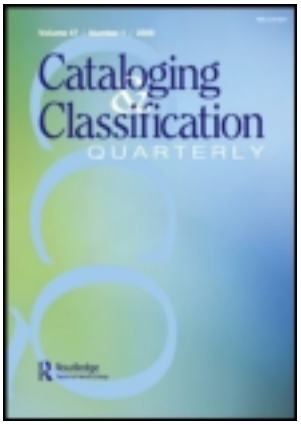

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From Testing to Implementation: Managing Full-Scale RDA Adoption at the University of Chicago

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The University of Chicago Library was a formal participant in the U.S. National Libraries' Resource Description and Access *(RDA), Test from October–December 2010. Immediately following the test period, the Library implemented RDA for original cataloging. This article will reflect on our RDA testing experience, and will address some of the major issues related to managing its adoption, including: staff training; implications on cataloging policies; preparing the integrated library system (ILS) for RDA metadata; managing the integration of RDA with* Anglo-American Cataloguing Rules *(AACR2) records; major costs associated with full implementation; and finally, what RDA may mean for the future of our metadata infrastructures.*

KEYWORDS Resource Description and Access *(RDA), cataloging administration, cataloging management, cataloging evaluation, cataloging quality analysis, cataloging,* Anglo-American Cataloguing Rules *(AACR2), MARC21 formats*

INTRODUCTION

The University of Chicago Library was a formal participant in the U.S. National Libraries' RDA Test from October–December 2010. The Library

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I thank the U.S. National Libraries' Test Coordinating Committee for selecting the University of Chicago to be a test participant, as well as the University Library administration for supporting our involvement in the test. Most of all, I thank all of the catalogers at Chicago who have contributed so much to this process.

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implemented *Resource Description and Access* (RDA), for most of its original cataloging production immediately following the test period. This article will reflect on our experiences during the test period, the results of that effort, and will address some of the major issues related to managing the implementation of the new cataloging code, including:

- managing training for staff;
- implications of RDA on cataloging policies and procedures;
- preparing the integrated library system (ILS) for RDA metadata;
- managing the integration of RDA and *Anglo-American Cataloguing Rules,* Second Edition (AACR2) records, and their displays, in the catalog;
- managing the impact on vended authority control and contract cataloging;
- major costs incurred while implementing the new code.

The process of testing RDA provided an opportunity to apply the new code under relatively normal cataloging conditions, over a long period of time. Testing helped to identify areas where catalogers saw improvements from AACR2, and provided a mechanism to communicate concerns. Subsequent implementation has allowed us to extend our learning curve, rather than interrupt it, and may help other libraries manage their transition as well. To that end, the article will outline post-test "next steps" we are engaging in at Chicago, and will offer some thoughts on what RDA could mean for the future of the MARC (Machine Readable Cataloging) and our metadata infrastructures as a whole.

STAFFING MODELS FOR TESTING AND IMPLEMENTING RDA

One of the first questions every institution in the formal test needed to answer was whether it would limit the RDA testing to a subset of its cataloging operations, or whether it would apply RDA more broadly. There were pros and cons to both approaches. Starting small, or with a subset of staff allowed an institution to minimize risk, and minimize the effects of slower processing that could accompany the learning curve associated with adopting new rules and practices. If the institution's own test experience resulted in a decision *not* to adopt RDA, fewer staff would have been affected. In some ways, a smaller testing team would have been easier to manage and train, and lessons learned from their experience could have been used to improve the transition to RDA for the other catalogers, if adopted. Fewer records would have been produced, resulting in less impact on review and quality assurance measures. And the impact on the system would also have been smaller because fewer RDA records would have been integrated into the database.

However, if the ultimate decision was to adopt RDA, there would be a duplication of training and review efforts for staff who had not already been trained. It may also have been difficult to judge the effects of moving to full-scale "production mode" across the entire organization if the initial subset of RDA catalogers, or even the resources cataloged, were not representative of the whole.

Implementing RDA across an organization all at the same time had a number of advantages. Training programs would need to be developed only once, and all staff would be "in it together." Everyone would have an opportunity to contribute to the process, and learn from one another at the same time, and we could test RDA application on a broader spectrum of resource types, subject domains, and cataloger expertise. A more holistic approach had the potential to foster organization-wide team building, avoiding the possibility of creating a privileged few who got to be part of a test while others were left behind to keep up regular production levels.

The University of Chicago Library ultimately chose to test RDA as widely as possible, and involved original catalogers from all cataloging units across the library system. But again, the risk was higher, especially for those implementing RDA before the U.S. national libraries made their final decisions on adoption. Costs were largely unknown and having more staff involved meant that the need for consultation between them would increase; certainly, the management team would also need to expect a higher volume of questions from staff about how to do their work. Policies and procedures would have been more difficult to change in a flexible way when all staff were using them. Implementing with everyone at the same time might also mean a period of time when processing times were slower, as catalogers learned to apply new rules, policies, or procedures.

TESTER DEMOGRAPHICS AND TEST PRODUCTION STATISTICS

The University of Chicago Library has a decentralized organizational structure for technical services and cataloging. The central cataloging department manages the majority of the Library's cataloging operations, with separate smaller cataloging units in the Law, Maps, and East Asia collections. The majority of non-MARC metadata is produced in the Special Collections Research Center. Approximately seventeen original catalogers from across the organization participated directly in the testing process. Twelve testers were professional original catalogers in librarian positions (responsible for cataloging monographs, serials, legal materials, and cartographic resources). Their cataloging experience ranged from eight years to over thirty years. Five of the catalogers were paraprofessionals responsible for some level of original cataloging (including monographs, cartographic resources, special collections, and digital resources/non-MARC metadata). Two of these paraprofessionals

TABLE 1 The University of Chicago Library's RDA Production Statistics for the Test Period, October 1–December 31, 2010

Total Original Dublin Core Records	20
Total Authority Records	1,202
Total Original Bibliographic Records	1,301
Monographs	637
Maps	598
Serials	23
Sound Recordings	19
Mixed Materials	10
Visual Materials	8
Integrating Resources	5
Computer Files	1

have accredited library degrees, and two were in library school during the time of the test. The paraprofessionals' experience with original cataloging, or the provision of non-MARC metadata, ranged from just a few months to over ten years. This team of original catalogers also formed the group of policy developers for testing and subsequently implementing RDA.

Of the twenty-seven institutions and groups in the test, the University of Chicago contributed approximately 17% of all bibliographic records and 12% of all authority records to the formal test, representing a wide array of resource types, and was second only to the Library of Congress in terms of total contributions to the formal test set. During the implementation period immediately following the test, between January 1 and May 15, 2011, original catalogers produced approximately 2,100 additional RDA bibliographic records, accumulating a wealth of experience applying the new code (Table 1).

THE RDA TESTING PROCESS AT CHICAGO

There were three main overarching philosophies that guided our approach to testing at the University of Chicago. The first was that we wanted to involve all original catalogers from all of the Library's technical services operations, partly in order to gauge the effects of moving an entire organization over to RDA at the same time, and partly so we could test RDA against the widest possible variety of resource types and cataloger perspectives.

Secondly, we wanted to test RDA as RDA. RDA 0.6 outlines elements designated as core because they reflect attributes and relationships in Functional Requirements for Bibliographic Records (FRBR) and Functional Requirements for Authority Data (FRAD) that support certain user tasks. Some of the elements are always core if applicable and the information is available; some are core only in certain situations. The cataloging agency can identify additional RDA elements as core for their cataloging production. The only change we made to our application of the standard was to make a few RDA

elements that are not core, part of our "UChicago Core." These elements were those that catalogers argued were important for descriptive purposes, or for the purpose of the test process itself:

- *Other Title Information* (RDA 2.3.4)
- *Copyright Date* (RDA 2.11)
- *ISSN of Series* (RDA 2.12.8)
- *ISSN of Subseries* (RDA 2.12.16)
- *Media Type* (RDA 3.2)
- *Source Consulted* (RDA 29.6)

Other title information, International Standard Serial Numbers (ISSNs), and citing sources consulted for authority work, were elements catalogers stated they would add in the normal course of their work anyway because of their value for either resource description or identification. *Copyright Date* was added to Chicago's core because of the growing need, particularly in a Web environment, to document rights management data. While it is only core in RDA when a date of publication or distribution cannot be identified, catalogers added it to records whenever present on the resource itself. *Media Type* (recorded in the MARC 337 field) was made "UChicago Core" because it is one element in the suite of new RDA elements and MARC fields that, for all intents and purposes, replace the General Material Designation (GMD) found in AACR2 records. Although not core in RDA, we wanted to populate *Media Type* during the test period to get a better idea of how this suite of elements would work as a whole.

Finally, RDA provides more options and alternatives than AACR2 for certain cataloging scenarios, integrating more instances where one must exercise cataloger's judgment. Again, in the spirit of testing RDA as RDA, we chose not to prescribe courses of action for most scenarios where RDA presents multiple options; instead, catalogers were to use their judgment in applying options based on the resource itself and the case at hand, and assess that experience in their survey responses to the Test Coordinating Committee.

DESIGNING A TRAINING PROGRAM

Original catalogers at Chicago entered the test process already somewhat familiar with RDA. When the draft of the standard was released for public comment in 2008, catalogers took time to read through various areas, discuss, and contribute formal feedback to the Joint Steering Committee via the representative from the American Library Association. However, by the time RDA was published in the *Toolkit* in June 2010, it had been over two years since catalogers had actively read the code, which had changed somewhat from the 2008 draft.

As a way to frame the main conceptual differences between AACR2 and RDA, and the effects of those differences on the data we would be producing and delivering via the catalog, one of the first things the original catalogers did to learn RDA was focus on significant changes between the two content standards. The Head of Serials and Digital Resources Cataloging created a document that outlined major differences in treatment for monographic, serial, and integrating resources. Catalogers then identified active AACR2 records in the local catalog (nearly fifty records in total) for a wide variety of resource types, and converted them to RDA-compliant records. Catalogers met weekly over the course of about a month to discuss questions, concerns, and results of the process. Creating these records fulfilled the dual purpose of helping the catalogers envision, in practical terms, some of the major differences in the codes, but also populated the local live database with some RDA-compliant records to test how they would be handled by the system.

FRBR provides the conceptual model that forms the framework for the RDA content standard itself. RDA is organized and structured around FRBR, and uses much of the same terminology. At minimum, an introduction to the FRBR concepts will be important for any institution creating RDA metadata, and should probably preface RDA training. Similarly, but perhaps more important for organizations that perform original authority work, a knowledge of FRBR's cousin for authorities, the FRAD, may also be important. At Chicago, most original catalogers have been familiar with FRBR for quite some time, having discussed it in their cataloging forum group. In retrospect, however, we perhaps could have spent more intensive time on FRBR than we did, as some catalogers continued to grapple with certain aspects of the model while applying RDA (for instance, distinguishing between Group 1 expression and manifestation entities).

Copy catalogers may have heard of FRBR, but were not as well versed in its structure or purpose. Starting with an introduction to FRBR concepts and terminology gave them context for the organization of RDA. While we were not expecting to directly involve copy catalogers in RDA testing, we included them in the training so they could begin to see what was on the horizon, and because we knew they would eventually encounter RDA records in OCLC. For them, a general overview of FRBR was best, and we used training materials freely available from the Library of Congress (LC) Web site to provide that basic introduction.

Training on RDA itself was a phased effort. In organizing the training, timing was critical. We did not want to provide training so far in advance that, by the time RDA was being applied, the training was forgotten. We also thought it would be best to integrate local policy decisions with the training on RDA. Using LC's video recorded "Train-the-Trainer" sessions as the main basis for local and more in-depth training was one low-barrier way to facilitate and organize local training. Using existing training materials

reduced local costs because we did not have to develop our own, and could instead concentrate on defining and then integrating local policies and practices into that training program.

For training on the *Toolkit*, we watched several of the Webinars held by ALA Publishing that demonstrated the workings of the *Toolkit*. We experimented with using workflow documents in the *Toolkit*, and training was supplemented with local demonstrations of how to use and navigate through those workflows, as well as between the Cataloger's Desktop, Library of Congress Policy Statements (LCPS), AACR2, and MARC21 bibliographic and authority mappings.

Finally, we spent some time covering how staff would encode the RDA data they created during the test. To that end, we reviewed the new fields and subfields added to the MARC bibliographic and authority formats, and also to OCLC Connexion.[1] Non-MARC metadata, like Dublin Core, presented different challenges because, of course, there are no new elements added to Dublin Core for RDA. To organize her work, the digitization manager in the University of Chicago's Special Collections Research Center, who was a member of the RDA testing group, used a working draft of a Dublin Core-RDA mapping published on the Joint Information Systems Committee (JISC) RDA ListServ in February 2010.[2]

POLICY DEVELOPMENT

Every organization is going to have different operational demands, organizational structures, staffing models, existing knowledge of RDA, and levels of administrative support (which may range from total support, to partial support, to skeptical support, and, at this stage, perhaps no support at all). How will administrators choose to address developing institutional policies on implementation? Will cataloging and technical services managers establish policies on their own, will a subset of managers and original catalogers do this work, or will everyone share in the process?

There is no single correct approach to these questions, and administrators will need to choose their direction based on local needs and abilities. Developing policies on anything requires investment of time and human resources. At Chicago, where original catalogers had collectively been following the development of FRBR and RDA for a number of years, there was a desire for all of them to share equally in developing initial policies. Catalogers began meeting regularly in January 2010. They established tasks that would need to be done, set timelines, and identified staff outside of cataloging operations who would also have a stake in setting various policies and practices for their domains (namely, staff in systems, acquisitions, and public services operations).

Making decisions on core elements will certainly be something all administrators will need to address. Institutions will need to decide whether, in addition to those that are already defined as core in RDA, there are other elements to be considered core for the institution's bibliographic and authority records. RDA also contains a number of instances of "options" or "alternatives," where a cataloger can apply local policies, or his/her own judgment, in applying one or more options outlined in the text of a given RDA rule. At Chicago, we reviewed all of the Library of Congress's decisions for these areas to assess where we agreed with their policy, and where we wanted to choose a different path for Chicago. We are an active member of the Program for Cooperative Cataloging (PCC), contributing to all four areas of PCC (Bibliographic Record Cooperative Program (BIBCO), Cooperative Online Serials (CONSER), Name Authority Cooperative (NACO), and Subject Authority Cooperative (SACO), so we already have a close alignment with LC policies. Managers at other institutions may need to choose a different path. Institutions may not want to make policy decisions in advance, but rather, for the initial period of implementation, apply cataloger's judgment to all of these options. Certainly, this may be an attractive option for administrators at smaller institutions with fewer catalogers, where it may be easier to keep track of what works and what does not in the local context. We chose to develop initial policies for the test period prior to providing the staff training, so that as we did the RDA training, we could also stop and contextualize how certain RDA or LCPS instructions would be applied locally.

IMPACT ON ILS SYSTEMS

Libraries have various levels of control over their ILS systems. Some institutions have a lot of local ability (both technically and in terms of staff expertise) to configure their ILS, while others have almost no local control and are dependent on the vendor to push out updates and changes. When starting to think about implementation, institutions will want to consult any documentation the ILS vendor has distributed with regard to its readiness for RDA. It may also be useful to contact testers or early adopters who have the same ILS to see how they handled the shift.

System administrators who may not be catalogers themselves, are going to require at least some knowledge of what new data will be contained in RDA MARC records—at least enough to know what needs to be done in the local system to accommodate the data. There are two main areas where administrators should focus attention in this regard. The first is the suite of new or modified fields in the MARC bibliographic and authority formats. For institutions that have not employed relator terms in their catalog systems before, the second area of concern may be the increased emphasis and ability with RDA to use relationship designators (manifested as

relator terms and/or codes in MARC) for entities related to the resource being described.

GMD DISPLAY

One of the things all institutions will need to decide is how to manage the integration of RDA records with AACR2 records. The University of Chicago Library has configured its SirsiDynix Horizon catalog to have a "Format" column that shows GMDs in the brief record display when a 245$h is present in the results set. Of course, GMDs will no longer be present in RDA records. For the time being, we have no specific intention to manipulate data for display in this column. Several options to consider going forward include: (1) map certain RDA data, perhaps the *Media Type* and/or *Carrier Type* elements, to the same display constant that GMDs have in AACR2 records, making an attempt to harmonize data values between the records, to the extent possible; (2) remove GMDs from display altogether; (3) do nothing and let existing GMDs display as they always have and not try to do anything to either "GMD-ify" RDA records, or "de-GMD-ify" AACR2 records. Again, there is no one right answer. Every institution will need to weigh the pros and cons on their own. At Chicago, we are hoping to develop local user assessment activities to help inform our eventual decisions for presenting this data.

NEW 33X FIELDS

When we initially populated the Horizon catalog with RDA records, the *Content Type*, *Media Type*, and *Carrier Type* elements (MARC 336, 337, and 338, respectively) naturally displayed under the "Description" label of the full record display because they are part of the MARC 3XX suite of bibliographic fields; they had no field-specific labels or context. Therefore, another decision we needed to make was whether to display these fields at all, and if so, how they should display. Our Cataloging Administration Group approached a collaborative committee of public and technical services staff, which is specifically charged with making decisions about public-access tools, including the catalog. We informed that group what these new fields were intended to do, what kinds of data they would contain, and showed example records. Concerns about the usefulness of the 33X fields resulted in an initial recommendation from public services to suppress the fields from display. For the purposes of the test, however, we ultimately agreed to display them, and the group assigned field-specific labels for the Horizon catalog interface as well as Aquabrowser, our faceted discovery layer to the catalog (Figure 1).

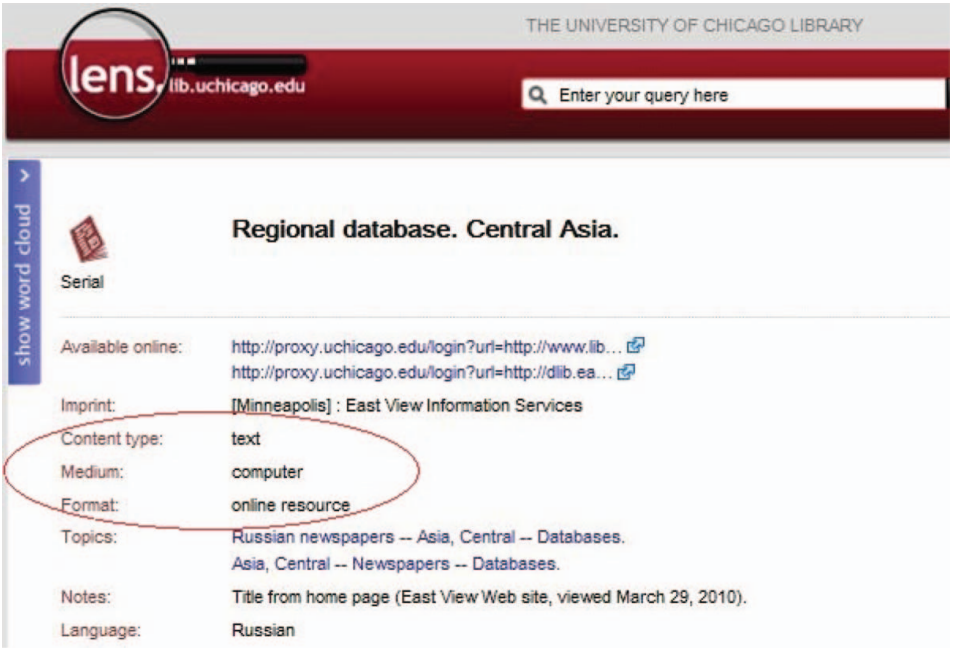

FIGURE 1 A View of the Field Labels ("Content type," "Medium," and "Format") Assigned to the RDA Elements *Content Type, Media Type, and Carrier Type*, Respectively, in the University of Chicago Library's Aquabrowser Catalog Interface (color figure available online).

This display decision is not a permanent one. There is a strong desire to investigate whether existing fixed fields already do an adequate job of faceting, identifying resource types, and whether the new fields are useful in supporting FRBR user tasks in ways that other data in the record do not.

IMPACT ON AUTHORITY CONTROL, VENDED PROCESSES, AND PRODUCTS

In AACR2, we apply the "rule of three": if the resource names more than three persons or corporate bodies performing the same function, we are to omit all but the first one and add "[et al.]." In RDA, we can either name all entities responsible for the resource, or, optionally, give only the first one, followed by a bracketed summary about the others. Again, administrators are going to have to make policy decisions on which of these choices to apply. At Chicago, we have decided to transcribe all names in a statement of responsibility, and leave it up to the cataloger's judgment whether and when to perform authority control for creators and contributors. As a PCC library,

though, it is generally understood that we place a high value and investment in authority control.

There are a number of new 046, 37X, and 38X fields in authority records, largely to accommodate name access points and musical works. It is hoped that the addition of these new data will help parallel, but still developing, efforts to make library bibliographic and authority data contribute to the Semantic Web. Again, this is an area where institutions that do create or edit authorities will need to make policy decisions on how much effort to invest in contributing these data, which are currently optional in RDA and for NACO work. Catalogers have been encouraged to contribute what they know about pertinent dates, occupations, gender, fields of activity, and so on based on what is available from the resource itself, or what they learn about an entity through the course of performing research to break conflicts. On the whole, catalogers report that authority records are taking slightly longer to complete than AACR2 ones did, but they also generally feel that this is a value-added investment worth making.

Administrators will also need to consider the eventual effects on MARC records purchased from vendors, outsourced contract cataloging, and vended authority control. It is unlikely that most vendors will move to RDA production themselves before there is market demand for them to do so. No doubt, there will be a lengthy period of time when we are creating, acquiring, ingesting, and managing a combination of AACR2 and RDA records. But when a library adopts RDA, library managers and administrators will eventually start requiring RDA conformity from vendors as well. As a result, libraries may need to develop new sets of criteria and requirements, possibly even new or amended business contracts.

RDA may also affect how a library manages processes like OCLC Bibliographic Record Notification, and the conditions under which the library receives updated records. Broadly, changing to a new cataloging code will require libraries to have a solid understanding of what they value in metadata, what they want as a product, and what their expectations are from vendors to meet those needs.

IMPACT ON ACQUISITIONS AND COPY CATALOGING PROCESSES

Every library will need to consider the impact of RDA metadata on acquisitions and copy cataloging processes. At Chicago, our acquisitions staff applies guidelines to assess MARC record quality upon receipt of the resource, and completes the cataloging process for resources with available copy records that meet certain pre-defined criteria for quality. We often hear of this kind of process being called "Fast Cat," or some other such name, and it is now common in institutions with acquisitions departments that can support this kind of work. One of the questions raised by managers early on was about

the effect RDA records would have on these existing criteria and workflows. Would we change the "Fast Cat" criteria to include instructions for assessing RDA Core elements, for instance, in records coded with an 040 $e rda?

For the first six months of the test and implementation period, we asked that acquisitions staff route all records containing an 040 $e rda to original catalogers for review. During that initial stage, we wanted to assess what was coming through as RDA copy. Over the course of those six months, errors decreased to the point of no longer necessitating the review process. As more libraries begin to adopt RDA in the future, and as the condition of RDA copy becomes more variable, we may need to re-evaluate our established criteria for what constitutes copy cataloging that is "good enough."As of May 15, 2011, the library has imported a total of over 2,200 RDA copy cataloging records—from OCLC and in batch from our many record vendor sources—and the process has been relatively seamless. For the time being, we are accepting RDA copy as-is, unless there is another reason that a record requires triage (e.g., low encoding level, missing a call number or subject analysis).

It may be some time before libraries know the long-term effects on copy cataloging workflows, but we expect that this is where The University of Chicago will experience the majority of the flux in its operations. Copy catalogers will require a different training approach than original catalogers. It is unlikely that copy catalogers will be reading or interpreting raw RDA instructions; instead, instructions on how to apply the code will be integrated into procedural documentation, in much the same way AACR2 practices are integrated into current procedures.

Copy catalogers will have to know how to spot errors or omissions in RDA copy records (e.g., assess the accuracy of 33X data; appropriate expressions of relationships; missing or incorrect 040 $e). It is not expected that copy catalogers will be routinely changing AACR2 copy into RDA copy. As RDA adoption increases, so, too, will the presence of RDA records in OCLC. While original catalogers may be creating RDA records exclusively, copy catalogers will likely be managing frequently alternating combinations of both AACR2 and RDA records as they catalog resources throughout any given day. The mental process of switching back and forth will require a different level of attention, and perhaps different expectations of how they approach their work, and will need to be monitored. Ultimately, we will need to make decisions on what to accept as-is in copy records, what to correct, and what is appropriate to "RDA-ify" from AACR2.

COSTS

In terms of subscribing to RDA, purchasing the code in print will initially seem like the least expensive option. Over time, it is difficult to know what

the cost of the updates for the print will be. It is likewise difficult to judge what the opportunity costs are of *not* subscribing to the online toolkit. For instance, the print version will not contain links between related RDA instructions, between RDA and the Library of Congress Policy Statements (the successor to Library of Congress Rule Interpretations), between RDA and MARC documentation, and the print version will obviously not be accessible through Cataloger's Desktop. For all of these reasons, Chicago chose early on to subscribe to the online version.

I am hopeful that down the road, the *Toolkit* could actually have the potential to support overall cost savings to the library and the community as a whole. Staff time is already being saved from having to manually interface separately with all of these tools and resources. Revisions to RDA will be integrated centrally in the *Toolkit*; we will not all need to have local staff print out revisions and replace/interfile within every paper version of the code we bought. The *Toolkit* also supports the creation of workflows. We have only experimented with this a little, but the potential is there to integrate some or all of our local procedures within the *Toolkit*, centralizing local and national documentation, and building on the functionality of dynamic interconnections between our documentation and the RDA instructions, LCPSs, MARC, and the like. We could also share local documentation with the entire *Toolkit* community; not everything will have to be redundantly maintained. Ultimately, we are choosing to approach the *Toolkit* as one tool at our disposal that helps us all work at the network level. The potential is there to support cost sharing and cost savings, and time will tell whether that potential gets realized.

In terms of the overall costs of implementing RDA, especially those related to staffing, it is difficult to imagine that those costs would be anything but relative to every institution. Many of the costs will be intangible. There were, however, tasks and activities related to preparation and implementation at Chicago that will be common to most institutions. Major activities we engaged in are listed below with estimates of the amount of time and number of people involved:

- Prepare the ILS for RDA fields (Spring 2010): *5 hours total (2 people)*
- Create test records for the system (Spring 2010): *20–30 hours total (10 people)*
- Implement public displays for RDA records (Summer 2010): *10 hours total (5 people)*
- Review LC and PCC documentation and make local policy decisions (Summer 2010): *10 hours × 13 people*
- FRBR and RDA *Toolkit* training (August 2010): *5 hours × 42 people*
- Initial RDA training (August 2010): *8 hours × 42 people*
- Regular meetings of testers (August–December 2010): *15 hours × 15 people*

- Library-wide presentation on RDA (September 2010): *1 hour* × *~60 people* + *5 hours preparation*
- NACO and BIBCO "refresher" (February 2011): *2 hours* × *15 people*

It is important to note that Chicago experienced no "productivity costs" during the pre-test practice period, the test period, or the post-test implementation period. No backlogs resulted from RDA testing and implementation, which may be attributed to: (1) the three-month practice period prior to going into production, when catalogers were getting acquainted with RDA (which we would recommend replicating in some fashion for other implementations); (2) to a group of dedicated and engaged catalogers who took personal responsibility for learning; and, (3) to a library administration that was not risk averse, that recognized the opportunity for individual and institutional leadership, and supported the learning and testing efforts. Knowing that October 1, 2010 was the target date for formal testing helped as a temporal "readiness" goal, and by the time we went into full RDA production, catalogers were relatively prepared.

Costs will be a moving target. Our hope is that the investment that some of the "early-adopter" institutions are making now can be used to help lower implementation costs for others in the future, and that our communities of practice and professional organizations (American Library Association (ALA)/Association for Library Collections and Technical Services (ALCTS), PCC, OCLC regional cooperatives, etc.) develop training options that meet a variety of needs, in as inexpensive a way as possible.

CATALOGER REACTIONS TO RDA

At the end of the testing, what were some of the common threads of likes and dislikes that catalogers had when creating RDA metadata? The new 37X fields in authority records were largely seen as positive outcomes of RDA, particularly because catalogers could, perhaps for the first time, visualize how library data could contribute to the Semantic Web. Likewise for expressing relationships between entities, although they also recognized that until those relationships could be expressed with linked data-compliant unique identifiers in the form of Uniform Resource Identifiers (URIs), rather than the literal display values, the functionality for the Semantic Web remains limited.

Most catalogers felt that eliminating abbreviations, while slightly more time consuming for themselves, was probably better for end users. Acquisitions, public services, and collection development staff responded similarly during user testing. Catalogers appreciated not being hindered by the "rule of three," which was nothing more than an arbitrary throw-back to the card catalog. And they felt that, in theory, the FRBR and RDA models for

cataloging reproductions as distinct manifestations was a good thing, but that other standards would need to be modified to make the description of reproductions work better for the end user (i.e., resolve conflicts with existing PCC Provider-Neutral guidelines and the general ability to not obscure data about the original resource that users would require for discovery, such as the original date and publication information).

Again, one of our overarching philosophies was to test RDA's increased reliance on cataloger's judgment in cases where RDA presents multiple options for a situation. In theory, catalogers liked the *idea* of employing their experience and judgment. In practice, exercising cataloger's judgment was often difficult. We found that catalogers sometimes struggled with the notion of applying a resource-specific judgment, balanced against an otherwise strong desire to provide a consistent treatment for all resources in the same category. While cataloger's judgment reinforces one's professional status, it may also decrease the application and overall value of consistency in descriptive practices over time. Similarly, it is often seen as simply more efficient to have documented pre-determined procedures that reduce the need for catalogers to stop and re-think a treatment for each resource requiring a similar decision.

There was a strong desire among original catalogers that we should investigate categories of already established AACR2 authorities that are truly compliant with RDA (i.e., the form of the RDA access point is not different from the established AACR2 heading). RDA forms of access points could be added as references to established AACR2 authorities, but, particularly for some personal and corporate names, where there is little or no meaningful structural change in the access point, catalogers were hesitant to promote investment in national efforts to retrospectively "flip" existing headings. One dramatic exception, they agreed, was the structural and conceptual changes in RDA for access points for the Bible and other religious texts. Likewise, there may be instances where sub-bodies would need to be formed that would conflict with existing AACR2 headings, where broader or more sweeping changes from AACR2 to RDA would be desirable. Analysis of records collected during the test period will hopefully inform national discussions about the impact of RDA on the National Authority File and PCC practices.

The utility of the new bibliographic 33X fields was widely questioned. Catalogers were concerned on two fronts: (1) was the terminology/vocabulary intuitive enough to users to contribute effectively to FRBR user tasks (e.g., whether users understand terms like "unmediated") and (2) could the data be more effectively employed by our systems if it were not recorded solely as human-readable free-text, but also as codes?

Finally, catalogers were almost unanimous in expressing a need for more useful examples within the RDA instructions themselves. Catalogers often felt a need to see not just examples of the element being described in the instruction, but also of the complete "field" of which that element would

form a part. They also wanted examples of complete records—especially when a certain piece of data is also reflected elsewhere in the record, or has some kind of relationship to another part of the record. Essentially, catalogers wanted the provision of more illustrative context, despite the recognized perils of cataloging by example. While they understood the intent of RDA to be encoding format-neutral, they also experienced the reality that, at this juncture, the majority of library RDA data is expressed in MARC, and that more examples should be provided that reflect that reality to aid the cataloger. Until then, catalogers are making use of the RDA-to-MARC mappings in the *Toolkit* to help see relationships between the instructions and the encoding format.

NEXT STEPS IN THE IMPLEMENTATION PROCESS

Catalogers at Chicago created a combined total of 2,500 RDA bibliographic and authority records during the test period, and while catalogers identified issues about individual aspects of RDA, by the end of the test none were identified that rendered RDA not implementable. Few argued that we should revert back to AACR2 cataloging while awaiting a decision by the national libraries. We also saw an opportunity to not just test RDA, but to test moving a large organization over to full-scale implementation. RDA production, therefore, continued past the test period. All of our NACO work is reviewed by staff at the Library of Congress who monitor contributions to the National Authority File, and we benefitted from direct feedback throughout the implementation period. This feedback highlighted knowledge gaps and areas where additional training was needed; a "refresher" class for BIBCO and NACO was provided shortly after the test period, and we will provide more as additional training issues are identified. We also instituted a peer-review process for our PCC contributions, in which original catalogers rotate reviewing each other's work prior to finalizing in OCLC. This review system is allowing catalogers to learn directly from one another, and to learn not just through the process of creating RDA data, but revising records as well.

Original catalogers have recently started working with assessment colleagues in the Library to build an assessment program for RDA data. Recognizing the need to gather and analyze user responses to RDA data, and our own library's local decisions on how to present and display RDA records, catalogers are considering a number of areas for research and testing, including: treatment of reproductions; the RDA *Content Type*, *Media Type*, and *Carrier Type* elements; RDA data for music resources; relationships between RDA data and our faceted catalog interface. Ultimately, it is hoped that we can focus on areas of research that will inform local practices and will contribute to providing an evidence base for cooperative cataloging decisions at the national level as well.

Designing and performing assessment will clearly require cataloger time away from cataloging, and represents another expenditure of staff time and costs related to implementing RDA. But we are hopeful that this investment will (a) provide a leadership and professional development opportunity for catalogers to assess bibliographic and authority data in a way we never have before; (b) allow us to integrate cataloging into the Library's overall assessment culture; (c) help catalogers learn assessment principles and techniques; and (d) contribute to a body of empirical data intended to inform the community about areas where RDA does or does not facilitate user tasks, how RDA might be improved, and the implications on local system configuration (labeling, use of RDA data in faceted browsing, etc.).

Throughout this entire process, we have tried to recognize when we are assessing (1) RDA as the RDA content standard itself, (2) RDA as data represented in the (often limiting) MARC formats, and (3) RDA in MARC, as configured by the library itself in our particular iteration of the local system. The lines get blurry and it is important to realize when something presents an issue with RDA, an issue with MARC, or an issue that reflects choices we have made in configuring the local systems.

Over time, and as we learn more about the effects of RDA on the National Authority File, PCC practices, and OCLC, we will also evaluate impact on local authorities processing and general database management. RDA implementation also coincides with the University of Chicago Library's involvement as a build partner for the Mellon-funded Kuali-OLE project (http://www.kuali.org/ole) to develop an open/community source library management system. Certainly, RDA and the broader implications of linked data, the Semantic Web, and a post-MARC metadata infrastructure will inform our work as we enter the phase of development for describing and relating entities and resources in the Kuali-OLE system.

IMPACT OF RDA ON MARC AND OUR METADATA INFRASTRUCTURES

A question garnering much discussion and debate currently is whether RDA will be the event that precipitates the demise of MARC. In many ways, one could argue that RDA is a convenient and timely scapegoat for moving away from MARC. It is really the Internet, and the fact that the world's technological infrastructure is changing at an unfathomably rapid rate, while our libraries' technology infrastructures are not, that should collectively be seen as precipitating the need to replace MARC. The bottom line is that MARC does not do the job we need it to do in a Web-based world now, let alone five or ten years from now. We have taken the MARC format as far as it can go as an encoding or communication standard, give or take a few tweaks here and there. Anything else we want to do with our metadata in a

Web environment requires intervening steps of crosswalking and performing transformations to other standards and formats—processes that carry with them the possibility, and in some cases a guarantee, that data will be lost.

Libraries will continue to manage MARC records for many years. There are probably upwards of billions of copies of MARC records in databases all over the world; the literal demise of MARC is a long way away indeed. The big question is not whether RDA will precipitate the demise of MARC, it is who, what body of people, what types of organizations representing which communities, will take responsibility for identifying the next formats and systems, and how well we support those efforts? Ideally, our large national library associations would see their role as facilitators for what is arguably one of the most challenging, dramatic, and potentially costly issues our profession will manage over coming years.

The MARC format almost exclusively requires literal, human-readable values to be useable. Every time there is a change to that literal value, it needs to be replicated in every populated instance of that value. The future of data management is not in redundant retyping of the same literal values over and over again in records; rather, it is the employment of unique, standardized, actionable identifiers in the form of URIs. Only a relative few even understand MARC records: catalogers, a handful of systems librarians, and an ever-smaller handful of reference librarians. Cataloging is not being taught as robustly in library school, and in many programs is no longer a required course. People do not come to our profession with existing knowledge of our data structures because they are almost entirely specific to our domain. Nor, when non-libraries want our data, do they usually want it or use it in MARC—they transform it to something else, perhaps something we should consider using too. We need a standard that is not used exclusively in our community, but can be understood and used by a variety of communities.

Part of the problem is that so few of us even know what those Semantic Web–enabled formats are or what they can do, because we have not made it a priority to start to understand these developments. The Semantic Web is largely foreign and somewhat (although not entirely) untested, and represents a risk. The Library of Congress has started to do its part by putting authorities and controlled vocabularies in SKOS (Simple Knowledge Organizational Schema), and providing URIs. However, for the most part the library community itself is not using these URIs because we do not employ data structures or systems that can take advantage of URIs. But it is these URIs, these linked data—not the literals and display values that we currently encode—that represent our data future, our data imperative. The benefits of RDA cannot and will not be realized until we can create an infrastructure that supports this functionality, and we invest in the continuing education of catalogers who will need to make the transition.

CONCLUSION

In 1986, catalog librarians at the University of Chicago co-authored a chapter in a book about experiences related to the 1981 implementation of AACR2. Thinking back on how they handled AACR2 implementation, they wrote: "Choices made in planning the AACR2 implementation process were guided by the principles of feasibility and merit: feasibility from the standpoint of systems support and staffing levels; and merit from the standpoint of minimizing disruption for the catalog users. Were we to do this again, these principles would still be the basis of planning and implementation."[3]

Thirty years later, this is precisely how we approached the testing process for RDA as well. But in addition to minimizing disruption to users, we were also hoping that this process, and RDA itself, would help maximize the use and benefits of the metadata. Of course, the extent to which we are eventually able to transform our metadata infrastructures beyond MARC will provide the true gauge for that success.

If we want to facilitate any kind of change in an organization, no matter what it is, we sometimes need to focus on culture as much as that which we are trying to change. With respect to RDA, our present culture is heavily influenced by AACR2 and MARC, which have not changed much over time. Moving forward, with a cataloging code that is issued primarily as an electronic resource, there are opportunities to change our profession's existing culture of rules development. As we identify areas where RDA can be improved, strategies will need to be adopted that promote a cataloging code that is truly living, that is flexible, and that can be speedily modified, distributed, and implemented.

Likewise, at the local level, we could do all of the strategic planning, training, and preparation for RDA that we like, but it will not amount to much if there is not organizational support, from both administrators and across staff lines. The real answer to the question about the future of MARC has little to do with whether there is available technology or whether we have the intellectual capacity within the profession to develop or adopt an alternative to MARC. We do. If we wanted to find a way to make this happen, we could. Technology is not our issue. The real answer to this question is whether librarianship can build a *culture* that will support the investment required to move away from MARC.

Throughout RDA testing, we have been reminded of the principles of agile development, which promote iterative and evolving development of software through collaboration.[4] Chicago has had to apply agile development principles to its work as a build partner for Kuali-OLE's efforts to replace the ILS. As a result, our organization has generally tried to divorce itself from the notion that there is only one perfect development stream for anything. In agile development, "shoulda, woulda, coulda" arguments are used constructively to make the product iteratively and incrementally better,

not destructively to start from scratch over and over again, or wait until it is "finished" before putting it to use.

We would do well as a profession to consider some of the agile development principles for our content standards as well. They will never be perfect, they will never be finished, and they will always need to be modified according to a broader context of other developments in, and understanding of, technology, systems, information cultures, user behavior, and the emergence of new resource types. Adopting this approach is how we will demonstrate our continued professional relevance and value, not by waiting until other people find the perfect solution for us.

To this end, Chicago has not decided to test and subsequently implement RDA because we think it is a perfect solution for anything. Rather, we saw this as the first step in a long continuum of change to our metadata infrastructures, and an opportunity to have a voice in its ongoing development, based on practical application and experience. An international group developed the content standard and released drafts for public comment. We exercised opportunities to submit our feedback, and the first iteration of their work has now been released and tested. So it is, too, with FRBR, the rest of the "FR Family," and any potential successor candidates for MARC. As we learn more about RDA data, we should expect to see refinements in the conceptual model that provides the framework for the content standards that are encoded in the MARC formats and future metadata standards.

In his 2004 paper "A Bibliographic Infrastructure for the 21st Century," Roy Tennant wrote:

> Our needs today will not be our needs tomorrow; therefore we need an infrastructure that will allow for extensions to be developed and applied without breaking the whole. There must be room at the edges for experimentation, since it is often through such experimentation that the way forward is demonstrated. . . . Having not been a part of the effort to create MARC those many decades ago, I cannot imagine what conditions fostered its birth. But in my ignorance I imagine that the opportunities created by computers inspired Henriette Avram and company to rise to the challenge of recreating our professional infrastructure in a revolutionary and farsighted way. We would do well to look to our past for the inspiration we need to create a future that our descendants will look upon with similar amazement.[5]

Indeed, the profession as a whole is going to need to come together—standards developers, systems vendors, the bibliographic utilities, national libraries, catalogers, and administrators alike—to muster the courage to challenge existing cultural and professional norms and develop a data infrastructure that will keep us relevant. This is not meant to malign or minimize the value of MARC. It has served us well for a long time and got

us into the "computer age." Now we need something to move us, our data, and our culture into the "Web age." And no one person or group or national library can do that for us; we have to do it together.

NOTES

1. Library of Congress, *RDA in MARC*, http://www.loc.gov/marc/RDAinMARC29.html

2. Alan Danskin (2010, February 22). G'day and question regarding RDA mapping to DC [ListServ], https://www.jiscmail.ac.uk/cgi-bin/webadmin?A2=ind1002&L=DC-RDA&F=&S=&P=1293

3. Jane Ciacci, Judith Nadler, and Richard C. Pollard, "AACR2—A Second Look: Implementation of AACR2 at the University of Chicago," in *Research Libraries and their Implementation of AACR2*, ed. Judith Hopkins and John A. Edens (Greenwich, CT: JAI Press, 1986), 83–107.

4. *Agile software development*, Wikipedia: The Free Encyclopedia. San Francisco: Wikimedia Foundation,http://en.wikipedia.org/wiki/Agile_software_development.

5. Roy Tennant, "A Bibliographic Infrastructure for the 21st Century," *Library Hi Tech* 22, no. 2 (2004): 175–181.