial efforts to turn commitments into expenditures. Martin described institutions that have to cancel all outstanding orders at the end of the year, leaving the library with "substantial unexpended funds."[13] An alternative is to cancel as needed and reinstate when that cancellation decision turns out to be premature. Cancelling orders may appear to be the best way to reduce commitments, but if done too early in the fiscal year, the need to reinstate cancelled orders may prove overwhelming. If commitments do not turn into expenditures, they must be expended as if they did not exist. The importance of focusing on cash balance as opposed to an available balance occurs near the end of the fiscal year.

Demand-Driven or Patron-Driven Acquisitions (DDA/PDA) present budgeting challenges and require some measure of control, either through limiting available records to a single subject collection or setting dollar limits with vendors. DDA requests represent a variation of firm orders, with a key difference. In an academic setting, faculty and students submit firm requests through librarians, who control any further action. DDA orders are presented to libraries as invoices for which no specific commitment has been established. To avoid over expenditure, suspend patron access to these records at the same time as firm orders. This will allay the concerns of collection managers that instituting such a program will inhibit a library's ability to control costs.[14]

Approvals are the most unpredictable group of library expenditures that occur on a week-to-week basis. Setting dollar limits with a library's vendor will help, but may generate the need for more firm orders in the next fiscal year if the shipments stop. If the goal is to maintain receipt and payment of approval shipments as long as possible, any projection of expenditures must be fairly accurate. Whether your library allows rejections of approvals, one can track and predict approval expenditures on a monthly basis. After six months, setting up projections for the remaining six months

and monthly thereafter will prove valuable further along in the process. Despite Granskog's assertion that approvals are "fairly predictable and even," comparison on a weekly basis of the total value of a shipment of approvals reveals variations.[15] The author's experience has shown that approval shipments can vary from each other weekly by as much as 50 percent. If approval rejections are permitted, tracking their monetary value will allow the calculation of a predictable percentage. With careful management of available funds, and the advance notice of the value of the current shipment, it is possible to accept an approval shipment and pay for it on the last payment day of the fiscal year. Allow for one shipment the last week, but be prepared to not process it. This can be a hedge against uncertainty. Access to a vendor's system to determine in advance the total value of the current shipment can provide enough information to stop any bulk loading process. What happens in a given year can be hard to predict because of the variability of publishing output, but recording values of entire shipments on a weekly cycle will provide a basis for prediction. If approvals are a manual process, stop approval processing by the next to last week to pay invoices.

Some vendors require prepayments for firm orders and are helpful to reduce cash, and prepayments for subscriptions may result in discounts for future use. Any library that lost funds to the 2002 divine/Faxon bankruptcy may no longer have this option. Using deposit accounts presents possible auditing concerns about expenses with vendors for unspecified materials. Depositing an amount at the end of the fiscal year, just to reduce the cash balance, does not help a library progress by adding new resources. It does reserve the expenditure for the library's use in cases where funds are provided on a "use it or lose it" basis. The author has not been able to use this method to reduce the cash balance to zero, so it should not be necessary to accomplish the goal, but deposit accounts remain an option for some libraries.

Predictability: Continuing Expenditures

Pursuing renewal invoices is a mandatory activity to meet a zero-spend down goal. An additional benefit is to stay ahead of vendors who are slow to bill and might cancel because of lack of payment. Librarians typically construct allocations to allow payment for one subscription period, not two. The consequences of not being active in this area are many, and none are positive. If an invoice for an unpaid subscription arrives after the renewal period has begun, the opportunity to cancel and get a refund may be missed, if that was the intent. Another consequence of not paying close attention is that the funds may have been spent on other resources, and payment will be delayed until the next budget is available. An additional consequence will be the need to provide funding in next year's allocation, when invoices for two fiscal years will appear. The goal is to pay for these resources and to focus elsewhere. By May (or the eleventh month), with strong efforts in this area, only a handful of outstanding invoices should remain. Not all integrated library systems have a separate serial encumbrance feature; nevertheless, serial allocations should be considered to be committed 100 percent, unless proven otherwise. Only a precise projection review will determine whether there is a surplus or a deficit, and whether one can add to reserve funds or deduct from them.

Databases and E-journal Packages

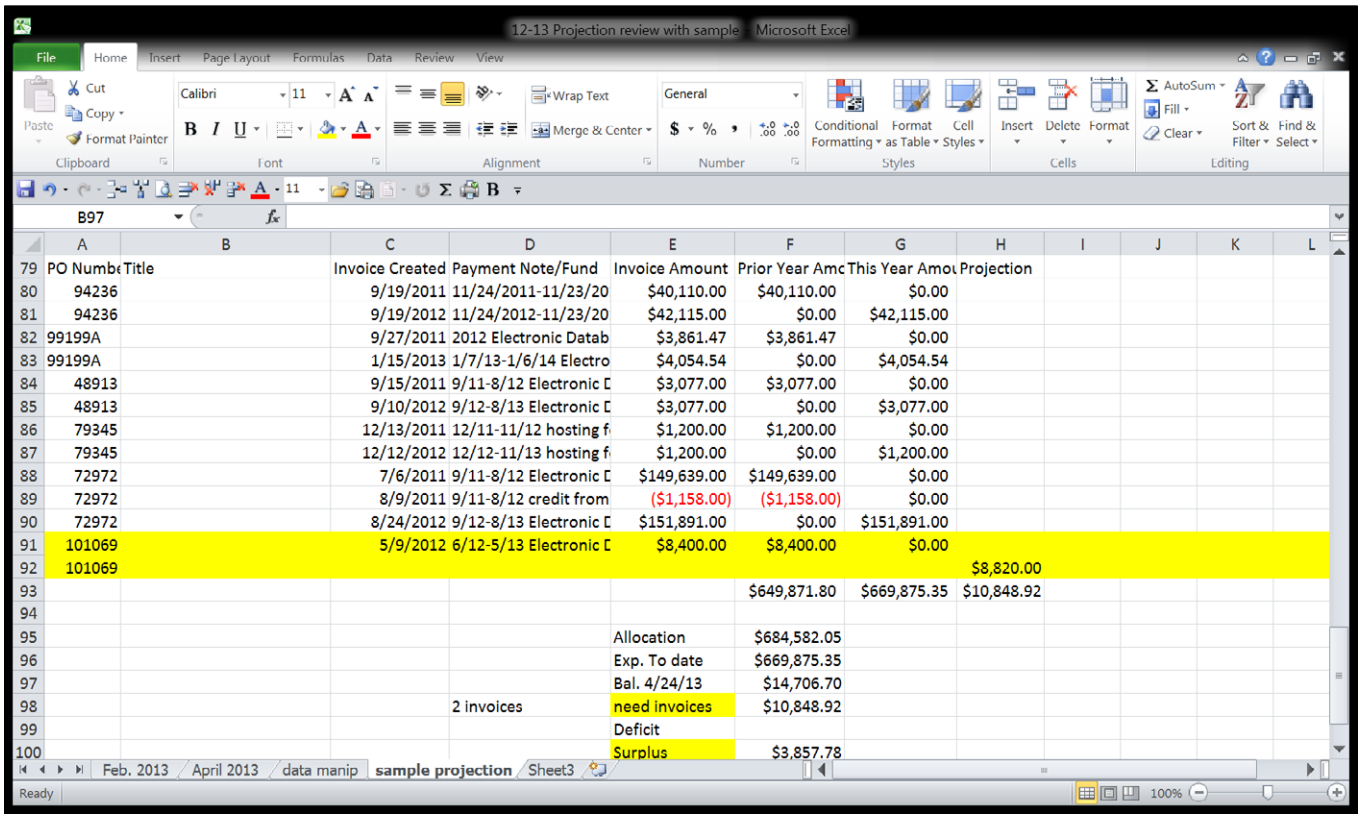
Many libraries have experimented with various funding mechanisms for their most expensive resources, including funding them first, separating resources that cost more than $10,000 into separate fund codes or distributing funds to subject area fund codes.[16] Whatever method a library uses, strict attention is necessary. If cost data are tracked in an Electronic Resource Management System (ERMS), there will be less dependence on separate fund codes. Using the renewal function of an ERMS to identify unpaid resources can be used as an interim step before creating projections to determine surpluses or deficits. Planning for and pursuing invoices is necessary in any case. After renewals are paid in July or August (or the first two months), September (or the third month) is a good time to start setting up projection reviews for these resources. Because these resources are the most expensive, they are more likely to be a source of significant surpluses or deficits.

Periodical Subscriptions (Print and Electronic)

After the main renewal is processed, typically before the end of the calendar year, it is an ideal time to review periodical funds balances. Allow funds for "bill laters," which will not follow any consistent pattern because of their irregular publishing cycle. The cost benefit of pursuing less expensive resources will diminish and there are limits to what billing can be forced, so reserve some funds on the basis of common pattern in billing. Typically, this means matching last year's expenditure level at a minimum. If the ledger structure has a large parent fund containing many dependent funds, the author's experience has shown that the underspent funds can support the overspent funds. The assumption is that all ledgers should have at least one contingency fund for transfers when needed.

Standing Order Serials

Standing order serials are less predictable than periodical subscriptions, but more predictable than monographic



	A	B	C	D	E	F	G	H	I	J	K	L
79	PO Numbe	Title	Invoice Created	Payment Note/Fund	Invoice Amount	Prior Year Amc	This Year Amou	Projection				
80	94236		9/19/2011	11/24/2011-11/23/20	$40,110.00	$40,110.00	$0.00					
81	94236		9/19/2012	11/24/2012-11/23/20	$42,115.00	$0.00	$42,115.00					
82	99199A		9/27/2011	2012 Electronic Datab	$3,861.47	$3,861.47	$0.00					
83	99199A		1/15/2013	1/7/13-1/6/14 Electro	$4,054.54	$0.00	$4,054.54					
84	48913		9/15/2011	9/11-8/12 Electronic D	$3,077.00	$3,077.00	$0.00					
85	48913		9/10/2012	9/12-8/13 Electronic D	$3,077.00	$0.00	$3,077.00					
86	79345		12/13/2011	12/11-11/12 hosting f	$1,200.00	$1,200.00	$0.00					
87	79345		12/12/2012	12/12-11/13 hosting f	$1,200.00	$0.00	$1,200.00					
88	72972		7/6/2011	9/11-8/12 Electronic D	$149,639.00	$149,639.00	$0.00					
89	72972		8/9/2011	9/11-8/12 credit from	($1,158.00)	($1,158.00)	$0.00					
90	72972		8/24/2012	9/12-8/13 Electronic D	$151,891.00	$0.00	$151,891.00					
91	101069		5/9/2012	6/12-5/13 Electronic D	$8,400.00	$8,400.00	$0.00					
92	101069							$8,820.00				
93						$649,871.80	$669,875.35	$10,848.92				
94												
95					Allocation	$684,582.05						
96					Exp. To date	$669,875.35						
97					Bal. 4/24/13	$14,706.70						
98				2 invoices	need invoices	$10,848.92						
99					Deficit							
100					Surplus	$3,857.78						

Figure 1. Sample Projection Review

series. One can project expenditures in this group to a reasonable degree. Martin stated that "standing orders offer the most trouble in predicting budgets."[17] The author tried to do this with his standing orders vendors, with limited success.[18] Creating a reserve of about $10,000 for all standing orders will be helpful. The timing and the amount will change on the basis of a library's particular needs. Allocations based on the previous year's expenditures may not be helpful in this area because of the lack of predictability.

Monographic Series

Monographic series can be highly unpredictable because of irregular publishing cycles. Series that produce more than one title per year, but not consistently, make any projection difficult. Including these standing orders in a reserve of $10,000 may work for your library.

Binding, Processing, and Shipping Charges

Binding, processing, shipping, and service charges require review for surpluses or deficits. Because of conversions of print subscriptions to electronic only, binding needs have steadily declined. Binding can be seasonal on the basis of patterns that may be uncontrollable. Processing charges for shelf-ready materials will vary because of shipment size of approvals and seasonal levels of firm orders. Shipping charges will decline as fewer firm orders are received, but approvals and standing orders will require continuous funding. Service charges will drop after the main renewal but will continue to present lower, but unpredictable, costs. Using an average weekly cost to project any of these charges may not work well, but consider all if the goal is to spend funds efficiently.

The allocation in figure 1 was determined on the basis of a projection using set percentages. The method of using known prices plus projections requires additional effort and will be more accurate. To determine an allocation, using the base budget increase added to the previous year's expenditures is a common method. A projection of some type is unavoidable because increased costs to databases and ejournal packages can be 0–8 percent or greater. In the course of nine years of managing this process, the author has not had to resort to using more sophisticated prediction models, such as those cited in the literature.[19] The ideal situation is to have as many actual expenditures as possible, and waiting until more invoices are paid will help provide financial clarity. Resist requests to transfer funds for other

purchases until a thorough projection reveals a potential surplus or deficit.

Minimum Requirements

Ability to Reconcile to the Central Ledger

If there is not an established process to reconcile your library's ledger with the central ledger, one must first be established. Otherwise, a goal of zero will not agree with the numbers seen by various accounting offices that review library balances. There will always be payment transactions and transfers of funds that are beyond the control of the library's normal payment processes. For example, credit card charges are extensively reviewed before posting, and the timing is variable; the same applies to wire transfers. Transfers of funds between departments can occur and corresponding transactions must reconcile the library's ledger to the ledger of record. Allocations and expenditures in the library ledger should match the central ledger. If one's budget has received a percentage increase, and to avoid an artificial inflation of that number, accounting will process any infusions of cash such as transfers or refund checks as expense reductions. This means that the library should reflect this transaction in the same manner as a credit memo.

Invoice Feed to Centralized Disbursements

For many libraries to process invoices, another department may handle the production of checks. The manual process of filling out requisition forms with invoices attached delay check writing and posting to the university ledger. Many libraries have an automated process that works with a centralized disbursements operation. It is possible to spend efficiently without an automated invoice feed, but reconciliation to the central ledger will be more problematic. Having a batch invoice process reduces reconciliation time by providing expenditure figures in aggregate. Dependable scheduling helps establish important deadlines, especially near the end of the fiscal year. The author is fortunate to have the access and processes needed to reconcile the library and university ledgers weekly. Obtaining this form of access is worth the time and effort to engage all of the entities that need to be involved to establish this automated process.[20]

Reports of Expenditures

It is easier to generate reports from some systems and is absolutely essential. Reports must contain all of the elements shown in figure 1.

Ledger Structure

A reasonably informed allocation process based primarily on expenditure history is a logical starting point. Allocations based on previous fiscal years may be too high or low. Basic divisions of the library ledger outlined above are minimum requirements. The structure of one's ledger will determine the ability to identify deficits and surpluses. The number of allocated fund codes can determine how many projection reviews are necessary. It is unreasonable to expect perfection in the allocation process. Most library ledgers separate one-time from continuing expenditures, and may also subdivide within those two groups. One-time funds will cover firm orders, but may also need to cover approvals. Separate fund codes for approvals or some other means of distinguishing approval expenditures are essential. It is typical to allocate approvals on the basis of previous year's expenditures. A percentage reserved for contingency funds will cover inflation and other emergencies, such as serial cost overruns. All allocations must be projected against expenditures and reviewed for accuracy to determine deficits or surpluses.

During the first two years of managing the spend down process, the author worked with a ledger that featured major e-resource expenditures organized into general fund codes that were allocated first. Subject fund allocations had a minimum of four allocated fund codes; one-time, periodicals, serials, and monographic series all had an allocation. The former ledger contained more than 250 allocated fund codes. The example in figure 2 reflects a major revision to the ledger that consolidated allocations and redistributed funds for electronic resources from the general to the subject areas. The red squares indicate a summary level, and the blue triangles designate an allocated fund code. Instead of three allocated fund codes for serials, only one remains. Expensive databases are allocated separately as "Humanities E Resources" and "VPA E Resources" in figure 2, which allows for a simpler projection review. Costs for e-journal packages are shared on a percentage basis in each subject area's serials fund to more accurately show support by broad subject area: arts and humanities, science, etc. Formerly, e-journal packages were allocated in the "General-Miscellaneous" area. The ledger in figure 2 contains fifty-three allocated fund codes. The author's experience has shown that having fewer allocated fund codes requires less tracking and transfers to help focus on the final cash balance.

Calendar for the Fiscal Year

Table 1 provides a defined period, activity, and goal, starting from the beginning of the fiscal year and ending in June (or the twelfth month). The process begins with establishing a

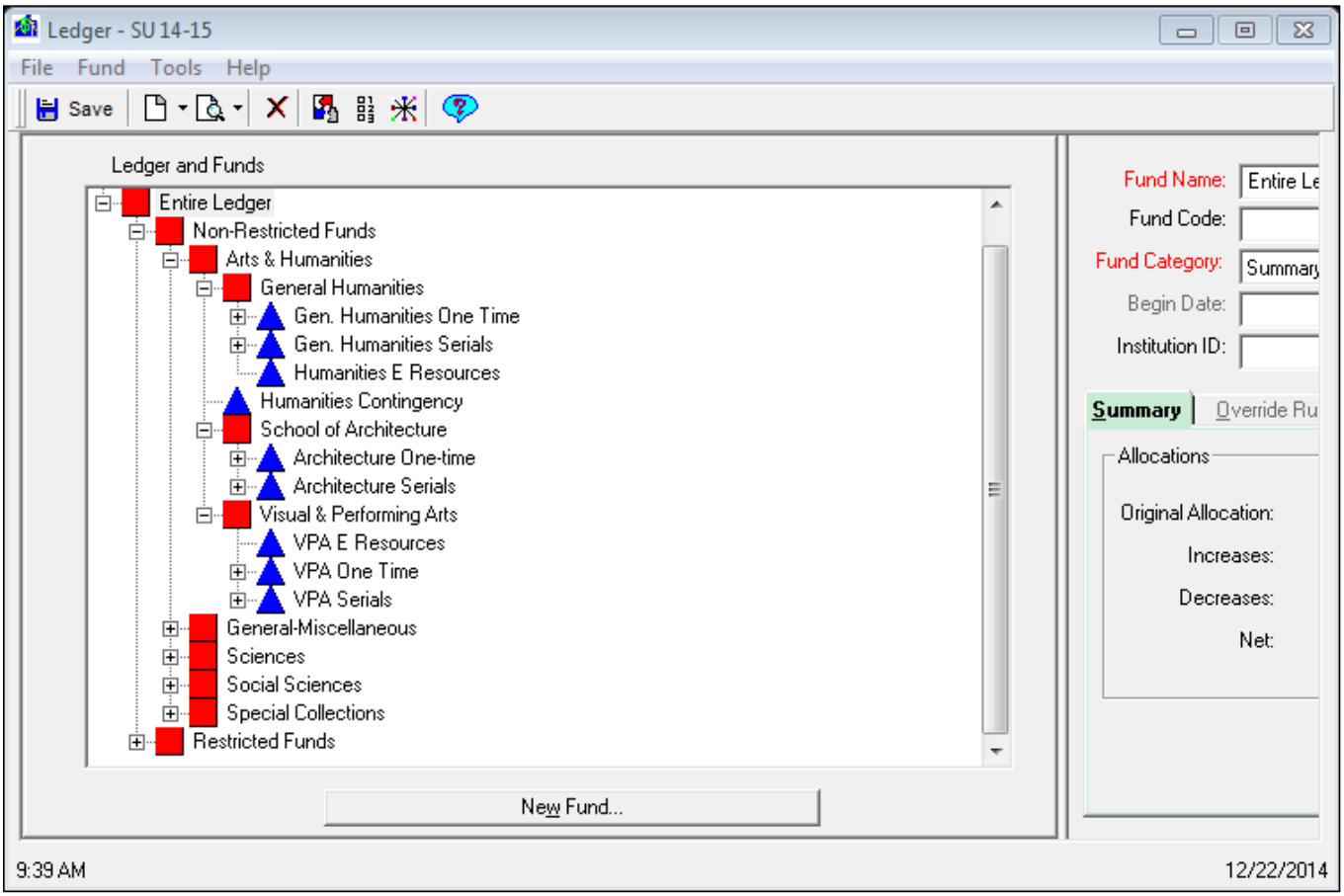


Figure 2. Sample Ledger

true cash balance and concludes with spending as close to zero as possible.

Zero-Countdown Spreadsheet

After invoices for expensive resources have been paid, predicting how cash will be spent is necessary. This can be done with a simple spreadsheet, which is provided in figure 3. In most systems, approvals are not committed in advance and are tracked with a projection figure. By May (or the eleventh month), there will be ten months' worth of data to project a monthly or weekly approval shipment value. The state of reserve funds will determine how many "big ticket" items can be purchased. The assumption is that these will be electronic resources, given that the turnaround time for acquisitions is short. One way to accommodate the unknown is to ask vendors for installment payment plans, usually starting in one fiscal year, with another in July (or the first month), when the new fiscal year starts. In some cases, advancing the schedule with an additional payment will help especially if the cash balance is too high. It will be necessary to work closely with collection development personnel to determine options for various amounts to expend available cash. While the temptation to expend aggressively may alleviate anxiety about meeting the goal, a conservative approach should match the time of the fiscal year. Delaying a decision on an expensive "big ticket" item can often be a wise choice and will prove to be either possible or not, as time progresses.

The zero-countdown spreadsheet example starts with four weeks left in fiscal year. A macro records the date and time and pertinent financial figures. The university ledger numbers are recorded one week later. The challenge of focusing on the cash balance is determining how to handle commitments. Given the need to spend beyond the available balance to spend-down cash, the question is one of how much. Within the range of roughly $10,000, establish a preference for orders that are formally committed, and maintain that policy as long as possible into the fiscal year. If invoices are paid using a batch process and there is an early cut-off date for paying invoices, this becomes even more challenging.

The author tracked commitments for big ticket items in the zero countdown sheet because the cash level remains

Table 1. Fiscal Year Calendar

Period	Activity	Goal
July–June (or Jan.–Dec.): weekly	Reconcile expenditures and cash balance to main ledger	Establish true cash balance
July–June (or Jan.–Dec.): monthly	Record approval expenditures	Establish data for projection of approvals in January to June (or last six months)
September through November (or third-fifth months)	Monitor original allocations versus expenditures for databases and e-journal packages	Determine deficits or surpluses
December (or sixth month)	Process main subscription renewals; review state of serial allocations.	Determine uninvoiced resources.
January (or seventh month)	Predict approval expenditures based on six months of data	Determine potential deficits or surpluses
February (or eighth month)	Analyze commitments	Determine available cash
March (or ninth month)	Retire database fund codes	Determine available cash
April (or tenth month)	Retire database fund codes	Determine available cash
May (or eleventh month)	Reduce firm orders to rush/reserve; turn off demand-driven acquisitions; determine available cash	Acquire big ticket items
June (or twelfth month)	Balance known and unknown obligations; closely monitor approval shipments; establish priorities for available cash; determine whether more big ticket items can be purchased or additional installment payments can be made; hold invoices to avoid over expenditure.	Spend as close to zero as possible

the focus. Focus on the base level of commitments, which can become obscured by commitments for big tickets, as shown in figure 3. That is why a calculation for the base level is provided, which generally includes commitments for materials that are less than $1,000. Since big tickets have already been counted as reducing one's cash needs, the balance after all of those items will reveal what can be spent on firm orders and uncommitted serials. The author has found that this method is preferable to using serials allocations. Every invoice that could be paid has been paid, and any subsequent invoicing is hard to predict or control. The assumption is that all subscriptions costing four figures and above have been paid, and subsequent invoices, for bill later titles for example, will involve lesser sums of money.

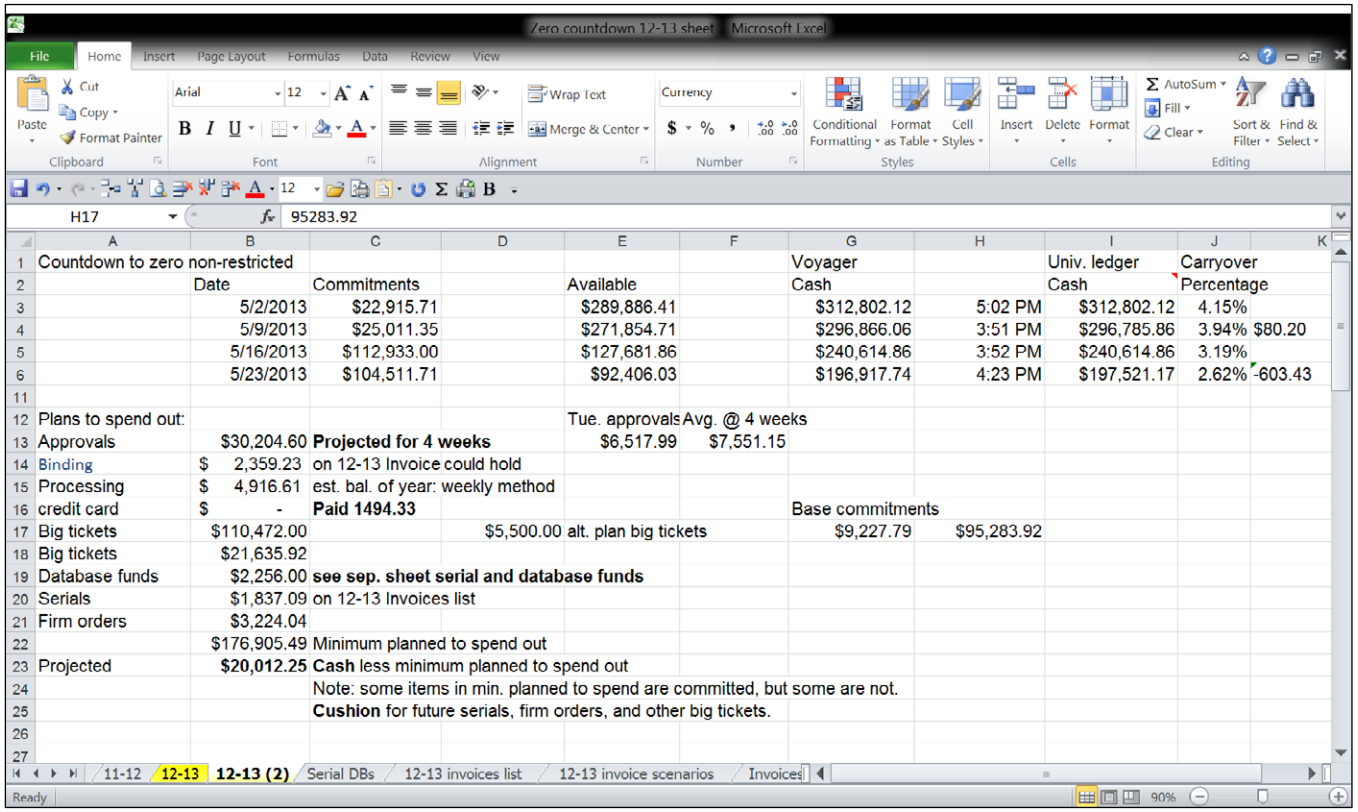
The list on the left-hand side of figure 3, under "plans to spend out" is a mix of projections and known figures. All projected figures must be adjusted against real figures. For example, by Wednesday, invoices for that week's approvals, firm orders, serials, and processing charges for shelf-ready books will be available. Approvals and processing charges have projections, and those figures will be adjusted. Processing firm orders will directly reduce cash and committed levels. Paying serial invoices will only reduce cash.

There will always be situations where combining committed and uncommitted, planned and unplanned expenditures on invoices will be problematic. If firm orders are sent with materials when only a quote was expected, if previously cancelled orders arrive, or if smaller, irregular approval plans produce materials with invoices, one must make a decision to deduct, accept, or defer. All decisions have consequences for the final balance, and a good practice would be to consider how accrual accounting practices would view a particular transaction.

Accrual accounting systems are more common in libraries than cash accounting systems.[21] The ability to accrue unexpended commitments and carryover a corresponding cash balance is unquestionably a less efficient use of a budget from a managerial accounting view. The author has applied these methods under an accrual accounting system, but because commitments are not recorded in the university's central accounting system, adjustments in approach to the cash balance are required. Offsetting remaining commitments with additional expenditures to reduce cash is a reasonable way to reconcile the concerns of efficiency and the accurate recording of obligations required.

At the beginning of June, holding all binding, processing, and serial invoices will allow the committed balance to go down. This will reserve cash to continue paying for all firm orders. The next step is to total the invoices held until the total exceeds the cash balance. Recording them in a spreadsheet and sorting by amount will show that various scenarios will help reduce the cash balance to slightly beyond or close to zero. It is possible to construct a group of twelve or fewer invoices that will clear the cash balance.

During the last possible week to pay invoices, make decisions about your approval shipment, and any invoices in



Zero countdown 12-13 sheet - Microsoft Excel

H17: 95283.92

	A	B	C	D	E	F	G	H	I	J	K
1	Countdown to zero non-restricted						Voyager		Univ. ledger	Carryover	
2		Date	Commitments		Available		Cash		Cash	Percentage	
3		5/2/2013	$22,915.71		$289,886.41		$312,802.12	5:02 PM	$312,802.12	4.15%	
4		5/9/2013	$25,011.35		$271,854.71		$296,866.06	3:51 PM	$296,785.86	3.94%	$80.20
5		5/16/2013	$112,933.00		$127,681.86		$240,614.86	3:52 PM	$240,614.86	3.19%	
6		5/23/2013	$104,511.71		$92,406.03		$196,917.74	4:23 PM	$197,521.17	2.62%	-603.43
11											
12	Plans to spend out:				Tue. approvals	Avg. @ 4 weeks					
13	Approvals	$30,204.60	**Projected for 4 weeks**		$6,517.99	$7,551.15					
14	Binding	$ 2,359.23	on 12-13 Invoice could hold								
15	Processing	$ 4,916.61	est. bal. of year: weekly method								
16	credit card	$ -	**Paid 1494.33**				Base commitments				
17	Big tickets	$110,472.00		$5,500.00	alt. plan big tickets		$9,227.79	$95,283.92			
18	Big tickets	$21,635.92									
19	Database funds	$2,256.00	**see sep. sheet serial and database funds**								
20	Serials	$1,837.09	on 12-13 Invoices list								
21	Firm orders	$3,224.04									
22		$176,905.49	Minimum planned to spend out								
23	Projected	**$20,012.25**	**Cash** less minimum planned to spend out								
24			Note: some items in min. planned to spend are committed, but some are not.								
25			**Cushion** for future serials, firm orders, and other big tickets.								
26											
27											

Sheet tabs: 11-12 | 12-13 | 12-13 (2) | Serial DBs | 12-13 invoices list | 12-13 invoice scenarios | Invoices

Ready 90%

Figure 3. Zero-Countdown Spreadsheet

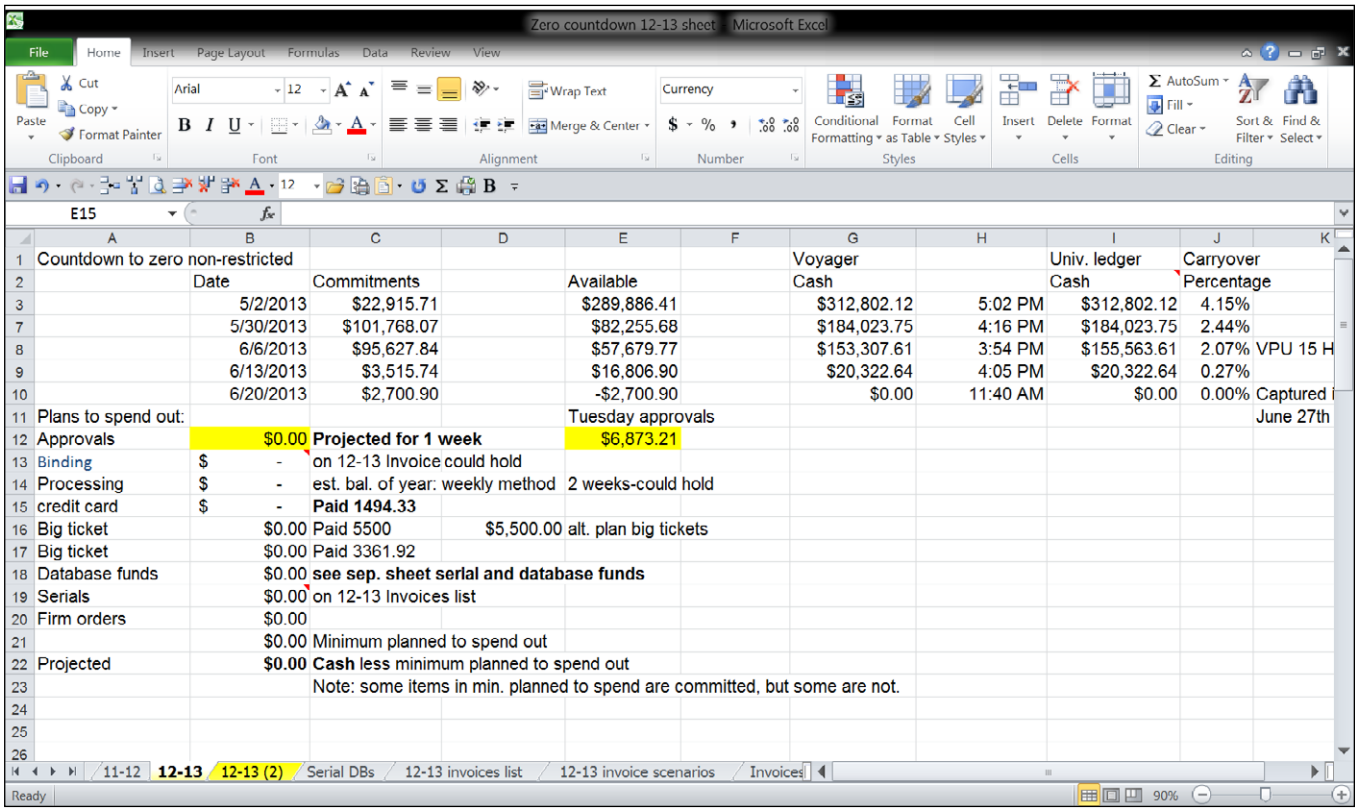
hand. If a library's approval invoices are batch loaded, it is best to avoid having to repeat the process by only accepting some invoices. If one has planned well, there will be more invoices than the budget can pay, but not too many. Once the goal of spending to zero is met, a follow-up goal for the next fiscal year is to avoid having too many accrued obligations. A key factor to success is to develop a feel for what is an acceptable "cushion." This will vary by the time of year, with the target amount trending progressively smaller. For example, a cushion at the beginning of May (or the eleventh month) of $50,000 is fine, and at the end of May (or the eleventh month), it should be about $20,000 and progress downward in June (or the twelfth month). This will vary with the size of the library's budget. It becomes extremely difficult to project standing order expenditures, and the cushion is intended to cover the hard to predict and control expenditures.

An alternative plan is needed if the cushion is too small to cover another large one-time purchase, but unpaid invoices do not cover the cushion amount. One choice is to violate the practice of only one payment per fiscal year for subscription renewals and to change the schedule of payments. Typically, there will be invoices that cover a renewal period of July–June (or January–December) that are traditionally paid in July (or January). With good planning, advancing that schedule is a choice that will have minimal effect on one's allocations. Most vendors understand that libraries do not pay all invoices for subscriptions in advance, but would surely appreciate an earlier payment. The problem is that this practice does not help the library progress in collection development by adding to its holdings. Another problem is the need to decide to stay with the new alternative schedule, or revert to the old, technically late, schedule of payment.

If there are multiyear agreements for large one-time purchases, this is likely the result of the need to spread the effect over the course of two or more budget years. These types of arrangement can be a source of additional expenditures if the cushion is too large to cover invoices in hand. This choice is sounder than changing the schedule of payment for subscription renewals, since access has already been granted.

During this process, and if a library's fiscal year runs from July to June, vendors that are more responsive to your needs to spend by the end of the fiscal year will be obvious. Vendors operate on a calendar-year basis and offer sales deals with a deadline of the end of December. It has been the author's experience that providing lead time is essential for electronic resources, even if all that is needed is to get a rider attached to an existing licensed signed and processed. Initiate big-ticket purchases no later than the last week in May (or the eleventh month) if your fiscal year ends as early as June 20 (or December 20).

The results of all of this attention are reflected in figure 4, in which actual balances appear. Over time, one develops



	A	B	C	D	E	F	G	H	I	J	K
1	Countdown to zero non-restricted						Voyager		Univ. ledger	Carryover	
2		Date	Commitments		Available		Cash		Cash	Percentage	
3		5/2/2013	$22,915.71		$289,886.41		$312,802.12	5:02 PM	$312,802.12	4.15%	
7		5/30/2013	$101,768.07		$82,255.68		$184,023.75	4:16 PM	$184,023.75	2.44%	
8		6/6/2013	$95,627.84		$57,679.77		$153,307.61	3:54 PM	$155,563.61	2.07%	VPU 15 H
9		6/13/2013	$3,515.74		$16,806.90		$20,322.64	4:05 PM	$20,322.64	0.27%	
10		6/20/2013	$2,700.90		-$2,700.90		$0.00	11:40 AM	$0.00	0.00%	Captured i
11	Plans to spend out:				Tuesday approvals						June 27th
12	Approvals	$0.00	**Projected for 1 week**		$6,873.21						
13	Binding	$ -	on 12-13 Invoice could hold								
14	Processing	$ -	est. bal. of year: weekly method		2 weeks-could hold						
15	credit card	$ -	**Paid 1494.33**								
16	Big ticket	$0.00	Paid 5500	$5,500.00	alt. plan big tickets						
17	Big ticket	$0.00	Paid 3361.92								
18	Database funds	$0.00	**see sep. sheet serial and database funds**								
19	Serials	$0.00	on 12-13 Invoices list								
20	Firm orders	$0.00									
21		$0.00	Minimum planned to spend out								
22	Projected	**$0.00**	**Cash** less minimum planned to spend out								
23			Note: some items in min. planned to spend are committed, but some are not.								
24											
25											
26											

Figure 4. Final Working Spreadsheet

a sense for how much of a "cushion" is needed before deciding to expend large sums on new resources. It is necessary to avoid creating new obligations and subsequently being unable to pay for current standing orders because funds were depleted. Martin stated that the goal should be to spend your budget "properly and profitably," but your institution will define what that means.[22] The consequences of overspending can vary from creating a perception of mismanagement, attracting the attention of accountants if large accrued invoice amounts are held when they could have been paid in the current fiscal year, negative carryover, or a large burden on the next year's budget. If your institution requires that expenditures that belong in the current fiscal year be expended in that year, there will be negative carryover. What should be acceptable is a reasonable balance. If the invoices held match the outstanding commitments, one has met this goal reasonably well.[23]

Best Practices

The following best practices are recommended:

- Establish a reconciliation process for the local and parent ledgers.
- Create reserve funds for a minimum of 5 percent of total allocation.
- Separate expensive resources into easily examined fund groups.
- Project approvals on a monthly basis.
- Limit expenditures on subscriptions to one payment per fiscal year.
- Project expenditures for as many unexpended resources as possible.
- Review existing commitments for anomalies and pursue unexpended orders regularly.
- Create flexibility by using installment payment plans for large one-time expenditures.
- Track cash balance on a daily basis in the final two months.

Conclusion

The problem of the difficulty of spending a collection development budget to zero is timeless. Whether 75 percent of one's budget pays for electronic resources or less, what has changed is that there are more tools to help speed up the process. The fax machine used to receive invoices on a

rush basis has been replaced by scanned PDF copies sent by email. Incidents of invoices lost in the mail happen less often. The need for paper invoices for an audit trail has not changed. Libraries still need cooperation from all personnel involved. In 1979, Snowball and Cohen reported that their methods for efficient expenditure resulted in .65 percent deficit on a budget of $1,336,000.[24] That translates into a deficit of $8,684, which would result in negative carryover at many institutions. Better results can be obtained using the methods outlined in this paper. When the author first had to meet this goal, five months remained in the fiscal year and a final negative cash balance resulted in negative carryover in the next fiscal year. In subsequent years, with an entire year to focus on the goal, no negative carryover was assessed, perhaps because of the relatively low negative cash balance (less than -$100). This is a goal that can be met with steady effort for any collection development budget.

Notes and References

1. Kathryn Hammell Carpenter, "Forecasting Expenditures for Library Materials: Approaches and Techniques," *Acquisitions Librarian* 1, no. 2 (1989): 31–48.
2. The author will use commitments throughout to also refer to what some systems call encumbrances. Primary references to timing are based on a July 1 to June 30 fiscal year, with other fiscal years noted in parentheses. A basic assumption is that a library's non-restricted budget is larger than any one restricted fund, but the same methods can be applied on a smaller scale to a restricted fund.
3. Lisa German et al., *Guide to the Management of the Information Resources Budget* (Lanham, Md: Scarecrow, 2001), 3.
4. Carpenter, "Forecasting Expenditures for Library Materials," 44. The author has used over encumbrance and cut-off dates, but the use of deposit accounts was not an option. Having this option allows the expenditure of flexible amounts without a specific resource in mind. Negative carryover has not been assessed when overspending was less than $100.
5. Julia A. Gammon and Carol A. Ficken, "The Balancing Act; or, How Much Money Do We REALLY Have Left?" *Acquisitions Librarian* 6, no.12, (1994): 37–49.
6. Nancy J. Gibbs, "It's Hard Work Spending Money: Handling Budget Aberrations," in *Acquisitions '91: Conference on Acquisitions, Budgets, and Collections*, ed. David C. Genaway (Canfield, Oh: Genaway & Associations, 1991), 115.
7. Murray S. Martin, *Collection Development and Finance: A Guide to Strategic Library-Materials Budgeting* (Chicago: American Library Association, 1995): 108.
8. Robert C. Miller, "Acquisitions Budgets: Planning and Control for Success," *Acquisitions Librarian* 1, no. 2 (1989): 1–11.
9. Mildred McGinnis and Mary Faust, "Establishing, Monitoring, and Spending the College and University Acquisitions Budget," *Acquisitions Librarian* 1, no. 2, (1989): 133–44.
10. Lynda Fuller Clendenning, J. Kay Martin, and Gail McKenzie, "Secrets for Managing Materials Budget Allocations: a Brief Guide for Collection Managers," *Library Collections, Acquisitions, & Technical Services* 29, no. 1, (2005): 99–108.
11. These percentages correspond roughly to $2,500 to $12,200 in outstanding commitments at year-end.
12. German et al., *Guide to the Management of the Information Resources Budget*, 13.
13. Martin, *Collection Development and Finance*, 13.
14. Denise A. Garofalo, "Tips from the Trenches," *Journal of Electronic Resources Librarianship* 23, no. 3 (2011): 274–76.
15. Kay Granskog, "Basic Acquisitions Accounting and Business Practice," in *Understanding the Business of Library Acquisitions*, 2nd ed., ed. Karen A. Schmidt (Chicago: American Library Association, 1999): 310.
16. Christina Kulp and Karen Rupp-Serrano, "Organizational Approaches to Electronic Resource Acquisition," *Collection Management* 30, no. 4 (2005): 3–29.
17. Martin, *Collection Development and Finance*, 61.
18. One vendor, who usually batches shipments together to arrive in May, but typically not June, changed their pattern in 2013. The cushion was sufficient to pay the invoice.
19. Carpenter, "Forecasting Expenditures for Library Materials," 42.
20. Rosann Bazirjian and Randall Ericson, "The Accounting Office Interface: Syracuse University," *Library Acquisitions: Practice & Theory* 16, no. 4 (1992): 393–403.
21. Nancy M. Stanley, "Accrual Accounting and Library Materials Acquisitions," *Bottom Line*, 7, no. 2 (1994): 15–17.
22. Martin, *Collection Development and Finance*, 82.
23. For example, if outstanding commitments are $2,701 and held invoices total $2,563, a scenario that creates a zero cash balance, in theory that represents an over-obligated budget by $2,563. The fact that the two numbers are so close is why the author states that the goal was met. The only result that would achieve perfection would be to have no invoices to hold, no commitments, and no cash. Once one has achieved a zero cash balance, this can be the next goal.
24. George J. Snowball and Martin S. Cohen, "Control of Book Fund Expenditures Under an Accrual Accounting System," *Collection Management* 3, no. 1 (1979): 5–20. The authors stated that "encumbered funds are regarded as spent" so it is possible that the deficit they cited was a mix of cash and encumbrances.

E-book Use and Value in the Humanities

Scholars' Practices and Expectations

Tina E. Chrzastowski and Lynn N. Wiley

A research project to study e-book adoption in the humanities was conducted at the University of Illinois at Urbana-Champaign (UIUC). This study had multiple components. Data were collected from a demand-driven acquisition program in humanities disciplines utilizing short-term loans purchased via an e-book aggregator. The study measured the choice of an e-book over print by reviewing print availability as an e-book loan was initiated. Use transactions were examined and categorized to determine levels of e-book use. Scholars from disciplines matching the Demand-Driven Acquisitions (DDA) offerings were invited to take a survey on e-books. Scholars were asked about their view on the adoption of e-books, e-book values, the role of print books in the future and factors in their choice of book format. The data showed a split in acceptance of electronic versus print. The data also show that although humanists may lag behind other disciplines in incorporating e-books into their research, they believe e-book availability and use will increase. Many would like to see more e-books available in their disciplines. The e-book format is appreciated, but scholars may also want the full text along with the print because of the varied types of reading employed by humanities scholars.

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E-books are a topic of interest to librarians from all library types and all subject disciplines. Librarians at the University of Illinois at Urbana-Champaign (UIUC) have published studies on e-book use and value that specifically focused on science disciplines. Chrzastowski's 2011 study revealed that physical and life scientists used and benefited from early adoption of e-books on campus, but these conclusions did not inform bibliographers and collection decision-makers in other disciplines at her institution.[1] It seemed intuitive that the use of e-books by scientists would not necessarily match those of humanists or social scientists; certainly the volume and availability of current e-books to scientists was initially greater than for other disciplines, at least at UIUC. However, the question of use in other subjects had not been explicitly addressed and required investigation. When the opportunity arose to continue conducting e-book research in another discipline, the humanities became the focus simply because e-book purchasing was of low volume in this area, and the investigators wanted to explore why. IMLS grant funding made it possible to examine e-book use and perceptions in the humanities using two methodologies, a Demand-Driven Acquisition (DDA) study using ebrary's (a major vendor for aggregated e-book access) title list and platform, and a survey of faculty and graduate students in the six areas matching

the DDA research: architecture, art, classics, history, music, and religion/theology.

Research questions for the study focused on humanities scholars' perceptions of e-books compared to print and their thoughts on future e-book availability in their discipline. Their answers are important in weighing collection decisions in the near future because bibliographers welcome information about the use of materials added to the library's collections. Humanities scholars' input on e-book use covers not only content but also format, the platforms to access content, navigation and viewing options, and devices used to access the text. Use is affected by purchase options where use may be limited because of the number of user constraints or by the digital rights management (DRM) set by publishers.

Specific research questions from this study include the following:

- What characteristics or circumstances drive the choice to use an e-book versus print?
- How important is accessibility and availability when weighed against the more traditional print use that can include, for example, the need to annotate text or lay open the pages of a print book?
- What type of reading do humanists do when using an e-book?
- What qualities or capabilities do humanists expect in an e-book?
- Do humanists believe that e-books will see both more availability and user adoption in their discipline in five years?

Literature Review

The authors looked at the literature in several areas for this study to best establish a frame for understanding humanities research and what that may look like in the digital arena. The discipline demands extensive use of monographs and it was important to know how these scholars read text. Therefore the literature review covered three areas: DDA models that include e-books simply to establish the effectiveness of that model, research about how scholars read and what it means to read in a digital environment, and users' interactions with e-books, specifically humanists' use of academic e-books.

The literature on DDA is fairly extensive, considering the short time this collection development strategy has been available. Kaczorowski published a thorough annotated bibliography of DDA research that covers the literature from approximately 2009 to 2012.[2] He notes that there is a paradigm shift underway as more libraries implement DDA; e-books are being made available to users more frequently and are consequently growing as a format in library collections. The consensus among the authors included in Kaczorowski's bibliography is that DDA is a supplement to traditional collection development, not a replacement. One of the more recent and most comprehensive documents on monographic DDA is the "NISO Best Practices Demand-Driven Acquisition (DDA) of Monographs" (www.niso.org/workrooms/dda/), which provides an overview with recommended practices for all library types.[3]

Because this study looks specifically at the humanities' use of e-books, it was important to understand how reading and research differ between disciplines. Studies have been conducted and opinion pieces written on not only the nature of reading and how it relates to the digital environment but also on the effect of the online revolution on learning, leisure reading, intensive reading, and work-related reading. E-book readers and devices and text formats ranging from PDF to ePub (electronic publication) are also part of the mix. Those that shed light on how academics read text and how e-content matches their needs with devices and platforms are an important part of the e-book puzzle. There is currently little known about how individuals read text (print or online), and this research is exploring new ground.[4]

Hillesund reported on a university study of reading by scholars on the basis of interviews he conducted. He labeled a variety of reading types used by the scholars whom he referred to as "expert readers."[5] Those types included immersive or deep reading, where the user may be immersed in the story or imagery that the story produces for them, or it may be reflective of when the reader is engaged with points made in the text. Those points may frame an argument or connect the reader to a new perspective and encourage deeper understanding of the subject. Reading is also described as continuous, discontinuous, and nonlinear. Continuous is linear and sequential, and Hillesund compares it to reading a novel, whereas discontinuous refers to reading "out of order," and the reading moves around in the text. Employing both together is referred to as "sustained," when the time spent reading is lengthy. He further qualifies discontinuous as being "fragmented" if it includes multiple texts of different material. Sustained reading may see the reader actively engaging with the text with annotations, note taking, comparing additional texts, or engaging with different parts of a printed book. Scholars read deeply but not smoothly from page to page, and the activity is highly individual and active. Librarians are not surprised about this, and libraries support and provide options to meet their users' differing needs. In 2010, Hillesund concluded in part that a significant challenge was to support sustained reflective reading, and he did not think digital text could replicate the printed text. One question this study sought to address is, do our humanities scholars utilize e-books for sustained reading and do they believe the online format supports this type of reading?

MacWilliam reported on an e-book use study that summarizes e-reading issues.[6] The study offers a review of how scholars engage with text and provides a framework for considering devices and platforms related to reading needs. He points out that content must be distinguished from a device or a platform. McKay describes a study of e-book use by researchers using material provided by their library at the Swinburne University of Technology in Australia.[7] The study sought to determine how users actually read e-books. The use study was facilitated by the library's DDA provider EBL, using 1,200 user session transactional logs that were analyzed and categorized by the actual reading done. The authors saw a range of behaviors including both sequential and nonsequential page views. They concluded that their participants used the nonlinear style most often when reading e-books. The transactional logs revealed that readers went back and forth a lot in the texts they used. The authors further described this reading as page hops, section reads, quick skims, and flipping around with some continuous reading employed.

Staiger published a review article, "How E-books Are Used," that covers the literature from 2006 to 2011 and reviews approximately two dozen e-book studies conducted by academic libraries.[8] Many of the studies that he reviewed focused on the "use rather than read" concept, meaning that users prefer print books for "deeper" reading and "use" e-books rather than deeply "reading" them. Staiger also points out that many studies agree that print and electronic can coexist and it is not a competition between the formats. He calls for future e-book use research to focus on use by discipline and type of material (e-reference, e-textbook, and e-book).

Two recent studies specifically considered humanities scholars' use of e-books and e-resources. Dahl reviewed recent library literature and concluded that humanists' growing acceptance of electronic resources, significant reliance on the monographic form of publishing, heavy use of library catalogs, and the increasingly interdisciplinary nature of their work mean that e-books and DDA programs can be viewed as largely compatible with their needs.[9] Kachaluba et al. surveyed 101 humanities faculty at Florida State University (FSU) (with follow-up in-person interviews with approximately 10 percent of respondents). Their results found both similarities and differences when comparing humanities faculty members' format preferences for reading and research to previous studies. The FSU humanities faculty appreciate the benefits of print (browsing, serendipity, copyright and image reproduction rights) while moving toward digital engagement and acknowledging the benefits of e-resources (availability, accessibility, searching capabilities).[10] These findings fit closely with this study's findings: "Where resistance to electronic resources remains, it is largely framed as a practical problem or set of problems, rather than as a simple preference."[11] The problems may be the platform, the device used, the format, or the limitations placed on the use, or simply because of some physical discomfort experienced with on-screen reading.

Method: Demand-Driven Acquisitions

As previously cited, many DDA studies have been tested and implemented over the past five-plus years and DDA programs have become increasingly commonplace in academic libraries. Since UIUC had already implemented many DDA programs (all with ebrary), the process was familiar. This was, however, the first time that short-term loans (STLs) were explored. Previous programs were for purchases triggered by use that exceeded specific thresholds and were budgeted for accordingly. UIUC has made DDA available for both print and e-book formats and found both these formats in a DDA program to be a successful and cost-effective way to provide materials to users within a given subject profile. The purpose of this DDA study was to provide humanities researchers access to a wide variety of academic e-books to gauge their interest and to determine their preferences. Wiley and Clarage's research found "titles purchased on demand do have repeat use . . . they cover all subjects . . . and that users are satisfied. Experimentation with concepts such as DDA overall leads to a better exploration of new processes that can maximize resources while meeting users' needs."[12]

The basic method for this DDA study is outlined below:

- Work with a major e-book content provider (ebrary), a vendor that works with publishers to aggregate that content on one platform, to identify titles available for a DDA program.
- Create a profile for humanities monographs by making a wide array of titles from mainstream academic presses available in the UIUC online catalog for STL (with a purchase to follow on the basis of use).
- Allow user access and discovery to these titles for six months.
- Monitor daily use and check for overlapping print copies and their availability.
- Track detailed use through a transaction log.
- Monitor costs, making sure expenditures match projected expenses, or be prepared to stop the project if funds are depleted.
- Analyze cost and use by subject and publisher.
- Analyze how e-books are used by employing a rubric on types of use based on transactions. The rubric was based on page views, page prints, and copies via cut and paste. Chapter downloads were an option for only a fraction of the titles because of publisher-set DRM

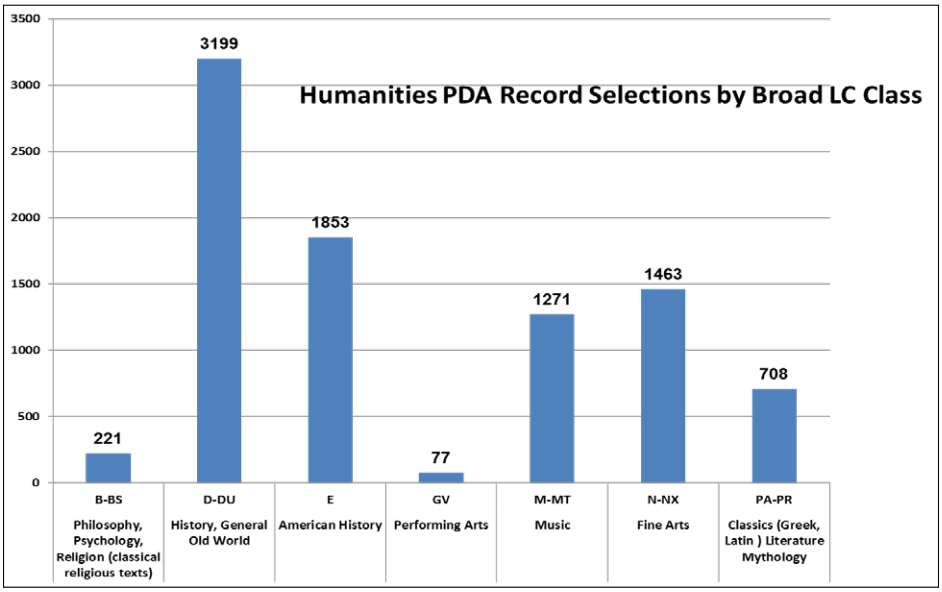

Figure 1. Humanities PDA Record Selections by Broad LC Class

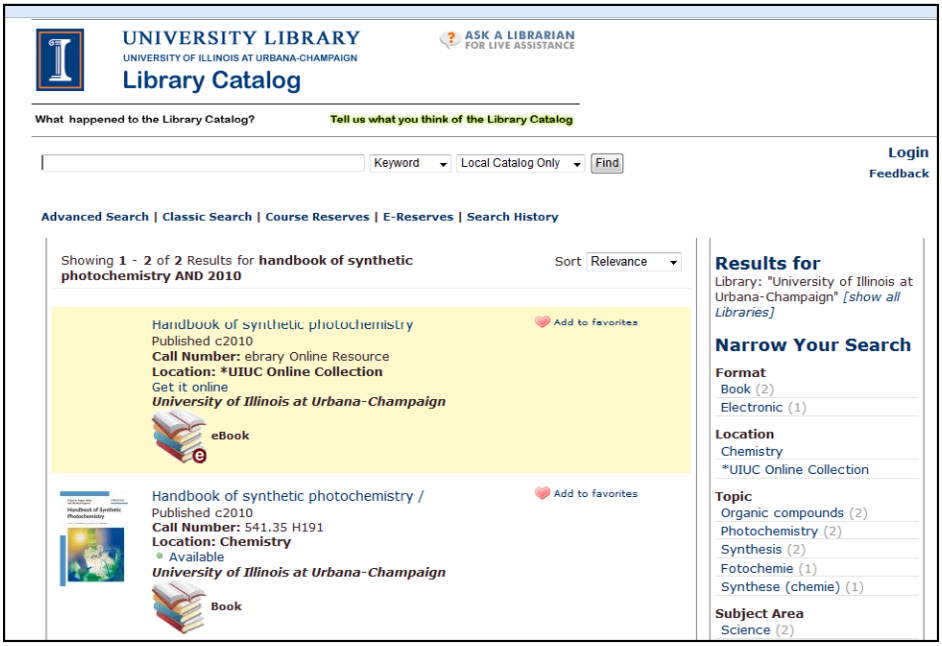

Figure 2. Example of a Record for an E-book versus a Print Copy of a Title

and therefore not included in the transactions analyzed.

Six humanities disciplines were selected for the study: architecture, art, classics, history, music, and religion/theology. They were chosen because they are representative of the humanities as a whole, library bibliographers dedicated to these disciplines provided support, and they represent discrete units on campus that could be invited to participate in the survey. The UIUC subject selectors for these disciplines were consulted before the study began and provided insight and assistance. Ebrary initially provided a list of more than 260,000 titles available from participating publishers who offered their content for library DDA STL programs. These covered all disciplines, a wide range of copyright years, and were from trade and university presses. This list was weeded (via a Microsoft Excel spreadsheet) using parameters agreed on for the study, including limiting by subject to the six humanities disciplines and eliminating nonacademic content, literature, serials, and imprints before 2000, and any readily identified reference title (dictionaries, handbooks, or directories). The limitation on copyright date was imposed to keep the number of records within reason and to better match the records to print copy availability. The DDA focused primarily on university press titles but also included titles from a few well-known and important trade publishers. The profile created a set of 8,792 monographic e-book records in the selected humanities disciplines. These titles were added to the UIUC OPAC in November 2012 with a proxy prefix for off-campus access. The data from this study cover the period from November 2012 to April 2013, or approximately six months. Figure 1 shows the distribution by subject of the 8,792 records loaded into the UIUC Voyager catalog. The distribution was directly attributable to the number of e-books available for each subject area via ebrary, i.e., a large number of history e-books are available and therefore make up a large portion of the study sample.

UIUC uses two separate bibliographic records when one format is an e-book. For this study, both electronic and print records were displayed to the user from a title or author search as separate records. E-books are prominently

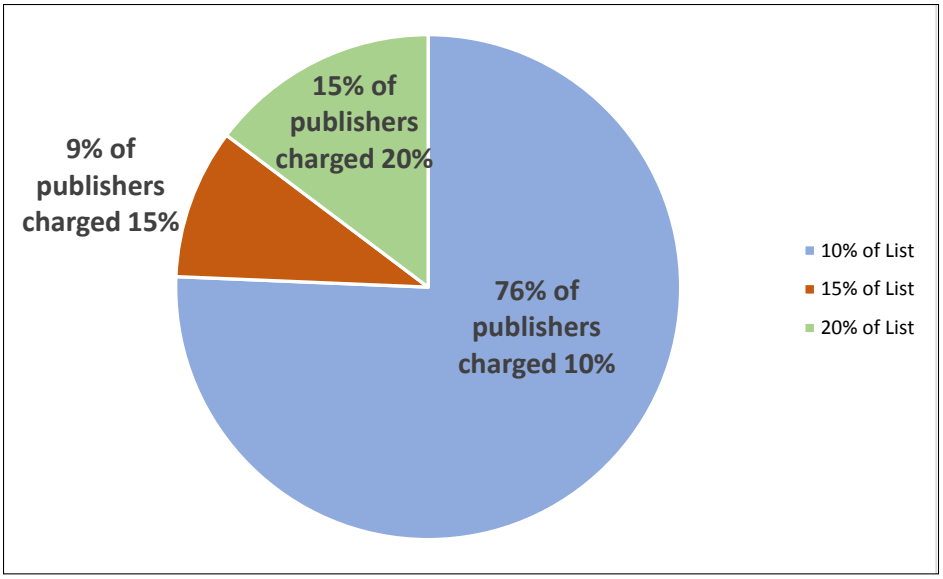

Figure 3. Percentage of List Price Assessed per Loan

marked as such in the brief title display to better lead users to this type of access. Figure 2 provides an example of the record for an e-book versus a print copy. Links to DDA e-books were available from the records loaded in the OPAC and could also be found on the UIUC ebrary site. Once at the UIUC authenticated ebrary platform, users could freely explore any of the 8,792 titles available for DDA.

The primary reason to use STLs in this DDA project was the limited budget. The library could not purchase all 8,792 titles because of their cost (a conservative estimate of $50.00 per title would have equaled close to half a million dollars). It was also likely that all those titles would not be used nor desired by UIUC humanities scholars and students as they are engaged in research very specific to their field and interests. To gauge use and interest at a granular level, the decision was made to employ the STL option with the opportunity to purchase a title after a predetermined number of STLs. In this DDA model, when a user accessed a title on ebrary's platform by clicking on the UIUC record link, a twenty-four-hour STL was initiated. During the loan period, the first user and subsequent users could explore the content (though with restrictions predetermined by each publisher). In this study, the authors chose to purchase an e-book when a third STL was initiated. Each loan resulted in a fee of 10–20 percent of the list price charged to the account. Figure 3 provides a breakdown by the percentage charged. The total purchase price at the third loan was the list price added to the previous two STL fees.

Although seemingly the more expensive path, this option proved to work exceptionally well and enabled users to sample many more titles while staying within the study's budget, which was approximately $6,000.00. Not surprisingly, STLs far outnumbered outright e-book purchases during the study period as users preferred to sample many titles before an e-book garnered enough multiple loans to trigger a purchase. There is no question that STLs allowed users to access many more titles and to use extensive amounts of each title's content within a reasonable set budget. Use and cost outcomes are available in the Results section below.

Publishers determine the parameters of e-book access provided by vendors, the mix of titles offered to those third party vendors, the price, and how content can be used. Ebrary serves as the vendor and supplies the platform, but publishers decide their own specific rules for a myriad of options. For this program, options included page views, page printing, and saving text, chapters, or the entire book, to other devices. The download option was rarely available, and page views were the one use metric consistent for all the loans. Image display (image availability and or resolution) is often an issue and especially for art history monographs as publishers cannot always obtain the rights to publish an image reproduction in an e-book format. These rights management issues are widely understood by librarians, though grudgingly accepted with frustration. Users become confused when "rules change" during a single ebrary session while accessing e-books from different publishers. E-book users are not aware that each publisher decides how an e-book can be used. This frustration was reported repeatedly in survey responses and is discussed in that section of this paper. The STL fees are also set by each publisher and are subject to change with terms agreed on between the vendor and the publisher, not generally with the library as the client.

Another specific purpose of the study was to compare the use of e-books to the same title in the UIUC print collection, if owned. This was done to help determine whether there was any format bias by humanists. Access to ebrary e-books for titles owned in print format at UIUC was deliberately included to compare use. A notification of any STL use was received by the authors via an email alert from ebrary within twenty-four hours of that use. Each title was then cross checked in the UIUC catalog for print ownership and availability. These data were logged into a report that was updated daily. Access to print materials at UIUC is designed to be as easy as possible. A simple click to request a book from the record will provide next-day retrieval and subsequent office delivery. The service makes access to print

titles an easy, quick, and convenient option comparable to online access if the book is available and therefore a choice to measure in this study.

A prepaid deposit account was created for the study. The study's initial budget was based on other DDA studies conducted at UIUC, and it was estimated that a $6,000 deposit would last approximately six months. Ebrary's weekly reports and real-time, immediate updates for STLs, plus preset alerts for budget levels, made it easy to monitor all DDA costs through the ebrary administrative account. Full control over the account was provided by ebrary so that the project could be disabled if the deposit funds were expended. Initial estimates proved to be fairly accurate and the study was allowed to run for six months with only a slight overspending of the initial estimate. Additional funds were added to continue the project through the full six months.

Results of the Humanities Demand Driven Acquisitions Program

There are many ways to measure e-book use, and ebrary provides multiple points of data on use. In the six months of the study, UIUC's humanities users generated:

- 1,536 total e-book user sessions, defined by ebrary "as the number of times a title is opened and the user performs at least one copy, print, view (page turn), or download."[13]
- 529 STLs over the 1,536 user sessions
- access to 385 unique titles

The 1,536 user sessions saw the following use metrics:

- 43,215 e-book page views
- 1,710 pages printed
- 605 e-book chapter downloads

The study resulted in 156 single-user sessions (with one user per one book), seventy multiple-user sessions (2 users per one book) and 158 with three or more user sessions (3+ users per book) with a total of 1,536 sessions. These multiple user sessions could occur within one STL. This helps explain why, despite the high volume of user sessions, that only forty titles generated a purchase at the third STL during the six month study. The authors authorized the purchase of those e-books that did not trigger a purchase but showed significant use in the number of views, downloads, and unique user sessions. These purchases were made at the end of the study to preserve access to those titles. Examples of significant use titles that did not get to the 3 STLs but were subsequently purchased are shown in table 1. The majority of the post DDA purchases were already owned in the print format.

The number of STLs generated during the study far outnumbered triggered purchases. Figure 4 shows the number of both types of user access and their cost. Costs totaled $2,587.00 for forty purchased titles (excluding STL fees) and $3,736.00 for 489 STL uses, for a total cost of $6,323.00. The average total cost per purchased title would include the STL fees and was $80.81. The average cost per STL was $7.76. Purchased titles were higher in cost than if purchased outright due to the cumulated STL fees.

Figure 5 shows the status of the 529 STL titles that were accessed via ebrary compared to print copy ownership and their availability at UIUC. At UIUC, print books can be charged through the online catalog from anywhere and delivered to offices or a nearby library on campus. Minimal effort is required to request a print book delivery, and print availability and the user time invested in retrieving a copy is closer to an online copy than may be true at other libraries. The choices for users in this study were to use the e-book for immediate access, request the print book for delivery, or go to the library to pick up the print book, the majority

Table 1. Actions Generating Short-Term Loans (STLs)

Two Short Term Loans Top 5	Three Short Term Loans Top 5 (purchased)
User Sessions:	User Sessions:
-19	-54
-18	-40
-16	-40
-9	-39
-9	-29
Page Viewed:	Pages Viewed:
-4,222	-4,021
-340	-1087
-334	-1020
-293	-1006
-284	-726
Pages Printed:	Pages Printed:
-172	-263
-125	-138
-105	-113
-10	-91
-9	-42
Chapter Downloads:	Chapter Downloads:
-18	-31
-6	-24
-5	-20
-5	-19
-4	-18

of which were available. Faculty and graduate students at UIUC can charge a book for sixteen weeks. A book can be recalled or requested from another academic library in our consortia should local availability be an issue or, in this study, accessing the e-book copy was another option.

When a user initiated one of the 529 STLs for an e-book in the study, 80 percent of the DDA STLs (425 STLs), were already owned in print at the Library. In 248 instances of 425 matches of owned and available titles (58 percent), a user in the humanities elected to use an e-book when the print book was available and when that book could have been delivered to the user at their campus office. Fifty-eight percent of users who were able to see both print and e-book availability in the online catalog opted to use the e-book rather than request the print book. It is possible that a print copy was requested sometime after an e-book was opened during a user session as a user was motivated to then seek that text. Our examination of availability was only done within twenty-four hours of an STL alert. If a book was subsequently requested, it would not have been immediately obvious. This question warrants more investigation as the perusal of the online copy may have led a user to the print for traditional reading. This study indicates that more researchers elected to consult the e-book first. A total of 20 percent of the STLs were for titles not owned at the time the DDA e-book was accessed, and therefore those users had no other option but to use the e-book.

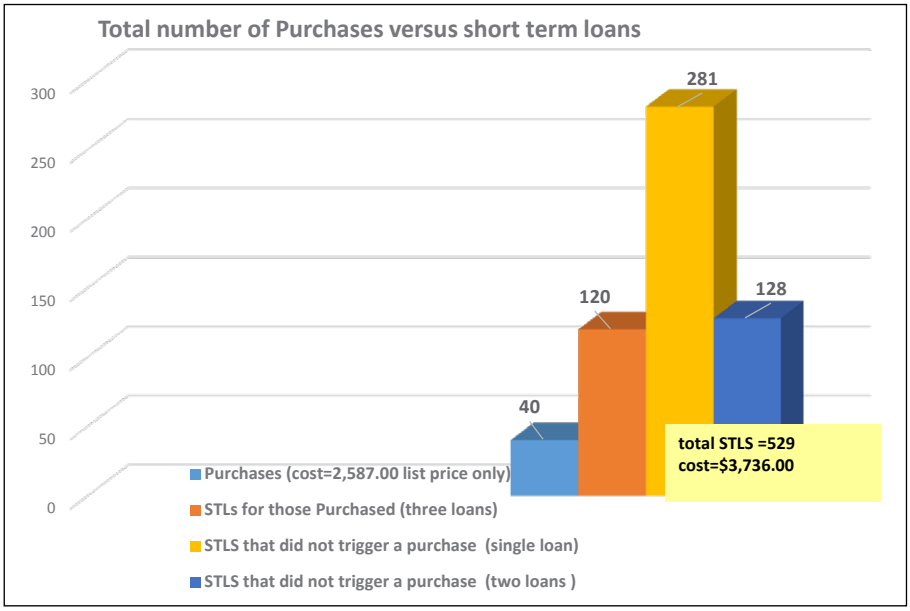

Figure 4. Purchase Cost versus STL Cost

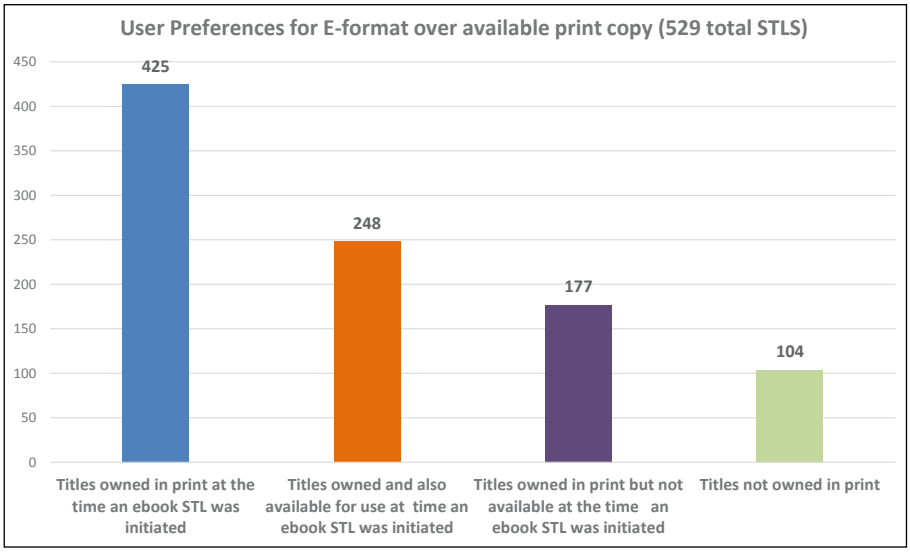

Figure 5. User Choice for the E-format when Print was both Owned and Available

The significance of this ownership, availability overlap, and user preference for the e-copy indicates the following:

1. The UIUC collection was robust before the DDA, with print holdings that matched the online version and that showed a continued user interest.
2. More users elected to immediately explore the online content of the e-copy in lieu of immediately requesting the print.
3. A total of 41 percent of the 425 books owned were not available and were checked out to other users, and having an e-copy offered users more access. This metric also indicates that users are making good use of UIUC's print collection.

In his 2006 study of humanists' e-book use at the University of Denver, Levine-Clark concluded from his data that humanists "only use the electronic version as a backup when print is not available."[14] This study does not point to that conclusion for UIUC. The six years difference between

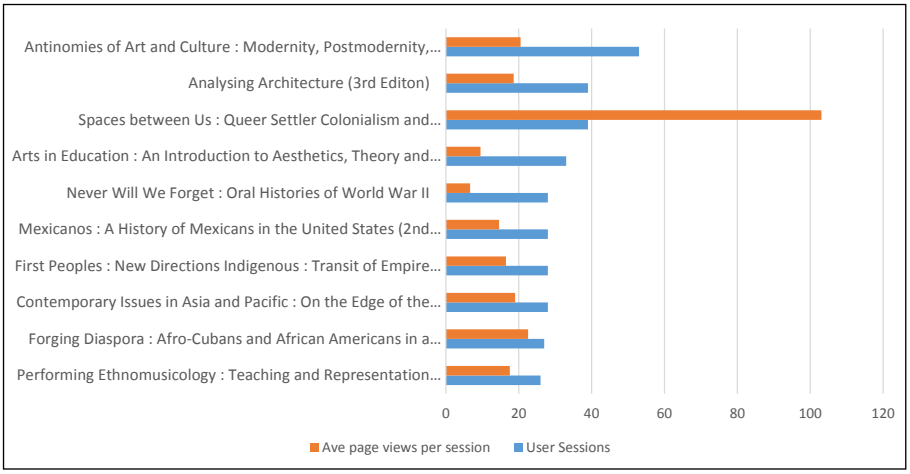

Figure 6. Top Ten Books by User Session with Average Pages Viewed per Session

these studies is a long time when measuring how comfortable users are when using e-books. Fischer et al. also considered print circulation of available e-books during their DDA study.[15] Although the data are not available by discipline, they found that "it is very apparent that the circulation of the print copy drops dramatically once the electronic version is available" and "the data show a notable preference for the electronic books" (compared to available print books).[16]

This research suggests that a shift may be happening with humanities e-books. Further research and tracking of e-book use is needed to confirm any humanities' scholarship move from print toward an online future. An analysis of the depth and breadth of e-book use is provided later to help frame that discussion. The study's survey results (outlined later in this paper) show more tipping-point evidence concerning the choices humanities scholars weigh when choosing a book format.

Figure 6 shows the top ten e-books used during the study, based on user sessions. The top title was accessed more than fifty times. Ebrary defines a user session as the number of times a title is opened and the user performs at least one copy, print, page view (page turn), or download. The study was timed to include a semester peak when papers are researched and written, and this timing is reflected in the use data. The top-ten list is also fairly diverse, with three of the six disciplines represented: art, history, and music. Additionally, none of the top ten shown here are reference e-books (handbooks, encyclopedias, etc.). Straiger notes that high use is often correlated to a "used not read" trend that is more meaningful when measuring the use of reference e-books rather than e-monographs.[17] In this study, reference book records were specifically removed when easily identified as noted in the method section. The "used not read" concept warranted more analysis of the ebrary use logs to see what was used in a session or loan, and the results are reported later in this paper. Figure 6 also shows the total page views with those user sessions. This illustrates that high user sessions did not always mean high page views as is true with the first title (*Antinomies of Art and Culture*). That title had the highest user sessions but only moderate page views.

It is helpful to study all the transactions to see how user sessions contributed to totals across the entire group of use metrics and the scope of use across the user sessions. As noted in the method section, a rubric was established to assign categories of use on the basis of the type and volume of transactions made. For this study, page-view volume and a combination of other uses were the criteria used to define four different types of e-book use/reading. It would have been very useful to know how much time a user spent on a page when multiple pages were accessed during a session as it is not possible to determine what was skimmed over versus read completely. But that is not an option for e-book use in general. Therefore the rubric looked at a combination of use that would demonstrate a level of user interest. Chapter downloads were not counted in the rubric as 69 percent of the titles accessed with STLS did not have any. This is because of the DRM set by publishers but also because users did not always opt to set up an account to use this feature, possibly because they found it cumbersome. In establishing the rubric, an average page count per book was determined from a sampling of the titles accessed by humanities scholars as STLs. This average was 309 pages and is slightly higher than the 258 page average as reported by *Publishers Weekly* on their blog (where 64,500 words is the average word count per book and the average words per page is 250).[18]

Use categories were defined as the following:

- Nonuse (aka "quick dip"): defined as nine page views or less per session or at a 309 page average, less than 3 percent of a book's content. This could include up to nine pages printed or cut and pasted, averaged over the sessions. This use was seen as sufficient to check the index or table of contents to see that deeper browsing was not desired. "Non-use" is dipping in to a book and seeing just enough to then "close" the text.
- Low use: 10–25 page views per session (a maximum of 8 percent of book content at the 309 page average) and could include up to nine pages printed or cut and pasted averaged over the sessions.

- Moderate use: 26–75 page views per session (a maximum of 24 percent of book content using the 309 page average) and up to nine pages printed or cut and pasted per session.
- High use: 75 and higher page views per session and any number of printed pages or cut/paste activity over nine per session (over 25 percent of the book content using the 309 page average).

Figure 7 shows the breakdown by level of e-book use. Despite the criteria and rubric established, use is hard to completely assess. Page views may also have meant flipping back and forth where use is not linear but may be sustained. This analysis revealed that most of the titles saw low (47 percent) to moderate (39 percent) use: combined low and moderate use totals 86 percent of the 385 unique titles. High use was 8 percent and 6 percent were used minimally and were categorized as nonuse. For a significant percentage of the titles (moderate and high use totaled 47 percent), users may have been reading full chapters per book if one assumes page views are generally consecutive. By carefully analyzing the level of e-book use in this study, we identified deep reading, consecutive reading, sampling of text to retrieve data or text, or sampling to determine no further use as needed. All represent a variety of what may be expected when examining how users use e-books.

Table 1 (referred to earlier) shows the most heavily accessed e-books that generated either two STLs (not purchased) or three STLs (generated a purchase). This figure demonstrates that a large number of uses can take place without triggering a purchase. For example, there were more pages viewed for the top STL that did not result in a purchase (4,222 pages viewed) than the top pages viewed (4,021) for an e-book that *did* result in an automatic purchase. Purchases were determined by user-initiated loans, not page views. Use of the top titles was often high, even without generating a purchase. These data show how libraries can use the STL option to provide access to e-books that may be heavily used without initiating a full purchase, which is a very cost-effective option. As noted earlier, this was the first use made locally of STLs and was for research purposes, not as part of an ongoing purchase program. The UIUC library reconsidered high use at the end of the study and purchased numerous e-books that generated high use but did not trigger a purchase.

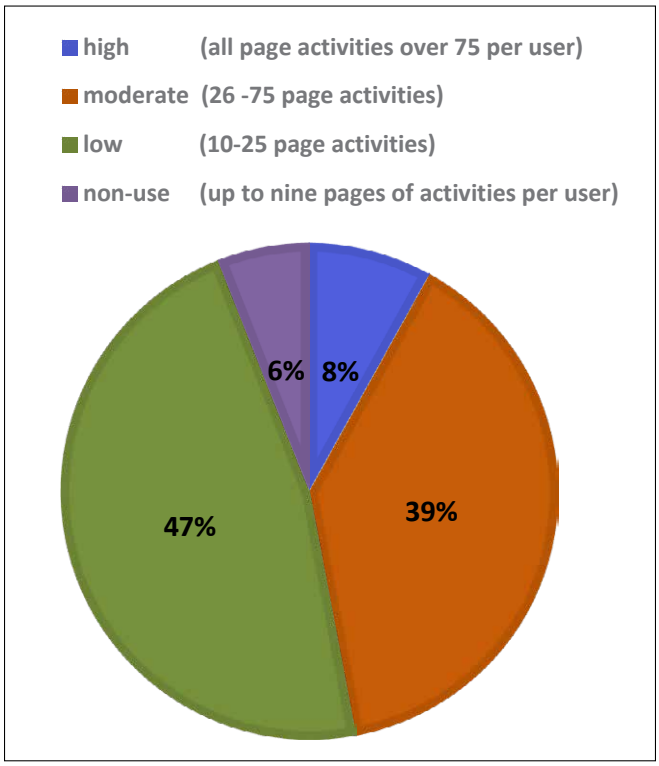

Figure 7. Categories of User for the Humanities STLS

DDA Conclusion

Many conclusions can be drawn from the DDA study concerning how humanists use e-books. Perhaps most important is the simple fact that they found and used many of the e-books made available to them, and often chose the e-format over print. Humanists found and used 385 unique e-book titles in six months, and when print copies of some of these titles were available for check out (and office delivery), the majority of scholars chose the e-book. On the basis of the STL model, which allows for sampling via page views before a purchase is triggered, humanists viewed 43,215 e-book pages during the six month trial. In addition, this study confirms the different types of reading that scholars do, based on page view data, matching the styles cited by McKay, "flipping through books, moving backward and forward, and using document structure for navigation."[19] The most important take-away from this focused study is that humanists will and do, indeed, use e-books. This simple conclusion is further supported by phase two of the study, the survey questionnaire, which was designed to determine how these scholars choose a monograph format (electronic or print) and their predictions for when a fuller migration to e-formats might take place in the humanities.

Method: Online Survey

The method for the survey portion of this study is outlined by these main points:

- Design and create the survey using Survey Monkey (www.surveymonkey.com/).

- Create question types and responses for evaluation. The survey used several methods: a Likert scale for a set range of responses for most questions, and several open ended questions.
- Gain Institutional Review Board (IRB) approval for a human subject survey as required.
- Invite survey participants through departmental email and assure anonymity.
- Establish incentives to encourage participants to complete the survey.
- Include a section that linked participants to e-books in their discipline and that led them to open that online text (users identified their subject discipline and on the basis of their response were asked to select an e-book to use).
- Qualitative responses to open ended questions were subsequently coded to allow for analysis.

IRB approval to conduct a survey of humanists' e-book use was granted in March 2013. On April 2, 2013, an email message was sent to faculty and graduate students in the six humanities disciplines, inviting them to complete the survey, matching the subject areas to the ebrary DDA study: art, architecture, classics, history, music, and religion/theology. Survey participants received an email from the study authors that was forwarded to them through their departmental offices. In some cases, multiple attempts were made to find the right department personnel to forward the survey request. All departments in the study were contacted at least once about the survey. The incentive for the survey were gift cards to the Illini Union Bookstore that had to be picked up, and participants were required to sign for them using a unique identifier not linked to a name to preserve user anonymity.

The survey included approximately thirty questions about e-book and print preferences and use, and also provided users with links to three e-books in their discipline. Skip logic directed users to a list of discipline-specific e-books following the demographic information each participant provided. Participants selected one to "use," were directed to the ebrary platform to open that text, and were subsequently asked questions about their experience.

To gain comparable data to other e-book studies, many questions from ebrary's 2011 e-book survey of students were used in the UIUC survey.[20] One question was borrowed from the California Digital Library survey of Springer e-book users published in 2012.[21] All other questions were based on information the authors sought to understand better about why and how humanists selected resources to use in their research.

The survey closed May 1, 2013, and 162 people had completed the survey. Although it was not possible to determine precisely how many people received the email inviting them to take the survey, the potential base of respondents was estimated at 1,134 and was derived from the number of faculty and graduate students in the departments targeted through departmental email. Based on that total, the survey response rate can be estimated at 14.4 percent. Survey Monkey was used for both the survey and analysis of the survey results. A complete copy of the survey is available from the University of Illinois Urbana Champaign institutional repository (IDEALS): https://www.ideals.illinois.edu and under the title *UIUC Library Ebooks Study*.

Results/Online Survey

Basic demographic information was collected, and results show that 73 percent of participants were graduate students, 19 percent were faculty and 8 percent were "other" (which self-identified as visiting lecturer, adjunct instructor, and other variations of faculty status). Gender was identified at 52 percent female and 48 percent male. More than 80 percent of respondents reported to be less than 40 years of age. Only 4 percent of respondents were over 60 years of age. Most participants (52.5 percent) were reported to be between 26 and 40. No one under 18 was included in the survey. When asked about their experience using e-books, 84 percent stated that they had previously used e-books, and 16 percent had not used e-books. Of the 16 percent who had not previously used e-books, all were under 60 years of age while the majority (29 percent) were aged 41–60. Surprisingly, the next highest reported age group of users who had not used e-books was age 18–25 (17 percent).

The survey sought to determine why or when a researcher or student in a humanities discipline would choose to use an e-book or print book. Figure 8 shows the responses to the question, "Given the option between e-books (e) and print books, which would you choose?" The responses to this question show a preference for print, but also indicate that the e format could be acceptable since 60.9 percent of respondents chose the option " . . . sometimes e" rather than "always print" option (18.6 percent). The DDA data however showed a clear preference for e when it came to actual use, since users chose the e-book copy in lieu of requesting the print vesion (see figure 5). Two questions were posed to determine the current status (figure 8) and the projected future (figure 9) of e-book use by humanists. While figure 8 points to a current preference for print, figure 9 shows that if projecting into the next five years, 46.2 percent predict that they will be using print books for over 50 percent of their book-format research. There is evidence here that researchers predict some momentum in more e-book availability and use.

When asked about the value of e-books, respondents selected the more positive comments in higher percentages (at 56.6,49.3 and 78.9 percent respectively), while lower percentages of respondents agreed with the negative options

(38.8 and 20.4 percent). Figure 10 shows that the availability of e-books was the most agreed-upon value. Researchers appreciate and acknowledge that e-books' availability/accessibility is valuable to them. The option suggesting that libraries build "extensive e-book collections in the humanities" was selected by 49.3 percent of respondents, again reflecting the near 50/50 split between this group of respondents when asked what their research format choice would be in 2018 (see figure 9). There appears to be, now, with this particular population of students and scholars, a nearly evenly divided view in the e-book/print debate. However, issues surrounding note-taking and e-readers are less critical in these results, perhaps due to inexperience with using e-books or the acceptance of current standards. The tipping point question was bluntly asked, with responses shown in figure 11. If the needed book is not available in print, 68 percent of respondents will locate and use the e-book. This willingness to use the e-book format is encouraging to humanities selectors who may only hear from users who are not as willing to try the e-format. It appears that at least among this set of users, immediate availability is a recognized benefit; less than a third (28 percent) of respondents were willing to wait for a print copy.

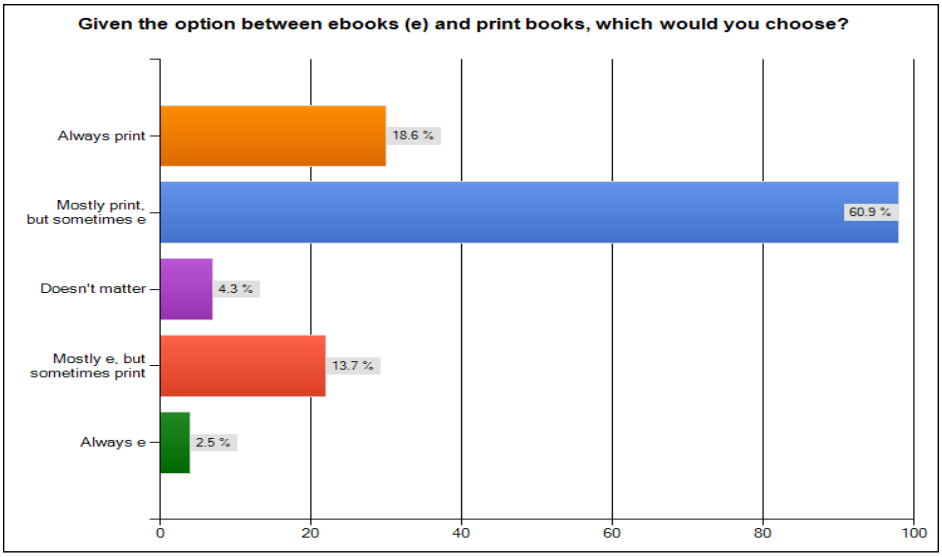

Figure 8. Preference for E-book or Print

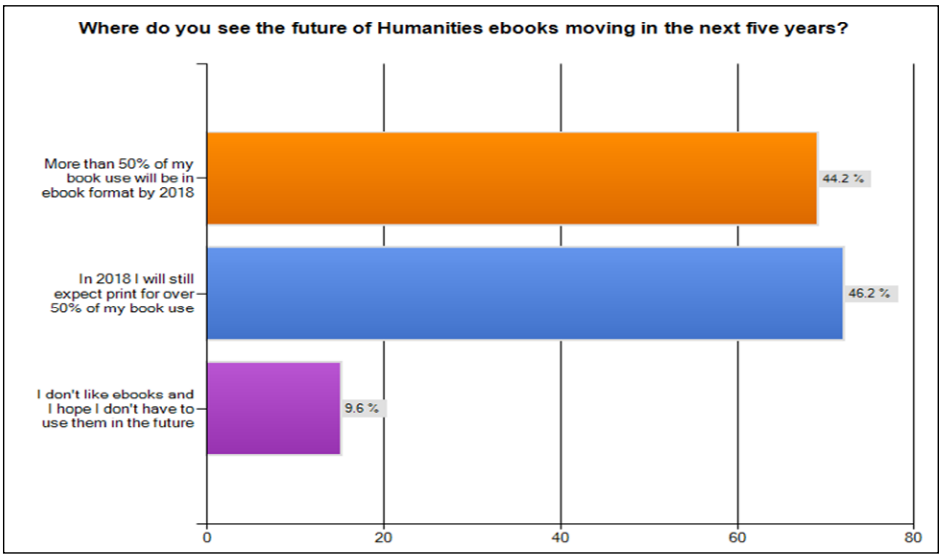

Figure 9. Survey Responses Regarding Future of Humanities E-books

Figure 12 clearly establishes that UIUC's humanities scholars want to use e-books, and are hampered by the lack of e-books available to them. This lack could be because they are not seeking them, that the library has not purchased e-books in their specific area of interest, or is due to publishers who have not provided current e-book content to this audience. Regardless, figure 12 shows that humanists indicate their agreement on the potential issues that prevent them from using e-books more widely: there are not enough available to them, current titles are lacking, and restrictions on image content, printing and copying make use difficult. If it was not specifically indicated that the results in figure 12 are from humanists, they could be construed as being from any research discipline. They are looking for the same access that any scholar would want from e-books: access, availability, and the ability to view images and print/copy/download content.

Open Ended Questions

Two simple, open-ended questions were asked at the end of the survey. The participants had already read and used an e-book and were familiar with the ebrary platform. The two questions were: "After participating in this study, are you more interested in using e-books?" and "Is there anything

else you want to tell us about your e-book experience?" Answers to these questions were coded and grouped by type of response/subject. Of the 162 respondents, 143 provided an open-ended answer to the question, "Are you more interested in e-books?" This question was coded for "yes," "no," and "maybe" or "same (as before the study). Of the 143 responses, 43 percent responded "yes, "indicating they had more interest in e-books, 9 percent replied "maybe," 35 percent answered "no," and 13 percent indicated the same level of interest as before the survey. The combined total of yes and maybe responses totaled 52 percent, showing that the majority of responses were positive. The comments for "same" provided additional details about the range of individual issues:

> "Not really; the system seems needlessly complicated."
> "Perhaps, but for true usability I would need to buy a portable reading device."
> "I still prefer the printed page,"
> "Possibly. Though I would need more evidence of the relevance and applicability to my work."

Issues of complicated access, usability, and relevance/applicability also came through clearly in the second question, where respondents were asked to add anything about their e-book experience. Responses to this question were also coded and grouped. Five major themes were reported to cover the issues: content, usability, functionality, ergonomics, and format preferences, along with a small miscellaneous category. Content described users' comments on the use of the actual content of the book. Usability described comments on the tools for using the content. Functionality focused on user comments about expectations in using the content. Ergonomics issues described any physical aspect of using this content online, and because many took the time to clearly note it, format preferences were tabulated. Figure 13 shows the number of responses per broad theme.

By more than two to one, humanities scholars who chose to comment were concerned about usability and functionality

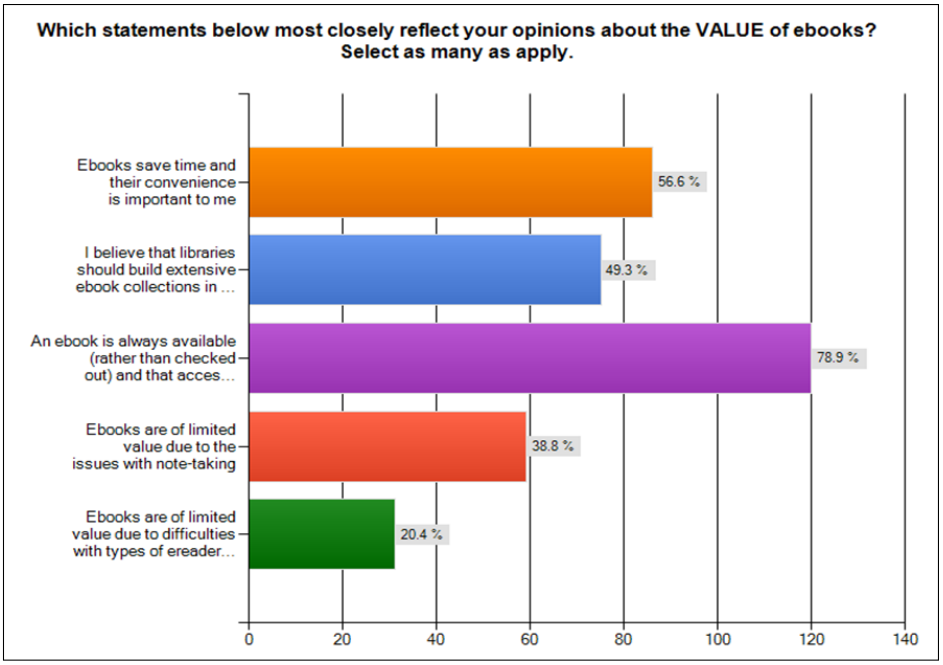

Figure 10. Survey Responses Regarding the Value of E-books

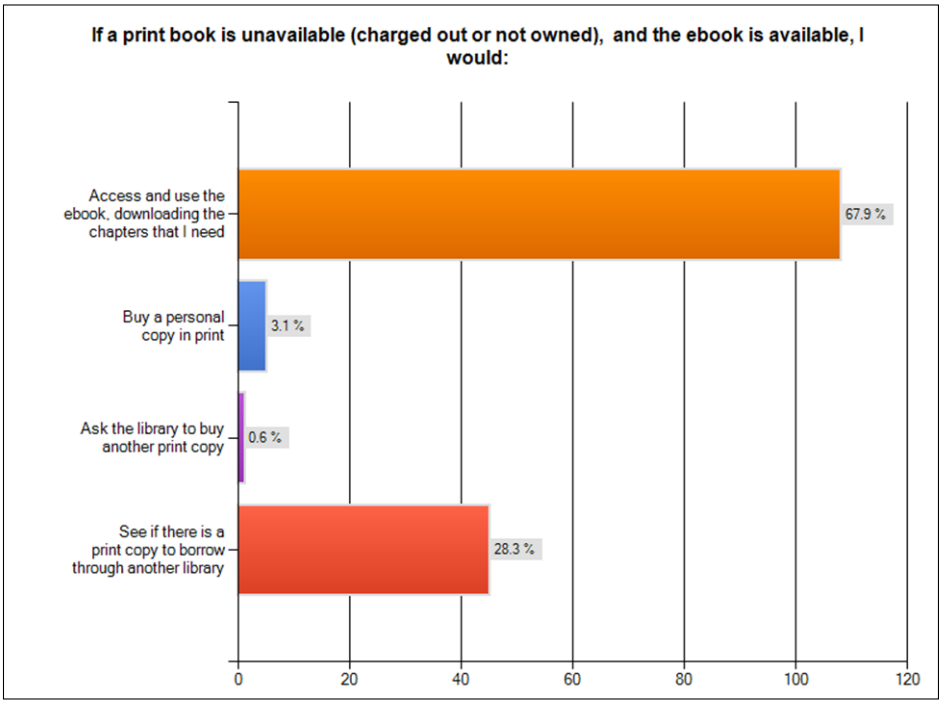

Figure 11. Survey Responses Regarding Availablity of Print and E-books

issues related to e-book use. Usability comments varied from concerns about too many interfaces to navigate, limited viewing capabilities on readers, the lack of non-linear reading capabilities, and the lack of a consistent and compatible format to download, i.e. PDF. Functionality issues were mainly concerned with note-taking and device/platform options that were inconsistent or seemingly nonexistent and included comments from users who purchased tablets and were positive about the difference the device made. Nearly 60 percent of users focused on functionality and usability issues. Seventeen percent of the respondents stated that they prefer print over online, but the majority reported on the benefits of e-books, with the need to use print for deep reading. Ergonomic issues were related to vision and eye strain issues; some respondents reported dissatisfaction with being tied to a computer or reader.

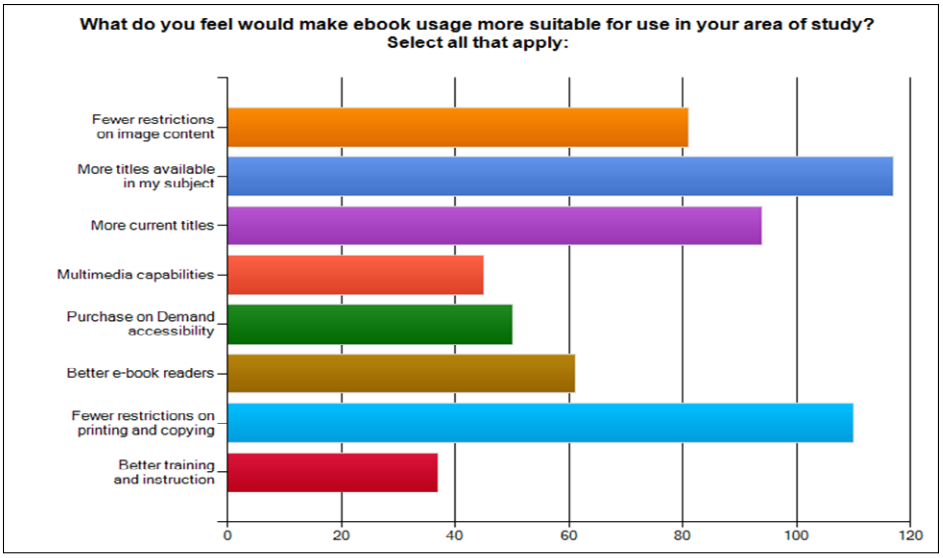

Figure 12. Survey Responses Regarding How to Make E-book Usage More Suitable to Humanities Researchers

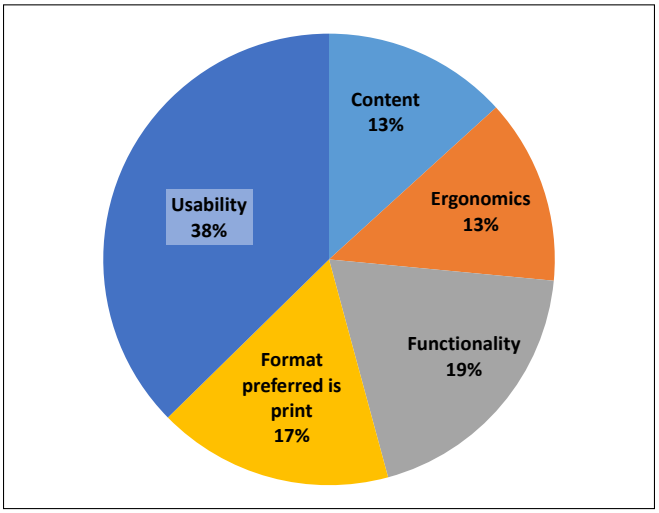

Figure 13. Survey Responses Regarding E-book Experience

Conclusion

Specific research questions asked by this study included:

- What characteristics or circumstances drive the choice between using an e-book versus a print book?
- How important is instant accessibility and availability when weighed against the more traditional need to take notes or lay open the pages of a print book?
- Under what circumstances are humanists more likely to seek a print version of a book than access the e-book version?
- What type of reading do humanists do when using an e-book (measured by creating a rubric to determine the breadth and depth of use per title)?
- What qualities or capabilities do humanists expect in an e-book?
- How widespread do humanists see e-book adoption in their discipline in five years?

The data from the DDA study showed a preference to use the e-content, even when the print copy was available, at least initially. This preference needs more investigation to determine whether users enjoy the online content to help them to decide what titles they want to read more deeply in print. The DDA use data indicate that there are different styles of e-book reading, but data still showed significant use of portions of the online texts, indicating there were some high levels of online reading. User surveys revealed the clear recognition of the value and convenience of e-books and also illustrated the frustration still experienced when electronic cannot emulate print. This study attempted to establish a baseline of humanities scholars' use of, and present and future interest in, e-books, with the complete understanding that humanities disciplines have not to date, adopted e-books at the same level of those in the sciences and social sciences. It is clear that humanities scholars (and humanities collection development librarians) have

been weighing the convenience and availability of e-books against the familiar print format. Survey respondents want to see more e-book offerings and better tools or devices to best emulate print reading. Options to offer both formats will likely continue with an increased emphasis on access to e-books through more formal DDA programs for humanities monographs.

The two methods employed in this study, a DDA program on the ebrary platform and a follow up survey, have helped to make some sense of the directions that selectors in these disciplines might choose. The data from the DDA study, with 43,215 e-book page views, 1,710 pages printed, and 605 e-book chapter downloads in just six months, points to a willingness by humanists to use e-books. Further evidence comes from our review of the print availability of e-books used: In 248 instances out of 425 matches of owned and available titles (58 percent), a user in the humanities elected to use an e-book when the print book was available and when that book could have been delivered to the user at their campus office (see figure 5). Furthermore, the cost of the DDA study, which capitalized on ebrary's option for STLs, showed that for a relatively low cost ($3,736.00 for 489 STLs for an average of $7.64 per loan), users found relevant, easily accessible materials in their humanities discipline. It is true that these data reflect only the UIUC student and faculty usage, but the cost of experimenting to determine any users' usage is relatively low.

The rubric developed to determine levels of e-book use during this study identified four levels of use: non, low, moderate, and high. The vast majority of e-books used during this study (86 percent) were categorized as low or moderate use. This does not mean these are not "valued uses," and they may not represent the type of "use rather than read" category identified by Staiger.[22] These uses can represent from 10 to 75 pages viewed per session, and clearly show more than quick dip use. "Using" an e-book still shows considerable interest in the content and the value of the material. The use of an e-book should also include "discovery." The ease of searching within an e-book is highly valued and offers the potential for much more exploration of the content that may provide for more focused subsequent reading.

The survey of 162 faculty and student respondents asked specific tipping-point questions to determine how familiar they were with e-formats and when they would choose an e-book over print. Data from the survey show a split in the acceptance of electronic versus print. As noted, there was a nearly 50/50 split between this group of respondents when asked about their research format prediction for 2018. However, there is a willingness to read in the e-format as shown in figure 12 of the survey. Nearly 70 percent of respondents would use an e-book if the print copy was unavailable, and 28 percent would still seek the print format with most of those opting to borrow it from a library, and a few would buy their own copy.

While it is clear that humanities scholars cannot yet support a total transition to e-books, it is also clear that it is a complicated question because of issues that persist in how this content is made available. DRM and copyright restrictions often limit the use of art work or other graphics in these monographs, note taking continues to be a challenge in e-formats, platforms are may be difficult to navigate, and many simply still love print books. But this study does show that when e-collections are available in humanities disciplines, they will be used. DDA allows selectors to profile specific subjects, publishers, and dates, and use is the ultimate criterion within the preordained parameters. Furthermore, survey respondents were more positive than negative when asked about the value of e-books, with accessibility, availability and time-savings most valued.

While progress has been made in moving humanists to more widespread acceptance of the e-book format, there are still reasons for them to be resistant, and their hesitancy is understandable. Librarians must continue to work with publishers and vendors to affect real change to the barriers that limit e-adoption in any discipline, but particularly the humanities. It is also important to remember that we are in the very early stages of e-book evolution. Tablets and other devices are changing rapidly, and as more research is conducted on reading styles and needs, devices will change and options for note-taking, skipping around within texts, and even the "look and feel" of text on a screen will evolve.

Next steps in this research include the exact replication of this study for nine social science disciplines at UIUC, substituting social science e-book titles for the humanities titles. The comparison of the survey results and the DDA purchases by these groups of scholars will help to better frame the collection decisions for selectors in these disciplines.

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What Makes an Effective Cataloging Course?

A Study of the Factors that Promote Learning

Karen Snow and Gretchen L. Hoffman

This paper presents the results of a research study, a survey of library and information science master's degree holders who have taken a beginning cataloging course, to identify the elements of a beginning cataloging course that help students to learn cataloging concepts and skills. The results suggest that cataloging practice (the hands-on creation of bibliographic records or catalog cards), the effectiveness of the instructor, a balance of theory and practice, and placing cataloging in a real-world context contribute to effective learning. However, more research is needed to determine how, and to what the extent, each element should be incorporated into beginning cataloging courses.

Cataloging is integral to the work of libraries. Its purpose is to provide and maintain content for the library catalog using content standards, encoding schemes, and controlled vocabularies, which facilitate discovery and access to library collections. In the cataloging process, library catalogers create bibliographic records that serve as surrogates for items in library collections. Catalogers apply various cataloging standards that guide the creation of descriptive records, including Resource Description and Access (RDA), Library of Congress Subject Headings (LCSH), Library of Congress Classification (LCC), or Dewey Decimal Classification (DDC). Cataloging is a complex process, and is a skill developed over time. Although cataloging is performed primarily by catalogers, ideally all librarians should understand cataloging to search the library catalog effectively and to assist library users.

Many librarians in all areas of librarianship are introduced to cataloging in a beginning cataloging course taken as part of their master's degree program in library and/or information science. Cataloging has been included in the library science curriculum since the beginning of the discipline in the late nineteenth century.[1] It is also one of the most challenging courses to teach. Cataloging is a complex subject, and learning cataloging can be difficult because students are introduced to a wealth of complex content. Students learn not only cataloging theory, but also how to apply cataloging standards to create descriptive records. Cataloging educators must be selective when choosing course content and learning activities because there is a limit to how much cataloging students can perform in one course. The pacing and timing of a cataloging course must

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be considered carefully. Content should be introduced in a way that allows students to build cataloging skills without overwhelming them with work. In addition, unlike other courses in the curriculum, cataloging instructors often deal with student anxiety about taking cataloging. Some students enter the classroom convinced they will hate cataloging and will not pass the course. Cataloging educators often have to be cheerleaders, presenting cataloging as fun and doable to convince students they can succeed in the course.

To help students learn cataloging, it is important for cataloging educators to develop the most effective beginning cataloging courses. Research is needed to understand what makes an effective beginning cataloging course and what promotes learning. There is a long history of research on cataloging education, such as studies on the presence of required cataloging courses in library and information science schools, textbooks and cataloging resources used in the classroom, and which topics best prepare new cataloging professionals.[2] However, there are no known studies that examine the elements of a beginning cataloging course (including class activities, professor-student interaction, instructor's teaching style, and assignments) that contribute to student learning and how effective these elements are for beginning cataloging students.

This paper presents the results of a research study that was conducted to understand the elements of a beginning cataloging course that make a difference when learning cataloging. The focus on beginning cataloging courses is due to the desire to obtain a broader sample of experiences and backgrounds (not just those who are currently catalogers) and the fact that more students pursuing a master's degree in library and/or information science take a beginning cataloging course than advanced cataloging courses. The research question guiding the study is, what elements of a beginning cataloging course help students learn cataloging? To answer this question, an online survey was distributed in October 2013 that elicited more than five hundred responses and generated a large amount of data. The results suggest that there are four primary elements that make a difference when learning cataloging: cataloging practice, effectiveness of the instructor, balance of theory and practice, and a real-world context. Further research is needed to determine the best way to combine the elements most effectively in beginning cataloging courses.

Literature Review

A historical look at cataloging education shows two things: the importance of teaching cataloging theory versus cataloging practice fluctuates over time, and there is very little research about the elements that make a difference when teaching and learning cataloging.

Cataloging Theory versus Cataloging Practice

For almost a century after the founding of the first official library school at Columbia College in 1887, cataloging's place within the required curriculum was never doubted. The primary concerns about cataloging education in the late nineteenth and early- to mid-twentieth centuries were (1) how much time should be devoted to the topic, and (2) what is the appropriate balance of theory and practice? Library schools in this period typically offered only one-year programs of study. As more library schools were established and curricula expanded, each school decided on a seemingly arbitrary basis how many hours their students should devote to every area of study, including cataloging. There was little consensus among library schools regarding the number of class hours spent on cataloging content. According to the 1921 "Williamson report," an influential report of library training schools by librarian Charles Williamson, one school required 105 hours of study in cataloging while another required only 35 (and this did not include study of classification, which Williamson counted separately).[3]

Before the 1920s, very little theory was taught in library schools, and instead library schools focused on teaching the skills students would need for future positions. Melvil Dewey, who founded the School of Library Service at Columbia College, was very clear about his vision of the library school: "Its aim is entirely practical."[4] In 1943, Metcalf, Russell, and Osborn wrote that Dewey promoted "enlightened apprenticeship" where experiential learning was emphasized over discussion of principles.[5] There were skeptics to this approach, especially regarding the teaching of technical courses such as cataloging. Concerning the courses of the Library School at the University of Wisconsin in 1910, Mary E. Hazeltine (the "preceptress" at the time) "hoped to remove what she called 'the dread and the terror' from technical courses" that left students with a negative impression of cataloging.[6] The focus on cataloging seems misplaced since twenty-three students from the same library school signed a petition requesting a lighter class and workload, with no specific mention of cataloging.[7]

In the 1920s, the idea of library school as essentially an apprenticeship program was under heavier scrutiny. Ruth French Strout mentions that the Graduate Library School at the University of Chicago (founded in 1926) was created "on the premise that librarianship is something more than techniques."[8] In his 1921 and 1923 studies of library schools in the United States, Charles Williamson cautions against "routine processes of hand work and the memorizing of rules and classes," which frequently results in "deadening" students' "initiative and enthusiasm."[9] Instead, schools should focus more on theory, particularly in cataloging courses. Those students who desire to be catalogers could take advanced cataloging courses that would be more skills-based.[10] This

sentiment only increased over the next few decades. In 1943, Metcalf, Russell, and Osborn recommended a broader, more theoretical approach to cataloging instruction. Rather than focusing on the "standard ways of classifying books and preparing cards for various types of materials" that had been traditionally emphasized, they suggested that library schools focus more on principles and how cataloging impacts the work of other areas of a library.[11] The former approach is perhaps "partially responsible for producing a generation of students who too often do not want to be catalogers."[12] Emphasis should be placed on the fact that "cataloging serves other ends than its own . . . it is important to trace those ends and to study them in relation to one another."[13] This does not mean that all library schools were consistent in promoting cataloging principles over practice, but the literature suggests a greater desire on the part of educators and students to decrease the amount of hands-on practice in cataloging courses.

Later cataloging literature notes a backlash from library administrators and practicing catalogers against the heavier emphasis on theory in cataloging courses at the expense of practice. Some claimed that "new librarians seemed prepared to discuss cataloging, but not to do it."[14] However, cataloging educators continued to defend the emphasis on theory. Shera noted that "Such condemnation usually takes the form, 'They don't teach students how to catalog, anymore!' What is really meant, however, is 'They don't teach students how to catalog *the way we do it in our library!*'"[15] Tauber expressed his frustration with librarians who believed that library school graduates should possess the same cataloging knowledge when starting an entry-level position as those catalogers who have been working for many years.[16] Strout wrote that the question of "the practical versus the theoretical" should no longer be the focus of the library world's attention since the "questions which face it now are of greater complexity."[17] In response to another library educator's comment that library schools should produce graduates who meet "the expressed needs of libraries," Strout retorted,

> If our schools were to exist primarily for the purpose of fulfilling the *expressed* needs of libraries, they would indeed be training schools. . . . It may be that the needs which are *expressed* by libraries are not their greatest needs. Perhaps there ought to be people trained in theoretical concepts who might sometimes point a questioning finger at the status quo, and think up new and possibly even disturbing theories of what libraries and librarians ought to be.[18]

Shera expressed a similar sentiment that focusing on libraries' current needs (skills more than principles) does a disservice to students who will face many changes in needed skill sets throughout their careers.[19] "All who are concerned with the education of librarians must think constantly of the future, not of the present nor of the past, for the people who come seeking instruction will be practicing librarianship during the next twenty or thirty years, not during the decades of an earlier age."[20]

Little Research about Cataloging Courses

Later in the twentieth century, discussion of cataloging education in the literature shifts from the theory versus practice debate, to more in-depth research on specific tools and skills taught in cataloging courses. MacLeod and Callahan conducted a study of cataloging courses in 1994 that is the most similar to the current study.[21] The authors surveyed eighty-four cataloging practitioners and forty-two cataloging educators to gather their opinions of cataloging course content, objectives, theory versus practice, and other topics related to cataloging education. Participants were asked to rank elements of cataloging education in terms of their importance for entry-level catalogers to know before receiving on-the-job training. Elements of a cataloging course in this context were primarily standards such as the Anglo-American Cataloguing Rules, 2nd edition (AACR2), Dewey Decimal Classification (DDC), Machine-Readable Cataloging (MARC) format, the use of bibliographic utilities, and department administration. Though there seemed to be some common agreement on the need for a balance of theory and practice, the study found a major disconnect between practitioners and educators regarding what is most important for students to learn in cataloging courses, how prepared students are when entering the workforce, and the objectives of cataloging education. While the study is enlightening in relation to what cataloging educators and practitioners think students need to learn in cataloging courses, the elements of a cataloging course that best promote learning are not discussed.

Current discussions in the literature about what "works" for students learning cataloging have been largely anecdotal, though heavily informed by years of teaching experience.[22] Intner, for example, noted that

> observation of student performance in formal library school cataloging classes for 40 semesters leads me to conclude that a direct relationship exists between the amount of hands-on cataloging done in the course through homework assignments and in-class exercises, and the ability of students to assimilate the factual material associated with cataloging practice and make it part of their personal knowledge.[23]

This, however, does not necessarily lead to an understanding of cataloging principles that inform good cataloger's judgment and prepare new professionals to be proactive and

flexible in the face of change.[24] Although Intner believes students may prefer practice to learning principles, she states that it is crucial for cataloging instructors to continually ask "why do we do this?"[25] The only known current study of student opinions on the theory versus practice debate is in Al Hijji and Fadlallah.[26] This study indicates that LIS students want more practice, more involvement from cataloging professionals, and more hands-on experience using library systems, utilizing cataloging tools and creating bibliographic records in their cataloging courses. However, does student preference for certain elements of a cataloging course mean that these are the same elements that have the most impact upon their learning of cataloging?

Method

Within the context of this study, to say that a beginning cataloging course is effective means that graduates of Master of Library and/or Information Science (MLS/MIS/MLIS) programs are able to take what they learned in the course and apply it in the field, regardless of their position. To understand the elements of a beginning cataloging course that make a difference when learning cataloging, an online survey was developed and administered through Survey Monkey (www.surveymonkey.com). See the appendix for the survey. Survey methodology was chosen to gather data from participants in all areas of librarianship and to understand participants' experiences in beginning cataloging courses, as well as how they have used their cataloging knowledge in their work. The survey included multiple-choice questions intended to gather demographic and other data, and open-ended questions that allowed participants to respond freely to the questions. The survey was open from October 1–31, 2013, and the survey link was posted on many professional library discussion lists to gather responses from all areas of library and information science, not just technical services and cataloging. An advertisement for the survey was posted on technical services and cataloging–related discussion lists, such as RDA-L and AUTOCAT, and also on noncataloging-related discussion lists such as PUB-LIB, a discussion list for public librarians, LM_NET, a discussion list for school librarians, and LIBREF-L, a discussion list for reference librarians. An advertisement was also posted on library-related Facebook groups, such as ALA Think Tank.

The survey was limited to professional librarians who hold a master's degree in library and/or information science or the equivalent (such as library service), and who completed a beginning cataloging course as part of that program. For the purposes of the study, the beginning cataloging course must have included instruction in a traditional library cataloging standard such as the Anglo-American Cataloguing Rules, 1st or 2nd edition (AACR or AACR2), RDA, MARC, LCSH, Sears Subject Headings, LCC, DDC, etc. Surveys from participants who reported not receiving a master's degree or who did not complete a beginning cataloging course were removed from the pool. After removing incomplete surveys and surveys completed by those outside the specified study population, there were exactly five hundred completed surveys, which was an unexpectedly high number. It was anticipated that few nontechnical services and cataloging librarians would be willing to take a survey about cataloging courses, so the high number of completed surveys was welcome. Also, the sample population included librarians from all areas in librarianship. The survey participants are split almost evenly between those who work in technical services (44.6 percent) and those who represent areas outside of technical services (55.4 percent).

The data were analyzed from November 2013 through May 2014. Multiple-choice questions were analyzed using Survey Monkey and Microsoft Excel. Responses to open-ended questions and comments were analyzed using content analysis. Preexisting categories were not used. Instead, broad and specific categories were developed and agreed on during data analysis. All open-ended survey questions were divided equally between the two researchers. Each researcher read the responses of each assigned research question, and then coded each of the responses. The coding of each question took much time. The high number of surveys resulted in a large amount of data, and each response could be assigned multiple codes, so each researcher spent several days coding each question. To facilitate coding, each researcher maintained a codebook with a list of codes and decisions made during coding. Additionally, the researchers consulted with each other regarding responses that were not applicable or difficult to understand. After the coding was performed, the results of each question were ranked by percentage, and tables were created for each question. After the preliminary results were determined, the data were analyzed in other ways to validate the results. First, each researcher verified each other's coding. This was done by reading the responses and checking the other's coding to verify results. The data also were analyzed by the decade in which participants received their master's degrees and by current and primary job responsibilities of the participants (i.e., technical services versus nontechnical services). These additional data analyses support the results.

There are some possible limitations of the study's sample. One limitation might be the sample population. Many participants work in cataloging and technical services (44.6 percent), so this may have placed cataloging education in a more favorable light. Future research might focus solely on participants working in nontechnical services positions. In addition, this survey required participants to talk about past experiences. Some participants may not have been able to remember or talk about their experiences because too much

Table 1. Question 3: In what area of librarianship are your current and primary job duties?

Answer options	No. of Respondents	% of Respondents
Technical services (e.g., cataloging, acquisitions, preservation, etc.)	223	44.6
Public services (e.g., reference, circulation, etc.)	115	23.0
Other (please specify)	76	15.2
Administration	42	8.4
Library and/or information science education	21	4.2
Not currently employed	10	2.0
Vendor/publisher	7	1.4
Retired	6	1.2
Total	500	100.0

time has passed. Future research might want to focus on recent graduates. Another limitation might be the sample size. Five hundred people took the survey, which was quite unexpected. The large number of responses produced an incredible amount of data. Because many survey questions were open-ended to allow participants to freely discuss their experiences, data analysis was complex and took much longer than anticipated. Finally, this research looked at the question of what makes an effective beginning cataloging course from the participants' point of view. It focused on participants' perceptions of their learning; it did not attempt to assess what they actually learned. Future research could study students in cataloging courses to get a deeper understanding of learning cataloging. It could determine whether the elements reported by participants in this research survey actually affect learning in the classroom. This type of study could pinpoint how learning occurs in cataloging courses and identify ways to facilitate learning.

The following paragraphs describe the demographics and the current and primary job responsibilities of the study participants.

Survey Demographics

The study demographics show who took the survey. Participants were asked when they received their master's degree, and responses ranged from the 1950s to the present. Most participants, however, received their master's degrees since the year 2000 (64 percent), and one-third of participants (32 percent) received their master's degrees between 2010 and 2013.

Professional Responsibilities

Participants were asked about their current and primary position responsibilities. As shown in table 1, most participants (45 percent) work in technical services (e.g., cataloging, acquisitions, preservation). The next highest response was public services (23 percent), followed by administration (8 percent), library and/or information science education (4 percent), not currently employed (2 percent), vendors and publishers (1 percent), and retired (1 percent). In addition, many participants (15 percent) chose the "other" category, which includes positions such as school library media specialist, technology/systems administration librarian, and archives/special collections librarian. Those working in positions with responsibilities that fall within two or more of the above categories also chose the "other" category.

Survey Results

The survey instrument was designed to elicit responses from participants to answer the research question: what elements of a beginning cataloging course help students learn cataloging? Because of space limitations, not all the survey questions and responses are included in this section. Instead, the questions that prompted the responses that most directly answered the research question are discussed below. The researchers have planned to examine the questions that do not directly answer the aforementioned research question in a future study.

Cataloging Course Delivery and Instructor

Participants were asked how their course was provided, and who taught it. As shown in tables 2 and 3, most participants completed their beginning cataloging course face-to-face in a physical classroom (72 percent) from a full-time professor with a PhD (61 percent).

Course Content

Participants were asked about the content of their beginning cataloging course, both regarding what was taught (theory, practice, or a mixture) and whether they learned to create physical catalog cards and/or online bibliographic records. Table 4 shows that most participants learned both theory and practice in their cataloging course (61.2 percent), and table 5 shows that of those participants who learned how to catalog, 57 percent learned how to create online bibliographic records only. A closer examination of the mixture of theory and practice question by decade the master's degree was received showed that participants who received their master's degree since the year 2000 noted that their beginning cataloging courses focused more on practice than those

who received their degree before 2000.

Reflection on Courses

Several survey questions were open-ended and asked participants to reflect on what they *liked* about their beginning cataloging course, what they *did not like* about their beginning cataloging course, and what they felt was *missing* from the course that could have helped them learn cataloging. Table 6 shows that most participants (52 percent) liked cataloging practice (the hands-on creation of bibliographic records and/or catalog cards) and would prefer more of it. Table 7 shows that most participants (30 percent) *did not like* to learn specific types of course content, such as MARC format or DDC, but preferences and experiences varied widely from participant to participant. The same can be said about the question concerning what was *missing* from beginning cataloging courses. Table 8 shows that most of the responses (36 percent) focus on specific content they wished was covered in beginning cataloging courses, but was not taught (such as RDA and MARC format).

Applying what was Learned

Participants were asked if they have used what they learned from their beginning cataloging course in their previous or current positions. If they answered yes, participants were asked to explain how they have used what they learned. Most participants (82 percent) have used what they learned from their beginning cataloging course in their previous or current job positions. Among the answers given, performing cataloging on the job is cited in more than half of the responses (52 percent), perhaps emphasizing the importance of classroom practice in preparation for job responsibilities. Since a large number of participants are currently working in technical services positions, this makes sense. The next most common usage of beginning cataloging knowledge is to help users, provide reference assistance, and to search the catalog (13 percent), plus to learn, understand, and interpret catalog records (10 percent).

Table 2. Question 4: How was your beginning cataloging course delivered?

Answer Options	No. of Respondents	% of Respondents
Face-to-face (in a physical classroom)	359	71.8
Online (in a virtual classroom, perhaps using a learning management system such as Blackboard or Desire 2 Learn)	102	20.4
Hybrid/Blended (some online, some face-to-face)	35	7.0
Other (please specify)	4	0.8
Total	500	100.0

Table 3. Question 5: Who taught your beginning cataloging course?

Answer Options	No. of Respondents	% of Respondents
Professor (PhD, full-time faculty)	303	60.6
Adjunct (part time, non-professor; practitioner or student)	142	28.4
Instructor/Lecturer (full time, non-professor)	27	5.4
I don't know/I don't remember	18	3.6
Other (please specify)	10	2.0
Total	500	100.0

Table 4. Question 6: How would you describe the content of your beginning cataloging course?

Answer Options	No. of Respondents	% of Respondent
A mixture of both theory and practice	306	61.2
Focused primarily on practice (more hands-on, creation of records)	114	22.8
Focused primarily on theory (less hands-on, more reading and discussing theories, ideas)	72	14.4
Other (please specify)	8	1.6
Total	500	100.0

Table 5. Question 7: If you learned hands-on creation of catalog cards/bibliographic records, what were you taught to create?

Answer Options	No. of Respondents	% of Respondent
Online bibliographic records only	263	57.3
Both cards and bibliographic records	102	22.2
Catalog cards only	94	20.5
Total	459	100.0

Suggestions to Improve the Teaching and Learning of Cataloging

The final survey question asked participants to provide suggestions on how to improve the teaching and learning of cataloging. There was a wide range of responses, and general

Table 6. Question 8: Think about the specific aspects of the beginning cataloging course that you liked. What, if anything, helped you learn cataloging? For example, think about the professor/instructor, the most helpful assignments, exercises, content, class activities, etc.

Aspects of a Beginning Cataloging Course	No. of Instances	% of Instances
Practice & "hands on" creation of records/cards	489	52
Instructor	172	18
Theory & history	96	10
Other class assignments & activities (not the creation of records)	70	8
Student/class interaction	56	6
Do not remember/nothing useful	42	5
Did not answer	8	1
Total	933	100

Note: Percentages are based on the number of instances of that category within participant answers, not the total number of participants in the study.

Table 7. Question 9: Think about the specific aspects of the beginning cataloging course that you did not like. What, if anything, did not help you learn cataloging?

Aspects of a Beginning Cataloging Course	No. of Instances	% of Instances
Other course content (except theory & hands-on creation of records	205	30
Course structure, assignments, etc.	122	18
Instructor	121	18
Theory	110	16
Disliked nothing/loved course	94	14
Do not remember	15	2
Did not answer	13	2
Total	680	100

Note: Percentages are based on the number of instances of that category within participant answers, not the total number of participants in the study.

Table 8. Question 10: What, if anything, was missing from your beginning cataloging course? That is, what specific things do you think could have helped you learn cataloging?

Aspects of a Beginning Cataloging Course	No. of Instances	% of Instances
Specific kinds of course content	223	36
Nothing/Everything was missing from the course	88	14
More practice/Hands-on creation of records	79	13
Course organization & assignments	58	10
No response/Did not answer question/Don't know	51	8
Theory/history/"big picture" discussion	49	6
Exposure to cataloging practice/practitioners	38	9
Instructor-related comments	27	4
Total	613	100

Note: Percentages are based on the number of instances of that category within participant answers, not the total number of participants in the study.

course content was mentioned 67 percent of the time. The most common suggestion was to incorporate more hands-on practice in beginning cataloging courses, but participants also suggest more exposure to technology and integrated library systems (ILS), more "big picture" discussion of the importance of cataloging, and a better mix of theory and practice. After general course content, 11 percent of participants suggest improving cataloging instruction and course delivery. They report the need for more fun, humor, and enthusiasm from instructors, and more face-to-face instruction rather than online course delivery.

The results presented here focus on those survey questions that best answer the study research question about understanding the elements of a beginning cataloging course that help students learn cataloging. The next section provides a discussion of the survey results.

Findings

What elements of a beginning cataloging course help students learn cataloging? The results suggest there are four primary elements that make a difference when learning cataloging:

1. Cataloging practice
2. Effectiveness of the instructor
3. Balance of theory and practice
4. Real-world context

Each element will be discussed separately.

Cataloging Practice

Cataloging practice, defined as the hands-on creation of bibliographic records and cards, was stated by most participants as the most important element in a beginning cataloging course. This finding was very strong in the survey results. For example, most participants said they liked cataloging practice the most in a cataloging course, and most participants said they disliked not having cataloging practice in courses. Many participants said that cataloging practice was missing from cataloging courses and that more practice would improve cataloging courses. The high number of responses about cataloging practice was unexpected.

Although it was assumed that cataloging practice would be an important element in a cataloging course, it is surprising how strongly the participants felt about the importance of cataloging practice in a beginning cataloging course. Most participants said they want more cataloging practice, even when they noted that their beginning cataloging course included more hands-on practice than discussion of cataloging theory. This may be because many participants work in cataloging and technical services; however, the results are consistent for participants working in different parts of the library. For example, 51 percent of respondents who work primarily in technical services and 50 percent of respondents who work primarily in nontechnical services positions stated that practice was the element of their beginning cataloging course they liked the most. Additionally, this was the case for participants regardless of the decade in which they received their library science degrees. For example, except for the participants who graduated from 1950 until 1969, hands-on practice was the element most liked by those who graduated after 1970 (ranging from 25 percent (the 2000s) to 38 percent (the 1970s) of respondents). To most participants, cataloging practice is the most important element in a beginning cataloging course, and many responses illustrate this. For example, many participants reported they liked the "hands-on" nature of their courses over an entirely theoretical approach:

> I adored that our class was as hands on as it was. I couldn't imagine taking a class that was entirely theoretical. Every day at work I put into practice the rules and practices I learned in my cataloging class. Over the course of the semester we were asked to create about 15 records for semiunusual or complicated items which would test that we really knew MARC, AACR2, LC subject headings, authority records, call numbers, and the Dewey Decimal System.

Many participants said that applying cataloging practice helped them understand cataloging theory:

> I preferred it when we were actually putting theory into practice. Beginning cataloging introduces a lot of new words and concepts that I didn't really understand until I was using them. Once I could understand what I was trying to create, the theory became much clearer.

Other participants reported that they wished they had more cataloging practice in their courses. One participant who wished for more practice and knew more about MARC responded:

> I wish we would have done more to practice cataloging, doing the real work of creating records. I look at a MARC record during my work now and do not know what all those codes represent, and I feel like I should.

Some participants had courses that focused on cataloging theory only, which made cataloging very difficult for them to understand. For example, this participant said the focus on cataloging theory made the course "confusing" and "esoteric":

> The material focused more on theory than practice. I found it confusing and the coursework seemed esoteric. I would have appreciated a more "hands on" approach to the world of cataloging.

The desire for more cataloging practice is shown in this response from a participant who wants cataloging courses to be more "practical":

> More practical work! Cataloging is a skill learned through practice. Theory is important, and should be taught, but always with lots of practical applications to back it up.

Instructor Effectiveness

Effectiveness of the instructor was cited as the second most important element that helped students learn cataloging. Effectiveness includes instructor attitude, knowledge, enthusiasm, teaching ability, and engagement. Participants report that the instructor is an important element in a beginning cataloging course, but participants did not mention the instructor as often as cataloging practice. This is an unexpected finding as well. With such a difficult and complex topic, it was assumed that the instructor would be the most important element of a beginning cataloging course. The instructor has the power to shape the course and guide learning. Although effectiveness of the instructor was the second most important element to participants, it did not emerge as strongly as cataloging practice. There were several characteristics of an effective cataloging instructor that emerged from the data. To participants, important characteristics include enthusiasm and passion for cataloging, the ability to provide clear explanations, possession of practical cataloging knowledge, and giving lots of feedback.

Responses focus on the importance of cataloging instructors and their ability to make a difference in the learning of cataloging. For example, this participant mentioned many elements that made a difference when learning

cataloging, even though the participant never intended to become a cataloger:

> The instructor . . . was actually a cataloger for a long time and made everything contextual. There were so many examples and she actually made the class really fun. I loved that we read the rules and then she would say, "Well, what the heck does that mean?" I was thinking that exact thing. [She] did a great job at breaking down these rules and making them make sense. Her examples were fun and people were actually really excited to participate. You could definitely feel her energy and she was so funny. You could tell that she was an expert and that she loved cataloging. I never wanted to be a cataloger and I probably will never be one, but I am glad that I took her class.

Another important characteristic for a cataloging instructor to possess is clear and effective instruction. This is shown in a comment from a participant who said the cataloging instructor was very clear:

> The instructor was very good at clarifying questions and confusing elements, and used her comments on homework assignments as another teaching opportunity.

Being a good communicator also was important to participants. This participant said good communication (among other things) is an important "trait" of a cataloging instructor:

> There are many traits that make a good instructor [and] my cataloging professor had all of them. He was relatable, a good communicator, funny, [and] knowledgeable about what he was teaching. I would have to say the hands-on exercises were the most beneficial.

However, several participants did not have positive experiences with their cataloging instructors. Some participants reported negative experiences. For example, this participant mentioned problems with unclear explanations and rigid teaching:

> My instructor was not very clear when teaching subject headings. It was her way or the highway and if anyone assigned variations, she said it was wrong but was not able to explain why.

This participant said the instructor's lack of knowledge of, and passion for, cataloging negatively affected learning in the course:

> My instructor was unfamiliar with the software being used to conduct the course, and the technological problems he encountered seriously encumbered the progress of the course. This, and the instructor's inability to seem engaged or enthused, were the things I most disliked about the course.

Balance of Theory and Practice

The third element mentioned most by participants was having a balance of theory and practice. Many participants stated strongly that both theory and practice need to be included in beginning cataloging courses. Participants said they wanted more theory, more history, and to understand the "whys" of cataloging. Participants did not want a wholly theoretical course, and would have preferred a balance of theory and practice in their beginning cataloging courses. They used words such as "mix," "blend," or "balance" when discussing theory and practice. For example, this participant liked the "combination of theory and practice" in the cataloging course:

> I liked the combination of theory and practice. We would read theoretical articles on how we divide up "stuff" into discrete categories (and how ultimately arbitrary that can be) and on user behavior in searching for materials, and also created some basic MARC records for various types of items (a monograph, one volume in a series, etc.). Combining them reinforced what we were doing and why—having the theory helped us really understand why certain fields were useful, how adding different subject headings etc. would affect search results, how it would all help users for various purposes, and that made it easier to remember how to handle the technical aspects.

This participant stated that theory and practice must go "hand-in-hand":

> Theory and practice must go hand-in-hand. At times the theory would leave us behind because we didn't have the experience to really understand its implications.

Many participants used the phrase "balance between theory and practice." This participant believes that instructors do students "a great disservice" if they do not present a balance of theory and practice:

> I truly think there needs to be a balance between theory and practice. Whether that balance comes in the form of one beginning cataloging class or in

> two separate but REQUIRED classes doesn't matter so long as both are covered. You're doing students—especially students who have never worked in technical services—a great disservice if you don't give them both the theory and the practical side of the field.

This participant mentioned that finding the "right balance" of theory and practice is important for people who do not intend to become catalogers:

> I think it is important to strike the right balance between theory and practice. I think that a beginning cataloging class that is accessible to people who do not intend to be catalogers is important. That course should be supplemented by one or more advanced cataloging courses that people can take if they want to learn more.

Real-World Context

Placing cataloging in a "real-world context" is the last element participants cited as important in beginning cataloging courses. A "real-world" context includes putting cataloging in the context of library work, showing how cataloging helps users, providing real items and examples for cataloging practice, giving students access to cataloging tools used in practice, discussing local practices, providing experience with an integrated library system, etc. There were many responses about this topic. For example, this participant liked how the instructor put cataloging in the context of library work:

> The most helpful thing was that my instructor connected the concepts required to create good catalog records to the work in the rest of the library. She made clear how an accurate holdings list, with excellent access points, could make all the difference in public services (reference, ILL, circulation) as well as on the back end (database management, serials holdings, acquisitions). Truly, this has stuck with me for 14 years. I also found it helpful that she openly discussed the "failings" and challenges of AACR2 and LCSH, having us read Sandy Berman and other contrarians.

This participant stated that local practices should have been discussed in the course:

> I didn't like that there wasn't a lot of "real world" discussion. Theory is good, rules are good, but you also need discussions about local practices and what's best for different situations.

This participant would have liked more practice using an ILS:

> Hands-on with an actual ILS. We filled in bib[liographic] records on paper but seeing what a cataloger would see in the ILS would have been helpful. I know libraries use tons of different types of ILS but just seeing one would be better than nothing.

This participant stated that cataloging courses should give students a broader view and show how cataloging fits into the work of libraries:

> Give students a "whole picture" outlook. Not just how to catalog—what to put where and how to punctuate it, but the reasons for cataloging. What are the benefits to users (both patrons and other librarians) for what is done?

Another participant answered that cataloging courses should reflect how cataloging affects the real world:

> I think it would be very useful for students to see the "real world" impact of cataloging and the ever growing importance of quality metadata production in the brave new RDA world. It can be too easy to get lost among the trees— students need to be reminded of the beauty of the forest!

Implications and Future Research

The survey results suggest that cataloging practice (hands-on creation of bibliographic records), effectiveness of the instructor, a balance of theory and practice, and a real-world context are elements that make a difference when learning cataloging. However, these elements are not disparate; they work together to help students learn cataloging. More research is needed to determine how these elements should work together to facilitate learning.

More Cataloging Practice

From the results, it is clear that participants want beginning cataloging courses to include more cataloging practice. This does not necessarily mean that more cataloging practice is needed in beginning cataloging courses. Although cataloging instructors might want to incorporate more practice into classes, it does not exclude other topics such as cataloging theory or cataloging management. Additionally, participants want more cataloging practice even though they claim that cataloging instructors have been including more practice for the last decade. Therefore, is more cataloging practice

necessary in beginning cataloging courses? It would be interesting to understand how much practice is actually being assigned in beginning cataloging courses, and how much cataloging practice *should* be assigned. It also would be interesting to understand what constraints exist in a cataloging course. This may affect how much practice can be assigned. For example, beginning cataloging students are learning a very complicated skill, and there is a limit to how much learning can occur in one course. There are also time constraints in a quarter-long or a semester-long course. This type of research could be used to help students learn cataloging practice in a manageable way.

Finding the "Ideal" Balance of Theory and Practice

Participants want more cataloging practice in beginning cataloging courses, but the results suggest that a balance of theory and practice is also important. This leads one to ask if there is an "ideal" balance of theory and practice. If so, what is that ideal balance? It would be interesting to understand if an "ideal" balance of theory and practice is dependent upon other factors such as a particular school, instructor, or mix of students. Another question for future research would be to understand what cataloging "theory" means in beginning cataloging courses. Participants defined "theory" differently. Does "theory" mean understanding various statements of principles, the purposes of cataloging, the history of cataloging, etc? In addition, what types of "theory" would be most beneficial for beginning cataloging students and how should instructors introduce theory to students? Understanding how to strike the right balance between cataloging theory and cataloging practice would strengthen students' understanding of both sides.

How the Instructor Affects Learning

The survey results suggest that the effectiveness of the instructor is an important element in beginning cataloging courses, but more research is needed to determine how an instructor affects student learning and if an instructor affects student attitudes toward cataloging. The results suggest that cataloging instructors can affect student learning both positively and negatively, but it would be interesting to understand exactly how the instructor affects learning. Cataloging is a complex skill to learn, and effective instruction is vital. It would be interesting to understand what makes an effective cataloging instructor. This could lead to better teaching and learning of cataloging.

Placing Cataloging in a Real-World Context

The results suggest that beginning cataloging courses should include some real-world context. To participants, it is important for cataloging to be framed in context of how the product of cataloging labor is important in different library environments. This could include factors such as showing how cataloging fits into a library's work, how cataloging affects users, having students catalog real items, having students use an integrated library system, etc. Future research could determine the best ways to provide a real-world context to give students "real" cataloging experiences. This may help students understand how cataloging is an important part of the mission of libraries, and not a task divorced from the work of libraries.

Conclusion

The intent of this research study was to understand the elements of a beginning cataloging course that make a difference when learning cataloging. The study garnered a large number of responses from various areas of library practice and education about which aspects of a beginning cataloging course were most effective in helping participants learn cataloging. Cataloging practice, effectiveness of the instructor, balance of theory and practice, and a real-world context are four important elements that emerged from the data. Even though there were many participants who reported negative experiences in their beginning cataloging course, many more participants noted positive experiences and a greater understanding of the value of cataloging, especially after they began their professional careers. This is encouraging. Future research should attempt to understand the most effective ways to teach cataloging to beginning students, and cataloging educators should pay close attention to these findings. Improving the teaching and learning of cataloging not only benefits future catalogers, but all information professionals. Knowledge of cataloging principles and practices will help information professionals perform their jobs more effectively. Moreover, positive learning experiences in a beginning cataloging course will, in turn, inspire a greater appreciation of cataloging work, something solely needed in the cataloging profession today.

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Appendix 1. Survey Questions

Question 1: Informed Consent—Do you agree to participate?

Question 2: In what year did you receive your Master's degree in library and/or information science (or the equivalent)? (enter 4-digit year; for example, 2001)

Question 3: In what area of librarianship are your current and primary job duties?

- Technical services (e.g., cataloging, acquisitions, preservation, etc.)
- Public services (e.g., reference, circulation, etc.)
- Administration
- Library and/or information science education
- Vendor/publisher
- Not currently employed
- Retired
- Other (please specify)

Question 4: How was your beginning cataloging course delivered?

- Face-to-face (in a physical classroom)
- Online (in a virtual classroom, perhaps using a learning management system such as Blackboard or Desire 2 Learn)
- Hybrid/Blended (some online, some face-to-face)
- Other (please specify)

Question 5: Who taught your beginning cataloging course?
- Professor (PhD, full-time faculty)
- Adjunct (part time, non-professor; practitioner or student)
- Instructor/Lecturer (full time, non-professor)
- I don't know/I don't remember
- Other (please specify)

Question 6: How would you describe the content of your beginning cataloging course?
- Focused primarily on theory (less hands-on, more reading and discussing theories, ideas)
- Focused primarily on practice (more hands-on, creation of records)
- A mixture of both theory and practice
- Other (please specify)

Question 7: If you learned hands-on creation of catalog cards/bibliographic records, what were you taught to create?
- Catalog cards only
- Online bibliographic records only
- Both cards and bibliographic records

Question 8: Think about the specific aspects of the beginning cataloging course that you liked. What, if anything, helped you learn cataloging? For example, think about the professor/instructor, the most helpful assignments, exercises, content, class activities, etc.

Question 9: Think about the specific aspects of the beginning cataloging course that you did not like. What, if anything, did not help you learn cataloging?

Question 10: What, if anything, was missing from your beginning cataloging course? That is, what specific things do you think could have helped you learn cataloging?

Question 11: Which of the following best describes your attitude toward cataloging when you started your beginning cataloging course.
- Strongly Disliked
- Disliked
- Neutral/No Opinion
- Liked
- Strongly Liked

Question 12: Which of the following best describes your attitude toward cataloging at the end of your beginning cataloging course.
- Strongly Disliked
- Disliked
- Neutral/No Opinion
- Liked
- Strongly Liked

Question 13: Do you believe your beginning cataloging professor/instructor cared about your learning?
- Yes
- No
- I don't know/I don't remember

Question 14: Did you take a cataloging course beyond the beginning course?
- Yes
- No
- Other (please explain)

Question 15: If you answered "Yes" to the last question, what influenced you to take the advanced cataloging course(s)? (Check all that apply)
- Cataloging was the focus of my program
- I liked my professor's/instructor's approach to teaching
- I wanted to learn more about cataloging
- Other (please explain)

Question 16: Have you used what you learned in your beginning cataloging course in your current position and/or previous positions?
- Yes
- No

Question 17: If you answered "Yes" to the previous question, how have you used what you learned?

Question 18: What are your suggestions to improve the teaching and learning of cataloging?

Book Reviews

Elyssa M. Gould

Guide to Ethics in Acquisitions. By Wyoma vanDuinkerken, Wendi Arant Kaspar, and Jeanne Harrell. Chicago: Association for Library Collections & Technical Services, 2015. 96 pages. $35.00 softbound (ISBN: 978-0-8389-8701-8). ALCTS Acquisitions Guides.

As is true of the other books that are a part of the ALCTS Acquisitions Guides Series, the *Guide to Ethics in Acquisitions* continues and summarizes current conversations regarding an important part of acquisitions librarianship. The *Guide to Ethics in Acquisitions* by Wyoma vanDuinkerken, Wendi Arant Kaspar, and Jeanne Harrell covers the previous and current aspects of ethical acquisitions practices in an academic library. As acquisitions librarians, we are tasked with various responsibilities including budgeting, adjusting, and adhering to a variety of payment workflows, reporting expenditure data to institutional stakeholders, and collection development, all of which require us to be ethical stewards of library funding and resources. This guide not only clarifies some of the reasoning for previous acquisitions practices, largely because of lack of specific ethical guidelines for librarians, but also provides information on some of the newer situations that librarians encounter because of the changing nature of research and information today.

The guide begins with touching on the importance of ethics and what helps frame what we consider ethical treatment of a given situation. As the authors point out, we are all shaped by a different set of morals and values that are taught by our families or imparted by our cultures. Without a firm understanding of the difference between personal ethics and professional ethics, those that we hold in common as members of the American Library Association (ALA), it is very difficult for us as librarians to act in an ethical manner. The authors also touch on legal ethics, which are different from professional ethics because they are tied to written law. Legal ethics encompass those ethical guidelines or procedures that we follow not because of personal feeling or professional obligation but because they are dictated by law either on the state or federal level.

The aspect of the guide that I found most helpful as an acquisitions librarian was the discussion of the evolution and history of the ALA's Code of Ethics. Since ALA's creation in 1876, librarians have discussed and revised the Code of Ethics several times. As the guide discusses, it became apparent that acquisitions librarians needed more specific and clearer ethical guidelines than were provided by the ALA's Code of Ethics. The Association for Library Collections & Technical Services (ALCTS) decided to create and put forth a set of supplemental guidelines to ALA's Code of Ethics to direct acquisitions librarians through the various situations that they find themselves in and help them make decisions in the most ethical manner possible.

Knowledge of the guidelines provided by ALCTS is essential to any acquisitions librarian regardless of library type. The authors also touch on the importance of reviewing your vendor choices and updating your acquisitions processes regularly to make sure that you are keeping in line with these guidelines and the ALA's Code of Ethics. They also review each of the twelve statements created for all acquisitions transactions to provide further information on the meaning and practice of fulfilling each of the statements. You can also find a copy of the "Code of Ethics of the American Library Association" and the "Guidelines for ALCTS Members to Supplement the American Library Association Code of Ethics, 1994" in the appendix of this book to ensure that acquisitions librarians have the guides at their finger tips.

The largest part of the guide deals with issues involving collection development. Though acquisitions is concerned with the acquiring and licensing of a particular item or subscription for the use of library patrons, the authors point out that making the best decisions with funding involves more than just purchasing an item and making sure it comes in. Acquisitions librarians need to think about collection development policies, scope of content, security of materials, checks and balances, cost of preservation, storage of materials, and collection access. Since we have to justify every purchase and ensure that all materials we purchase are available and accessible, additional ethical issues that used to only affect other areas within the library have become issues that acquisitions librarians have to contend with as well. Ethical issues concerning patron privacy and confidentiality because of patron requests and use of electronic resources now means that acquisitions librarians need to be making statements about how they are safe guarding patron information and about the openness of personal information that is kept for auditing purposes.

Guide to Ethics in Acquisitions provides a comprehensive look at ethical issues in acquisitions within an academic setting. However, I believe that as time goes on further discussion and updates to current ethical guidelines for acquisitions needs to occur in all libraries. This guide, as the authors were very clear in explaining, is meant largely for academic acquisitions librarians, with only general acquisitions ethical

practices being applicable to public and school libraries. I suspect that additional guides can be created for acquisitions librarians in public and school library settings. Ethical practice in school and public libraries seem to be a much more difficult environment to contend with given issues like requests to ban material by a student's parents or the school board and instances in which parents do not want children viewing certain materials that are accessible but purchased largely for adult patron use. My hope is that additional guides or future revisions will be provided to incorporate more information for public and school librarians dealing with ethical issues in acquisitions. The guide is very helpful and provides a good framework for reviewing and discussing current issues in ethics and acquisitions.—*Kristina M. Edwards (kedwards@ccsu.edu), Central Connecticut State University, New Britain, Connecticut*

Rightsizing the Academic Library Collection. By Suzanne M. Ward. Chicago: ALA Editions, 2015. 168 pages. $60.00 softcover (ISBN: 978-0-8389-1298-0).

The author, the current head of collection management at Purdue University Libraries (West Lafayette, Indiana) and a long-time proponent of meeting user information needs with innovative collection development practices as reflected by her extensive record of scholarship, has written a provocative work that can serve as both a wake-up call and catalyst to action for academic librarians who manage collections. Ward introduces readers to the concept of "rightsizing," a term adapted from the corporate world that can be used to encapsulate activities done to increase a library's overall floor space by reducing space devoted to storing physical collections. Effectively organized into five chapters, *Rightsizing the Academic Library Collection* provides a brief historical account of the state of affairs for academic library collections today, argues for the uncluttering and routine culling of physical collections based on current user needs, shows how to use a variety of data to make informed decisions, gives examples of actual rightsizing projects that can be duplicated, shows best practice workflows, and gives a glimpse into workable solutions that can be applied to make a library more relevant to its users. And, according to Ward, it is the user's needs (scholarly or otherwise) and positive library experiences that should provide the impetus for librarians to "rightsize" (as opposed to supersize or wrongsize) their resource collections (viii).

Chapter 1 sets the tone by explaining how a large portion of academic libraries arrived in the twenty-first century with bloated physical collections with declining or, at best, static use by campus constituents. In all, the author did an impressive job constructing a literature review of the major research involving use studies of library collections and their relevant findings. The only drawback was the lack of inclusion of e-book use findings, which is steadily growing despite the lack of a matured format.[1] Ward suggests wholesale adoption of electronic resource formats to distill physical collections to only those items that have demonstrated use to current users. Rightsizing is akin to adjusting a food recipe by mixing the right ingredients to get the desired results depending on the diner's taste expectations. In the library's case, librarians come up with the correct mix of resources in terms of formats, plus provide the necessary services to access information on the basis of predetermined rules and procedures. Whenever possible, libraries engaging in rightsizing practices must involve other nearby, system, consortial, regional, and potentially national libraries to ensure that the preservation of discarded items is done.

Chapter 2 focuses on how past practices of collection building, such as repeatedly purchasing resources on the basis of "just in case" notions or via large approval plans, have put academic libraries at odds with current users. Most libraries have run out of space even when able to add more space or relocate physical items to other storage facilities. Collections contain many resources that receive little or no use for a variety of reasons. Ward wants librarians to move from the old paradigm to a new one that morphs to "just in time," another concept borrowed from the corporate world. This requires reducing print collections except in the case of major research institutions where comprehensiveness in collections is desired.

Chapter 3 takes librarians through the rightsizing process, from start to conclusion. Emphasizing the development of a goal or plan, already having a weeding plan in place, and transparent communication, Ward gives readers several approaches to making withdrawals of their physical collections. Exploiting technological innovations, such as multifaceted report generation, can more efficiently assist in the rightsizing process. Information on costs associated with undertaking similar projects was purposely not given, as each library is unique in terms of their situations. Instead, readers might benefit at this point from detailed instructions on how to calculate such expenses using staff salaries, hours of involvement, square footage needs, annual costs of physical item storage, or even if local regulations allow for the disposal of printed material in landfills. Other formats like VHS or microform disposal may incur additional costs as well, as they can be hazardous to the environment. In the end, Ward importantly emphasizes that there are costs, possibly more severe that can affect the usability of a library's collection, by not engaging in a rightsizing project.

Chapter 4 is devoted to how best to manage the overall rightsizing project. Proper care must be exercised to select and task one person with the authority and responsibility to oversee the rightsizing project from start to conclusion. The author importantly outlines the many eco-friendly ways of disposing a library's withdrawn items. Libraries should carefully consider any additional time spent on these activities

versus recycling or simply giving the materials away. Ward provides a thorough checklist of issues for project managers to be mindful of and an extremely detailed step-by-step instruction for the withdrawal of physical journal titles that are duplicated electronically in JSTOR. The author also goes through a similar process for print books and audiovisual items, but in a less specific way. Ward reminds readers that rightsizing is an iterative process and does not end with the conclusion of a current project. Simply put, continual assessment and evaluation of all collections must be done.

In conclusion, Ward reiterates the rightsizing mantra for library collections. She predicts (on the basis of past trends) that the library of the future will rely less on physical collections and more on electronic counterparts. Physical collections will not totally go away but rather be focused solely to meet current user informational requirements or have special local interest. Libraries will need to accept that fewer print copies will remain and most non-research-based academic libraries need to adopt access over ownership collecting philosophies; especially with electronic formats. New modes of material acquisition that put users at the helm of selection, such as patron-driven acquisition (also known as demand-driven purchasing), allow more titles to be available for instant use and purchase than would ever be feasible under the traditional title by title purchasing model. The reviewer appreciates Ward's acknowledgement that librarians will still have a role to perform in this process, but less so for patron/demand-driven or big deal/package collections unless special profiling is needed. Ward predicts the rise of regional and/or national collections that will function as preservers of knowledge. These collections would not necessarily be located in single libraries and could be spread out collaboratively. These libraries would not engage in rightsizing activities as per a previously created agreement. But this type of an arrangement is also dependent on funding and space, both of which can potentially run out at any given time. It is also in this last chapter that Ward only briefly mentions the need to weed e-book collections, despite the fact many libraries have had e-books for over fifteen years and that there is a growing body of literature on this subject. To be fair, while starting to gain attention, "the corpus of published library literature on e-book weeding is still small compared to that of published library literature on print book weeding,"[2] but not less important.

Rightsizing the Academic Library Collection is a wonderful addition to works on collection development and management. Administrators, library directors, collection development librarians and LIS students all would benefit from reading Ward's book. After reflecting on this work, other issues worth pondering are the short- and long-term effect of student-centered selection; how well this type of a collection will serve future institutional research needs; and if a majority of users will ever truly become comfortable having a majority of digital-only materials. User selection presumes that users know what it is they need and have the ability to judge quality. The findings on whether or not populating resource discovery systems with all sorts of articles, books, videos, theses, and digitized items helps or hinders users' attempts to meet their specific informational needs has yet to be determined as well. Resource discovery tools and the materials indexed within them might very well qualify for their own dose of rightsizing. After all, should not libraries strive to provide access to information that Google cannot locate in the interest of remaining distinctive and relevant to all campus constituents? Yet, until publishers and libraries work together to find a way to remove the restrictive barriers associated with lending and borrowing e-books, homogeneity in collections will dominate—not distinctness. However, if a library suffers from a lack of space, static or decreasing budget, low gate counts, and a declining use of physical collections, then performing rightsizing activities is definitely part of the solution toward attaining importance and relevance. For "no useless lumber is more useless than unused books."[3]—*John N. Jax (jjax@uwlax.edu), University of Wisconsin—La Crosse, La Crosse, Wisconsin*

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Digital Preservation in Libraries, Archives, and Museums. By Edward M. Corrado and Heather Lea Moulaison. Lanham, MD: Rowman & Littlefield, 2014. 270 pages. $60.00 paperback (ISBN: 978-0-8108-8712-1).

Digital preservation involves careful planning and management and *Digital Preservation in Libraries, Archives, and Museums* addresses the technology, but more importantly the all-inclusive meaning and objectives of digital preservation. The authors thoughtfully organized the book into four parts grounded in a concept called the Digital Preservation Triad. Management tools that encompass the scope and depth of the project while considering the present and future of the collection are also included.

The first section, "Introduction to Digital Preservation," covers everything from what, why, and how management deals with the challenges of a digital preservation project.

The Digital Preservation Triad is introduced as being composed of management, content, and technology, all interconnected in the life cycle of digital preservation stewardship. This section highlights the fact that management is just as important as the technology used to preserve the content. The second part, "Management Aspects," discusses the Open Archival Information System (OAIS) Reference Model. The authors advocate that for a digital preservation project to be successful, communication must occur between management, preservationists, and stakeholders. Commitment to the long-term preservation should hold just as much importance as the plans, policies, technology, and funding for a project. The chapters in this section explain digital management and trends as well as successfully setting up a project while considering all the aspects involved in a digital undertaking.

The next section, "Technology Aspects," emphasizes that trust is central to any digital preservation project. Trust includes the integrity and confidence of a person or thing that also bears evidence that the digital repository or system can be trusted. Explanation of the audit and certification standards supports the authors' statement of trust and the need for trustworthiness for everyone involved in the digital process. Various criteria, checklists, and certifications are discussed along with the reasons why all of these measures provide digital preservationists with the structure that creates a successful environment for long-term digital preservation projects. Incorporating these measures will enable stakeholders to trust in and carry their interest for a sustainable digital environment into the future.

The authors provide insight into the organization and retrieval of metadata. The chapter emphasizes that metadata's accuracy is a continual process that must be accomplished via standards such as Dublin Core Metadata Element sets, National Information Standards Organization (NISO), and Metadata Encoding and Transmission Standard (METS). Various markup languages are defined throughout this chapter and clarify the elements of metadata involved in the description of digital preservation. The final chapter goes over file formats and reminds the reader that there is no one definitive format for all digital archives, but rather determinations will need to be made as to which format a digital archive will use for the particular collection. This chapter is a must read for digital preservation managers and staff because it is especially useful as a resource to examine the descriptive options available to their projects.

Part 4, "Content-related Aspects," is the final area discussed as part of the Digital Preservation Triad. This area ties together all the reasons why content is not only valuable to, but also the reason for, any digital preservation project. Management, staff, and the technology being used must take into consideration the content. This involves the areas of collection development, copyright, metadata, staffing, and funding. This chapter provides the reader with direction for any digital project, pinpointing steps to consider and succeed in a preservation project. The authors emphasize that the life-cycle of a digital object defines the research data acquired in the collection and creation of that object. The detailed discussion of present and future challenges of any preservation project are a vital resource for anyone contemplating a data management plan.

The book concludes with the authors stating that though any digital preservation project can seem daunting and insurmountable, the Digital Preservation Triad provides three elements that must be present to ensure success: management, content, and technology. They also include additional educational opportunities, directing readers to other sources pertinent to any digital preservation project management. The book includes a foreword by Michael Lesk, a forerunner in digital librarianship and preservation. An appendix provides additional information and resources for preservationists. The book includes technical jargon, but the authors do an excellent job of explaining and providing resources that define the relevant terminology through a thorough glossary. Each chapter is well organized and leads the reader into the next chapter without changing the flow of how to approach a digital project.

The objective of this book is to benefit libraries, archives, and museum personnel in their development of a digital preservation project. This objective succeeds in providing the aspects of such projects. The authors' use of the Digital Preservation Triad brings management, content, and technology into the life cycle of not just the object, but provides the backbone of a sustainable digital project and this text. The book is full of practical and understandable steps, as well as explains in detail all that must be considered by the organization as well as the managers, staff, and stakeholders. The authors address how management planning must include funding now and in the future, policies to ensure that digital obsolescence does not render the collection closed to generations of the future, and usage of the skills of staff to create the metadata necessary to provide access. This book would certainly be a practical guide that appeals to librarians, archivists, administrators, and managers, as well as professionals seeking answers to questions that should be addressed before or during a digital preservation initiative.—*Susan I. Kane, MSLS (susan.kane@alvernia.edu), Alvernia University, Reading, Pennsylvania*

Managing Copyright in Higher Education: A Guidebook. By Donna L. Ferullo. Lanham, MD: Rowman & Littleton, 2014. 191 pages. $45.00 hardcover (ISBN: 978-0-8108-9148-7).

The author of *Managing Copyright in Higher Education* is uniquely qualified to tackle this topic. With a Doctor of Jurisprudence (JD) degree from Suffolk University Law

School in Boston and a Master of Library Science (MLS) degree from University of Maryland College Park, Ms. Ferullo is the Director of the University Copyright Office at Purdue University, where she advises the University on copyright compliance issues. This book demonstrates Ms. Ferullo's mastery of the legal and library science aspects of copyright; the book's organization also shows her extensive knowledge of her audience and their copyright information needs. The text begins with an "introduction to intellectual property" and "copyright basics;" "the university culture;" followed by chapters on the role and establishment of a copyright office within the university; and concludes with chapters focusing on copyright services to librarians, faculty, administration and staff, and students. The organization of the book provides a logical progression of copyright issues in higher education in a straightforward style that can be readily understood by the novice and appreciated by the expert.

Ms. Ferullo's stated objectives for writing this book are to "provide a basic understanding of copyright law and strategies to consider when faced with copyright issues on campus" (xi). She identifies the intended audiences for the book as librarians, attorneys, faculty, students, administrators and other people in higher education. Each chapter tries to address the general needs of the academy, while specific chapters are dedicated to special publics within the academic environment with descriptions and remedies for applied situations.

Chapter 1, "Introduction to Intellectual property," provides the framework for and is integral to the book's subsequent discussions of copyright and copyright laws applied in higher education. The assumption, however, is that the reader has some basic understanding of copyright and copyright laws. A more extensive introduction to copyright and copyright laws would have made it easier for readers not versed in the language of copyright to use the book without looking up concepts that are mentioned but not explained. Butler does a better job of providing the fundamentals before going into the specific applications of copyright laws.[1] Ms. Ferullo, for example, does a good job of discussing copyright basics and history with explanations of the 1976 version of the law, explaining that "ideas are not protected" (13), and provides a list of works that are eligible for protection under the current copyright laws. In the other text consulted for this review, Strong provides general information about copyright and copyrighting, such as registration of copyright, rights in copyrighted works, all of which are useful but does not specifically address copyright issues in higher education in any detail.[2] It should be noted that Ms. Butler uses three hundred pages to cover copyright background while Mr. Strong enjoys almost five hundred. As Ms. Ferullo limits background discussion to less than fifty pages, some things needed to fall away. Ms. Ferullo has carefully chosen what she includes, leaving it to the reader to fill any needed gaps along the way.

Managing Copyright is unique in that the role and location of a copyright office in an institution is explained with the possible placement of such an office within the administrative framework of the institution. Ms. Ferullo makes a compelling case for the establishment of a copyright office within the university and having a copyright officer with necessary qualifications. The demand for copyright services is increasing and establishment of copyright services has increased in the past fifteen years (55). Institutions that do not currently have a copyright office should consider doing so, making sure the placement of such an office will provide a high visibility and authority to provide accurate and timely copyright information to the institution.

Managing Copyright gives detailed and comprehensive guidelines for implementing copyright laws relevant to the functions of each of the intended audiences. Librarians are provided information of relevant sections of the law, such as section 107 and section 108, with extensive coverage of *Fair Use* and the four factors for applying the considerations for *fair use*. The use of actual court decisions to explain the application of *fair use* is very helpful to understanding the appropriate factor in making decisions on *fair use*. The book also provides detailed questions that need to be answered in setting up electronic resources agreements. All aspects of library functions such as archives, special collections, and digitization are addressed. The book introduces copyright issues and laws that are still being developed for newer technological developments such as institutional repositories and open access. The text also highlights new initiatives that librarians need to be aware of such as *CHORUS*, which will help collect open access works produced by federal agencies, and the Shared Access Research Ecosystem (SHARE) model which will ensure the preservation of, access to, and reuse of research outputs. The text highlights copyright issues with regards to evolving electronic resource management in higher education; online instruction and the use of Learning Management Systems (LMS) such as Blackboard; and the use of social media.

Faculty, administrators, and students are provided detailed guidelines on special issues that need to be addressed in their specific academic activities, such as online teaching and the use of copyrighted material in online courses. The issues are explained using real life scenarios. All aspects of administrative services that use copyrighted materials are given comprehensive attention, some with examples and relevant court decisions. Comprehensive discussions are provided on pertinent copyright issues for University Copy Services, including provision of course packets, student services, and financial aid. Coverage includes both guidelines and detailed questions to assist in

guiding copyright considerations during the performance of duties by each of these offices.

In addition to providing detailed coverage on copyright and the use of social media, new electronic resources such as digitized and born-digital resources, and open access resources for which the copyright laws are still being drawn up, *Managing Copyright* articulates the next steps to be considered with regards to the implementation of copyright laws on campus. The book provides information on professional best practices that are currently not found in other copyright texts; these best practices helps establish a system of currency to stay in step with changes in the evolving copyright laws environment, particularly as the effort continues to overhaul the copyright laws to reflect the needs in our current electronic information environment. Tables, figures, and appendixes are included to make the text a useful guidebook for setting up copyright instruments for use in the academic environment.

Managing Copyright in Higher Education is an important addition to every academic library and will appeal to librarians, administrators and staff, faculty, and students. As the author states, "In both the library environment and the university as a whole, managing copyrights to further the educational goals of teaching, learning, and research is critical to the success of faculty, students, administrators, and staff as well as their institutions" (151).—*Elsie Rogers Halliday Okobi, EdD, MLS, MSIS (okobie1@southernct.edu), Southern Connecticut State University, New Haven, Connecticut*

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