

3R Project Final Report

Prepared by the RDA Steering Committee

Abstract

This report summarizes the process and outcomes of the RDA Toolkit Restructure and Redesign (3R) Project (2016-2020), a project jointly conducted by ALA Digital Reference (publisher of RDA Toolkit) and the RDA Steering Committee (RSC; the group responsible for the content of *RDA: Resource Description and Access*). The Project resulted in an updated and more flexible underlying infrastructure to support the standard, a significantly modernized and improved Toolkit website, and updated and reorganized RDA instructions and guidance that conform to the IFLA Library Reference Model (IFLA LRM).

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Beginnings

The broad goal of the 3R Project was to “enhance the RDA Toolkit website so that it can better meet the needs of its users and play a more productive role in their work.”¹ The intent was more than changing the look and feel of the website; RDA content would also be re-worked to add greater flexibility, utility, and international applicability to instructions. The timing was such that the RSC folded into the Project adjustments to ensure compatibility with the IFLA Library Reference Model (IFLA LRM).²

The project was formally named the RDA Toolkit Restructure and Redesign (3R) Project. The restructure term referred to a major technical rebuild of the instruction repository, which was closely tied to synchronization with RDA Registry data.³ The redesign term referred to the adoption of responsive design (so the Toolkit would render well on a variety of devices and window or screen sizes) and a plan to bring the site into compliance with established accessibility standards. There was also a commitment to creating a user experience that is more intrinsically “of the web” and to break with its book-based roots.

Initial planning for the project began in mid-2015, but the project began in earnest in early 2016. It was publicly announced on 12 October 2016.⁴

Goals

Toolkit Functionality

- Rebuild the technical infrastructure and data repositories for greater modularity and flexibility and to bring them in line with current best practices.
- Adopt responsive design.
- Comply with current digital accessibility requirements.

- Enhance the user experience through content integration and greater customization and create a user experience that is more intrinsically “of the web.”
- Improve the reporting of revisions and changes.
- Implement personalization to allow users to set preferences.
- Improve the infrastructure that supports RDA translations.
- Implement a design that brings together instructions and policy statements for display without requiring multiple clicks.

RDA Content

- Update RDA to bring it into alignment with the IFLA LRM.⁵
- Reorganize the structure of RDA to support IFLA LRM and linked data practices.
- Integrate RDA Reference data⁶ more fully into RDA instructions for more efficient and effective maintenance.
- Optimize RDA for international use, including removing Western focus.
- Optimize RDA for linked data environments.

Organizational Approach and Process

The early impetus for the Project was the need to improve infrastructure and modernize the Toolkit website. However, the timing of the publication of the IFLA LRM presented a significant opportunity to align RDA content with this underlying model. RSC members weighed seriously the advantages and drawbacks of including this substantive adjustment to RDA content, concerned about the **amount of change** that cataloguing communities could absorb at once. Recognizing that change in cataloguing standards is often frustratingly slow and using the analogy of “pulling off a band-aid quickly,” the RSC agreed to undertake one large and arguably radical project rather than deliver smaller changes in separate and inevitably prolonged projects.

The 3R Project was organized in rough, overlapping phases. The “**core phase**” ran from 2016 through July 2018 and consisted largely of action and decision-making on the technical level. The key participants were James Hennelly (ALA Digital Reference), Gordon

Dunsire (RSC Chair), Judy Kuhagen (RSC Secretary), and Linda Barnhart (RSC Secretary-Elect). This group, known as the “core team,” held regular weekly conference calls, worked via email, and met before and after in-person meetings. The group was sometimes joined by technical experts. The core team expanded over time to include Kate James (RDA Examples Editor), Kathy Glennan (RSC Chair-Elect), and Ebe Kartus (Wider Community Engagement Officer). Daniel Paradis (Translations Team Liaison Officer), and Dave Reser (representing policy statement writers) were added in 2018 in an expansion to the “core team plus.”

An outcome of the RSC’s Frankfurt meeting in November 2016 was the formation of the group known as **RSC Plus** (RSC+). This expansion of the RSC to include RSC working group chairs was a time-limited experiment for the purpose of introducing broader perspectives and consultation during a process in which traditional input and communication processes would be too slow. While the core team drove the agendas, RSC+ participated in considerable consultation and review, for example in reacting to the initial designs for the new Toolkit interface and with reviews of content. A wiki was started in November 2016 to improve communication and keep topics together and was used for about a year. RSC+ met twice in person in 2017 (in May in Chicago and in October in Madrid) before being disbanded.

The Project transitioned to a new phase (the “**RSC phase**”) in July 2018. This new phase marked a deliberate change from a technical focus to a content-based focus. RSC members more actively came to grips with the implications of IFLA LRM implementation. Substantive discussions were held, for example, on the topics of appellation elements, fictitious entities, and application profiles. Discussion of aggregates was an ongoing challenge. The RSC undertook several projects focused on reviewing the wording of instructions. Communication processes (email lists, regular international conference calls, etc.) were re-tooled for this phase, and Basecamp software was tested and retained as a new collaborative workspace.

The RSC also established a “**stabilization phase**” from the April 2019 Toolkit release through the end of the Project in December 2020. This meant that the English text of the then-beta Toolkit was no longer under substantive revision and could serve as baseline text for the work of translators, policy statement writers, application profile developers, writers of supplementary materials, and the RDA Examples Editor. The RSC publicly stated, though, that

stable did not mean unchanging,⁷ and several categories of minor acceptable changes were announced.

The internationalization of RDA content was a key area of focus, especially in the latter stages of the Project. A report shared at the RSC’s 2019 Santiago meeting⁸ provided the impetus for specific ideas and broader discussion. In 2020, the RSC discussed a report on progress made to support the internationalization strategy of the RDA Board.⁹

By mid-2019, the RSC began planning for the establishment of **post-3R Project processes**, including testing new Fast Track and proposal processes and creating a new series of Operations policy documents. The group also began a new quarterly meeting schedule in September 2019, meeting asynchronously using Basecamp software. The core team was formally disbanded at the end of the Project, but two new ongoing subgroups were established (an administrative “checkin” group and a technical group, called the “Development Team”) that would each hold monthly calls to make decisions and maintain momentum.

Major milestones in the 3R Project are shown in this table; other milestones are shown in the Timeline appendix.

12 October 2016	3R Project publicly announced
11 April 2017	Final release of the original Toolkit; content is now frozen
13 June 2018	Public release of the beta Toolkit; eight subsequent releases before end of the Project
30 April 2019	English version of beta Toolkit is announced as stable, allowing work to proceed on translations and policy statements
Mid-March 2020	Worldwide pandemic affects workloads and processes for all
16 September 2020	First release to include translations (partial translations in Finnish and Norwegian) and test sets of policy statements from the British Library and the Library of Congress/Program for Cooperative Cataloging

15 December 2020	Beta Toolkit becomes the official Toolkit and original Toolkit moves to a different URL; 3R Project officially ends
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Early Decisions and Principles

At the November 2016 meeting of the RSC in Frankfurt,¹⁰ several important decisions were taken:

- The group agreed that extensive changes to the original Toolkit would not be implemented because of time and bandwidth constraints. No proposals or discussion papers would be accepted in 2017 (and beyond, until the official Toolkit was ready). The moratorium on proposing new relationship designators was continued, although efforts were made to seek out pending and new relationship elements from specialist communities and incorporate them into the official Toolkit. Future releases of the original Toolkit were cancelled.
- Normal consultation processes could not be followed during this period due to the need to move forward quickly. The RSC planned to keep communities informed, but the process would not be business as usual.
- The RSC confirmed the plan to adopt and fully align RDA with the (then draft, but near final) IFLA LRM. A structural outline for RDA was proposed. The rough plan was that current content would be disassembled and reassembled into an element-based structure, creating an element-based approach rather than a workflow-based approach. General guidance and principles would need to be drafted.
- General principles were agreed upon:
 - RDA Reference data for entities, elements, and controlled vocabularies will be managed using the Registry infrastructure, so that data are maintained in only one place.
 - The entities will be treated equally in their structure and presentation.
 - Instructions will be generalized where possible.
 - As little as possible of the current content should be revised.
 - Content for recording methods (then called the 4-fold path) must be included.
 - Transcription and recording of data (in the context of the recording methods) must be clarified.

- The organization of RDA is a rearrangement and will not change current cataloguing practices.
- Instructions or elements will not be removed unless they are in conflict with the IFLA LRM.
- Strive for clarity and simplicity and avoid unnecessary duplication.
- The RDA Board's interest in expanding RDA's scope to cultural heritage communities was noted.
- Principles added later in the Project:
 - Examples are not considered part of base RDA.
 - RSC should not continue the principle of translating everything in parallel; translations need to be able to customize their own examples and choose the relevant non-RDA resources to translate.

Infrastructure Development

The **integration of RDA Reference data** into RDA Toolkit content was one of the earliest and most significant technical decisions for the 3R Project. These data became the basis for filenames, element labels, and the content of major blocks of element page design: the Element Reference section, the Related Elements section, and parts of the (unseen by users) prolog. Synchronization between the RDA Reference data and the Toolkit simplified data maintenance with the need to update in only one place. That up-to-date and basic RDA data was available outside the Toolkit paywall in the RDA Registry was also recognized as a benefit to users. The RSC was briefed about the details of the RDA Reference infrastructure through a presentation by Gordon Dunsire at the RSC's November 2016 meeting in Frankfurt "RDA Reference Data Maintenance and Flow."¹¹

At the time the 3R Project began, RDA Reference data were stored in the Open Metadata Registry (OMR) in Resource Description Framework (RDF). Over the course of the Project, several newer versions of the OMR were developed to resolve various technical issues. RDA Reference data were moved in August 2019 to a new server and back-end database infrastructure called the Staff Registry under the aegis of ALA Digital Reference.

Significant improvements were made to the public-facing RDA Registry site before the end of the Project, with the goal to present an updated RDA Registry website along with the official Toolkit in December 2020. As part of this refresh, maps and alignments were updated and documented. The official Toolkit contains mappings (maintained in the Registry) to MARC 21 authority and bibliographic, Dublin Core, and the IFLA LRM; the RDA Registry contains additional mappings and alignments.

RDA Reference data are dynamic and were developed throughout the Project. RSC+ engaged in reviewing glossary definitions, and a systematic review was undertaken by Anoushka McGuire in mid-2019. Early on, scope notes were systematized¹². It was expected that the number of elements in RDA would substantially increase. In addition to elements associated with entities new to RDA, for example, representative expression elements, manifestation statement elements, and high-level relationship elements were added. A major expansion was made when the “agent breakout” elements were introduced, as proposed by Dunsire at the RSC’s Montréal RSC meeting.¹³ The number of RDA elements expanded by over 1,200 elements from this action alone.

The role, integration, and display of **RDA value vocabularies** was discussed from the outset. The first technical challenge was the mechanism for populating value vocabulary terms within RDA element instructions. New vocabulary encoding schemes (VESs) were created as needed throughout the Project (for example, RDA Recording Source or RDA Interactivity Mode). Considerable attention was paid to the RDA Terms vocabulary, which resulted in significant expansion. Terms that were re-used in more than one RDA vocabulary but with different meanings were examined and de-duplicated.¹⁴

Value vocabulary terms were always intended to display in the Glossary, but the value of having a consolidated and linked list of all RDA vocabularies and their terms in Toolkit was raised in February 2018 and implemented quickly (by May). Notations (identifiers) were added to RDA vocabulary metadata as part of this effort. As part of the tight integration of RDA Reference and RDA Toolkit, VES data in the Toolkit would be autogenerated from RDA Reference, as is the Glossary.

Instructions in the original Toolkit were stored and managed in the Alfresco **Content Management System**¹⁵ (CMS) using the DocBook¹⁶ schema. With the 3R Project, the decision was taken to implement the latest version of the Alfresco CMS but to use the DITA XML standard (Darwin Information Typing Architecture),¹⁷ a structured authoring

standard that gives greater control over re-using and re-purposing content in different contexts. In early 2017, Dakota Systems¹⁸ (the contractor that provides back-end data services for RDA Toolkit) converted pre-frozen original Toolkit files from DocBook to DITA and provided initial training in DITA to some RSC members.

In July 2017, a new Alfresco instance was being built by Dakota, and in March 2018 the old Alfresco site was retired. The new CMS shifted to the URL of the old site. Core team members had preliminary discussions about directory structure, filenaming conventions, and possible processes. At the same time, Dakota staff was working on building empty DITA files (“shells”) to hold RDA instructions. While a well-intentioned first attempt, no one was happy with this approach and other solutions were sought.

The frontrunning solution for **building the file structure** for RDA with maximum efficiency and effectiveness was to use a script that utilized RDA Reference data. This idea was formed in the lead-up to the RSC meeting in Madrid in October 2017 and was refined there by the core team. Script requirements were drafted in November 2017 and Dakota began writing the script in December 2017. The script was called the “Big Bang” as it brought something from nothing; this name then spawned other “Bang” scripts later for other purposes. Two iterations of the Big Bang script which were reviewed, tested, and adjusted, and in February 2018 the third version was approved, and the RDA file structure was created.

It was recognized at about the same time that a script would be needed to maintain synchronization between the dynamic RDA Reference data and the Toolkit files. RDA Reference data is published in GitHub releases, which would form the basis for the synchronization. Unlike the “Big Bang” script, which was intended to be run only once, this script (the “**operational**” script) would be run for every Toolkit release. In February 2018, the requirements for this operational script were developed.¹⁹ Dakota began writing the script in April, and discussions began about workflows, timing of GitHub releases, and data loads. To enable self-reliance, in August, Dakota provided a tool to allow ALA Digital Reference to run the operational script and load and overlay data in the CMS. At about the same time, the “publish” script was also developed, which transforms the DITA XML into the HTML publication file that is supplied to the front-end website vendor.

Another idea for a useful script arose around the same time. This script (“Wee Bang”) would populate approximately 1,000 relationship elements with a standard package of

instructions, saving a significant amount of manual data entry. This approach was discussed with the core team and testing and implementation was concurrent with that of the operational script. The timing was geared toward the initial release of the beta Toolkit, planned for June 2018.

The Wee Bang script was re-used six months later in conjunction with the “agent breakout” project. This project created explicit relationship elements between Work, Expression, Manifestation, and Item entities and the five Agent entities. The script (the “Extra Wee Bang”) was run in December 2018 and created element files with instructions in the CMS to parallel the elements added to RDA Reference data.

Finally, a script that would create files for the policy statement writers (to build in cross reference links to RDA) was discussed in 2019 (the “More Bang” script). Requirements, adjustments, and iterative testing was done throughout 2019, with the final version creating “shell” files for the British Library and Library of Congress/Program for Cooperative Cataloging in early 2020. This script, while not perfect, gave a substantial head start to the technical implementation of policy statements and ensured correct internal linking.

With the directory and internal file structure created by script, the next step was **adding RDA instructions** marked up with the DITA standard. This was a laborious and iterative process and practices changed over time with editorial experience. While the text had been bulk converted to DITA by Dakota, those files had very limited utility. Brute force inputting of the text allowed further review and refinement in the context of the editorial tools in the CMS. Inputting was largely done by the RSC Secretary from November 2017 through mid-2018.

Ideas for displaying clear, consistent, and neutral **conditions and options** in RDA instructions was raised in March 2018 in a briefing paper prepared by Dunsire.²⁰ The existing if/then sentence construction and markup had proven problematic, and the need for the categorization of options (e.g., alternative, exception) was questioned. The number of options increased dramatically due to the implementation of recording methods and the international audience, leading to more choices for communities. Serious discussion about the wording, design, accessibility, and markup took place over several months, including the involvement of the site designers. The Condition/Option structure was accepted and

implemented for the beta site release and announced in the Outcomes document published by the Chair.²¹

There was much to learn for even basic DITA markup. Decisions were made and sometimes adjusted or reversed, with markup re-done, throughout the process. The increasingly granular discussions resulted in decisions about filenames and element labels. A project was undertaken to remove punctuation and stopwords from element labels to improve search results. We learned the hard way about the need for random and persistent topic identifiers. Most significantly, in October 2018 the need for file keys became apparent, which would create a level of indirection to manage the inevitable filename changes. Implementing a map between keys and filenames and switching to a key-based system was done with the help of Dakota in November 2018. In response to the report on Toolkit accessibility in late 2019, new markup practices were defined and implemented for non-English terms in instructions to support screen reader functionality.

Metadata to help manage RDA files was agreed upon and defined. Early in the Project (October 2017) “element type” was defined and implemented in the RDA Registry to identify and group different types of elements (e.g., high-level relationships, attributes). The “Create date,” “Revised date” and “Published date” for each file were important to preserve. “RDA type” was defined so that the publication script could differentiate files that needed to be processed differently. Metadata was embedded in the DITA prolog to match the element with its data in RDA Reference. Finally, values for the DITA outputclass attribute were defined and used extensively, often to govern output display.

One of the most important efficiencies in the new infrastructure supporting RDA was the DITA function of re-usable text, a capability that was shorthanded to “**boilerplate**” in RSC usage. This supported the RSC principle of using standard sentence and phrase constructions and promoted consistency and clarity in RDA instructions. At first, boilerplate was implemented only for text that was intended to be re-used in multiple files. It was expanded later in the Project to one-off statements, like conditions, where a parallel sentence structure was desired, and to external cross references, for ease of recurring link validation. As with other components of DITA markup, practices changed as lessons were learned.

Once there was marked-up text in DITA from original Toolkit, a new editing phase began. The process, largely undertaken by Dunsire, was called “**shredding**,” which meant that text

was reviewed at a very deep level for appropriateness, placement, semantics, and grammar. Dunsire took on the lead editorial responsibility for RDA upon the retirement of Judy Kuhagen in August 2017. Shredding was done for groups of similar elements (e.g., all vocabulary encoding scheme elements, all manifestation statement elements) so that consistency across files could be ensured. If a template could be designed for the instructions for a group of elements, editing was turned over to the RSC Secretary to replicate in the appropriate files. There was considerable communication and review between the editors.

In preparation for the stabilization release in April 2019, discussions began about how to **document changes in RDA text** in an automated way to feed into edit reports for translators and policy statement writers, and into the Toolkit Release Notes so that cataloguers would be notified of major changes. Tagging and commenting conventions were developed, and Dakota developed a tool to gather the data into a spreadsheet from the tags and comments.

Toolkit Site Design and Functionality

The content of the original Toolkit was frozen with the 11 April 2017 release in order to carry out data conversion, implement the new Toolkit infrastructure, and allow translations to synchronize. Neither ALA Digital Reference nor the RSC had the bandwidth to maintain two standards, especially not with both being moving targets. As discussions proceeded and user feedback was received, decisions were made about **features in the original Toolkit** that would not be carried into the 3R Project, among them the advanced search filters, the table of contents, the “floating blue heads,” and the margin lines denoting updated text. Controversial with RDA users was the decision not to include an index, because the design was “of the web” and not a book, and the search function would suffice.

Design for Context,²² a **user experience** firm, was engaged by GVPI²³ (now Sage Publishing; the contractor that supported the front-end, public Toolkit site) in June 2017 to assist with the redesign of the Toolkit. User stories were collected and shared, and several meetings were held, including one in-person meeting. The design requirements for the new Toolkit were completed by early 2018; wire frames and mockups were reviewed and revised. One of the key requirements was a design that brings together instructions and policy statements for display without requiring multiple clicks. The design deliverables

included a color template, general aesthetic (fonts, buttons, etc.) and new logos for RDA and for the Toolkit.

A “pre-alpha” site for RSC review based on the Design for Context deliverables was created in March 2018. After further iterative development, this became the **beta site** and was published publicly on 13 June 2018.²⁴ Before the end of the Project, the beta site had a series of eight releases, documented on the Toolkit blog.²⁵ These releases provided incremental improvement to Toolkit functionality, refined RDA content, and added more content, such as policy statements and translations.

One of the primary goals of the redesigned Toolkit was to improve and meet accepted **accessibility** standards. For accessibility compliance in the initial site design, ALA Digital Reference relied on the expertise of Design for Context. After the beta site was published, an expert subcontractor was hired for further assessment and recommendations. The Voluntary Product Accessibility Template (VPAT) report,²⁶ completed in October 2019, confirmed that the Toolkit accessibility goals were met.

Vocal user feedback made the group aware very early on of the strong concerns about abandoning **instruction numbering**. The RSC and ALA Digital Reference were steadfast that, with the new structure of the Toolkit (which was not widely understood), instruction numbers were no longer needed. The group recognized, however, that print materials might need a succinct method for citing particular pieces of RDA text; online users would find linking more convenient. In July 2018, just after the public release of the beta site, the group issued a statement of the problem and broadly requested potential solutions.²⁷ Users made a number of suggestions, including one by Ed Jones which was adopted. Technical implementation of citation numbers began in Fall 2018, and they were introduced into the beta site with the May 2019 release, including the fanfare of a public announcement.²⁸

Issues with the **large, flat table of MARC data** found in the original Toolkit were discussed beginning in November 2016, with recognition that, while popular with users, this approach had become technically unworkable. Revised approaches for the supporting infrastructure were discussed with those responsible for the intellectual work of the MARC mappings in April 2018. The maintenance infrastructure for MARC alignments was completely redesigned and is effectively controlled by the British Library staff (for MARC 21 bibliographic) and Library and Archives Canada/Bibliothèque et Archives Canada staff (for MARC 21 authority) independently of the Toolkit maintenance infrastructure. The new

approach was designed to be extensible to other maps and alignments such as Dublin Core and the IFLA LRM. In the October 2018 release, the new public display was revealed with individual mappings as part of the Element Reference section on each element page. It was expected that the ability to search a specific MARC tag would offset the need to see a large and unscrollable table.

The RSC recognized that its expertise permitted mapping outward from RDA to another standard, and that it did not have the ability or responsibility to create maps or alignments from other standards into RDA. For MARC data, the RDA Registry provides spreadsheets²⁹ that may be used by other communities, with a little work, for that reverse mapping.

At the same time that MARC mappings were added to the Toolkit, mappings to the Dublin Core standard were added as well. In July 2020 mappings to the IFLA LRM were added. Other maps and alignments may be found in the RDA Registry.

Near the end of the Project, **unconstrained properties** for non-LRM applications were broken out from RDA properties in the Registry into a separate, linked map.³⁰ There had been a fair amount of focus (and misunderstanding) by communities on the unconstrained element set, and this map was intended to reinforce that the unconstrained element set was not an alternative to RDA element sets or labels. Rather, the mappings transform data that is conformant with RDA into data that is not conformant with RDA.

ALA Digital Reference worked closely with GVPi to update the administration subarea of the Toolkit, where authorized users can manage their subscription account, users, and institutional profile, and obtain reports. For users logged into an individual profile, separate functional areas of views, documents, and bookmarks and notes were created to provide a detailed level of **personalization**. The RSC provided support in early discussions about changes to the management of user-created documents, urging that known responsibility (perhaps institutional and not individual) and regular maintenance are critical.

There was recognition early on that the Toolkit's reporting of **revisions and changes to RDA** needed to be expanded and enhanced to include reports for every release and every language version. Following the English language stabilization release, work immediately began to develop the Revision History area, which includes both Release Notes and the

Instruction Archive. Changes are noted during the editing process and compiled into an edit report, which is refined into reports for translators and policy statement writers, and into Release Notes for Toolkit users. The decision was taken early on that typos and minor editorial changes would not be reported out, and that users would be referred to third-party comparison tools to identify specific changes.

RDA and Toolkit Structure

The **structure of the official Toolkit** breaks from the traditional workflow organization associated with AACR2 and the original RDA Toolkit. This structure received mixed reviews from Toolkit users when the beta site was released, with some people pleased and others upset. The RSC recognized that this new structure was essential to creating an international standard that could meet a broad range of cultural needs. The approach deliberately shifted the onus of setting local requirements and designing workflows to each user community.

While the structure of the entity and element pages was set largely through the underlying modelling and technical decisions, **guidance chapter** topics were suggested and drafted throughout the Project. Although RSC members accepted assignments to write draft text, the bulk of the writing and editing was done by Dunsire.

The RDA Examples Editor proposed new and better ways of **displaying and managing examples** at the RSC+ meeting in Chicago in May 2017. Example sets fall into four types: basic, recording methods, view as relationship and view in context. Separate files and specific markup methods (particularly for linked data examples) were created so that examples could be easily re-used within RDA instructions. In translations of RDA, translators not only can but are encouraged to adapt examples for their language as appropriate. Examples are not considered part of base RDA.

It became apparent that the RSC needed to clearly identify text that was an **official part of RDA** and thus was required work for translators, as opposed to text that was outside those boundaries. It was agreed in March 2018 that the Resources tab on the standard Toolkit interface would accommodate content that was not part of official RDA, as long as it was not already available in the Policies tab. This tab was further broken into subsections that corresponded to content created from RDA Reference, content from the original Toolkit

appendices, and other resources such as Revision History and AACR2. This structure was established in the underlying directory and file structure as well to provide clarity for translators.

By the middle of 2019, as shredding of instructions progressed, there was increasing recognition that many instructions, particularly in the formulation of access points, were legacy instructions that applied only to the Anglo-American community and did not belong in internationalized RDA. Dunsire raised this topic at the RSC's Santiago meeting, and the RSC approved an exploration of **relocating these "SES instructions"** (string encoding scheme instructions) as documented in the Outcomes report from that meeting.³¹ At the January 2020 meeting, a briefing paper,³² drafted by Dunsire, presented the results of that exploration and made recommendations for the next stages of development. The RSC agreed to completely remove the SES instructions, together with associated Condition boxes and Examples boxes, from the official RDA.³³

The last parts of original Toolkit to be shredded were the former appendices. The April 2020 RSC meeting considered a briefing paper³⁴ that proposed placing these in a new Community vocabulary area within the Resources tab as an extension of the SES relocation project. While unanimously supported by the RSC, the discussion about a broader **Community Resources area** also raised significant questions that would occupy the RSC for the rest of the year and beyond. The Community Resources area became the solution for an ongoing problem of "pseudo-elements,"³⁵ and the September 2020 release featured a new sub-area of Community refinements. Work will continue on Community Resources content beyond the end of the 3R Project, when it is expected that this content will be turned over to appropriate communities to manage.

RDA Content

The **implementation of IFLA LRM** in RDA brought many challenges to the RSC. At the Frankfurt meeting in November 2016, four briefing papers³⁶ introduced the RSC to new terms and concepts. At the RSC+ meeting in Chicago in May 2017,³⁷ three topics from the IFLA LRM were introduced that prompted ongoing discussion.

A major divergence from past RDA practice was the IFLA LRM re-definition of the Person entity, restricting the definition of Person to real persons who are known or assumed to

have existed. This change in treatment of **non-human personages**, including fictitious entities, animals, and legendary beings, resulted in a large outcry from the Toolkit user community. Discussion with the Fictitious Entities Working Group chair about the group's work since their 2015 report³⁸ took place at the 2017 meeting in Madrid,³⁹ and a direction was planned at the 2018 Montréal meeting, where a briefing paper was submitted.⁴⁰ A guidance chapter "Fictitious and non-human appellations" and instructions in the appropriate elements were put into place for the April 2019 release. Content was amended in 2020 to provide instruction on fictitious places and timespans.

One of the most conceptually difficult areas in the implementation of IFLA LRM in RDA was **aggregates**.⁴¹ This work was led by the diligent and granular analysis of the Aggregates Working Group, chaired by Deborah Fritz. The Outcomes document⁴² and the restricted minutes⁴³ from the Chicago meeting in May 2017 summarize the initial discussions on aggregates. Discussion continued at the October meeting in Madrid,⁴⁴ sparked by an unpublished report from the Aggregates Working Group ("AWG Information paper for the May 2017 RSC meeting"). The Montréal Outcomes document⁴⁵ announced to users to expect further development of guidance and refinement of terminology for aggregates, as well as the review and adjustment of relevant instructions in the entity chapters. Preparation of element-level instructions for aggregates was noted as progressing well in March 2019. The text of the guidance chapter was finished for the April 2019 stabilization release. As an indicator of the complexity of this topic, even by the end of the Project there were still loose ends that needed to be tied.

Regarding **diachronic works**, the Serials Task Force, a subgroup of the Aggregates Working Group, was formed following the October 2017 RSC meeting in Madrid and submitted a report in April 2018 with recommendations for the handling of serials.⁴⁶ The group was also instrumental in drafting a joint briefing paper on behalf of the RSC with the ISSN International Centre "Issues on IFLA LRM alignment for serials and other continuing resources."⁴⁷ The RSC and ISSN International Centre agreed that the radical approach expressed in the LRM would have a significant impact on the RDA and ISSN instructions and elements, and further agreed to a number of common points of view on the practical implications. The Outcomes document⁴⁸ from the Madrid meeting in October 2017 describes some of the challenges.

The implementation of the LRM concept of **manifestation statements** was tackled early in the Project. The RSC began its learning curve with a briefing paper at the 2016 Frankfurt meeting,⁴⁹ and moved ahead with decisions at the following meeting in Chicago. A briefing

paper that included substantive analysis was the foundation for that discussion.⁵⁰ Elements were created in the RDA Registry which triggered the creation of CMS files, including boilerplate instructions, as part of the Big Bang script. The guidance chapter on manifestation statements was drafted in February 2018 and was largely complete by October.

The implementation of the LRM concept of **representative expression** was handled slightly later. An unpublished briefing paper “Briefing Paper for Representative Expression Elements” was drafted by Dunsire in June 2017, which was followed by “Representative Expression Elements: Specific Recommendations “ in December.⁵¹ Discussion took place on the wiki and preliminary decisions (subject to future change) were taken by the core team on a conference call. A new aspect to this topic—representative expressions of aggregating works—was brought to the attention of the RSC through a briefing paper⁵² at the April 2020 RSC asynchronous meeting.⁵³ Elements were created in the RDA Registry which triggered the creation of CMS files, including boilerplate instructions, as part of the Big Bang script. The guidance chapter on representative expressions was drafted in February 2018 and was largely complete by October.

The RSC agreed at its meeting in Madrid in October 2017 that **data provenance** (meaning information about the metadata recorded in an element or set of elements) was a key piece of information for all elements and should be built into RDA. As a result, the specific instructions within each element in original Toolkit for sources of information would be dropped in favor of general guidance on data provenance. Discussions about data provenance began early on, at the Frankfurt meeting, with a proposal by the Technical Working Group (“RDA Models for provenance data”).⁵⁴ At the May 2017 meeting in Chicago, the RSC agreed that “always record a source of information” could be a default starting point, and that a value vocabulary for sources of information should be developed; the RDA Recording Source vocabulary was added to the RDA Registry in October 2017.

An aspect of the official Toolkit that was under development well before the Project began was the notion of the “4-fold path” as four methods for recording metadata. These techniques were in use in the original Toolkit but not labelled as such. Discussion about technical implementation began in November 2016 at the Frankfurt meeting with the briefing paper “Developing the RDA 4-fold path for catalogue cards and linked data.”⁵⁵ The RSC agreed that this information (now called “**recording methods**”) needed to be explicit in the official Toolkit, and the four methods became part of the basic structure for element

pages. The implementation of the four recording methods also necessitated changes in the underlying structure of the RDA Registry, adding object and datatype element sets.

One of the key actions to come out of the 2017 Chicago meeting was the decision to consider **treating access points as elements**; this decision was confirmed at the following meeting. The group recognized that because of this approach, the text for all appellation elements would need careful review to differentiate name instructions from access point instructions and make them consistent across entities. Thomas Brenndorfer stepped up and undertook a systematic review of all appellation elements in the second half of 2018, which the RSC then reviewed at the end of the year. This was a substantive effort that contributed enormously to stabilizing the RDA text.

Another change which increased the number of elements in the official Toolkit was the transition from **relationship designators to relationship elements**. This was driven by the linked data relationships between RDA entities. Because of this structure, it made no sense to include the relationship designator appendices from original Toolkit, much to the consternation of some Toolkit users. This drew particular attention when a large number of “agent breakout” elements were added in the February 2019 release.⁵⁶ There was considerable discussion within the RSC about development of a relationship matrix to show element relationships in a hierarchy and at a glance, but this proved technically unfeasible. A workaround was developed for the April 2020 Toolkit release with a filtering functionality added to the element list at the end of each entity chapter.

Another concern voiced by Toolkit users surrounded the RDA **element labels**, which are taken from the RDA Reference ToolkitLabel field. While an English label is a human-readable shorthand for the URI--the key piece of infrastructure--Toolkit users raised a number of concerns about the usability and wording of these labels in discovery systems, a purpose for which these labels were not intended. This led to speculation about the potential use of “user-friendly” labels from the unconstrained element set for this purpose, a task that North American RDA Committee (NARDAC) members investigated in 2019-2020. At the April 2020 asynchronous RSC meeting, the RSC agreed that a parallel set of element labels and not the unconstrained set would be required to suit the function of user-friendly labels.

As communities began to ready themselves for implementation of the official Toolkit, questions arose, primarily from the North America community, about what it would mean

to **conform to RDA**. The RSC noted that the bar for RDA conformance is low and is set out in minimum description guidelines. In May 2020, Dunsire drafted a discussion paper on RDA Conformance⁵⁷ which was discussed in a May 2020 phone call with concerned individuals and at the July 2020 asynchronous RSC meeting. The result was the addition of a guidance chapter “Well formed RDA” in the September 2020 release, as well as plans for a post-3R Project implementation of a self-service checklist of conformance conditions.

Translations

One of the goals of the 3R Project was to improve the infrastructure that supports RDA translations. A key initial step taken to achieve this was the **appointment of the Translations Team Liaison Officer** Daniel Paradis in December 2016, who held that leadership position throughout the 3R Project. The Translations Team Liaison Officer represents the interests of RDA translators and the Translations Working Group on the RSC.

The first step in the implementation plan for translations was that translators would **translate RDA Reference data** using spreadsheets. This began in November 2018 with the RDA value vocabularies, which (ahead of the rest of the RDA text) were stable. Translators then would move on to the RDA element sets, which were released to them in February 2019. Some languages stop there and are considered a “partial” translation of RDA because the data is published only in the RDA Registry. Other languages, however, continue on with a “full” translation of RDA instructions and guidance.

An area was set up in Google Drive by Paradis so that the technical process of file submission, review, and uploads of RDA Reference translations could be better managed. The process was complicated, though, by the shift of the Registry infrastructure partway through the 3R Project to a new server and a new system with new processes. The spreadsheet templates used by the translators were re-engineered, unfortunately necessitating some re-work. A page was created on the RDA translations wiki to collect questions and suggestions for revisions or corrections from the translators. This led to several changes in RDA Reference data.

The next step was the **implementation of Trados software**,⁵⁸ which provides more effective and efficient translation through tools for “remembering” and sharing translations

of terms, phrases, and earlier versions. For the 3R Project, the Trados GroupShare platform was also used to help translation teams manage their translation projects. With the English text declared stable in April 2019, Trados training was held in September and October of that year. Once trained, the Finnish and Norwegian translators moved ahead quickly. First to be translated was the large English boilerplate file (re-used text which would populate many element instruction files) and then other small files that comprise user interface and other templated text. By working in this order and with the help of various scripts, most of the Toolkit element pages would be automatically translated without manual intervention. However, the guidance chapters and approximately 500 element files would still need to be put through Trados for “custom” translation. The Finnish translation team finished translating RDA guidance in March 2020; testing of the uploads of these files to the CMS and preparation for publishing began immediately thereafter. The initial Finnish and the Norwegian translations were published in the September 2020 release, with updated data published in the December 2020 (final 3R) release.

Policy Statements

An informal but very active **Policy Statement Writers group** was formed in December 2018. Intended to be an early adopters group that would make decisions to set the stage for all policy statement writers, the group was led by James Hennelly and included representatives from the two largest English language policy statement producers: the British Library (BL) and the Library of Congress/Program for Cooperative Cataloging (LC/PCC). The group held monthly videoconference calls through the end of the Project. The initial work of the group focused on identifying what subset of base RDA content would require policy statements and on how the existing policy statements from original Toolkit could be matched up with their new locations in official Toolkit.

It became apparent early on that significant manual editing would be avoided, and there would be less likelihood of human error, if links between base RDA and the policy statements could be set up by **script**. The group began work on a set of requirements for a script that would create blank “shells” inside DITA files that would then be filled in by the policy statement writers. Script specifications and testing for the “More Bang” script began in January 2019 and was finished in early 2020. Run against the most current version of the base RDA files in the CMS, a full set of empty policy statement files for the BL and LC/PCC was created in March 2020. Files with test policy statement content were prepared for publishing in the April 2020 Toolkit release; more content was added for the September and December 2020 releases.

In parallel with shell development, the policy statement writers undertook detailed CMS training to become familiar with DITA, boilerplate, and editorial processes. Documentation was developed to support this effort.

The policy statement writers worked within their own institutions to determine **internal processes** for analysis, decisions, writing, review, and general support for this substantive process. Members generously shared their local experiences and information. The British Library contributed a spreadsheet that compiled all RDA options as well as a comparison document. The Library of Congress kept the group apprised on their efforts to develop a batch processing system. In November 2019, the group expanded from a planning group to include all policy statement writers.

Staff from the Library of Congress created and refined a process for **automated batch processing** using spreadsheets which was shared with the group in November 2020. This raised considerable interest and sparked a similar endeavor that was implemented by the British Library after the end of the 3R Project. These approaches significantly sped up internal processes, and batch uploads allowed much faster input into the CMS.

The implementation of RDA by a specific community necessitates the creation of an **application profile** by that community to specify the entities, elements, and vocabulary encoding schemes that are expected. While the RSC recognized this in principle during the 3R Project, details about application profiles were left vague. Several actions were taken to rectify this. First, EURIG presented some trailblazing work on application profiles to assist in understanding. In January 2019, the RSC sponsored a preconference to the ALA Midwinter meeting focused on hands-on application profile development. A guidance chapter was added in early 2019. The RSC also appointed an Application Profiles Working Group (2020-21)⁵⁹ charged with making recommendations.

External Communication and Feedback

In mid-2016, ALA Digital Reference formed a small user group to provide **user stories** to inform project goals and to react to the initial Toolkit designs. Their user stories were forwarded to and discussed with the site designers.

With its ambitious goals and the intent to finish as quickly as possible, the RSC recognized that the 3R Project necessitated a **new mode of engagement** with RSC communities. At the November 2016 meeting in Frankfurt, the RSC decided that the usual consultation process with RSC communities and other groups was not suitable for the Project. The group instead decided to provide announcements through the Toolkit blog, with five status reports published between February 2017 and April 2018. Following the release of the beta Toolkit in June 2018, major developments were announced on the Toolkit blog and the RSC website. These are listed in the Timeline appendix.

The RSC then relied more on its **Working Groups** for consultation, and the working group chairs took on more responsibilities and were added as “RSC+” to be able to give direct input. The RSC also held outreach events associated with RSC meetings and major library conferences to provide updated information and gain community feedback. In June 2017 the RSC reached out to special communities to solicit requests for new or amended content to be accommodated as part of the Project. A 3R Project Frequently Asked Questions document⁶⁰ was developed to provide up-to-date information on the RSC website.

With the release of the beta site, a regular channel for user **feedback**⁶¹ was established. By the end of the Project, over 700 suggestions had been received through this mechanism. Some communities formed task forces to provide feedback to the RSC on ideas under consideration, and letters with substantive suggestions and concerns were received from major organizations.

A key need that emerged from users in February 2017 was that a grace period was needed to provide overlap between the original Toolkit and the official Toolkit. This would allow libraries to adjust to the changes in RDA content and prepare training. The RSC agreed, and published information on the **countdown clock** first in Status Report #1,⁶² with frequent reminders after. The countdown clock remained unimplemented at the end of the 3R Project, however the RSC, RDA Board, and Copyright Holders continue to discuss criteria for determining what the end date for the original Toolkit should be.

Orientation

Orientation—to IFLA LRM, to the official Toolkit functionality, and to RDA content—was discussed by the RSC and ALA Digital Reference throughout the Project. This topic was differentiated from the “training” frequently asked for by communities--instruction in local workflows, practices, and decisions--which can only be done by those communities. The RSC provided a number of in-person and remote opportunities for learning about aspects of the official Toolkit throughout the Project.

Preconferences on specific RDA topics and general update conference sessions were provided at venues worldwide in association with national and international meetings beginning in 2017. Preconference topics included application profiles, cataloguing using RIMMF4⁶³, and RDA Toolkit basics.

An RDA YouTube channel⁶⁴ was established in October 2018 that brought together various audio and video presentations in one place and also included instructional video clips. Slide sets from presentations by RSC members were also published on the RSC website.⁶⁵

A webinar sponsored by ALA was held in May 2019 in association with the April stabilization release, which drew 1,400 registrants—the largest webinar ever for that organization.

The Orientation Project, organized by Hennelly, was presented in July and August 2019. Two series were formed, each with five 90-minute webinars presented primarily by experts outside of the RSC: the Special Topics Series, and the New Concepts Series. The New Concepts Series was presented a second time beginning in February 2020. The RDA Lab Series, taught by Kate James, was designed to help participants understand how to apply the new RDA and RDA Toolkit created by the 3R Project. This series ran from June to December 2020 and was re-run in 2021 at times better for audiences outside of North America.

Ongoing Concerns and Future Development

The internationalization of RDA, including the transfer of legacy Anglo-American instructions out of base RDA, shifted a large body of work to already-burdened communities. To implement the official Toolkit, communities need to document their practices in application profiles, policy statements, and other metadata guidance

documents, as well as provide training for their users. The RSC recognized early on that this was a big ask and remains watchful and concerned about community implementation.

ALA Digital Reference and the RSC hoped to include the following areas in the 3R Project, but for a variety of reasons these needed to be deferred for future attention.

- **Application profile** integration and placement within the Toolkit.
- **Collective Agent** further development.
- **Collection level description** further development.
- **Community resources** area refinement and development.
- **Extent instruction** development.
- **Generic mapping tool** implementation.
- **Performance aggregates** development.
- **Relationship matrix.** An early and frozen version was removed from the Toolkit in June 2020 in favor of filtering the elements lists on entity pages, but there is some hope that this concept can be resurrected in the future.⁶⁶
- **Relationship with BIBFRAME.** Communication about the relationship and interoperability began in July 2019 and continues. The RSC also has the intention of developing a map between the standards.
- **Specialized views.** The official Toolkit was intended to provide multiple functional views, such as those for specialized communities (e.g., music, law, rare books).
- **Visual browser.** Also called the graphical browser. Discussion of expectations and requirements happened in late 2018, with Dakota sharing a mockup in April 2019.⁶⁷ The group was not satisfied with the mockup, which was neither visual nor a browser; it would not enhance the user experience and would be an expensive undertaking. The decision to stop development was made in April 2019. The interim solution was the addition of breadcrumbs.

Appendix: Timeline

12 October 2016	3R Project kickoff announcement published
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7-11 November 2016	RSC meeting in Frankfurt, Germany (minutes and outcomes)
03 February 2017	Implementation of the LRM in RDA published
07 February 2017	Preparation of RDA for the 3R Project published
28 February 2017	Status Report #1 published on Toolkit blog
11 April 2017	Final release of original Toolkit; content frozen
17-19 May 2017	RSC+ meeting in Chicago, USA (outcomes)
16 June 2017	Broadening the appeal of RDA through the 3R Project and RDA Governance published by RDA Board
26 June 2017	Pop-up meeting of specialist communities held at ALA Annual Conference in Chicago
19 July 2017	Status Report #2 published on Toolkit blog
30 August 2017	New content management system up; testing begins
29 September 2017	Status Report #3 published on Toolkit blog
24-26 October 2017	RSC+ Meeting in Madrid (outcomes)
14 February 2018	Status Report #4 published on Toolkit blog
18 February 2018	Final release of original Toolkit for translations; includes Norwegian translation and Finnish update
24 April 2018	Status Report #5 published on Toolkit blog
26 April 2018	Changes to 3R Rollout and Schedule published
08 June 2018	What to Expect from the RDA Toolkit Beta Site and Outcomes of the RDA Toolkit Restructure and Redesign Project (RSC/Chair/19) published
13 June 2018	Beta Toolkit published
16 June 2018	Issues on IFLA-LRM Alignment for Serials and Other Continuing Resources (RSC/Chair/20) published
30 July 2018	RDA Toolkit Instruction Identification (RSC/Papers/1) published
09 October 2018	Beta Toolkit release
22-26 October 2018	RSC meeting in Montréal (minutes and outcomes)

27 November 2018	Stabilization of the English text of RDA (RSC/Chair/21) published
21 February 2019	Beta Toolkit release
29 and 30 April 2019	Beta Toolkit release and follow-up release
30 April 2019	Stabilization of the English Text of RDA Achieved (RSC/Chair/2019/1) published
05 September 2019	Beta Toolkit release
16-19 September 2019	First RSC asynchronous meeting (minutes)
15 October 2019	Statement on 3R Project Completion published
21-25 October 2019	RSC meeting in Santiago (minutes and outcomes)
06-09 January 2020	RSC asynchronous meeting (minutes)
07 February 2020	Beta Toolkit release
06-09 April 2020	RSC asynchronous meeting (minutes)
29 April 2020	Beta Toolkit release
06-09 July 2020	RSC asynchronous meeting (minutes)
16 September 2020	Beta Toolkit release
12-23 October 2020	RSC virtual meeting (minutes and outcomes)
24 November 2020	RDA Toolkit Switchover: Beta Toolkit Becomes Official RDA (RSC/Papers/2020/1) published
15 December 2020	Final Beta Toolkit release ; beta site becomes official Toolkit and 3R Project ends

Appendix: 3R Project Contributors

The RSC would like to acknowledge and thank **Gordon Dunsire** for his vision and leadership during the 3R Project. We also recognize and thank:

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¹ “Kickoff announcement” on RDA Toolkit blog, 12 October 2016:

<https://www.rdatoolkit.org/3Rproject/announcement>

² “LRM and related issues,” Minutes of November 2016 meeting, agenda item 15: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>, Restricted minutes may not be fully visible to all.

³ “RDA Toolkit Release – August 9, 2016” on RDA Toolkit blog, 01 August 2016:

<https://www.rdatoolkit.org/august2016release>

⁴ “Kickoff announcement” on RDA Toolkit blog, 12 October 2016:

<https://www.rdatoolkit.org/3Rproject/announcement>

⁵ IFLA Library Reference Model (LRM): <https://www.ifla.org/publications/node/11412>

⁶ RDA Reference includes all RDA Elements, their definitions and any related scope notes, and all value vocabulary terms and definitions.

⁷ “Stabilization of the English Text of RDA Achieved” 30 April 2019: <http://www.rda-rsc.org/sites/all/files/RSC-Chair-2019-1.pdf>

⁸ “Western and Christian bias in the 3R Toolkit,” Minutes of October 2019 meeting, in the public appendix related to agenda item 166, undated, pp. 53-58: <http://www.rda-rsc.org/sites/all/files/RSC-Minutes-Public-159-204.pdf>

⁹ “Internationalization of RDA Toolkit during the 3R Project,” 21 September 2020: <http://www.rda-rsc.org/sites/all/files/247%20Internationalization%20of%20RDA%20Toolkit%20during%20the%203R%20Project.pdf>

¹⁰ Minutes of November 2016 meeting: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>

¹¹ “RDA Reference data maintenance and flow,” Minutes of November 2016 meeting, in the restricted appendix related to agenda item 05, 17 June 2016, pp. 54-57: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>

¹² “RDA Toolkit scope section and Glossary scope notes,” Minutes of November 2016 meeting, in the restricted appendix related to agenda item 12, 14 October 2016, pp. 81-103: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>

¹³ Minutes of October 2018 meeting, agenda item 147: <http://www.rda-rsc.org/sites/all/files/RSC-Minutes-Restricted-117-148.pdf>. The subsequent briefing paper on the “agent breakout” topic by Dunsire was not published.

¹⁴ “Duplicate entries in new Glossary,” Minutes of November 2016 meeting, in the restricted appendix related to agenda item 12, 03 October 2016, pp. 103-107: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>

¹⁵ <https://www.alfresco.com/>

¹⁶ <https://docbook.org/>

¹⁷ <https://www.oxygenxml.com/dita/1.3/specs/>

¹⁸ <https://www.daksys.com/>

¹⁹ “Extraction of RDA Reference data to generate CMS structure and content,” undated but with ongoing updates: <https://docs.google.com/document/d/1V7-gNCQI0H92lhUHOErzM6klcDlnjzKPcrOXrws0ss/edit?usp=sharing>

²⁰ “Options for options in 3R” 15 March 2018 (unpublished).

²¹ <http://www.rda-rsc.org/sites/all/files/RSC-Chair-19.pdf>

²² <https://www.designforcontext.com/>

²³ <https://us.sagepub.com/en-us/nam/home>

²⁴ “RDA Toolkit Beta Site is Here” on RDA Toolkit blog, 13 June 2018: <https://www.rdatoolkit.org/index.php/betarelease>

²⁵ “What’s New with the Beta Site” on RDA Toolkit blog, 09 October 2018:

<https://www.rdatoolkit.org/index.php/node/169>;

“February Update to the Beta Site” on RDA Toolkit blog, 21 February 2019:

<https://www.rdatoolkit.org/index.php/node/176>;

“April Update to the Beta Site” on RDA Toolkit blog, 29 April 2019:

<https://www.rdatoolkit.org/index.php/node/185>;

“The Follow-Up Release” on RDA Toolkit blog, 30 April 2019:

<https://www.rdatoolkit.org/index.php/node/189>;

“September Update to Beta RDA Toolkit” on RDA Toolkit blog, 05 September 2019:

<https://www.rdatoolkit.org/index.php/node/197>;

“A Minor Update to the Beta RDA Toolkit” on RDA Toolkit blog, 07 February 2020:

<https://www.rdatoolkit.org/index.php/node/214>;

“April 2020 Beta RDA Toolkit Release” on RDA Toolkit blog, 29 April 2020:

<https://www.rdatoolkit.org/index.php/April2020release>;

“September 2020 Beta RDA Toolkit Release” on RDA Toolkit blog, 16 September 2020:

<https://www.rdatoolkit.org/index.php/September2020release>;

“December 2020 RDA Toolkit Release” on RDA Toolkit blog, 15 December 2020:

<https://www.rdatoolkit.org/index.php/December2020release>

²⁶ American Library Association Accessibility Conformance Report, VPAT version 2.3 (revised), April 2019:

https://www.rdatoolkit.org/sites/default/files/2019-10/ALA_RDA_Toolkit_VPAT2.3.pdf

²⁷ “Statement on Instruction Numbering,” 06 July 2018, on RDA Toolkit blog:

<https://www.rdatoolkit.org/index.php/node/163>;

“RDA Toolkit Instruction Identification,” 30 July 2018, on RSC website: <http://www.rda-rsc.org/sites/all/files/RDA%20Toolkit%20Instruction%20Identification.pdf>

²⁸ “Citation Numbering Arrives,” 22 May 2019, on RDA Toolkit blog:

<https://www.rdatoolkit.org/index.php/node/190>

²⁹ <http://www.rdaregistry.info/Maps/>

³⁰ <http://www.rdaregistry.info/Maps/mapRDA2Unc.html>

³¹ “Outcomes of the October 2019 RSC Meeting,” 26 November 2019: <http://www.rda-rsc.org/sites/all/files/RSC-Outcomes-2019.pdf>

³² “String encoding schemes in RDA Toolkit,” December 2019: <http://www.rda-rsc.org/sites/all/files/String%20encoding%20schemes%20in%20RDA%20Toolkit%20Dunsire.pdf>

³³ Minutes of January 2020 Meeting, agenda item 209: <http://www.rda-rsc.org/sites/all/files/Minutes%20Public%20January%202020%20meeting.pdf>

³⁴ “Community vocabularies in RDA Toolkit,” March 2020: <http://www.rda-rsc.org/sites/all/files/Community%20vocabularies%20in%20RDA%20Toolkit.pdf>

³⁵ “Pseudo-Elements,” 18 December 2020: <http://www.rda-rsc.org/sites/all/files/PseudoElements.pdf>

³⁶ Minutes of November 2016 meeting: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>. These briefing papers were published only in the Restricted Minutes.

- (1) “LRM Basics for RDA,” 01 November 2016, pp.127-133;
- (2) “Developing the 4-Fold Path for Catalogue Cards and Linked Data,” 31 October 2016, pp. 133-143;
- (3) “Transcription and Manifestation Statements,” 31 October 2016, pp. 143-153;
- (4) “RDA Use of the Term ‘Resource,’” 26 October 2016, pp. 153-156.

³⁷ Minutes of May 2017 meeting: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-59-83.pdf>. These briefing papers were published only in the Restricted Minutes.

- (1) “Manifestation statements,” 12 May 2017, pp. 38-55;
- (2) “Nomen hierarchies,” 12 May 2017, pp. 56-75;
- (3) “AWG Information paper for the May 2017 RSC meeting,” undated, pp. 76-110.

³⁸ “Fictitious and other entities in RDA and the consolidated FR models,” 05 August 2015: <http://www.rda-jsc.org/sites/all/files/6JSC-FictitiousWG-1.pdf>

³⁹ Minutes of October 2017 meeting, agenda item 110: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-84-116.pdf>

⁴⁰ “Non-Human Personages in New RDA,” Minutes of October 2018 Meeting, in the public appendix related to agenda item 131, 15 October 2018, pp. 31-42: <http://www.rda-rsc.org/sites/all/files/RSC-Minutes-117-148.pdf>

⁴¹ (1) “Impact of the LRM on aggregates and serials in RDA,” Minutes of October 2017 Meeting, in the restricted appendix related to agenda item 93, 09 October 2017, pp. 39-76: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-84-116.pdf>; (2) “Issues on IFLA-LRM alignment for Serials and Other Continuing Resources,” 16 June 2018: <http://www.rda-rsc.org/sites/all/files/RSC-Chair-20.pdf>

⁴² “Outcomes of the May 2017 RSC Plus Meeting,” 06 June 2017: <http://www.rda-rsc.org/sites/all/files/RSC-Outcomes-2017%20May.pdf>

⁴³ Minutes of May 2017 meeting, agenda item 74: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-59-83.pdf>

⁴⁴ Minutes of October 2017 meeting, agenda item 93: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-84-116.pdf>

⁴⁵ "Outcomes of the October 2018 RSC Meeting," 27 November 2018: <http://www.rda-rsc.org/sites/all/files/RSC-Outcomes-2018.pdf>

⁴⁶ "Reports to the RDA Steering Committee October 2018," 27 November 2018, pp. 19-23: <http://www.rda-rsc.org/sites/all/files/RSC-Reports-2.pdf>

⁴⁷ "Issues on IFLA-LRM alignment for serials and other continuing resources," 16 June 2018: <http://www.rda-rsc.org/sites/all/files/RSC-Chair-20.pdf>

⁴⁸ "Outcomes of the October 2017 RSC Plus Meeting," 28 November 2017: <http://www.rda-rsc.org/sites/all/files/RSC-Outcomes-2017%20October.pdf>

⁴⁹ "Transcription and Manifestation Statements," Minutes of November 2016 meeting, in the restricted appendix related to agenda item 15, 31 October 2016, pp. 143-153; <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>. This briefing paper was published only in the Restricted Minutes.

⁵⁰ "Manifestation Statements," . Minutes of May 2017 meeting, 12 May 2017, pp. 38-55: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-59-83.pdf>. This briefing paper was published only in the Restricted Minutes.

⁵¹ "Representative Expression Elements: Specific Recommendations," undated: <https://docs.google.com/document/d/0Bz-Ra1eqkkc0RFdFWTc5NDNITzA/edit?resourcekey=0-FTFrPS4Z9a4S1JQHJPulqw#heading=h.gjdgxs>

⁵² "Representative expressions of an aggregating work," March 2020: <http://www.rda-rsc.org/sites/all/files/Representative%20expressions%20of%20aggregating%20works.pdf>; the Appendix is at <http://www.rda-rsc.org/sites/all/files/Representative%20expressions%20of%20aggregating%20works%20appendices.pdf>

⁵³ Minutes of April 2020 meeting, agenda item 221: <http://www.rda-rsc.org/sites/all/files/Minutes%20Restricted%20April%202020%20meeting.pdf>

⁵⁴ "RDA Models for provenance data," 08 August 2016: <http://www.rda-rsc.org/RSC/TechnicalWG/1>

⁵⁵ "Developing the RDA 4-fold path for catalogue cards and linked data," 31 October 2016, pp. 133-143: <http://www.rda-rsc.org/sites/all/files/RSC-M-Restricted-1-58.pdf>

⁵⁶ "Breaking out the resource entity to agent entity role relationship elements," 19 December 2018: https://drive.google.com/file/d/19JloQaFTjXIZ1E7ZQPe_7XvA-5z9op81/view?usp=sharing

⁵⁷ “RDA conformance,” 12 May 2020: <http://www.rda-rsc.org/sites/all/files/RDA%20conformance%20proposal.pdf>

⁵⁸ <https://www.trados.com/>

⁵⁹ “Application Profiles Working Group:” <http://rda-rsc.org/node/630>

⁶⁰ “3R Project Frequently Asked Questions:” <http://rda-rsc.org/node/551>

⁶¹ “RDA Toolkit Feedback:” https://www.rdatoolkit.org/RDA_feedback

⁶² “3R Project Status Report #1:” <https://www.rdatoolkit.org/index.php/3Rproject/SR1>

⁶³ RIMMF4 is software environment that models changes to RDA introduced by the IFLA LRM and 3R Project.
<https://www.marcofquality.com/wiki/rimmf4/doku.php>

⁶⁴ <https://www.youtube.com/channel/UCd5pa3AoQlr17wESE9YHcnw>

⁶⁵ “RSC Presentations:” <http://www.rda-rsc.org/rscpresentations> and “Historical Documents (2015-2017):”
<http://www.rda-rsc.org/node/650>

⁶⁶ “Facilities for browsing RDA entities and their elements,” Minutes of October 2018 meeting, in the restricted appendix related to agenda item 125, 12 October 2018, pp. 68-70: <http://www.rda-rsc.org/sites/all/files/RSC-Minutes-Restricted-117-148.pdf>

⁶⁷ <https://3.basecamp.com/4121405/buckets/9685925/messages/1729312333>