FRBR and RDA: What They Are and How They May Affect the Future of Libraries

by Charles R. Croissant

ABSTRACT: "Functional Requirements for Bibliographic Records," a document issued by the International Federation of Library Associations' Cataloguing Section in 1997, has achieved the status of an important theoretical model of the cataloging process, in effect, a theory of cataloging. It is the foundation on which the new cataloging code, Resource Description and Access (RDA), is based. An understanding of the FRBR model is essential to the understanding and application of RDA. This paper explains the entity-relationship model that FRBR presents: the bibliographic entities (work, expression, manifestation, item), their attributes, and the relationships that connect them. It explains how bibliographic records based on the FRBR model would be structured, and demonstrates how FRBR informs the structure of RDA. It describes the controversies connected with the forthcoming implementation of RDA in March 2013, and explores the implications of this implementation for the library community.

INTRODUCTION

In 1995, an event took place in the world of library cataloging that can be compared in its significance to the Paris Conference of 1961 and its *Statement of Principles.* This was the publication, by the Section of Cataloguing of IFLA, the International Federation of Library Associations, of a document entitled *Functional Requirements for Bibliographic Records.*[1] The document is now widely referred to by its acronym FRBR (pronounced "furbur"). FRBR is the foundation document for an ongoing re-conceptualization of cataloging, whose most significant product to date is a new cataloging code, *Resource Description and Access* (RDA). RDA is intended to take the place of the *Anglo-American Cataloguing Rules, 2nd edition.* RDA has been accepted (albeit with reservations) by the major players in the English-speaking library world (e.g., Library of Congress, the British Library, Library and Archives Canada); we can expect that it will be implemented in most English-speaking libraries beginning in 2013. The present essay offers an overview of FRBR and RDA that will, it is hoped, be especially helpful to librarians who are not themselves catalogers. My aim is to explain the basic concepts of FRBR and to show how they inform the structure of RDA. I will conclude with an account of certain features of the new code that will be especially important to theological libraries.

PART 1: FRBR (FUNCTIONAL REQUIREMENTS FOR BIBLIOGRAPHIC RECORDS)

FRBR is an attempt to develop a conceptual model that can express a common international understanding of what bibliographic records should be and what they should be expected to accomplish. The impetus for its development was a recognition within the international library community of the need to make optimal use of all the opportunities for shared cataloging in the new online environment, as well as a need to frame a rational

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[1] IFLA Section on Cataloguing. *Functional Requirements For Bibliographic Records. Final Report* (1998). Freely available online at http:www.ifla.org/files/cataloguing/frbr/frbr_2008.pdf

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response to the increasing pressures libraries were under to reduce the cost of cataloging. By way of responding to those economic pressures, the writers of FRBR hoped to establish a consensus at the international level on just how minimal a record could be while still performing its necessary functions. But as is often the case, once the work was underway, FRBR quickly grew beyond the original intentions of those who commissioned it, and is now seen as a full-fledged theory of cataloging.

FRBR was launched as an initiative of the IFLA. It came to life in 1990, at the Stockholm Seminar on Bibliographic Records. At that seminar, it was decided that IFLA's Section on Cataloguing should form a task force to study the issues outlined above. A number of major players within the world-wide cataloging community were asked to join the task force, among them John Byrum (Library of Congress), Dorothy McGarry (UCLA), Tom Delsey (National Library of Canada), Elaine Svenonius (UCLA), and Barbara Tillett (Library of Congress). After several years of research, they produced a report, which they entitled *Functional Requirements of Bibliographic Records.* Their report was then presented to IFLA, which formally adopted it in 1997.

Since its publication, FRBR has become our new theoretical model for cataloging, and also the basis for the forthcoming cataloging code, *Resource Description and Access* (RDA).

How FRBR Works

FRBR begins by establishing a set of user tasks, that is, behaviors that library users seek to perform in order to meet their information needs. Originally, FRBR identified four user tasks:

> *Find* (a resource that meets certain criteria)
>
> *Identify* (make sure the resource is the one you want and not some other, similar resource)
>
> *Select* (from a number of possible resources, select the one that is most useful to you in your particular situation)
>
> *Obtain* (get the chosen resource from its current location to a place where you can use it – gaining access to the resource)

Some subsequent writings on FRBR include a fifth user task, called *Navigate* (being able to make your way through a catalog, a search engine, a website to find what you want).

Having defined these user tasks, FRBR then poses the question: What data and what kinds of data structures are required so that a user can successfully perform the user tasks?

In order to answer that question, the writers of FRBR decided to make use of an "entity-relationship" model. An entity-relationship model is constructed as follows:

> STEP 1: Identify all the possible entities that play a role in the process you are analyzing.
> STEP 2: For each of the entities you have identified, identify all the attributes that the entity can possess.
> STEP 3: Identify all the possible relationships that can exist between any two entities.

For Step 1 of their model, the FRBR task force defined three groups of entities:
> Group 1: The "bibliographic" entities – FRBR identifies four bibliographic entities, defined as Work,

Expression, Manifestation, and Item, and places these entities in a hierarchy.

Group 2: The "people" entities – individual persons and named corporate bodies.

Group 3: The "subject" entities – concepts, events, places, etc., plus any of the Group 1 and Group 2 entities.
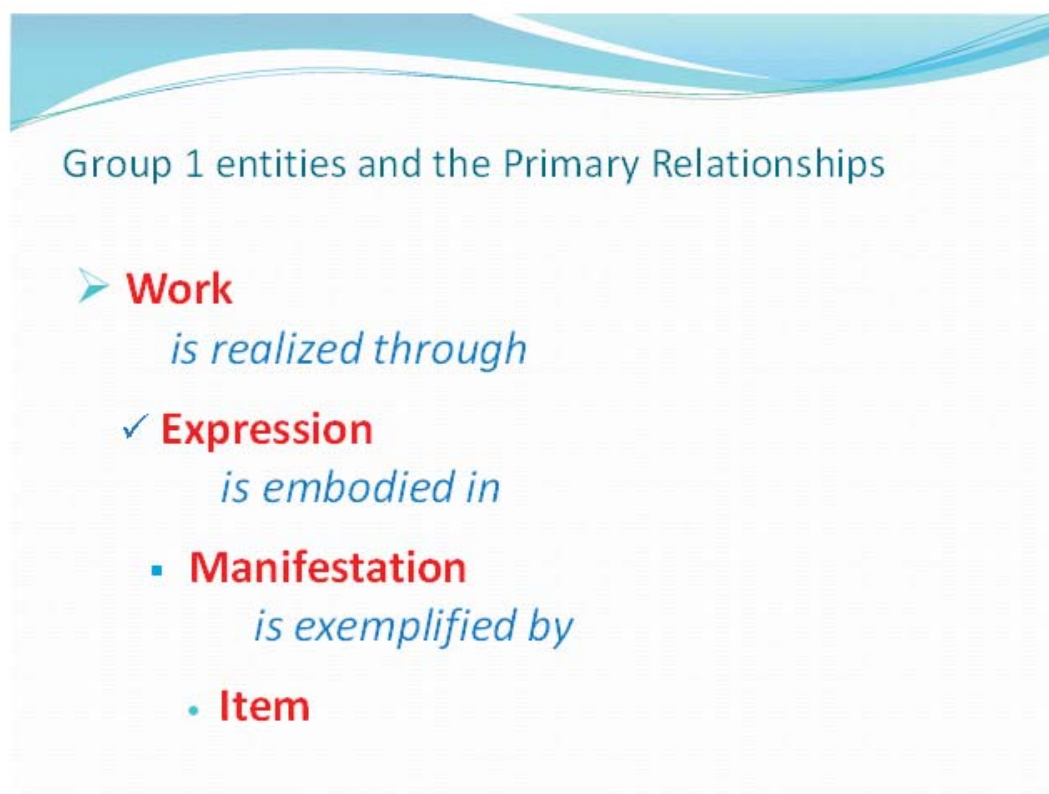
FRBR's conceptualization of *four bibliographic entities* stands at the core of its model. The official definitions of the Group 1 bibliographic entities (quoting from the IFLA document) are as follows:

- A *work* is "a distinct intellectual or artistic creation."
- An *expression* is "the intellectual or artistic realization of a *work* in the form of alpha-numeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such forms."
- A *manifestation* is "the physical embodiment of an *expression* of a *work*."
- An *item* is "a single exemplar of a *manifestation* ... a single physical object."

In the literature on FRBR, we see with increasing frequency the acronym WEMI, as shorthand for "*work, expression, manifestation, item.*"

The Group 1 entities (see above) can be thought of as existing between two poles: at one pole, we have the work, which is entirely abstract (think of it as a Platonic ideal). The work is the highest level of FRBR's bibliographic hierarchy. At the opposite pole, and the bottom of the hierarchy, is the item, which is entirely concrete.

Figure 1.

Group 1 entities and the Primary Relationships

➢ **Work**
is realized through

✓ **Expression**
is embodied in

▪ **Manifestation**
is exemplified by

• **Item**

As the FRBR document remarks, in section 3.2.1, "A work is an abstract entity; there is no single material object one can point to as the *work*." Think of a work as being, for example, the ideal form of a novel or a musical composition, as it came to exist in its creator's mind.

Then we can move one step down the hierarchy, from the work to its expressions (note the plural, for a work can have multiple expressions). An expression is the *realization* of a work, in any one of a number of possible forms: "alpha-numeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such forms. An *expression* is the specific intellectual or artistic form that a *work* takes each time it is 'realized.' *Expression* encompasses, for example, the specific words, sentences, paragraphs, etc. that result from the realization of a *work* in the form of a text, or the particular sounds, phrasing, etc. resulting from the realization of a musical *work*." (FRBR, Section 3.2.2)

This expression level is a major innovation of the FRBR model, and, like all innovations, requires some getting used to. The intent here is to enable us to speak more coherently about situations that we used to refer to by a number of sometimes ill-defined terms: "version," "edition," "printing," or "adaptation," for example. The concept of "expression" allows us to group entities together in a meaningful way, based on the fact that they all are *realizations*, in one way or another, of the same work. Probably the best way to convey the meaning of the term expression is to use it in the context of a specific example of FRBR's bibliographic hierarchy, in this case by applying it to Tolstoy's *War and Peace*.

Tolstoy's *War and Peace*

a. as a "Work"

At the level of the *work*, we should imagine *War and Peace* as the ideal form of the novel, i.e., as it existed in Tolstoy's mind — and since Tolstoy conceived it in Russian, it would be best to refer to it by its Russian title, *Voina y mir.*

b. as an "Expression"

One expression of this work (call it e^1) would be Tolstoy's own handwritten manuscript of his creation.

Another expression of Tolstoy's work (e^2) would be the English translation made by Constance Garnett in the 1890s; a third expression (e^3) would be the English translation made by Richard Pevear and Larissa Volokhonsky around 2007.

Each of these expressions can be "embodied" in any number of manifestations. The manifestation has an actual physical existence; think of it as the entire print run of a particular publication.

c. "Manifestations" of *War and Peace*

One of the manifestations of e^1, Tolstoy's manuscript, would be the first Russian publication of the complete novel, in Moscow in 1869 under the title Война и мир (*Voyna i mir*). We can call this m^1. e^2, the Constance Garnett translation, has a manifestation in the form of the publication issued by W. Heinemann in London in 1904; call this m^2. And e^3, the Pevear-Volokhonsky translation, has a manifestation in the form of the publication issued in 2007 by Alfred A. Knopf in New York; we'll call this m^3.

d. *War and Peace* at the level of "Item"

At the bottom of the hierarchy is the item, that is, an individual copy of a particular resource, something that in most cases can be held in one's hand, for example, a copy of m^1 held by Harvard University Library, or a copy of

m² held by the British Library.

ATTRIBUTES WITHIN THE **FRBR** HIERARCHY

Having defined the four bibliographic entities, FRBR goes on to list the attributes that each of these entities is capable of possessing. Any bibliographic entity can then be defined and described in terms of its attributes.

A work has some or all of these attributes (among others not listed here):
- Title of the work;
- Form of work (i.e., genre; the class to which the work belongs: novel, play, poem, concerto, map, etc.);
- Date of the work (date of its creation);
- Intended termination (finite? Or continuing on?);
- Intended audience;
- Medium of performance (i.e., for a musical work).

An expression has some or all of these attributes (among others):
- Title of the expression (may differ from the title of the work, i.e., in the case of translation into a new language);
- Form of the expression (e.g., alpha-numeric, musical notation, musical sound, photographic image, dance);
- Date of the expression;
- Language of the expression.

Here are some of the attributes of a manifestation (a manifestation is a set of physical objects, and its attributes correspond to the elements of our current bibliographic descriptions):

- Title of the manifestation, statement of responsibility;
- Edition statement;
- Place of publication, publisher, date of publication;
- Form of carrier (book, CD, DVD, microfilm);
- Extent of carrier (e.g., for a book, number of pages, height of book);
- Mode of capture (e.g., for a sound recording, analog or digital).

The attributes of an item can include:
- Item identifier (a number or code uniquely associated with the item, like a call number or bar code);
- Provenance (who are the current and previous owners of the item?);
- Physical condition of the item (undamaged? damaged in some specific way? brittle paper?);
- Restrictions on access (may it only be used by particular persons, or in a particular location?).

FRBR RELATIONSHIPS

Having dealt with bibliographic entities and attributes, FRBR moves on to the next step of its entity-relationship model by defining the relationships that can exist between any two bibliographic entities, as well as the relationships that can exist between a bibliographic entity (a Group 1 entity) and any Group 2 entity (a person or corporate body).

The *primary bibliographic relationships* are shown in Figure 1 above – I'll repeat them here for clarity:

> The relationship between a work and an expression – *Realized through.*

The relationship between an expression and a manifestation – *Embodied in.*
The relationship between a manifestation and an item – *Exemplified by.*

Then there are the "responsibility" relationships, the ones that link some Group 2 entity (a person or a corporate body) to a Group 1 entity (work, expression, manifestation, item).

Examples:
- *Created by (authorship)*
  Relationship between a person in the role of creator and the work he or she has created.
- *Realized by*
  Relationship between a person and an expression – think of stage designers, translators, performers of musical works.
- *Produced by*
  Relationship between a person or corporate body and a manifestation:
  for example, the relationship between a manifestation and a publishing house, or a manifestation and a sound recording label.
- *Owned by*
  Relationship between a person or corporate body and an item:
  for example, the relationship between a library and a copy of a book.

Let's try applying the FRBR model to our *War and Peace* example:

The author Leo Tolstoy is, in FRBR terms, a Group 2 entity, namely a person.

The person Leo Tolstoy *Has a relationship as creator to*
a Group 1 entity, a work (w^1): his novel *War and Peace*, in its abstract form as Tolstoy's own distinct intellectual creation.

w^1 has a number of expressions:
e^1 = Tolstoy's own manuscript of the novel
e^2 = The English translation made by Constance Garnett
e^3 = The English translation made by Pevear and Volokhonsky

A Group 2 entity, the person Constance Garnett *Has a relationship as translator to* e^2

The expressions we've listed have a number of manifestations:

m^1 = the first Russian publication of the complete novel, in Moscow in 1869 under the title Война и мир (*Voyna i mir*).
m^2 = Constance Garnett's English translation, as published by W. Heinemann in London in 1904.

W. Heinemann, the London publisher, is an example of a Group 2 entity, namely a corporate body. The corporate body W. Heinemann

Has a relationship as producer to m^2

At the item level,
i^1 = a copy of m^1 held by the Harvard University Library.

i² = a copy of **m²** held by the British Library.

The corporate body British Library
Has a relationship as owner to **i²**

The FRBR approach compared to our current MARC data environment

It is instructive to compare our present cataloging practice to the model envisioned by FRBR. Our current data model is based on a "flat" data structure, in which all pertinent information is collapsed into a single record. We are accustomed to cataloging at what FRBR would consider the "manifestation" level. That is, our bibliographic record, while based on an "item in hand," is a surrogate that stands in for any copy of a specific production (i.e., print run) of a publication. But in FRBR terms, we are conflating within a single record information that properly belongs to different entities . Data that pertain to the work, to the expression, and to the manifestation — all alike get "mashed-up" into a single record. One consequence of this is that many elements of bibliographic data are essentially being re-keyed *every single time they are needed*, rather than being keyed once and then used over and over again.

FRBR points us toward a "decentralized" or "distributed" data structure, based on the entities and relationships described above. A record can be created for each individual bibliographic (i.e., Group 1) entity that we need to deal with. Similarly, records can be created for each individual Group 2 entity, i.e., for persons and corporate bodies.[2] Each of the relationships identified in FRBR can be treated as a data element; it can be defined and assigned some kind of identifier, such as an ID number or a URL. The "relationship" data elements can then be used as links to connect pre-existing records for Group 1 or Group 2 entities. A computer can retrieve and assemble the needed entity records according to their proper relationships and display the result as a bibliographic record that can be interpreted by a human user.

Figure 2 is the existing MARC record for Pevear and Volkonsky's English translation of *War and Peace.* This MARC record is an example of a flat record structure. The record has been color-coded to show how data belonging to three different FRBR levels have been combined into a single record:

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[2]   It should be noted that there is already a huge storehouse of records for Group 2 entities in the form of the millions of authority records contained in the National Authority File.

Figure 2.

Author	Tolstoy, Leo, graf, 1828-1910.
Uniform Title	Voĭna i mir. English
Title	War and peace / Leo Tolstoy ; translated from the Russian by Richard Pevear and Larissa Volokhonsky.
Edition	1st ed.
Published	New York : Alfred A. Knopf, 2007.
Description	xviii, 1273 p. ; 25 cm.
Bibliography	Includes bibliographical references (p. [1223]-1247) and index.
Subjects	Russia -- History -- Alexander I, 1801-1825 -- Fiction.
	Napoleonic Wars, 1800-1815 -- Campaigns -- Russia -- Fiction.
Related Author	Pevear, Richard, 1943-
	Volokhonsky, Larissa.
ISBN	9780307266934

Information pertaining to the *Work* is in **red.**
Information pertaining to this *Expression* of Tolstoy's *work* is in **green.**
Information pertaining to this particular *Manifestation* of the *Expression* is in **blue.**

FRBR, on the other hand, envisions an "exploded record" environment: our conventional bibliographic records can be broken down into a set of separate data elements. The data elements that represent a particular entity are assembled into a record that represents that particular entity. The possible relationships between entities are also treated as data elements. To create a bibliographic record, the cataloger (or some other intelligent system) chooses a set of entity records and defines the relationships between these entities, such that a computer system can assemble all the various entity records into a display that users can read and interpret.

A record for a particular entity, whether from Group 1 or Group 2, can be assigned a persistent identifier. From then on, there is a stable one-to-one relationship between that entity and its identifier. The data elements within the entity record can be added to or revised as needed, but *the persistent identifier remains the same*. Any time a representation of that particular entity is needed, it can be retrieved by means of its persistent identifier and inserted into the appropriate position within a display.

Each entity record can be linked with others using a controlled set of relationships, each of which also has its own persistent identifier. In this way, each item in the bibliographic universe can be described by a unique combination of data elements and relationships.

Another Example from *War and Peace*

In Figure 3 below, each colored block represents a FRBR entity; the arrows represent the FRBR relationships that connect them. Each colored block would be a separate record; these records would be assembled on the basis of the relationships that link them. The result would be a display for the 1904 English edition of *War and Peace* published by William Heinemann, with its associated item record for the copy held by Harvard Library.
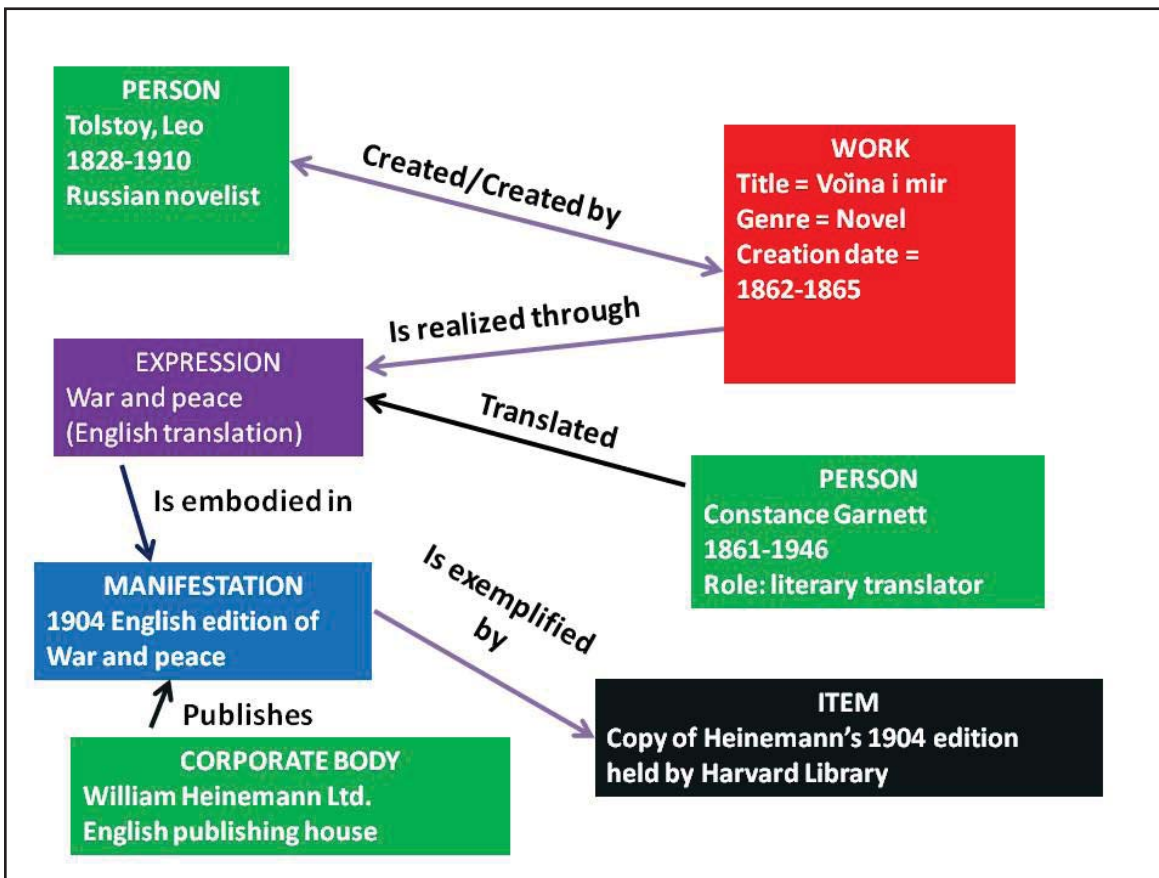

Figure 3.

FRBR thus has the potential to enable a migration of our vast storehouse of bibliographic data out to where it can be better accessed on the Internet, and where it can become a part of the Semantic Web. As things stand, so much of our library data is difficult to access because of the data formats we use (and which no one outside of libraries uses).

Once our bibliographic records are structured as data elements linked by defined relationships, it is much easier for a computer to interpret our data. As an example of the kind of computer manipulation the FRBR model would allow, take the following "Related work" situation:

Jane Austen published her novel *Pride and Prejudice,* in 1813. In 1995, the BBC issued a video version of the novel starring Colin Firth and Jennifer Ehle.

Our bibliographic record for the BBC video contains the note: "Based on the novel by Jane Austen." While this makes perfect sense to a human reader, it is useless to a computer. In the FRBR environment, we would have *Work record 1*, representing Jane Austen's novel, and *Work record 2* for the BBC video.

The two records could be connected by a link with a defined value:

HasAdaptation/IsAdaptationOf

Such a combination of entity records and links can be understood and used by a computer. Eventually – assuming that we have robust voice recognition software at our disposal – this model could allow patrons to pose requests to our catalogs in natural language.

For example, the patron states: "I'd like to see video versions of Pride and Prejudice by Jane Austen." The sound "Jane Austen" could be keyed to the author's person record. From the person record, the computer could follow the "Created" links to the work record for Pride and Prejudice, and thence to related works and their expressions in video format.

The case for FRBR

A question that naturally arises is "Why adopt the FRBR model?"

The hope of FRBR's creators is that this model will better serve the needs of the user, especially in helping the user more easily find and identify:

- works of prolific authors, and all their expressions;
- works that exist in many versions and/or formats (whether expressions or related works).

FRBR could lead to increased efficiency, by decreasing the re-keying of data: once an entity record is created, it could be stored in the cloud or some other location that catalogers around the world could easily access, and be used over and over again in any situation; there would be no more need to re-enter that data into newly created records.

There is an increased potential for international sharing of data, and systems could be created that are language-neutral as well: the data elements used for assembling entity records could contain a variety of language forms for the data being described. These language forms could be switched on or off as needed, depending on the particular language environment in which the entity record was being used. Then, when the data elements are assembled into an entity record, only the forms that are in the language of the user would display and the other language forms would remain hidden.

There is an increased potential for machine interpretation and manipulation of data: the FRBR model is more in tune with formats used by other metadata communities, is more in tune with the Web environment, and is better positioned to make better use of the coming Semantic Web.

The data elements used as the building blocks of entity records could be expressed as triples. The triple is the foundational structure of the Resource Description Framework (RDF) which underlies the Semantic Web; it is an expression consisting of subject, predicate, and object, where the subject is an entity, the predicate defines the attribute of the entity that is being described, and the object represents the value of the attribute.

Currently, our bibliographic records generally contain a physical description, in which the first text string expresses a number of pages:

194 p. : ill. ; 25 cm.

This can easily be interpreted by a human reader, but (as with the earlier example from Austen) means nothing to a computer. The page numbering could be expressed as a triple in a way that could be understood by a computer:

Subject = Entity = Manifestation A
Predicate = Attribute = Has Extent
Object = Value, consisting of a definition of the unit being used (pages) followed by a number (194)

FRBR has the capacity to make explicit a great deal of data that are currently "buried" in our bibliographic records, accessible to a human who carefully reads the record but inaccessible to the computer. This reaches far beyond the rather mundane page level example given above. FRBR can *make explicit* any role that a person or corporate body performs with regard to a work, expression, manifestation, or item. This is something that our current library software is unable to achieve. As Kevin Randall, Principal Serials Cataloger at Northwestern University, recently posted in an e-mail to the list OCLC-CAT (March 23, 2012), "The network of links goes far beyond what we currently have in our catalogs. Most of the links between the FRBR entities in our catalogs are implicit only, and the nature of them needs to be deduced by reading notes in the records. While the name 'Matt Damon' may be linked up between the authority record and several bib records, that link doesn't say whether Damon's responsibility is as actor, writer, or producer."[3] In a FRBR environment, the link between "Matt Damon" and any particular bibliographic record would explicitly state the nature of Damon's role with regard to that specific resource.

PART II: RDA (RESOURCE DESCRIPTION AND ANALYSIS)

RDA is the acronym for *Resource Description and Access,* the new cataloging code that has been developed over the past decade as a replacement for the Anglo-American Cataloguing Rules, 2nd edition (AACR2). The body responsible for its development is the Joint Steering Committee (JSC) for Development of RDA, earlier known as the Joint Steering Committee for the Anglo-American Cataloguing Rules.[4]

RDA is an attempt to build a cataloging code on the FRBR model, and as such departs completely from the structure used in AACR2, which was based on the International Standard Bibliographic Description (ISBD). Part 1 of AACR2, dealing with bibliographic description, was structured around the eight Areas of Description laid out in the ISBD, and was further organized according to eleven types of material (books, maps, music, sound recordings, etc.). Part 2 of AACR2, dealing with access points (headings), was based on the Statement of Principles that came out of the Paris Conference.

RDA, on the other hand, bases its structure on FRBR. First, it identifies all the entities concerned. Then, it specifies which attributes of those entities should be recorded, and instructs the cataloger how to record each of the chosen attributes. Finally, it defines the possible relationships between entities, and instructs the cataloger how to record these relationships.

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[3]　See the archives of the listserv OCLC-CAT, at http://listserv.oclc.org/archives/oclc-cat.html.
[4]　The JSC maintains an important website at http://www.rda-jsc.org/rda.html.

AN OVERVIEW OF RDA

Sections 1 through 4 of RDA instruct the cataloger on recording attributes of the FRBR entities.

Section 1 (chapters 1-4) gives instructions for recording the attributes of manifestations and items.

Section 2 (chapters 5-7) gives instructions for works and expressions.

Section 3 (chapters 8-11) deals with recording the attributes of persons, families, and corporate bodies.

Section 4 (chapters 12-16) deals with the Group 3 entities, the subject entities, for example, concepts, events, and places. It must be noted that Section 4 has yet to be written; it will be developed after the initial implementation of RDA.

Section 5 (chapter 17) gives instructions on recording Primary Relationships between works, expressions, manifestations, and items.

Section 6 (chapters 18-22) gives instructions on recording relationships to persons, families, and corporate bodies.

Section 7, consisting of chapter 23, will eventually give instructions for recording relationships to concepts, objects, events, and places, i.e., instructions for providing subject access. Like Section 4, this section has yet to be written.

Section 8 (chapters 24-28) gives instructions for recording relationships between works, expressions, manifestions, and items (that is, relationships beyond the primary ones treated in Section 5 – these are "related work" situations, etc.)

Section 9 (chapters 29-32) gives instructions for recording relationships between persons, families, and corporate bodies – this would include such situations as a writer who uses pseudonyms, or describing the relationship between a subordinate corporate body and its superior body.

Section 10 will consist of chapters 33-37 and will deal with recording relationships between concepts, objects, events, and places. Like Sections 4 and 7, this section has yet to be written.

Finding one's way around RDA becomes much easier once one understands the FRBR model. For example, the elements of our existing bibliographic descriptions, such as titles, statements of responsibilities, and publication information, are all attributes of a manifestation, and so the needed instructions will be found in Section 1, Recording Attributes of Manifestation & Item – specifically, in Chapter 2, Identifying Manifestations and Items.

The RDA Toolkit is an online electronic publication that contains the full text of RDA. It also includes several tools that are very helpful in guiding AACR2 catalogers to the relevant chapters of the new code. There is a search option that allows one to enter a rule number from AACR2, then be taken to the corresponding rule in RDA. Another helpful feature is found under the Tools tab: the RDA Mappings. Of these mappings, the most useful is probably the MARC Bibliographic to RDA Mapping. This map presents all the MARC tags and subfields in their usual order. One can click on a particular tag or subfield and be taken to the section of RDA that tells the cataloger how to deal with the data that is input into that location in MARC.

PART III: HOW RDA AND AACR2 DIFFER: SOME EXAMPLES

One major difference between RDA and AACR2 is that RDA deliberately avoids making any provisions as to how data should actually display – it is independent of any specific display standard. By contrast, AACR2 mandated a particular form of display that drew on the ISBD. This means that the rules of formal punctuation that are such a prominent feature of Part 1 of AACR2 are absent in RDA. RDA assumes that any decisions about how data should display will be made externally to itself, by individual cataloging agencies, national library institutes, or library software vendors. RDA treats each element of data in a record as a separate entity in its own right, and its rules make no statements as to the order or sequence in which these elements should be presented in a print or screen display. The ISBD is offered as one option among others for structuring a display, but it is relegated to an Appendix (Appendix D). I believe this decision was made in order to leave the way clear for innovations that are bound to occur in the realm of data recording and manipulation, so as to place as few barriers as possible in the way of new developments.

Inaccuracies that appear in the source itself, i.e., misspellings on a book's title page, will no longer be signaled through the use of [sic]. Instead, obvious errors are corrected, and a note is made giving the wording as it actually appears on the item (rule 2.3.1.4).

RDA dispenses with AACR2's General Material Designators (GMDs) – the bracketed phrases like [Sound recording] or [Electronic resource] that we are all familiar with. Instead, the cataloger is asked to record three separate data elements:

> *Content type* (such as text, performed music, spoken word, still image, etc.), see RDA 6.9.1.
> *Media type* (this essentially expresses whether or not some type of equipment is needed in order to access the resource, such as audio [player], video [player], computer, unmediated, etc.), see RDA 3.2.1.
> *Carrier type* (expresses the actual physical form of the resource, for example audio disc, microfilm reel, volume, etc.), see RDA 3.3.1.

It should be noted that Content type is an attribute of the expression, so it is treated at the expression level, in Chapter 6 (rule 6.9.1). Media type and Carrier type are both attributes of the manifestation, so they are treated in Chapter 3.

The decision to abandon AACR2's General Material Designators resulted, I believe, from a desire to stay true to the internal logic of the FRBR model. The problem with the General Material Designators, from the RDA point of view, is that they can't consistently be placed in a one-to-one relationship to a specific level of the FRBR bibliographic hierarchy: "sound recording," for example, may be intended to express content type, which is an attribute of the expression, but it can equally be intended to express the media or carrier types, which are attributes of the manifestation. In order to avoid the inevitable logical confusions, RDA opts to replace the GMDs with the more rigorously defined content, media, and carrier types.

One term that is bound to cause some initial consternation is "unmediated," in the list of media types. The media type terms are used to designate pieces of equipment needed to access a particular resource. The term "unmediated" is used if no equipment is required. Thus "unmediated" becomes the media type that RDA uses to describe a printed book:

Content type = text.
Media type = unmediated.
Carrier type = volume.

Presumably the developers of RDA hope that ultimately these data elements can be expressed through visual icons that users can easily understand. For the time being, three new MARC fields have been created for these data elements, which can be recorded either in the form of terms or codes. These are the MARC fields 336 (for Content type), 337 (for Media type), and 338 (for Carrier type).

The MARC record for a printed book will contain these fields:

336 Text.
337 Unmediated.
338 Volume.

The MARC record for a music CD will contain these fields:

336 Performed music.
337 Audio.
338 Audio disc.

RDA dispenses with abbreviations in the bibliographic description – it no longer uses "p." for "pages," "ill." for "illustrations," "S.l." for *sine loco*, etc. Instead, such information will be spelled out. Abbreviations were useful when catalogers were typing up cards, but in the computer environment, such space-saving conventions are no longer needed. Additionally, it was felt that spelling out words and dispensing with Latin abbreviations would be easier on our users, many of whom may not be familiar with the meaning of such abbreviations as "s.n." or "*et al.*"

For physical descriptions of books, instead of the present

350 p. : ill., ports. ; 25 cm.

we will see:

350 pages : illustrations, portraits ; 25 cm.

("cm" is considered to be the symbol for "centimeter" and not an abbreviation, so its use has been retained.)

S.l. (*sine loco*) will be replaced by *Place of publication not identified*; similarly, s.n. (*sine nomine*) will be replaced by *Publisher not identified*.

The AACR2 term "uniform title" has been replaced by the term "preferred title," although the instructions on how to formulate a preferred title are essentially the same as those for uniform titles found in Chapter 25 of AACR2.

One change in RDA will be of particular note to theological librarians, and that is the formulation of preferred titles for the books of the Bible. The abbreviations O.T. and N.T. will disappear. If the item being cataloged is an edition of the entire Old Testament, its preferred title is "Bible. Old Testament." Similarly, for editions of the entire New Testament, the preferred title "Bible. New Testament" is used.

Individual books of the Bible will have preferred titles consisting of the word Bible followed directly by the brief citation form used in the Authorized Version (i.e., the King James Version), for example:

> Bible. Genesis.
> Bible. Matthew.[5]

Adopting RDA will entail a very significant amount of database maintenance, and that is particularly the case in catalogs that contain many Bible headings.

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[5]   The rule in question is RDA 6.23.2.9.2.

Part IV: The Challenges of Migrating to RDA

The development of RDA was accompanied by a considerable amount of debate and controversy. Many questioned whether RDA was needed – couldn't we make do with a new edition of AACR, i.e., AACR3? In the United States, the Library of Congress played a major role in organizing working groups and conferences to study the question. Under the leadership of the three national libraries (Library of Congress, the National Library of Medicine, and the National Agricultural Library), it was decided to conduct a test of RDA, and the U.S. RDA Test Coordinating Committee was appointed to oversee the process. A representative group of libraries, made up of libraries of various types and sizes, was chosen for the test, and catalogers at these institutions were trained in RDA. A common set of resources was cataloged by all the cataloging departments in the test group, and the results were compared. Additionally, each cataloging department chose a group of resources on its own and created RDA records for these resources. The test began in July of 2010 and lasted until the end of March 2011.[6]

After reviewing the test results, the Coordinating Committee issued its recommendation on May 9, 2011. The Committee was in favor of implementing RDA, under a set of clearly defined conditions. Of those conditions, the two most important were

- Reword the RDA instructions in clear, unambiguous, plain English. Work on this objective began with the hiring of Chris Cole to be Copy Editor for RDA. She is expected to present several rewritten chapters in the course of 2012.

- Demonstrate credible progress towards a replacement for MARC (i.e., a new data format tailored for the recording of the data elements and relationships defined by RDA). The timeframe for "demonstrating credible progress" – not, it should be noted, for actually introducing a new format – is a year-and-a-half to two years. Work on a new data format is currently underway at the Library of Congress.

On the assumption that its conditions will be met, the Committee later announced a date for the implementation of RDA: March 31, 2013.

Controversy remains, however. The biggest concern is the increased cost likely to be associated with RDA. RDA is designed to be an electronic publication, accessed via the Internet and subject to a regular schedule of updating. Its pricing model thus resembles that of online databases: libraries are asked to pay an annual subscription, plus an additional fee based on the number of users. Currently, an annual subscription costs $325.00 per year – this allows for a single user. There is an additional annual fee of $55.00 for each added concurrent user, up to nine concurrent users. Above nine concurrent users, the annual fee per user begins to drop in small increments. As an example, a set-up allowing for three concurrent users would cost $435.00 per year (base price of $325.00 plus two times $55.00). RDA is available in print as well as online – the print version is currently on sale from ALA Publications for $150.00. Users of the print version, however, will miss out on the updates that are scheduled to be added to the RDA Toolkit on a regular basis, as well as the hypertext capacity and the cataloging tools that the Toolkit contains.

There is a distinct fear that the introduction of RDA will divide the library community into RDA haves and have-nots. In our current economic hard times, budgets are stretched so thin at many libraries, particularly small public libraries, that the money for an ongoing subscription to RDA is simply not available. The likelihood is that libraries that can't afford RDA will continue to catalog using AACR2.

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[6]   The Library of Congress has an informative website on all matters pertaining to RDA at http://www.loc.gov/aba/rda/.

There is also the question of loss in staff time and productivity while RDA training is taking place. It's not yet clear how much time most catalogers will need for re-training, but again, small libraries, especially those where only one person is trained as a cataloger, will probably feel the heaviest impact. Some librarians state that they can't envision at this point how they will find time in their busy schedules for re-training.

The biggest unanswered question involves a new data format that can replace MARC, along with the development of new library software. It is clear that RDA will not achieve its real potential until we have a data format tailored to recording data elements in a much more granular way, along with library software that really supports the linking of records to each other via links that express the relationships RDA recognizes. Even if we are successful in developing a new data format, we will still be dependent on our library software vendors for software that can utilize the new format. And where will the money come from for the development of new software and a new data format? The future is unsettled, to say the least.

It is clear that the national libraries will be issuing their cataloging in RDA beginning in 2013, and if past history is our guide, once they start to do so, the rest of us will sooner or later follow suit. In the near term, RDA records will be created using the familiar MARC format. These MARC RDA records will show only a few obvious differences from AACR2 records for the same resources, and those differences will be more of a cosmetic nature.

Here are two sample records, input into OCLC last year by the University of Chicago, one of the participants in the national test of RDA.

- 245 00 Between the cultures : $b the central Tigris region from the 3rd to the 1st millennium BC : conference at Heidelberg, January 22nd - 24th, 2009 / $c edited by Peter A. Miglus & Simone Mühl.
- 260 __ Heidelberg : $b Heidelberger Orientverlag, $c 2011, ©2011.
- 300 __ vi, 464 pages, xl pages of plates : $b illustrations (some color), maps ; $c 30 cm.
- 336 __ text $2 rdacontent
- 337 __ unmediated $2 rdamedia
- 338 __ volume $2 rdacarrier
- 490 1_ Heidelberger Studien zum alten Orient ; $v Band 14
- 504 Includes bibliographical references.
- 651 _0 Iraq $x Antiquities $v Congresses.
- 650 _0 Excavations (Archaeology) $z Iraq $v Congresses.
- 700 1_ Miglus, Peter A.
- 700 1_ Mühl, Simone.
- 830 _0 Heidelberger Studien zum alten Orient ; $v Bd. 14.

Record 1

Record 1 is for a printed book, which is now signaled by the terms found in MARC tags 336, 337, and 338: *text, unmediated,* and *volume*. The only other differences vis-à-vis AACR2 are

- The treatment of the date of publication (MARC tag 260): RDA calls for two separate data elements, one for the year of publication, if known, and the second for the date of copyright.

- The spelled-out terms in the physical description (MARC tag 300): pages, illustrations, color.

- 245 00 Medical education development.
- 260 __ [Pavia] : $b PAGEPress $c [2011]-
- 336 __ text $2 rdacontent
- 337 __ computer $2 rdamedia
- 338 __ online resource $2 rdacarrier
- 362 1_ Began with vol. 1, no. 1 (2011).
- 515 __ Papers published as accepted.
- 588 __ Description based on: Vol. 1, no. 1 (2011); title from journal home page.
- 588 __ Latest issue consulted: Vol. 1, no. 1 (2011).
- 650 _0 Medical education $v Periodicals.
- 650 _0 Medicine $x Study and teaching $v Periodicals.

Record 2

Record 2 is a record for an online journal, an electronic publication that is regularly updated. The designator [electronic resource] is missing from the 245 tag, and that information is instead conveyed by the terms in MARC tags 336, 337, and 338: content type is *text*; media type is *computer*; and carrier type is *online resource*.

CONCLUSION

Creating RDA records in our current MARC format calls for a few, fairly small adjustments on the part of the cataloger. The full potential of RDA can only be realized once we have library software that allows for linking records on a scale we have never experienced to date. Is the disruption to our current way of doing things worth the possible benefit? If all goes well – if RDA is widely used, if a robust new data format is developed, if new library software becomes available at a price we can afford – the potential benefit is real: library collections could become truly open to the World Wide Web, and libraries could become a far more significant presence in the online environment. But there are still many "if's" to be dealt with.