Development of Resource Description and Access (RDA): The New Cataloging Standard

Kaynak Tanımlama ve Erişim'in (RDA) Gelişimi: Yeni Kataloglama Standardı

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Abstract

Resource Description and Access (RDA) is a new standard for describing and accessing information specifically designed for the digital environment. It is a shift from Anglo American Cataloging Rules II (AACR2) and it aims to provide a more user friendly service to library users in locating information in the library online catalogs. It is also targeting to facilitate a cataloging standard which can be shared globally and be edited simultaneously by the catalogers and other users when needed. There are similarities as well as differences between these two cataloging standards. Since the development of RDA started in 2005, there has been a hot discussion among catalogers about the advantages and disadvantages of the two standards against each other. There are also arguments on the changes that RDA would introduce to the cataloging standards and questioning if this is the right time to move forward with these changes. This paper provides the reader an overview of the development of RDA standards and the outcome of this new standard yet to be adopted.

Keywords: *Library catalogs, Anglo-American Cataloging Rules II (AACR2), Resource Description and Access (RDA), Bibliographic control, Functional Requirements for Bibliographic Records (FRBR), Functional Requirements for Authority Data (FRAD), RDA*

Öz

Kaynak Tanımlama ve Erişim (Resource Description and Access - RDA) özellikle dijital ortam için tasarlanmış bilgiyi tanımlamaya ve bu bilgiye erişmeye yönelik bir standarttır. Bu standart Anglo Amerikan Kataloglama Kuralları 2'den türemiştir ve kütüphane kullanıcılarına çevrimiçi kütüphane kataloglarında bilginin yerini belirlemek için daha fazla kullanıcı dostu hizmetler sağlamayı amaçlamaktadır. Ayrıca gereksinim duyulduğunda katalogcular ve diğer kullanıcılar tarafından eş zamanlı olarak düzenlenebilen ve dünya çapında paylaşılabilen bir kataloglama standardı oluşturabilmeyi hedeflemektedir. İki kataloglama standardı arasında farklılıklar olduğu kadar benzerlikler de bulunmaktadır. RDA standardının 2005 yılından itibaren gelişmeye başlaması, katalogcuların her iki standardın birbirine karşı avantajları ve dezavantajları üzerinde tartışmalarını beraberinde getirmiştir. Ayrıca RDA'nın kataloglama standartlarına getireceği

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değişiklikler, bu değişikler için doğru bir zamanlama olup olmadığı ve bu değişikliklerle ilerlemenin mümkün olup olmayacağı konularında tartışmalar bulunmaktadır. Bu çalışma, okuyuculara RDA standardının gelişimi ve henüz yeni benimsenmiş bu standardın çıktıları hakkında genel bir bakış sunmaktadır.

Anahtar sözcükler: Kütüphane katalogları, Anglo-American Katologlama Kuralları II (AAKK2), Kaynak Tanımlama ve Erişim, Bibliyografik denetim, Bibliyografik Kayıtlar İçin İşlevsel Gerekler, Yetke Verileri İçin İşlevsel Gerekler, RDA

Introduction

Libraries have gone through tremendous changes in the past two centuries. One of these important changes was the changes to the formats of the library data. In order library catalogs to be compatible with these changes libraries have tried new methods of storing and managing their data. Once used to be only print books and local newspapers, the library collections started to have magazines and journal titles. With the changes in technology and the formats moving toward more electronic, libraries also shifted toward acquiring more electronic materials. They subscribed to thousands of magazine and journal titles which are available online rather than subscription to their print versions. Along with purchasing print monographs, libraries are adding more and more electronic books to their collections. Libraries, especially academic and research libraries started to have their own publishing as Book Presses and Journals. Suber (2004) states that libraries brought the Open Access Publishing to the market in different forms and features such as Institutional Repositories (IR) or Journals which are locally hosted in university libraries or presses. These developments have forced the library catalogs toward the changes in the 21st century's bibliographic information.

The web is also evolving and pushing the information storage from a local network to global Linked Data and Semantic Web which ultimately provides a better integration of data across different sources with a multilingual taxonomy. This data is collected in one place and connected or referenced to each other and can be re-used while it will be easily accessible to the users as well. These transitions in the information world have had an impact on the cataloging processes and libraries' cataloging records. The International Federation of Library Associations and Institutions (IFLA) started a study on the functions of bibliographic records in order to establish some changes in retrieving materials which are based on the users' needs and the ways they could successfully locate the materials they need. Maxwell (2012, p.2-3) says this study was not based on the catalogers' ease of work in creating cataloging records but mostly concentrated on users and describing a model that would be universal in organizing information anywhere in libraries or other information institutions such as museums or archives. In 1998, IFLA published the Functional Requirements for Bibliographic Records (FRBR). Tillett (2003, p.1, 11-13) indicates that FRBR is simply a conceptual model describing the entities (materials that users need), attributes (the characteristics that a particular entity

may have), and the relationships between these entities and attributes. This model is based on the relation between a work, the different editions of a work (manifestations), the translations of a work (expressions), and its different formats (items) that any information institution may have anywhere in the world.

IFLA (2012) continued to work on authority files as well and it first established a working group on Functional Requirements and Numbering of Authority Records (FRANAR) in 1999. In their reports prepared for the IFLA working group on FRANAR, Tillett and Patton (2008) described the option of having authority records that uses a clustered approach. This way, authority records could uniquely identify an entity or a cluster of variant names for entities. They further emphasized that users will be able to see the existence of close matches to what they need with related names, languages, scripts and transliteration schemes that a machine could either read and display or provide link to them. The final report on Functional Requirements for Authority Data (FRAD) was then first published in IFLA Series on Bibliographic Control, No. 34 in 2009 edited by Glenn E. Patton. IFLA (2012) points out at its website[1] that FRAD by itself concentrates on authority data such as persons, families, corporate bodies and builds up their relations with FRBR groups which are works, expressions, manifestations, and items. In this way, authority records created based on FRAD would provide a clear structure of reference points that relates the ownership of a work to specific individuals or group of people or corporate bodies and connect them to the bibliographic records. As it was mentioned above, both FRBR and FRAD are based on the needs of the users in locating items within the libraries online catalog or any other sources of information. These models put more emphasis on retrieving data from the end user's perspectives and their ease of navigation of the resources and locating the information. It is necessary for the cataloging community to understand these new conceptual models because they are the important components of cataloging standards and the building blocks of the transition from AACR2 to RDA.

RDA Replacing AACR2

The first edition of the Anglo-American Cataloging Rules (AACR) was published in 1967 in separate editions for the North American and the British Libraries. In 1974 American Library Association (ALA), the British Library Association (BL), the Library of Congress (LC) and the Canadian Library Association (CLA) started to work on creating a single text of 1967 edition of AACR in order to facilitate the countries which are using AACR as their cataloging rules and standards. They set up a committee at that time named as Joint Steering Committee (JSC) for Revision of AACR with a total of eight members. It had two types of representative; one voting and one non-voting member from each participating organization mentioned above. The members were responsible for appointing the editors and reviewing the received proposals for any changes as well

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1   http://www.ifla.org/publications/ifla-series-on-bibliographic-control-34

as the revisions of the rules and standards as an ongoing task. The JSC's work was then reviewed and commented by a national committee which was screening the proposals before the final revision is getting approved. It took until 1978 for the second edition of AACR to be published as a single version (Lewis, 1978) which was called AACR2. AACR2 has been revised over the years and its last revision was done in 1997. In 2004, work on the new edition of the standard began with the intention of creating a revised version of the cataloging rules to be called AACR3. In December 2004, a draft of Part-I of AACR3 was submitted for the review. However in 2005 it was announced that there is a need for a new standard rather than a revision of AACR2 and hence a totally new approach was agreed upon (Joint Steering Committee (JSC), last updated 2012, August 5, RDA: Resource Description and Access-Background). This new guideline was anticipated to address the changes in the age of information and to include new multimedia or electronic resources and online databases. This new guideline was called Resource Description and Access (RDA) instead of AACR3 in order to clearly show a breakdown from the past (Coyle & Hillman, 2007).

Joint Steering Committee (JSC) says "the foundation for RDA is FRBR and FRAD whereas the foundation for the first part of AACR2 was International Standard Bibliographic Description (ISBD)" (JSC, last updated 2010, January 18, Frequently Asked Questions -9.2). ISBD was a set of rules which was also created by IFLA and it was machine readable for the library catalog at that time.

In 2005 the Joint Steering Committee working group on RDA consisted of The American Library Association (ALA), The Library of Congress (LC), The Australian Committee on Cataloging, The British Library (BL), The Canadian Committee on Cataloging and Chartered Institute of Library and Information Professionals (CILIP) started to prepare a draft of RDA. Its part-I was available in December of the same year (Kiorgaard, 2005). In 2012 a representative from The German National Library (Deutsche National Bibliothek, DNB) joined the JSC working group on RDA (JSC, last updated 2012, May 30, JSC membership 1974-).

The research in the area of cataloging and its new standards has followed several issues in favor or against it. For example, Chapman (2006) provided the reasons why RDA is needed by pointing out the issues and problems when applying AACR2 standards and how these could be addressed if RDA is being employed. Medeiros said in his article "The development of a code that could be far-reaching in the international community is a bold move, and if successful, will facilitate meaningful data exchange across disparate metadata providers" (2005, p. 262). According to Michael Gorman (2007, p. 65) RDA tries to find a solution between the standard cataloging, metadata schema and the way that Google manages the retrieval of information.

"The sad thing is that betraying the former has not managed to appease the latter. Articles stating that RDA will he dead on arrival have already appeared, not because it is a mess and a giant leap backwards for cataloging but because the neophiliacs think it is not a radical enough break with the past (Gorman, 2007, p. 65)."

The full draft of RDA was issued in November 2008 and JSC commented to the full draft with a number of issues that required further discussion at its meeting in April 2009[2].

The draft of RDA was revised and made its way to the publishers and finally after five years of challenges on revising the cataloging standards in June 2010, RDA was published in RDA Toolkit (JSC, Last updated 2012, January 11, Announcement of RDA publication date). At this point different libraries started testing the process of employing RDA and they came up with some suggestions. Library of Congress (LC), National Library of Medicine (NLM) and National Agriculture Library (NAL) were part of this testing process from US national libraries. In June 2011 they announced that they would adopt RDA with certain conditions. They have crafted their recommendations and statements in a report on RDA test. This report (Library of Congress (LC), 2011, May 9, Reports and recommendations) involved 26 institutions including the three US national libraries which are mentioned above. They provided their recommendations according to the goals they had set in examining RDA during the test period. Based on this report, while some of the goals have been partially met, some completely met and some not met at all. Two of the most pressing issues and major concerns mentioned in this report were: 1) the cost of retraining the cataloging staff and 2) the difficulties in making the new standard and workflow easy and within a comfortable zone for catalogers to use[3].

RDA Goals

RDA is suggested as a new tool to manage a digital environment for electronic materials within the cataloging standards. It is also supposed to be a multinational web-based tool and compatible to internationally accepted cataloging principles and standards. It is intended for usage of library communities but also targeted other communities such as vendors, publishers or book stores. One of RDA's main goals has been set in favor of the users in order to be able to locate the items they need in more convenient ways**.** Therefore, it incorporated Functional Requirements for Bibliographic Records (FRBR), Functional Requirement for Authority Data (FRAD) and intends to add the Functional Requirement for Subject Authority Data (FRSAD). While these functional requirements by themselves are not cataloging standards, they are suggested models to help improving terminologies and their relationships which are used in cataloging and organizing information especially in a digital environment. Tillett (2003, p. 12) says these functional requirements will give a new look on structure and relationships of bibliographic and authority records. She emphasizes that FRBR and FRAD will bring a

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2   The full documentation of the JSC work history and the annual reports or their strategic plan could be found in detail at http://www.rda-jsc.org.
3   Full report is available at http://www.loc.gov/bibliographic-future/rda/source/rdatesting-finalreport-20june2011.pdf.

level of bibliographic control for all types of material while integrating users' tasks and their searching criteria to help with "find, identify, select, and obtain" resources.

On the catalogers' side, not only RDA will bring efficiency and ease of use in applying the guidelines, but also it will create consistency, clarity, currency, rationality, and compatibility in its instruction. While it will eliminate the redundancy of information, it will provide supplementary information for the catalogers to apply whenever they need it in special cases.

In short, according to the Library of Congress working group on the future of bibliographic control (2008, On the record) the changes that are hoped to be effective by RDA while targeting the library communities include but are not limited to:

◊   Flexibility and extensibility in sharing and exchanging the data,

◊   Simplicity in language; clear interpretation of the cataloging rules and standards and easy understanding by users of the online catalog,

◊   Web based and online; open cataloging workflow with ready tools supporting export/import of data,

◊   Global accessibility; could be used beyond the library community such as vendors or publishers,

◊   Delivery of information in the digital environment: increasing users' satisfaction.

RDA Outcome

In June 2011, after the RDA testing period, The U.S. RDA testing committee created a report and released it to public (LC, 2011, May 9, Reports and recommendations). In responding to the question whether the U.S. should implement RDA or not, the results reported in this report were different. For example, the institutions who were participating in the RDA implementation test period responded differently to those who were creating RDA records in that period. Where institutions survey analysis showed that 34% are in favor of using RDA and 28% have agreed to use it with some changes, 24% are ambivalent as to what to decide and only 14% do not want to use RDA. On the other hand, 45% of the test participants as "record creators" say yes to using RDA only with some changes whereas 30% say absolutely no and 25% say yes (LC, 2011, May 9, Reports and recommendations, p. 41).

In the same report, the committee put their findings together and pointed out how well each RDA goal had been met. Basically, as it appears from the list provided at the beginning of the report (LC, 2011, May 9, Reports and recommendations, p. 1-2), more improvements will be needed before the full implementation of RDA. These improvements include but not limited to increasing: 1) The efficiency of bibliographic records, 2) the processing methods, and 3) the technology which are going to be employed in the implementation of this new cataloging standard. The working

committee's findings were based on the RDA test period and the list of goals which are met or not met could be found in detail at Library of Congress's report[4] (LC, 2011, May 9, Reports and recommendations).

Two important aspects of RDA that are also brought up at this report are: 1) avoiding redundancies and 2) sharing metadata within and outside the library world. To this end, different communities have established working groups or blogs for accomplishing or testing the goals that have been recommended by JSC at their website. Library of Congress is one of the most active communities that has not only started to train their staff on RDA but also consistently added the helpful documentations and reports on their website. At the ALA Annual Conference held in New Orleans in July 2011, which was right after the end of RDA testing period, Library of Congress announced that it will begin cataloging records partially in RDA environment and across all subject areas. About a year after this announcement, Library of Congress stated that it is planning to fully implement RDA in March 31, 2013 when all their staff gets trained on RDA (LC, 2012, March 2, Library of Congress announces). Likewise LC and NLM and NAL, the other non U.S. national libraries such as the British Library, Library and Archives Canada, the National Library of Australia and Deutsche Natioanbibliothek (DNB) have agreed on coordinating and implementing of RDA. They are providing training and documentation as well as news and announcements which are regularly updated on their websites, on IFLA's website[5] or LC news on RDA[6]. These libraries as well as some representatives from Canada, United Kingdom and some United States professional library associations are members of the Committee of Principals (CoP) which is overseeing the development of RDA by JSC.

Many libraries have not decided yet if they want to implement the full RDA records or to use AACR2 ones or even to employ the hybrid records which are simply RDA records that keep some of AACR2 structures at their local database such as General Material Designation (GMD)s or standard abbreviations based on libraries local needs. Large numbers of libraries especially those who had participated in RDA testing have already begun the shift and started to add RDA records to their local databases. A few libraries to count are libraries at Stanford University, University of Chicago, Brigham Young University, State Library of Pennsylvania as well as Blackwell Book Services. Special Libraries Cataloguing (SLC) who is giving services to international libraries is also amongst the RDA implementation group[7]. In creating original MARC records or editing the derived records, they are using rules according to ISBD/AACR2/MARC21 and adapting RDA standards as far as it is possible based on their clients' needs. Other participant libraries in RDA testing such as University of Chicago Libraries however create the RDA records based on Online Computer Library Center (OCLC) and the

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4   http://www.loc.gov/bibliographic-future/rda/source/rdatesting-finalreport-20june2011.pdf
5   http://www.ifla.org/en/news/international-implementation-of-rda
6   http://www.loc.gov/catdir/cpso/news_rda_implementation_date.html
7   Their cheat sheets for editing MARC records in RDA mode is available at http://special-cataloguing.com/node/1408.

Program for Cooperative Cataloging (PCC) guidelines and follow their standards.   A few example of RDA records of different formats such as books, visual materials, maps, sounds recording, and scores are provided at Appendix.

Maliaburton (2010) says in his blog that sharing metadata could reduce the redundancy. He then claims the distribution of metadata creation among different libraries/institutions would cost less time, funds and energy. From what he says, it seems that metadata would be likely created by people who may not have enough training with adequate documentations. The quality of these metadata then may be poor but this cannot be known until it is practically experienced.

Pursuing new technology in cataloging and in a digital environment is another important discussion point in library communities. One of these discussions is about using XML (eXtensible Mark Up Language). XML has existed long before JSC started to work on RDA. Likewise, many cataloging communities had already started to learn and to use this language in their digital collection. A good example where libraries especially academic libraries are using metadata in the XML format is in Institutional Repositories (IR). Using XML enables computers to read and process the data the way that is desirable in Semantic Web. A glance at the history of formats that have been used in the cataloging records of libraries shows that MAchine Readable Cataloging format, MARC I and its successor, MARC II were designed to be machine readable at their own times in 1960s. While MARC I's scope was only for English language monographs, MARC II was intended to adopt all different types of materials by adding a leader field to its record to specify the type of the material (Spicher, 1996, p.84). MARC 21 with some major changes to MARC II came on board in 1980s. Seikel & Steele (2011, p.326) indicate in their article that the changes MARC II introduced included but were not limited to: 1) controlling formats of archival and manuscript materials, computer files and visual materials, and 2) supporting non-Roman data. This was first called USMARC but then the name was changed to something that would reflect its competency in the global format and not particularly in the United States. So it was called MARC 21 emphasizing that the new format is designed for the 21st century (LC, 1998, October 22, MARC 21). Along with the changes in MARC, library communities went through many changes as well to adapt themselves and their library data to the new environment and in doing so they were successful. The machine readable coding which was designed for a closed data structure worked well in that environment such as in our current library systems. But with the technology moving so fast and with the introduction of linked data structure, libraries have to move out of this closed data in order to not only have their data compatible to this structure but also to be able to compete with other search engines and their retrieval mechanism. As a response to the technology which is continuously on the move, libraries have to lean toward more digital collections and online resources. One way to do it is using more XML format or converting the existing MARC to XML which in turn would be compatible and doable with the new cataloging standard, RDA which is mainly designed for digital environment.

With the changes that RDA will introduce to the cataloging practices, libraries and cataloging communities have to be prepared to mitigate the intensity of these changes. There is a popular concern about the format to be used in cataloging records and which one to fit best and behave more naturally in the new standard, RDA. There is a strong feeling that MARC would be still an ideal format to use or at least be so for a while. This is simply because most of the records are already in MARC format. MARC is also a more detailed language in cataloging that has been used for years. As a result, it provides a more comfortable zone for catalogers to work in than any other formats. However, some complexities may occur in changing MARC to other formats. Looking at Online Information Exchange (ONIX) as an example; it is a format used in book industries and by publishers as a mean of improving the digital products and digital contents. There needs to be a crosswalk from records in MARC to ONIX. As it has been pointed out earlier, one of RDA goals is to be a standard that could be used not only by library communities but also by publishers or any other communities outside the libraries. With the MARC format currently being used as a dominant format, it is more likely to maintain large numbers of mapping as crosswalks from MARC to other formats including those that might hardly being ever used. At the 2011 International Conference on Dublin Core and Metadata Applications, Bai, Qiao and Liang (2011) argued that the meaning of mapping in the Linked Data environment would be completely different in the new data model. They also pointed out that there is a need of crosswalk for different degrees of mapping, such as one-to-many, one-to-one, or many-to-one.

Another concern among the library communities is the type of a system that could embrace FRBR model and harvest the information regardless of the format to be used in RDA environment. Oliver (2011) says that for a future implementation of RDA, a new database structure that can display better and function well in the linked data and semantic web, a new system that could be visible in the web along with all other types of metadata is needed. An open source called eXtensible Catalog (XC) has been introduced which offers libraries a set of tools to manipulate and manage the metadata with built in applications. XC schema is based on Dublin Core Application but uses different metadata from various schemas and it is the first live implementation of RDA in a FRBR–based, non-MARC environment. According to Jennifer Bowen & Lindahl (2011), RDA can interact easily with elements of other metadata schemas; it can act as a bridge between current library systems and other applications such as XC because its standard could function both in MARC and any online-based environment. XC could harvest RDA records in MARC and from a FRBR-based carrier of another source. As a result, less amount of metadata manipulation would be necessary. Bowen & Lindahl promise that XC will be doable in the existing Integrated Library Systems (ILS) and web content management systems.

The bottom line is that the cataloging community should find a way to make the transition as smooth as possible. Using RDA in a non MARC format in XML is on its way in the near future. A widespread usage of RDA records by libraries and their catalogers could help to shed more light on the future of ILS.

There were other recommendations in the RDA Test report which was released in June 2011 and they need to be addressed before RDA full implementation. U.S. RDA Test Coordination Committee provided an update on implementation of RDA in which announced the status and the progress of these recommendations (LC, 2012, January, U.S. RDA implementation updates). A few important areas that have been addressed or are in the process include:

◊ Improving RDA Toolkit and its functionality,

◊ Rewording the RDA instruction in a clear, unambiguous, and plain English,

◊ Defining the process of updating RDA in the online environment,

◊ Developing full RDA examples in MARC and other possible encoding schemas,

◊ Ensuring the involvement of the communities with providing updates on changes to practices, decisions or documentations,

◊ Coordinating trainings on RDA.

James Hennelly (2011), Managing Editor of ALA Digital Reference also announced that a new release will go live at RDA Toolkit on November 8, 2011. He indicated that if there is any new release for RDA Toolkit, it would be uploaded to the RDA Toolkit on the second Tuesdays of each month and that will basically cover the updates to the content, metadata, and the functionalities of the toolkit itself with fixing any existing bugs.

On the other side of the activity line on RDA, there are ongoing hot discussions in different communities and Listserv about various rules applied in RDA in comparison to AACR2. There has been also discussion about the timing of RDA implementation which may cause problems in practice. While RDA has undergone changes and enhancements, these discussions and their focus of topics have also been changed accordingly. One major focus of the discussions for example has been about RDA replacing General Material Designation (GMD) and Special Material Designation (SMD) with new MARC tags as 336 content type, 337 media type, and 338 carrier type. There are some arguments whether removing the GMD at 245 |h field and replacing it with 336-338 tags would be user friendly enough in identifying and locating the materials. The displacement of the information as well as the new suggested 336-338 fields' functional placement in the display structure of online catalogs are the main concerns of this argument. ISBD (International Standard Bibliographic Description) and the changes in punctuations and justifications in added entries or collective titles within the new FRBR model has been another topic of concern. There are other discussion about advantage or disadvantage of using different 26x fields with various indicators to designate production, publication, or manufacture statements. These discussions and similar ones could be available at Web archive interface if subscribe to RDA-L@LISTSERV. LAC-BAC.GC.CA from L-Soft international, Inc. Another topic of focus has been recently on RDA and MARC and their bibliographic concepts in relation to database principles and systems when using FRBR as a conceptual model (Spero, 2012). It discusses whether

there needs to be compatibility between RDA, MARC, bibliographic concepts and the relational model and in doing so if libraries need specific technology to implement or not. If the answer is yes then, it further argues the cost versus the users' satisfaction. There are similar discussions that are taking place at the international cataloging level focusing on RDA and FRBR and how to properly approach those. An example of approaching RDA in international libraries is the European RDA Interest Group (EURIG) which its documentation and meetings are available on their website (Scottish Library and Information Council & European RDA Interest Group - SLIC & EURIG, 2011).

In March 2012, the Program for Cooperative Cataloging (PCC) announced that PCC Task Group would be ready to apply the first phase of RDA authority records with a clear distinction between authority files which were created for AACR2 headings and those to be used for RDA. Headings not acceptable under RDA would be flagged with a 667 note to alert catalogers that these headings cannot be used in an RDA bibliographic record until further notice and improvement. They marked the calendar that beginning Sunday, March 31, 2013, all access points on bibliographic records coded "pcc" must be RDA, even if the bibliographic description follows AACR2 rules (LC, 2012, March, Program for Cooperative Cataloging).

Conclusion

ILS is evolving both at the users' layer as well as behind the curtain at the catalogers' layer. This evolution is toward embracing more digital contents which actively involves catalogers and the way they prepare these contents to the users interface. It also involves users and their ever growing needs toward more open and easy access of information. With the implementation of RDA down the road, the catalogers' layer is the one which is going to be mostly influenced in this transition. There will be changes to the catalogers' workflow which are necessary in order to make the cataloging procedures compatible within RDA standards. For the libraries and their staff, this transition would not be easy but exciting since the new environment would not only meet users' expectations and their desires for a more user friendly online environment but also be more flexible for catalogers in following the cataloging rules and their interpretations when creating cataloging records.

The users have already seen the changes through Web 2.0 applications. In the past few decades, their needs and expectations have changed as well as the nature of their searches. These adjustments were in response to the movement in the field of technology. Most users care more about what is immediately available to them rather than where they could find it. Libraries today are not the first place they seek information. In order libraries to compete effectively with the rapidly pacing technology and be able to attract more users to libraries they need to create a balance between what they provide and what other searching engines offer. Libraries have tried to create this balance by moving toward adding more digital collections and more electronic resources as journals or books.

They are changing their gears toward acquiring more online resources. Many of libraries, especially academic and research libraries have also focused on library automation. They have developed or employed web-based interfaces to suit the needs of current users' generation who are more tech-savvy. In doing so, many libraries moved to the Next Generation Catalogs also known as Web-Scale Discovery Tool or Discovery Layer. Using this tool, the library catalog provides an interface with searching behaviors similar to what other search engines such as Google or Google Scholars offers. It acts like one single search engine which holds all library information and content regardless of its format and with one single search box it locates the information for the user. The features provided through these tools include but are not limited to: multifaceted navigation, federated results, enriched content, and tag clouds where users could also contribute to the content.

The ILS vendors and their products have not been successful in bringing the existing library data in to an effective and user friendly display. The available data and the relationship among the data in the library online catalogs are not clear for a user to locate the information. With RDA, the hope is to have these relationships in a much more prominent structure under FRBR and FRAD. RDA would bring changes to the interface of the library catalogs. These changes generated by RDA may not be felt much by the users at least in the early stages of the RDA implementation and in the current catalogs. But it will attract their attentions in the long term when it starts to operate in new databases and serve in the linked data and semantic web.

On the other hand, catalogers need to deal with this new standard more intimately. There would be a learning curve for all the catalogers and cataloging community. Catalogers need to be prepared for this new experience and make plans on how to ease the process of changes. Cost of implementation as well as the efficiency and timely accessibility of resources to the users should be planned and managed. Cataloging backlogs is anticipated especially in small libraries which have limited staffing in their cataloging department. Employing RDA would have an impact on copy cataloging as well. According to Cronin (2011), there are a few options for libraries to decide when employing RDA records: accept the RDA record as is, enhance poor RDA copies, upgrade the old AACR2 records to RDA ones, or applying all these above on a case by case scenario. Libraries would definitely experience tough times as they did a few decades ago when they were switching from Card Cataloging to Integrated Library Systems (ILS). Card Catalog had its own advantages and disadvantages against ILS. The same is true if we compare AARC2 with RDA. Each standard has its own pros and cons that have to be thoroughly examined with respect to each library data structure and its patrons' needs. RDA is currently evaluated by catalogers, metadata librarians, and many other interested parties. These collaborative work needs to be continued even after the implementation of RDA. The new standard and its enhancements and adjustments would highly rely on a close collaboration of interested groups as mentioned above to ensure the interoperability, applicability and accessibility of the changes among the library communities. After the implementation of RDA in order to enhance and

promote the new standard, the cataloging community needs to have more discussions within the library groups, various agencies, and vendors to receive input and feedbacks and to incorporate them into effective and productive changes.

The important thing to keep in mind is that RDA is simply a new approach in cataloging standardization which tells the catalogers how to record the data. Likewise, the entities, relationship and attributes that come from FRBR and FRAD would be just a new approach in retrieving information out of ILS or library databases. The notion is that ultimately the library data from their closed silos would open up and be exchangeable not only within the library communities but also with the data coming in and out from other sources. The more open and interoperable metadata we have, the easier will be to master the relationships between them. RDA will bring a structure to bibliographic data based on the FRBR relationships while having less emphasize on catalogers' created notes. By employing RDA, catalogers will use attributes in an entity description. Likewise, the ILS would have an entity-relationship structure which retrieves more meaningful data for the users.

Going through this transition, libraries and their staff need to know that it may take a long time to see the results of the changes and the accomplishments. They may not even know when to change gears and how to do it at the early stages of the implementation. The truth is that almost everyone in the library communities feels the overwhelming stream of changes. If libraries decide to swim with the RDA current and implement this new cataloging standard, they need to face consequences such as cost, staffing and training and they have to be prepared to embrace these consequences.

As it has been discussed above, there are still essential concerns and questions that library communities are expecting patiently to be answered. These are:

1) Which ILS and Web Scale Discovery Tools would be the most ideal ones to support RDA, FRBR, and FRAD,

2) Would MRAC still have a share in creating data in RDA environment as a new cataloging standard?

As far as the first question concerns, on RDA Toolkit there is a page available providing interviews with ILS vendors[8]. These interviews are dated between June-September of 2011. At the ALA Annual Conference held in Anaheim in June 24, 2012, there was a forum lead by a few ILS vendors' representatives such as Sirsi-Dynix, Ex Libris, and Innovative Interfaces Inc. at which they were giving more information on their RDA implementation plans[9]. They discussed how they have updated their integrated library system and their bibliographic utilities to accommodate RDA for a more discoverable view for users. They are working on developing better displays and data functionality to support new ways of cataloging and exporting/importing data to and from their systems.

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8   http://www.rdatoolkit.org/blog/category/29
9   http://ala12.scheduler.ala.org/node/1299

While the vendors are taking different approaches to modify and enhance their existing systems to support RDA, they all seem to have one shared strategy to follow and that is designing a practical entity-relationship database structure based on FRBR and FRAD models and Linked Data to support the ease of navigation and locating information for the users and for a better display of data.

The second question is still under investigation and the cataloging community is holding its breath to see what would happen in near future and if there would be a new format replacing MARC21 or not. In the meantime OCLC, as a world wide database holding thousands of libraries' cataloging records, is preparing itself for the implementation of RDA and the format changes that the new standard might impose to the cataloging records. In doing so, the OCLC staff has prepared a policy statement about incorporating RDA practices into WorldCat. In this statement (OCLC, 2011, June) it has asked a few protocols to be respected by OCLC member libraries. A few examples of the protocol are as follows:

1) In the 040 field use "|e" with value "rda" and Leader/18 (Desc) coded "i" if ISBD punctuation is used or *blank* if not,

2) If a record created according to either AACR2 or RDA which is already exists in WorldCat, do not create a duplicate record according to the other code, and so on.

McCallum (2005, June) says MARC 21 is essentially a cluster of three MARC 21 record types (bibliographic, authority, and item records) which are related to each other. While the authority record could provide information and access entries in the bibliographic records they are not necessary for display of the data in a bibliographic record. The bibliographic record could exist by itself or it could embed the holding information in it. "The three record types are useful, however, for the increased richness they provide in a system in which they are fully exploited (e.g. authorized forms and cross references in the Authority record and claiming, interlibrary loan, and automatic check-in support in Holdings records)" (McCallum, 2005, p.[2]). In a report provided by RDA/MARC working group (LC, 2011, June 21), the group reported briefly that experimentations with the concepts and the issues of records in applying different entity models is needed in an exchanging environment when the RDA is being used and tested for a longer period of time. Then the results could be re-examined and further analyzed. There is a list of proposals at MARC 21 homepage which is provided through Library of Congress that holds all the information about MARC 21 and the proposals in an order[10].

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10 http://www.loc.gov/marc/marbi/list-p.html

The two questions or concerns discussed above as well as many others are still under analysis by library specialists and are monitored by library communities around the world. Different groups are currently working on improvement of RDA. A few to count are:

1) JSC to re-write or re-word RDA rules in a more clear and plain English and definite its process for an online environment,

2) PCC to address authority control issues and training,

3) ALA publishing to improve the Toolkit and its functionality,

4) Vendors to move beyond MARC and to develop a better integration of data with the new standard and to support a better display.

The goal is that these groups of professionals with the feedback provided from the involved community would bring more practical models and find answers or solutions to different issues that concern the library community before the launch of RDA.

References

Bai, H., Qiao, X. & Liang, B. (2011). Semantic bibliography based on ontology and Linked Data. In *Proceedings of the International Conference on Dublin Core and Metadata Applications, (DC-2011--The Hague Proceedings)*, (pp.178-181). Retrieved March 3, 2012, from http://dcpapers. dublincore.org/index.php/pubs/article/view/3641/1867

Bowen, J. & Lindahl, D. (2011, April 8). *RDA and the eXtensible Catalog.* Retrieved November 22, 2011, from http://hdl.handle.net/1802/14588

Chapman, A. (2006, October). RDA: A new international standard. *Ariadne, 49*. Retrieved November 22, 2011, from http://www.ariadne.ac.uk/issue49/chapman

Coyle, K. & Hillman, D. (2007, January/February). Resource Description and Access (RDA): Cataloging rules for the 20th century. *D-Lib Magazine, 13*(1/2).

Cronin, C. (2011, September 27). *RDA update and next steps: What you need to know.* Retrieved August 21, 2012, from http://www.oclc.org/ca/fr/multimedia/2011/files/ GoodPracticesChicagoCronin.pdf

Gorman, M. (2007). RDA: Imminent Debacle. *American Libraries, 38*(11), 64-65.

Hennelly, J. (2011, November 8). *RDA Toolkit blog: RDA Toolkit release- November 8, 2011* [Web log post]. Retrieved December 26, 2011, from http://www.rdatoolkit.org/content/274

International Federation of Library Associations and Institutions (IFLA). (2012). *Functional Requirements for Authority Data: A conceptual model*. [IFLA series on bibliographic control 34, by G. E. Patton (Ed.)]. Retrieved August 16, 2012, from http://www.ifla.org/publications/ifla-series-on-bibliographic-control-34

Joint Steering Committee for development of RDA (JSC). (2010). *RDA: Resource Description and Access- Frequently Asked Questions, 9. Adopting RDA- 9.2.* Retrieved August 20, 2012, from http://www.rda-jsc.org/rdafaq.html#9-2

Joint Steering Committee for development of RDA (JSC). (2012). *JSC membership 1974 - .* Retrieved August 20, 2012, from http://www.rda-jsc.org/jscmembers.html

Joint Steering Committee for development of RDA (JSC). (2012). *RDA: Resource Description and Access-Background.* Retrieved August 16, 2012, from http://www.rda-jsc.org/rda.html#background

Kiorgaard, D. (2005). *RDA: Resource Description and Access Part I of RDA- Constituency review of December 2005 draft* (Joint Steering Committee for revision of AACR, 5JSC/RDA/Part I). Retrieved January 20, 2012, from http://www.rda-jsc.org/docs/5rda-part1.pdf

Lewis, P. R. (1978). *Preface to the Anglo-American Cataloguing Rules, Second Edition (1978).* Retrieved August 16, 2012, from http://www.rda-jsc.org/docs/aacr2preface1978.pdf

Library of Congress (LC). (1998). *MARC 21: Harmonized USMARC and CAN/MARC.* Retrieved March 10, 2012, from http://www.loc.gov/marc/annmarc21.html

Library of Congress (LC). (2008). *On the record: Report of the Library of Congress Working Group on the Future of Bibliographic Control*. Retrieved March 3, 2012, from http://www.loc.gov/bibliographic-future/news/lcwg-ontherecord-jan08-final.pdf

Library of Congress (LC). (2011). *Report and recommendations of the U.S. RDA Test Coordinating Committee: 9 May 2011 revised for public release 20 June 2011.* Retrieved February 15, 2012, from http://www.loc.gov/bibliographic-future/rda/source/rdatesting-finalreport-20june2011.pdf

Library of Congress (LC). (2011). *Report on the RDA/MARC Working Group discussion of identifying entity types in MARC records*. Retrieved August 21, 2012, from http://www.loc.gov/marc/marbi/WEMI_report.html

Library of Congress (LC). (2012). *U.S. RDA implementation updates from the U.S. RDA Test Coordinating Committee.* Retrieved February 28, 2012, from http://www.loc.gov/aba/rda/pdf/RDA_updates_16jan12.pdf

Library of Congress (LC). (2012). *Library of Congress announces its long-range RDA training plan.* Retrieved March 2, 2012, from http://www.loc.gov/catdir/cpso/news_rda_implementation_date.html

Library of Congress (LC). (2012). *Program for Cooperative Cataloging: What's new, decisions, policies and tasks- PCC day one for RDA authority records*. Retrieved August 23, 2012, from http://www.loc.gov/aba/pcc

Maliaburton. (2010). *Learning about RDA, The future of bibliographic control: Data infrastructure* [Web log post]. Retrieved October 10, 2011, from http://Learningaboutrda.wordpress.com

Maxwell, R. L. (2012). *Maxwell's handbook for RDA: Explaining and illustrating RDA, Resource description and access, using MARC21.* Chicago, Illinois: American Library Association.

McCallum, S. H. (2005). *Using MARC 21 with FRBR: Record configurations.* Retrieved August 21, 2012, from http://www.loc.gov/marc/marbi/2005/2005-report02.pdf

Medeiros, N. (2005). The future of the Anglo American Cataloging Rules. *OCLC Systems & Services 21*(4), 261-63.

Oliver, C. (2011). *Preparing for transition: Here comes RDA!.* Retrieved August 25, 2012, from http://www.rda-jsc.org/docs/CLA2011-Preparing-for-transition-Oliver.pdf

Online Computer Library Center (OCLC). (2011). *OCLC policy statement on RDA cataloging in WorldCat for the U.S. testing period and beyond.* Retrieved August 22, 2012, from http://www.oclc.org/rda/policy.htm

Scottish Library and Information Council and European RDA Interest Group (SLIC & EURIG). (2011). *European RDA Interest Group: Documents.* Retrieved February 28, 2012, from http://www.slainte.org.uk/eurig/documents.htm

Seikel, M. & Steele, T. (2011). How MARC has changed: The history of the format and its forthcoming relationship to RDA. *Technical Services Quarterly, 28*(3), 322-334.

Spero, S. (2012). *RDA-L, LISTSERV.LAC-BAC.GC.CA Library and Archives Canada - Bibliotheque et Archives Canada.* Retrieved May 18, 2012, http://www.lsoft.com/scripts/wl.exe?SL1=RDA-L&H=LISTSERV.LAC-BAC.GC.CA

Spicher, K. M. (1996). The development of the MARC format. *Cataloging & Classification Quarterly, 21*(3-4), 75-90.

Suber, P. (2004). *A very brief introduction to Open Access*. Retrieved November 28, 2011, from http://www.earlham.edu/~peters/fos/brief.htm

Tillett, B. (2003). FRBR (Functional Requirements for Bibliographic Records). *Technicalities, 23*(5), 1-13.

Tillett, B. & Patton, G. (2008). *A review of the feasibility of an International Standard Authority Data Number (ISADN)*. Retrieved August 16, 2012, from http://archive.ifla.org/VII/d4/franar-numbering-paper.pdf
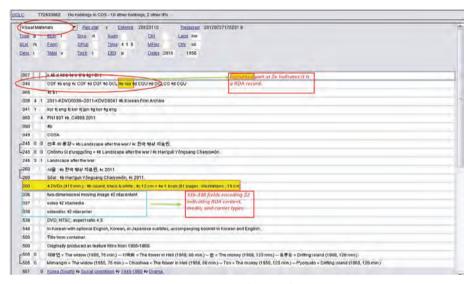
Appendix: Samples of RDA
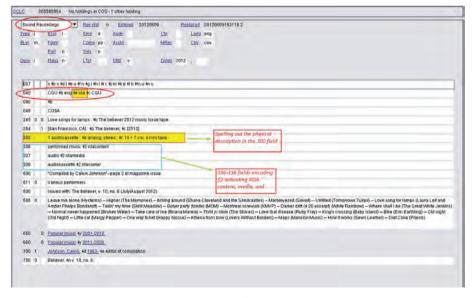

Figure 1. Visual Materials
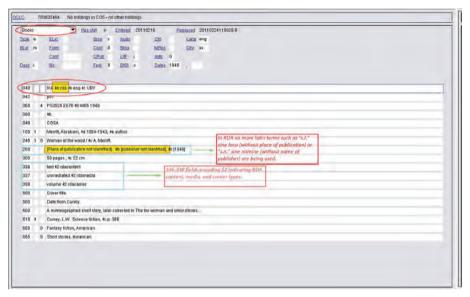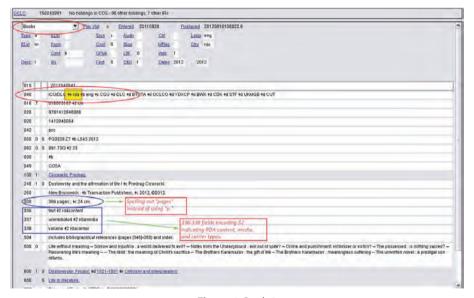

Figure 2. Sound Recordings

Figure 3. Book-1

Figure 4. Book-2
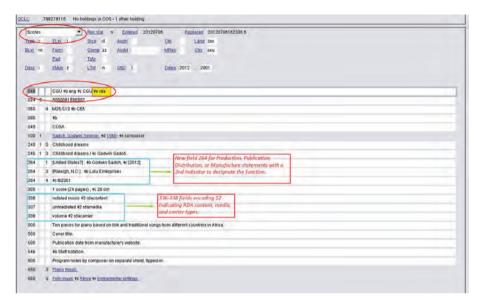
Figure 5. Book-3

Figure 6. Book-4

Figure 7. Scores

Figure 8. Maps