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ABSTRACT

Resource Description and Access (RDA) is intended to provide a flexible and extensible framework that can accommodate all types of content and media within rapidly evolving digital environments while also maintaining compatibility with the Anglo-American Cataloguing Rules, 2nd edition (AACR2). The cataloging community is grappling with practical issues in navigating the transition from AACR2 to RDA; there is a definite need to evaluate major subject areas and broader themes in information organization under the new RDA paradigm. This article aims to accomplish this task through a thorough and critical review of the emerging RDA literature published from 2005 to 2011. The review mostly concerns key areas of difference between RDA and AACR2, the relationship of the new cataloging code to metadata standards, the impact on encoding standards such as Machine-Readable Cataloging (MARC), end-user considerations and practitioners' views on RDA implementation and training. Future research will require more in-depth studies of RDA's expected benefits and the manner in which the new cataloging code will improve resource retrieval and bibliographic control for users and catalogers alike over AACR2. The question as to how the cataloging community can best move forward to the postAACR2/MARC environment must be addressed carefully so as to chart the future of bibliographic control in the evolving environment of information production, management and use.

INTRODUCTION

In our rapidly changing technology environment, library data created by cataloging and metadata professionals now have the potential for interconnecting with related data distributed across the Web, thereby improving resource discovery for information seekers beyond the traditional silos of library catalogs. However, the cataloging community—the potential source of quality bibliographic and authority data for a wide variety of Web-based contexts—is bracing itself for another significant time of major change and uncertainty, as *Anglo-American Cataloguing Rules*, 2nd edition (AACR2) is set to be replaced by a new cataloging code—*RDA: Resource Description & Access*—for the first time in more than 30 years.

In the Anglo-American cataloging community, there was an increasing interest in making fundamental revisions to AACR2 since the mid-1990s. The official process began in 2004 to develop a revised cataloging standard with the working title of "AACR3: Resource Description and Access." In 2005, however, there was a major change in the direction, when the decision was made to create a new cataloging code that would be aligned more directly with the new conceptual model developed in *Functional Requirements for Bibliographic Records* (FRBR) by the International Federation of Library Associations and Institutions (IFLA)—which was later extended to *Functional Requirements for Authority Data* (FRAD) (IFLA Study Group on the Functional Requirements for Bibliographic Records, 1998; Patton, 2009; Howarth & Weihs, 2007). Now renamed *RDA: Resource Description & Access*, a full draft was issued in late 2008 and the new text was finally published in June 2010. Following the initial testing by the three

U.S. national libraries (the Library of Congress [LC], the National Library of Medicine [NLM], and the National Agricultural Library [NAL]) and other selected libraries, RDA is scheduled for official implementation at the Library of Congress (and presumably in much of the U.S. library community relying on its copy records in regular cataloging workflows) on March 31, 2013.

While RDA is backward compatible with most AACR2 instructions, those instructions have been reworked to a reflect a new framework for understanding the bibliographic universe within the international cataloging community, as defined in the IFLA *Statement of International Cataloguing Principles*, an extension of the FRBR and FRAD models (IFLA Cataloguing Section and IFLA Meetings of Experts on an International Cataloguing Code, 2009). Based on the entity-relationship model developed for relational database systems, RDA provides a set of guidelines and instructions for formulating data representing the attributes and relationships associated with FRBR entities in ways that support user tasks related to resource discovery and access. As a practical application of the underlying FRBR and FRAD models, RDA is intended to provide a flexible and extensible framework that is easily adaptable to accommodate all types of content and media within rapidly evolving technology environments, while also producing well-formed data that can be shared easily with other metadata communities in an emerging linked data environment.

Goals of the Study

The U.S. national libraries' RDA testing showed that the current version of RDA still had many issues that needed to be resolved before its full implementation. Such issues included rewording the RDA instructions in "clear, unambiguous, plain English"; improving the functionality of *RDA Toolkit*, (RDA's online version);, developing more RDA examples in MARC and other metadata schemes; facilitating the development of a replacement for MARC; and developing RDA training programs for cataloging practitioners. In fact, RDA was only conditionally adopted by the U.S. national libraries in June 2011, and the anticipated full implementation was made contingent on the satisfactory progress being made to address those unresolved issues (U.S. RDA Test Coordinating Committee, 2011). Since then, LC (2012) has determined March 31, 2013 as a target date for RDA implementation, so that it would have sufficient lead time to train and prepare its large cataloging staff to apply RDA. Likewise, a comprehensive understanding of how RDA will affect the future of bibliographic control will better inform mechanisms for successful RDA implementation across the library profession and produce much better outcomes in easing catalogers' transition from AACR2 through adequate training and preparation.

RDA-related questions are still emerging in the cataloging community nationwide. While the cataloging community is still grappling with practical issues in navigating the transition from AACR2 to RDA, there is a definite need to evaluate new subject areas and broader themes in information organization under the new RDA paradigm. This articles aims to accomplish this key task through a thorough, critical review of the emerging RDA literature published from 2005 to 2011. The research questions the article intends to address are key areas of difference between RDA and AACR2, comparison between RDA and other metadata standards, impact on encoding standards such as MARC, and end-user considerations. The comprehensive overview of RDA research already in progress will help library and information science (LIS) researchers identify potential directions for future studies on RDA and information organization in general. The article will not address FRBR-related questions, as RDA is a content standard designed for use with a variety of encoding standards, including the current MARC formats.

Also, there is a critical research need to examine practitioners' views on the new cataloging code. The publication and testing of RDA is only the first, if critical, step to its full implementation across the library community. Ultimately, the successful transition from AACR2 will require that all catalogers and cataloging paraprofessionals accept the new code, if grudgingly, and undergo intensive training nationwide to re-learn cataloging library materials under RDA. This article evaluates several U.S. and international survey data to identify major themes and patterns in practitioners' reactions to and/or experience with RDA and how they are coping with the impending changes in cataloging theory and practice. Also, the article intends to present an empirical analysis of RDA implementation challenges, focusing on the re-training needs of cataloging staff. The answer to these questions will help to create a more beneficial, timely training experience for practitioners as the U.S. library community needs to avoid the pain of a tumultuous transition from AACR2. LIS trainers, educators, and researchers will gain from this article a clearer understanding of course content, format, and learning objectives that better meet practitioners' needs during the critical time of transition in library cataloging standards.

CURRENT STATE OF RDA LITERATURE

At this early stage, much of current writings on RDA understandably has taken the form of introductory overviews and essays on imminent changes found in the new cataloging code. In addition, we have a small but increasing number of general cataloging texts that aim to explain the new cataloging rules in clearer, more accessible language (Oliver, 2010; Hart, 2010a; Weber, 2011). Medeiros (2005), Moore (2006), and Duszak (2006), for example, offered initial, generally positive reviews as a new plan was announced to cancel work on AACR3 and create a new standard for resource description and access instead, designed for the digital world. On the other hand, Hillmann (2006), Coyle and Hillmann (2007), and Tennant (2007) offered sharp critique of the initial development of RDA—which they attacked for still being mired in outdated, print-based cataloging practices and failing to develop a new standard that would be relevant for today's Web environment. The opposite critique came from Gorman (2007), the original editor of AACR2, who blasted RDA for rashly abandoning the well-established descriptive cataloging rules and defended AACR2 as still being easily adapted to accommodate newer formats for the digital world (see also Kraus, 2007; Intner, 2008; Buhler, 2011; Elrod, 2011). Either way, RDA represents a paradigm shift in the cataloging community, forcing both practitioners and LIS researchers to come to terms with a new vision of bibliographic control framework for the twenty-first century (Ascher, 2008; Adamich, 2010; Copeland, 2010; Hart, 2010b; Klossner, 2010; El-Sherbini & Curran, 2011; Ehlert, 2010a, 2010b, 2010c, 2010d, 2011; Intner, 2010, 2011a; Miller, 2011; Tillett, 2011).

Key Differences between AACR2 and RDA

Maintaining continuity with AACR2 was one of the key concerns in the design of RDA. Because most RDA instructions are intentionally derived and reworked from AACR2, RDA-based records are largely indistinguishable from existing AACR2 records for most non-catalogers and users in the traditional MARC-based library catalog. However, perhaps more important changes have happened mostly under the hood, so to speak. In AACR2, general rules for description—based on International Standard Bibliographic Description (ISBD), the general standard for the description of library materials dating back to the early 1970s—are followed by separate chapters for special rules arranged by class of materials, along with rules for choosing and formulating access points. By contrast, RDA organizes its instructions according to the functional needs for recording discrete data elements based on the entities, attributes, and relationships identified in the FRBR/FRAD conceptual models. The overarching goal of RDA is to produce a comprehensive set of general instructions and guidelines that are logically defined, easier to use, and more adaptable in describing all types of resources designed for the digital and non-digital environments, while simplifying cataloging rules and minimizing special rules for describing specific types of materials. Thus, while many changes from AACR2 may appear to be purely cosmetic, AACR2 instructions have been reconfigured to fit the new RDA objectives and principles grounded in the FRBR/FRAD models.

This focus on providing a flexible and extensible framework for cataloging all types of content and media has also underscored some of the key changes from AACR2 to RDA—a new approach to categorizing resources and recording relationships. The format-specific categorization in AACR2, as evident in its class-of-materials structure, has been increasingly problematic as new types of resources with multiple characteristics are created in the digital age (e.g., electronic documents, streaming videos). Instead, RDA introduces three new data elements based on the FRBR framework—content type, media type, and carrier type—that can be combined to accommodate both current and future types of resources. (Content type is an expression-level attribute reflecting the fundamental form of communication in which the work is expressed; media type and carrier type are manifestation-level attributes reflecting the general type of media device and specific physical carrier required to access and convey the content of a resource, respectively.) RDA also introduces the use of a controlled vocabulary—relationship designators—to record the precise nature of the relationships in access points as defined in FRBR. Relationship designators, though optional under the current RDA rules, can be machine-actionable to improve navigation and data display in FRBR-based catalogs. Hider (2009a, 2009b) studied new RDA terms from user perspectives and found that users often used more complex categories than the ones listed in RDA, in addition to emphasizing other facets, such as mode of issuance, purpose, audience, and extent. While these new FRBR-based data elements remain largely unusable in current library catalogs, their potential user benefits in future library systems will be an important area of continuing research in the cataloging literature (Miksa, 2009).

Since the key to understanding RDA is its overall goal of producing a general framework that can be used to describe and organize all types of materials, some attempts have been made to critically compare AACR2 and RDA and examine RDA's impacts on cataloging various types of resources. Knowlton (2009) examined the impact of RDA on the cataloging of microforms and other reproductions and criticized the new cataloging code for complicating, rather than simplifying, the cataloging workflow for reproductions without increasing access and retrieval for users. Conners (2009) focused on the treatment of *Bible* under RDA and analyzed how the lack of distinction between the Hebrew Bible and Christian Bible would continue to cause difficulty in Judaica libraries. Impacts on serials cataloging—a major problem in AACR2's principles and structure (Howarth & Weihs, 2007)—have been highlighted by Jones and Carr (2006), Adams, Santamauro, and Blythe (2008), and Curran (2009, 2010). In particular, Adams et al. (2008) criticized successive entry cataloging in AACR2 and addressed RDA's potential for meeting the challenge of an ever-increasing electronic resources management and improving access to serials content by highlighting relationships between all manifestations in various formats. Curran (2009, 2010) reviewed specific changes in serials cataloging that would occur with the implementation of RDA and presented print serials cataloging guidelines in RDA, thereby illustrating the need to develop specialized RDA manuals for various cataloging communities.

The need to develop alternative or special guidelines for particular classes of materials will have important implications on cataloging practice under RDA. The idea was called into question by Biella and Lerner (2011), who provided an extended discussion of several major cataloging issues as they applied RDA instructions to Hebrew religious materials, such as initial generic terms in titles, long statements of responsibility, publication dates, and formulating access points. In light of RDA's overall goal, the authors suggested that specialized cataloging communities avoid creating specialized manuals to fit their own cases and interpret and/or adapt the existing rules, and work with RDA developers instead to ensure that its basic instructions could truly cover all types of content and media. Intner (2006, 2009) has raised more general questions about RDA's promise of simplifying cataloging rules. She doubted that catalogers would be ready to make their own decisions based on the general instructions—which she often found not simpler at all—especially given the complexity of cataloging an increasing variety of non-book special-format resources. Indeed, the need for specialized cataloging manuals could provide a good test for evaluating RDA and its ability to provide logically consistent and coherent guidelines covering a wider range of practical cataloging situations.

While RDA's impacts on cataloging various types of content and media should clearly remain a major area for further investigation, issues related to other aspects of RDA's general structure and principles also have been addressed in the cataloging literature. Howarth and Weihs (2008) reviewed a historical debate on the concept of main entry—which had been retained in the initial RDA draft distributed in 2006 but was removed in subsequent revisions—and viewed the decision to eliminate the "rule of three" (which has limited the number of added entries that a cataloger was instructed to make under AACR2 for a work of more than three joint authors) as a positive development that would play to the strengths of current online information retrieval systems (see also Conners 2008 for critique of RDA's initial failure to abandon the main entry concept in the current metadata environment).

Weihs and Howarth (2008b) also provided an overview of changes in the treatment of uniform titles—now renamed "authorized access points representing works and expressions"—in the RDA draft. Seikel (2009) examined RDA instructions on recording names and titles in non-Latin scripts in the context of its goal of designing a cataloging code for international use and concluded that its failure to establish them both in romanized and vernacular forms would discourage global use and perpetuate the Anglo-centric bias of AACR2 (see also Yee, 2011). These general questions also should hold possibilities as areas of potential new research as we move forward to a new cataloging environment under RDA.

RDA and Related Standards

One of RDA's basic goals is to maintain compatibility with legacy library data and technologies so that RDA records can be presented in accordance with ISBD specifications using MARC 21 standards so that they can co-exist with AACR2 records in existing catalogs and databases. Seikel and Steele (2011) provided an overview of the history of library automation and MARC formats and discussed several new key changes introduced to accommodate RDA data elements within the existing MARC structure. However, Bianchini and Guerrini (2009) called RDA a "regression not a progression" because it marginalized the ISBD standard and imperiled the past progress made in international cataloging standardization. In reviewing the growth of next-generation catalogs, Singer (2008) indeed observed that while RDA must be accommodated first within the existing integrated library systems, its ultimate success would likely require a new encoding standard and discovery system that could work with the Web and integrate data from other sources in a distributed modern information universe.

There seems to be little question that MARC is not best suited for representing RDA's entity-relationship data model because of the inherent limitations of its flat file record structure. As a result, the cataloging community has witnessed some key initiatives launched with the goal of developing a new data framework to accomplish RDA's goal of producing robust, well-formed metadata for shareable and interoperable use on the Web (see also Hillmann, 2007; Yee, 2011). Perhaps the most important initiative came from the Dublin Core metadata community. Since 2007, the DCMI/RDA Task Group has worked to define RDA data elements and appropriate concepts as RDF vocabularies to move RDA data out of library silos and make them more visible and usable for the broader metadata community. In the summer of 2011, the first set of RDA vocabularies—covering terms relating to modes of issuance, aspect ratios, and others—was approved and registered for use as linked open data in Open Metadata Registry (http://rdvocab.info/). The second set covering RDA terms for content, media, and carrier types was also published in January 2012, promoting formal representation of bibliographic entities and relationships in ways that will open up and prepare library data for wider use in the Semantic Web environment (Hillmann, 2007a, 2009; Coyle, 2010a, 2010b; Hillmann, Coyle, Phipps, & Dunsire, 2010; Dunsire & Willer, 2011). Awareness of MARC's limitations also led LC (2011) to launch the Bibliographic Framework Transition Initiative in mid-2011 in an effort to develop a replacement for MARC that can better accommodate RDA data and also reap the full benefit of emerging and new technologies. Development of a more flexible, extensible library data standard will be an essential step forward in keeping the library community relevant in a 21st-century data environment, and should rightly present itself as a critical area for future innovations and research in the cataloging literature.

Because one of RDA's key goals is to develop a new content standard that can be easily adaptable to meet the specific needs of other metadata communities, some of the research conducted on RDA development has also examined the new cataloging code in comparison with other non-library standards. Dunsire (2007) reported on the 2006 joint initiative to develop the RDA/ONIX Framework for Resource Categorization (which has been since then incorporated into the final RDA text) and facilitate the transfer and re-use of descriptive metadata and their semantic equivalence between the library and publishing communities (see also Weihs & Howarth, 2008a). Some studies from other cultural heritage communities have examined RDA in the context of reflected long-standing dissatisfaction with the manuscripts chapter in AACR2. Beacom (2007) provided an overview of similarities and differences between the RDA draft and *Cataloging Cultural Objects*. Beacon noted fundamentally different conceptual models underlying the two content standards (i.e., the work as an abstract intellectual or artistic content vs. tangible cultural objects—art, architecture, material culture), although he felt that the theoretical difference should not prevent RDA elements from being usable together in the practical end-user search environment. Whittaker (2007) examined how *Describing Archives: A Content Standard* (DACS) had produced a new content standard for the archival community that foreshadowed many of the same questions facing the cataloging community at large in the digital environment, such as a simpler, flexible descriptive standard that is not tied to a single encoding schema, current or future ones. At the same time, she questioned whether other communities that had created their own descriptive standards would ever want to use RDA and its library-like practices for their metadata needs. By contrast, Nimer (2010) saw RDA as a great opportunity and potential improvement for archivists working in a library setting and called for continued engagement and collaboration so that the archival community could influence the future development of the new library cataloging code.

During the U.S. RDA test, Columbia University, the University of Chicago, and the University of Illinois each evaluated RDA with non-MARC metadata standards—MODS (Metadata Object Description Standard), EAD (Encoded Archival Description), and Dublin Core—and reported issues encountered with test record creation, such as difficulties in applying RDA elements to the cultural objects being described, most notably semantic interoperability issues with Dublin Core (Wacker, Han, & Dartt, 2011). Because the rapid proliferation of digital collections and repositories has created problems in achieving interoperability among metadata records that were created according to different schemas, there is a pressing need to further evaluate RDA's ability to attain an effective level of interoperability with metadata standards used in other communities (see Park, 2006; Chan & Zeng, 2006; Park & Tosaka, 2010).

RDA and User Research

Because "responsiveness to user needs" is one of RDA's primary objectives, user research is essential to evaluation of the new cataloging code. However, it is perhaps the least studied area in RDA research and development. (Research on library catalogers and staff—another key user group for bibliographic and authority records—will be discussed later in the next section.) One of the few user studies was conducted during the U.S. national libraries RDA test (discussed in more detail in the next section), in which 163 respondents from the 26 formal test institutions, mostly library staff members or students, took part in an online survey designed to assess how well RDA served their catalog needs. The survey showed some mixed results. The respondents had overall favorable opinions about the new cataloging code—especially new provisions for abandoning most abbreviations and the AACR2 "rule of three." Yet, only 40 percent responded that RDA records were easier to understand, and the decision to abandon the AACR2 general material designation drew particularly negative comments from many respondents (U.S. RDA Test Coordinating Committee, 2011). As mentioned earlier, Hider (2009a, 2009b) studied how RDA terms for content, media, and carrier types did not necessarily correspond to end-user categorizations of library resources. Hider and Liu (2011) examined how academic library users perceived the relative value of various RDA elements and found that what RDA designated as core did not always match what they found useful. Since the convenience of the user has always been the key principle in the cataloging community, there is a critical need for user validations of the new cataloging code. Also, as Markey (2007) suggested in her review of the online information retrieval literature, it is essential that such user research will not rely solely on convenience samples, i.e., expert or semi-expert searchers like library staff and LIS students, so that we can learn how new RDA instructions actually benefit ordinary people and improve over AACR2 in facilitating their everyday user tasks.

PRACTITIONERS' VIEWS ON RDA

To a large extent, RDA's success as a new cataloging code depends on its responsiveness to the professional needs of the cataloging community as much as on its ability to facilitate end-user access and retrieval. The transition from AACR2 to RDA would make practical sense only if it can be adopted easily by catalogers and metadata creators to accommodate the rapid proliferation of new types of resources and lead to improvements in their ability to serve specific user tasks through efficient cataloging and metadata creation in the Web environment. When AACR2 was published, controversies in the library community surrounding the new cataloging code were once described as the "war of AACR 2" (Martell, 1981). Apparently, the reception of RDA has not reached the same level of criticism and acrimony that characterized the previous cataloging code revision (Randall, 2011). Compared with end-user research, however, a larger (if still relatively small) number of studies have been conducted on practitioners' views on the new cataloging code—if only to gather information about the technical, operational, and financial implications of RDA implementation. These test results served to throw much needed light on some pockets of lingering concern and skepticism among practitioners in the field about RDA costs and benefits and how the criticisms and concerns could be better addressed in preparing a smooth transition to the new cataloging code.

U.S. National Libraries RDA Test

In early 2009, the three U.S. national libraries announced a joint plan to test the new cataloging code and conduct a systematic review of its operational, technical, and economic implications. The stated goal of the U.S. RDA test was in large part to address concerns within the cataloging community, raised most prominently in *On the Record* (2008) report of the LC Working Group on the Future of Bibliographic Control (which recommended that all work on RDA be suspended until business cases and benefits for implementing RDA could be demonstrated through large-scale, comprehensive testing). Following RDA's public release as the Web product *RDA Toolkit* in June 2010, official testers from the three U.S. national libraries and 26 institutions produced test cataloging records using RDA during the three-month period (October 1–December 31, 2010) (Bloss, 2011; Cronin, 2011; Kuhagen, 2011; McCutcheon, 2011; Shieh, 2011; Wacker et al., 2011). One of the main evaluative tools used for the U.S. RDA test was a set of online surveys designed to obtain both quantitative and qualitative information from the test participants. More than 8,500 survey responses were submitted, mostly during the record creation process. At the same time, the U.S. RDA Test Coordinating Committee also created an online survey that was made available to all who wanted to provide feedback on RDA, even if they did not create any RDA records.

Overall, these survey results showed interesting differences between the official testers and the non-RDA test participants. Regarding RDA implementation, the responses of the first group proved to be far more positive than those of the second group, two-thirds (66%) of which did not create or update RDA records during the test period. Among the RDA testers, 70% agreed that the U.S. library community should implement RDA (25% "yes"; 45% "yes with changes"), while only 22% took the same position in the second group (12% "yes"; "10% "yes with changes"). On the other hand, 34% were "ambivalent" toward RDA; opposition to RDA implementation was the most common response (44%) in the second group (U.S. RDA Test Coordinating Committee, 2011).

Selection bias may partly explain the more positive responses from the official RDA testers. As members of institutions that had volunteered to take part in the U.S. RDA test, they may have been collectively more favorably predisposed to the new cataloging code. However, it is also possible that the different attitudes reflected varying degrees of direct experience creating RDA records. Although many official testers reported a lack of confidence in their ability to use RDA efficiently, average record creation times were reduced by half as they produced more original RDA records. In addition, while RDA records tended to contain more data elements, the number of errors was roughly the same between AACR2 and RDA records created for the test—although the test did identify consistent patterns of errors relating to some new RDA instructions and thus indicated areas in which further RDA training materials might be necessary. The overall positive opinions among the RDA testers, and particularly the high percentage of "yes with changes" responses, might provide good evidence that further training and familiarity in the real production environment could contribute to a reduction in widespread professional concerns about the transition from AACR2 by giving them opportunities to think about how RDA could be usable—at least with some minor needed changes—in creating bibliographic and authority records that were compatible with existing catalogs and databases (U.S. RDA Test Coordinating Committee, 2011).

During the U.S. RDA test, the Coordination Committee also partnered with the ALCTS (Association for Library Collections & Technical Services) Continuing Resources Section (CRS) to gather informal feedback and comments from the serials cataloging community. The much smaller survey among 25 serials catalogers who volunteered to take part in the informal RDA test also seemed to provide evidence for the importance of training and practical cataloging experience in changing practitioners' views on RDA. Unlike the formal RDA testers, this group received no official training, although they differed from the non-participants in the U.S. RDA test in that they consulted the training materials and documentation available from LC and other sources heavily (Library of Congress, n.d.). Unlike the majority of non-RDA test participants described above, however, 15 of the serials catalogers (60%) actually created RDA bibliographic and authority records as "testers," while the rest (40%) contributed to the test mostly by critiquing records as "reviewers." Interestingly, the responses of the CRS survey participants occupied a somewhat middle ground between the official RDA testers and non-RDA test participants—possibly a reflection of the composition of the CRS survey group in terms of RDA cataloging experience—with 43% reporting positive opinions about RDA implementation (7% "yes"; 36% "yes with change"). Indeed, while the serials group also reported difficulty understanding and using RDA instructions, the CRS survey results also tended to indicate that the negative impacts would lessen as catalogers gained more experience with the new cataloging code (Young & Bross, 2011).

Voices from Catalogers/Cataloging Managers in Small and Medium-Sized Libraries

Prior to RDA's official release in June 2010, Sanchez (2011) also conducted a survey of cataloging librarians on the transition from AACR2 to RDA. Her survey—titled *AACR2, RDA, and You*—showed a decidedly pro-AACR2 direction, as she had suggested that AACR2 continue to be retained and updated for the cataloging community. Sanchez's stated goal was to capture practitioners' views on AACR2 and RDA, as well as their familiarity with the new cataloging code. The online survey obtained usable responses from 459 participants, mostly from the United States. About 70 percent of the survey respondents were catalogers and cataloging managers. The majority of the respondents were from small to medium-sized libraries, with 10 or less staff to be trained on RDA.

The survey showed that ambiguity—uncertainty (62%), resignation (34%), and anxiety (21%)—was the most common attitude toward RDA. Positive responses like curiosity (43%) and interest (34%) were comparatively smaller in number. While only 30 percent rated their knowledge of RDA issues as above average, the survey participants tended not to see the new cataloging code as a significant improvement to AACR2, except for the introduction of the FRBR entity-relationship model and the abandonment of the "rule of three." Although the slight majority (57%) accepted the idea of transitioning to RDA, more than 75% of the respondents still believed that AACR2 could remain a "useful cataloging code" with continuing official updating and support. 40 percent even supported the idea of maintaining AACR2 with voluntary discussion and revision by the cataloging community at large if it was not maintained by any official agency. Only about 15 percent responded that RDA should be implemented as a "useful and more forward-looking cataloging code."

Much of the concerns expressed in Sanchez's survey related to learning and training issues, impacts on the cataloging workflow and productivity, and overall costs/benefits equations of RDA implementation. In particular, nearly half of the survey participants responded categorically that RDA would not be "cost effective in relation to its cataloging results and its immediate ability to serve as a useful and usable cataloging code." The overwhelming majority of the respondents (83%) expected at least some decreased cataloging production due to RDA implementation, while only 6 percent showed positive expectations about the transition from AACR2.

The results of Sanchez's survey—when compared with those of the two U.S. RDA test surveys discussed above—suggest that much of the debate within the cataloging community was fueled by the fact that there seemed to be so many unknowns with the new cataloging environment. The range of lukewarm sentiments expressed toward RDA by Sanchez's respondents mirrored the relatively higher level of opposition to RDA implementation found among informal survey participants during the U.S. RDA test—who tended to lack direct experience using the new cataloging code. That is perhaps even more true in the case of Sanchez's survey—which had been conducted a few months before RDA's official release—and raises the inevitable question about any catalog code revision: Does the low opinion of RDA among many practicing catalogers only reflect initial fears and skepticism about the profound changes in cataloging standards? Whether RDA cataloging experience will bring about a change of attitudes alone will help answer practitioners' questions about RDA's costs and benefits, impacts on cataloging operations, training issues, and other implications of the catalog code revision.

RDA IMPLEMENTATION AND TRAINING ISSUES

The few existing surveys reviewed in the previous section underscore a strong undercurrent of anxieties within the U.S. cataloging community about practical issues arising from the transition to RDA. Adamich (2008, 2009) expected that RDA would have a limited impact on cataloging in school libraries, as the school library community typically does not modify incoming copy records from bibliographic utilities and vendors. But he called the reader's attention to the future impact of FRBR-based RDA records on library catalogs and the potential use of non-MARC standards outside the traditional library world. RDA's practical impacts on the daily cataloging and processing of library materials are only likely to draw more attention with the official implementation of RDA by the U.S. national libraries.

At the same time, a far more pressing concern is how to train professional catalogers and paraprofessionals for RDA as the U.S. cataloging community prepares for the transition from AACR2. Hitchens and Symons's article (2009) was an early attempt to help cataloging managers and trainers begin the process of preparing RDA training for their staff and students. While mostly highlighting the content that must be addressed in any training sessions, they also touched on the need to consider formats that would be best suited to deliver the training content to working catalogers and ease their transition to RDA, including online distance education and workshops and conferences at the local, regional, or national level. Inter (2011b) raised concern about how RDA implementation might be hindered by the fact that professionally trained catalogers have been replaced by an army of paraprofessional copy catalogers within most cataloging departments.

Indeed, a good case can be made that training issues are the single most paramount concern for working catalogers as they begin preparing for implementation of RDA. Not surprisingly, analysis of various surveys evaluating practitioners' views on RDA indicates that adequate training materials and practical methods for delivering them are critically needed for easing their professional transition to the new cataloging code. However, the U.S. RDA Test Coordinating Committee (2011) only concluded that a variety of methods for RDA training should be made available, including in-person workshops and webinars, while making no efforts to determine which format was the most effective or most preferred training method. Neither did Sanchez's survey (2011) ask specifically about their preferred training methods preferred by the respondents. And yet, the survey results did show that more than 60 percent of the respondents had serious concern about funding available for their RDA training. As some respondents suggested, it may be that free or low-cost training programs—most likely Web-based—will be in much greater demand within the U.S. cataloging community, as training budgets are strained or even non-existent and as many libraries have difficulties bringing in outside trainers for on-site local training or sending their staff to any extended training.

Prior to the U.S. national libraries RDA test, library organizations in other English-speaking countries also conducted their own surveys to assess practitioners' views on RDA in each country, particularly relating to RDA training needs. The Australian Committee on Cataloguing and the National Library of New Zealand initiated their surveys in March 2010, asking the same set of questions with slight national modifications (Kiorgaard, 2010; Todd, Stretton, & Stewart, 2010). The Technical Services Interest Group of the Canadian Library Association (2010) administered its survey between April and June 2010. In Great Britain, following the official RDA release, the British Library and the Chartered Institute of Library and Information Professionals Cataloguing and Indexing Group released an online survey in July 2010 to evaluate the training and support needs of the British cataloging community in preparing for RDA implementation (Danskin, 2010). To a large extent, results of these surveys mirrored those of the two U.S. surveys reviewed above and further painted a picture of working catalogers who are primarily concerned about having to re-learn cataloging rules while meeting the daily demands of cataloging production and management.

According to the Australian survey (Kiorgaard, 2010), less than a quarter of cataloging staff were reported to have a "moderate" (21%) or "high" (2%) level of knowledge about RDA on the eve of its official publication. The percentage of "moderate" responses was slightly higher (32%) in the New Zealand survey, while "high" levels of RDA knowledge received the same percentage of responses (Todd et al., 2010). Since the large majority of responses indicated limited levels of current knowledge about the new cataloging code, it was not surprising that top 4 RDA training topics suggested for catalogers in both countries were all concerned with practical cataloging questions—"cataloging with RDA (structure, vocabulary, core elements, using RDA in daily work)," "changes from AACR," "MARC21 and RDA," and "use of the RDA online product." Many respondents "wanted the training to start with the basics and be practical." For catalogers in the Australian survey, blended learning—"online training to supplement face to face training"—was the preferred delivery method for RDA training, followed by "offsite training" and "onsite training (using external trainers)." In the New Zealand survey, "offsite training" was slightly preferred to blended learning methods. In both countries, online training only and onsite training with in-house trainers who are trained first in train-the-trainer programs did not receive as much support as the other training methods. The training time preferred by the respondents ranged mostly from 1 full day to 3 full days, with 2 full days receiving the largest support (38%). Many respondents responded that they wanted RDA training to last as long as needed, and both surveys indicated that continuing follow-up and support would be needed over a long period, regardless of the methods used to deliver initial RDA training.

The Canadian survey (TSIG RDA Training Needs Assessment Working Group, 2010) also showed that RDA training and implementation were primary areas of concern within the cataloging community. RDA training choices were apparently influenced by practical cataloging questions; "new and changed instructions," "new RDA vocabulary and concepts," "RDA structure," "differences between AACR2 and RDA," "similarities between AACR2 and RDA," and "mapping between RDA elements and MARC21" were generally rated as the most important topics. For cataloging supervisors and trainers, the most preferred method for delivering such training was in-person training, either one-on-one or in small groups. Webinars and other self-study methods like viewing PowerPoint slides or reading manuals on their own were not popular choices, a result that illustrated the importance of hands-on training and interactive exercises in training experiences. This result mirrored the self-reported effectiveness with which the survey participants learned new content with each type of training. Nevertheless, the report concluded that in-person training methods would be impractical for RDA implementation due to their costs and accessibility. Instead, online training was recommended as a "key component of a Canadian training plan." Webinars were identified as a "principal method" for delivering quality training with the current Web technology. At the same time, the report emphasized the need to find ways to incorporate some types of interaction and hands-on exercises during online training, as revealed in multiple comments by survey respondents.

The British RDA survey painted a similar picture of catalogers' concerns and training needs, with some minor national differences. Familiarity with the new cataloging code was still fairly limited; less than one-third of the respondents reported that they could "explain" or "understand" RDA. As a result, practical questions like "MARC21 and RDA," "differences between AACR2 and RDA," and "RDA elements and core elements" were predominant areas of concern for RDA training. In-house training using local resources (47%) or in-house trainers (41%) was the most preferred method for delivery of RDA training, followed by off-site training and online training (35% each). Interestingly, in-house training with external trainers was the least preferred method (28%), in contrast to its widespread acceptance in the Australian and New Zealand surveys. Furthermore, the British RDA survey asked the respondents how much time their institutions would be prepared to commit to RDA training, rather than asking catalogers how much training they would need (as in the Australian and New Zealand surveys). Over 90 percent of respondents believed that their institutions would provide for more than two days of initial training to help catalogers prepare for RDA implementation—the length of training that exceeded the training time preferred by the catalogers and cataloging managers who responded to the Australia and New Zealand surveys.

By the time LC announced its RDA implementation date, more detailed plans for RDA training have started to emerge from many quarters. At the time of this writing, LC itself has released a training plan for its 400 cataloging staff, which combines no less than 35 hours of classroom instruction—limited to 20 trainees each and delivered over 4 weeks—with formal post-training review by RDA trainers. LC also plans to film these training sessions and share them online for use by members of the broader cataloging community (Library of Congress, 2012b). Other national organizations, such as the Association for Library Collections and Technical Services (a division of the American Library Association) and the Program for Cooperative Cataloging, have also worked on preparing RDA webinars and training documentation, not to mention regional networks and state and local library associations that provide and/or coordinate continuing education and training programs for catalogers and other interested professionals in different parts of the country. However, it appears that the RDA training landscape currently remains fairly fragmented—characterized by the duplication of *ad hoc* efforts among various library organizations and continuing education providers, as they scramble to fill the pressing need for RDA training materials and programs among practicing catalogers who are understandably anxious about the impending transition from their long-trusted cataloging code. At the same time, little attention seems to have been paid, if at all, to performing detailed, systematic needs assessment and developing RDA training content based on identified needs and preferences, while there has been little evidence of coordinated, broad-based efforts to identify and integrate the instructional methods that have been proven to be effective in the adult and continuing education literature to meet the needs of cataloging and metadata professionals in carefully tailored learning environments. Future research needs to include careful evaluation of professional learning needs and outcome measures, as well as a coordinated approach to identifying and applying proven and effective professional training methods in various contexts.

CONCLUSION

RDA was published in June 2010 to supersede AACR2, the mainstay of descriptive cataloging in the U.S. library community for three decades. AACR2 had been developed in the days of the card catalog, designed for the predominantly print-based environment. Issues with AACR2 included the nature of authorship, bibliographic relationships, format-specific categorization of resources, and the description of new types of media. Based on the new FRBR/FRAD conceptual model, RDA provides a flexible and extensible bibliographic framework that is designed to overcome these problems, among others, and move the cataloging community forward to the 21st-century digital environment. Also, while RDA is primarily designed for use by the library community, one of its stated goals is to support an effective level of data sharing and interoperability with metadata standards used in other communities. Rather than make a clean break from the AACR2 foundation, RDA is designed to be compatible with the legacy AACR2 data and the existing MARC formats. At this moment, RDA still needs a new data standard to overcome the limitations of the MARC formats and take advantage of its full capabilities as a new content standard. Nevertheless, RDA is a key, significant step in laying a solid foundation for improved bibliographic control in the emerging linked data environment.

The library and information science literature regarding RDA is only starting to take shape. Much of the literature to date has been written as introductory overviews and essays, primarily intended as a guide to explain the new cataloging code and its features to an audience of catalogers and cataloging managers. However, various aspects of RDA have already started to gain attention as areas of potential new research. Research already in progress includes evaluation of key differences and similarities between RDA and its predecessor, AACR2, such as RDA's relationship to newer international cataloging principles and models (e.g., FRBR, FRAD); RDA's ability to accommodate all types of media and resources; and RDA's general structure and features, such as questions of cataloger's judgment, access points, and its potential for international use. Future research will require more in-depth studies of RDA's expected benefits and how the new cataloging code will improve resource retrieval and bibliographic control for users and catalogers alike over AACR2. In this regard, user research—perhaps the least studied area in RDA research—will play a particularly important part in validating RDA's ability to support its key objective—"responsiveness to user needs"—in the context of library catalogs. For example, there is a critical need to build an evidence base for evaluating how the additional information provided by RDA—such as bibliographic relationships and content, media, and carrier types—will prove ever useful to end-users.

Another major topic in future RDA research will be the relationship of the new cataloging code to related metadata standards. Libraries have traditionally produced bibliographic records, or metadata, for use solely within the library catalog. While almost all RDA-based records will be encoded in the MARC formats at least for several years, RDA itself has been intended to provide a content standard that produces robust, well-formed metadata in other encoding, or data display standards. How well RDA data will be compatible and shareable with other metadata standards will be a main test of RDA's stated goal to open up bibliographic records out of library silos, make them more accessible on the Web, and support metadata exchange, reuse, and interoperation. Also, since the traditional MARC formats are not well-equipped to take advantage of RDA's new entity-relationship model on Day One for RDA implementation in March 2013, its full capabilities cannot be fully evaluated until LC completes its work on the Bibliographic Framework Transition Initiative to re-design library systems and better accommodate future metadata needs within the library community. Impacts of the emerging data standard on the future of bibliographic control should also inspire and inform a wide array of new research agenda in the cataloging and metadata literature.

RDA implementation issues also should be another major focus in the emerging LIS literature on RDA. Studies addressing the responses of catalogers and cataloging managers to RDA have been conducted only sparingly, developed for the most part as parts of larger efforts by national library organizations to prepare training and transition plans for the new cataloging code. As RDA moves forward from the drawing board to the production environment, they will continue to be the frontline personnel responsible for creating and managing library metadata to support users' information needs on a daily basis. There is a critical need for more in-depth, systematic research in relation to practitioners' views on the new cataloging code, ease of application, and benefits and costs of implementation, using a wide array of quantitative and qualitative methods including surveys and interviews. On a related note, training issues should hold possibilities as an important area of future research on RDA. During the initial transition period, in particular, the successful adoption of RDA across the cataloging community will require close attention to evaluating professional re-training needs, developing appropriate instructional materials and resources, and assuring delivery of such continuing education opportunities to working catalogers. This will have implications both in research and in practice that go far beyond any individual library organization or continuing education agency—because developing procedures for making quality continuing education materials to all interested catalogers will be critically important in the current shared cataloging environment—and may even increase in importance as the cataloging community grapples with the future of bibliographic control in the post-MARC environment in the coming years.

In summary, RDA is designed to provide a robust metadata infrastructure that will position the library community to better operate in the future Web environment, while also maintaining compatibility with AACR2 and the earlier descriptive cataloging traditions. As the cataloging community begins the transition from AACR2 to RDA, the RDA literature will likely shift from mostly introductory, practical works to empirical and theoretical studies evaluating implications of the new cataloging code for users, catalogers, and the library community as a whole, as well as information access in the wider data environment on the Web. More in-depth studies of RDA implementation and training issues are also critical areas for future research. Catalog records, or metadata, are the building blocks of a functional catalog that supports users' information needs on an everyday basis. For that reason, a library catalog is the core foundation upon which all library services are built. The question of how the cataloging community can best move forward to the post-AACR2/MARC environment must be addressed carefully to chart the future of bibliographic control in the evolving environment of information production, management, and use.

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