Understanding FRBR As a Conceptual Model

FRBR and the Bibliographic Universe

By Allyson Carlyle

Functional Requirements for Bibliographic Records *(FRBR) presents a complex conceptual model. Because of this, it is not easy for everyone to understand. The purpose of this paper is to make some of the more difficult aspects of the FRBR model, in particular the Group 1 entities* work, expression, manifestation, *and* item, *easier to understand by placing FRBR in the context of what it is: a conceptual entity-relationship model. To this end, a definition of the term "model" is presented, a variety of types and functions of models are introduced, conceptual models are discussed in detail, modeling an abstraction is explained, and different ways of interpreting FRBR are suggested. Various models used in the history of cataloging are introduced to place FRBR in the context of the historical development of document models.*

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It is the outcome of six years of teaching the FRBR model, answering student questions about it, reading student papers about it, and explaining it to inquisitive faculty who return from conferences at which it was mentioned. My thanks to the students, faculty, and friends who helped me clarify the issues presented in this paper. I also wish to acknowledge the contributions of Tom Delsey, Patrick LeBoeuf, Elaine Svenonius, Barbara Tillett, and the members of the IFLA Working Group on Harmonization of FRBR/CIDOC CRM to my thinking about FRBR and models. My thanks also to Peggy Johnson and the anonymous reviewers for their helpful comments and suggestions.

FRBR, *Functional Requirements for Bibliographic Records,* presents a complex conceptual model that is not easy for everyone to understand.[1] One reason people have difficulty understanding the FRBR conceptual model is that they have difficulty understanding the nature of models, in particular, conceptual models. In this paper, FRBR's status as a model is examined in detail to explicate more fully what it is, what it is not, and what it attempts to do. Various definitions of the word "model" are presented, followed by a variety of examples of model types and functions. Because FRBR is a conceptual model of abstract entities, a discussion of modeling abstractions also is presented. The focus of the discussion throughout this paper is the Group 1 entities: *work*, *expression*, *manifestation*, and *item.* Several strategies are presented to clarify the more difficult abstract entities in FRBR: *work* and *expression.* Because FRBR is the most recent of a series of conceptual models used in library cataloging, models used prior to FRBR are described and compared to FRBR. Finally, various challenges surrounding the adoption of FRBR are discussed, for example, drawing the line between such abstractions as *work* and *expression.*

Models

FRBR is a conceptual model, but what does that mean? Models are used everywhere, from civil engineering to life-and-death situations in hospitals to playtime in the backyard. Because models are used in so many contexts, encountering many different meanings of the word "model" in the dictionary is not surprising.

The four definitions below illustrate the range of meanings for "model":

- A representation of something (sometimes on a smaller scale).[2]
- A schematic description of a system, theory, or phenomenon that accounts for its known or inferred properties and may be used for further study of its characteristics: a model of generative grammar; a model of an atom; an economic model.[3]
- A simplified description of a complex entity or process.[4]
- A preliminary work or construction that serves as a plan from which a final product is to be made: a clay model ready for casting.[5]

Models are extremely useful, particularly in library and information science (LIS), a discipline that has at its core an abstraction—"information." Bates states, "Models are most useful at the description and prediction stages of understanding a phenomenon."[6] Documents are the central phenomena of LIS in general, and cataloging in particular. Despite several centuries of practice, the profession is still beginning to understand what it means, or perhaps can mean, to catalog a document.

In essence, FRBR is a model of a model, if one considers that a bibliographic record is a representation of a document and so, in its own way, is as much a model as FRBR. If one considers a title page or other chief source of information to be a representation of a document as well, and thus a model in its own right, FRBR is a model of a model of a model of a document. In the list of definitions above, the first and third fit FRBR most closely. FRBR is a representation and simplified description of the bibliographic universe.

As noted in the definitions, models come in different types, which are used in a variety of environments, among them scale models (used in architecture), representational models (used in engineering), mathematical models (used in many of the sciences), and conceptual models (used in database design and cataloging). These types of models serve specific types of purpose. For example, models may be used to predict behavior, events, or other phenomena; test theories; produce technologies or artifacts; demonstrate a potential finished project; and improve products, processes, or technologies. FRBR is a conceptual model with the primary purpose of improving cataloging records (a product), cataloging (a process), and catalogs (a technology).

Conceptual Models

Conceptual models (in the systems world, these are sometimes called abstract models) are theoretical models. Mäki, exploring the nature of models in an article for the *International Encyclopedia of the Social & Behavioral Sciences,* describes theoretical models as "simplified systems or structures . . . [which are] imagined or described but not literally built."[7] One of Mäki's comments helps to make the nature of FRBR clearer. He states that a theoretical model "often assumes away many complications while highlighting limited aspects of the object."[8] This statement describes a major strength of conceptual models, which is that they facilitate understanding and manipulation of complex entities by rendering them *less* complex. This is also a potential weakness, if critical aspects of what is modeled are somehow assumed away.

Conceptual Models of Love and Work

Conceptual models can model things, processes, or abstractions—in other words, they can model almost anything. Of all of the things that a model can model, abstractions may be the most difficult. One reason is that the act of modeling, particularly the type of modeling that the creators of FRBR used, is often an attempt to make something that is abstract into something that is, at least in some senses, concrete. That is, it is an attempt to make the presence of an abstraction knowable by identifying the things that point to its existence.

To give an example outside of cataloging, imagine trying to model something like love. Love is an abstraction, but it is something we all know and can recognize. Exactly how do we do that? To make a model of love that can be used in research or in some other kind of rationalized practice or process, we operationalize it. Operationalizing makes it possible to observe, count, or verify something such as love. However, operationalizing something very abstract, such as love, is not only difficult, it can cross the line into the comical. For instance, because we cannot see love, we have to identify things that are observable to indicate the presence or existence of love. Thus, one could operationalize the presence of love between two people by counting the number of times they kiss each other and the amount of time they spend with each other, or observing whether they live together, and so on. Doubtless, these actions are easy enough to verify, but no matter how many of them we come up with, any model of love gives a rather sorry representation of the real thing.

The FRBR Group 1 entities *work* and *expression* are abstractions that have a lot in common with love. How do we count or point to evidence of "a distinct intellectual or artistic creation?"[9] To use the FRBR entities *work* and *expression,* we have to find ways to make them identifiable. Fortunately, we have two acceptable types of evidence to verify the existence of *work* and *expression:* first, what documents say about themselves and what others say about

them; and second, what people say when they want to find a document. A document may say about itself, "Translated from Amy Tan's *Joy Luck Club* into Spanish by Jordi Fibla" or "*Rudden and Wyatt's EU Treaties and Legislation*, edited by Derrick Wyatt, 8th edition; revision of *Basic Community Laws*, edited by Bernard Rudden and Derrick Wyatt, 7th edition." These are statements found on title pages that identify expressions. A library user may ask a question like "Do you have Seamus Heaney's translation of *Beowulf*?" (a request for an *expression*) or "Do you have Stephen Hawking's *A Brief History of Time*?" (a request for a *work*). Upon further questioning, many such users do not have a particular item or even a particular manifestation in mind. What they are interested in are abstractions—the content, either at the *expression* or the *work* level (not as published by a particular publisher on a particular date or on a particular item signed by an author or translator).

If library users did not ask such questions or initiate such searches, cataloging models including such abstractions as *work* and *expression* would not be needed. If they were not needed, they would never have been created by the cataloging community, regardless of statements made in items. We care about connecting users with the materials they seek. To do this well, we need the catalog to identify such abstractions as *work* and *expression*.

In our profession, we find a variety of troublesome abstractions. Consider, for example, the notions of "information" or "document"—many have tried to define and model these abstractions. However, the LIS community has yet to reach consensus as to what these words mean, or to agree on a particular model of them. To quote a familiar example, is an antelope a document? Under what circumstances might it be a document, if it could be one? LIS students often laugh when they read Briet's 1951 assertion that an antelope, under specific circumstances, is a document.[10] However, Briet's claim that an antelope is a document, and the circumstances under which it is or is not a document, is a serious attempt to make the notion of document more concrete—in other words, to model the notion of "document." It offers an example of the type of evidence needed to decide when one has a document and when one does not.

Entity-Relationship Models

To make matters more complicated, FRBR is a very specific type of conceptual model—an entity-relationship (ER) model. ER modeling is a technique that specifies the structure of a conceptual model. In other words, it specifies the kind of things that have to be in it and the properties those things may have. A simplified explanation of the structure stipulated by an ER model is that three kinds of things are allowed in it: *entities, attributes,* and *relationships. Entities* are things, either physical or abstract. Thus, an entity can be virtually anything: *relationships* are interactions among entities; and *attributes* are properties or characteristics of either entities or relationships. For example, one of the simpler FRBR entities is "object," which is defined as "a material thing."[11] Objects have attributes such as "term"; thus, Seattle's most conspicuous architectural object has the term attribute "Space Needle." In the bibliographic universe, objects frequently have an aboutness relationship with works, so the work *The Space Needle: Symbol of Seattle* is about the Space Needle.

Chen introduced ER modeling as a technique to facilitate the development of database systems.[12] Creating a good database is difficult, and good conceptual modeling of the world that the database system is intended to capture can help make a more successful system. In general, the better the conceptual modeling, the more successful the system.

Because ER models are created for specific purposes and have a specific structure, they include only those aspects of the world that are relevant to their purpose. As a result, ER models tend to highlight limited aspects of what they are modeling. Thus, an ER model is not a complete picture of the world but a picture that is drawn to accomplish a purpose. One ramification of this fact is that limitless ER models could be created to represent the same thing.

Evaluating Conceptual Models

Many people want to evaluate a conceptual model such as FRBR using true or false criteria. While one can say that a model is true to the extent that it explains accurately and false to the extent that it does not, this is not a very helpful way to look at models. A much more useful way to evaluate models is to ask whether they are successful at fulfilling their purpose. When the purpose of a model is to improve a product or process, the best way to make an evaluation of that model is to see whether it succeeds or not. From this perspective, a model that contains many inaccuracies could do a better job than one with few, because it is more successful at fulfilling its purpose. For example, some conceptual models are very complex—so complex that they are difficult for people to understand and implement. A complex model could fail quite easily if, because it was too complex, it was never used.

Another way to look at evaluating models is to consider love again. If one were to model love, how would one do it? In ER modeling terms, love could be modeled as a single entity, encompassing all different types of love, or it could be modeled as multiple entities (parental love, brotherly love, and so on). The choice to make love one or more than one entity should relate to purpose—what end is a particular model of love trying to serve? Saying that an ER model of love that treats it as one entity is true and one that treats it

as multiple entities is false, or vice versa, makes little sense. The point is, does the model do its job well or not?

The developers of FRBR clearly state their goal: "The aim of the study was to produce a framework that would provide a clear, precisely stated, and commonly shared understanding of what it is that the bibliographic record aims to provide information about."[13] Thus, one of the main purposes of FRBR, in addition to creating better catalogs and cataloging records, is to promote a commonly shared understanding—a much desired goal in a bibliographic universe made increasing complex by new and varied material types, user requirements, and information systems.

FRBR is an exciting model with great potential. It has taken the cataloging world by storm and may be the most far-reaching development in cataloging for many, many years. However, we do not know if it will meet its goals. If its success is limited, one of the reasons could be the *expression* entity, which can be difficult for people to understand. If this lack of understanding were widespread and persisted through implementations of FRBR and the cataloging rules, one could consider that part of the model as not successful. If that happened, it would not mean that the FRBR model was wrong or false, but only that part of it failed to perform the task it was intended to perform.

Another characteristic of conceptual models is that different models of the same phenomenon could all be successful (or not). A good example of multiple models of the same thing are FRBR and Interoperability of Data in E-commerce Systems (INDECS), which both model the bibliographic universe.[14] While INDECS looks a lot like FRBR, it is not the same, even though it describes the same phenomenon. INDECS was created to respond to needs in the intellectual property rights management community and, because it has a different purpose, much of it is different from FRBR. Saying that one is a better or more true model of the bibliographic universe than the other is not helpful. Each may serve its respective community well and, as such, be an equally good model of the same universe.

Other Cataloging Models

One of the clearest ways to understand the Group 1 entities model in FRBR is to look at it in the context of other models that have been used in the history of cataloging. A review of historical trends suggests that the cataloging community's view of the object of its work—the document—has become increasingly complex. Perhaps that is not unexpected, given the availability of increasingly varied document types and the increased complexity of our retrieval environments. Although this discussion is framed historically, the progression presented is not strictly chronological. Current catalogs could be found that exemplify each of the models described here; some early catalogs—for example, Panizzi's catalog of the British Museum—exemplify the more complex models.[15]

One-Entity Model

Many early library catalogs were inventories, simple lists of items owned by a particular library. The model being used in any document inventory is a "one-entity model," in that the only entity recognized is "item" or "copy." Rare book or manuscript catalogs are one-entity catalogs when the only entity being described is a single physical document.

Two-Entity Model

As library collections grew, and libraries collected multiple editions of a work more often, catalogs began to function as retrieval systems as well as inventories. Cataloging records in these catalogs represented editions as well as copies. Looking at these cataloging records now, one can see the distinction between edition (analogous to manifestation) and copy (item) quite clearly. In figure 1, a partial result from an author search on "Shakespeare, William" in a typical online catalog is presented. Assuming that the selection of any title presented would result in a record in which call numbers for a copies are presented, this catalog display represents a two-entity model: edition and copy. Any catalog that does not use uniform titles as filing titles, which collocate manifestations representing a work, would exemplify this model.

Three-Entity Model

In 1936, Pettee proposed that catalogers formally recognize and identify in the catalog an entity she called "literary unit," which is more or less equivalent to what we now call *work*.[16] This view was promoted by many catalogers, including Lubetzky, who was instrumental in incorporating works into the objectives of the catalog presented in the 1961 Paris Principles.[17] Although Pettee was, perhaps, the first person to explicitly define and write about *works,* library catalogs had been implicitly identifying *works* for a very long time via cataloging and filing rules, and the resulting record arrangements.[18]

Any library catalog using uniform titles consistently as filing titles is a catalog that exemplifies a three-entity model: copy, edition, and *work*. The three-entity model is currently supported, although not required, in the *Anglo-American Cataloguing Rules,* 2nd ed. (*AACR2*).[19] Chapter 25, providing rules for use of uniform title, contains rules that are applied optionally. In figure 2, the same partial results for an online catalog author search on "Shakespeare, William" are presented. This catalog display collocates editions of Shakespeare's works by using uniform title, then subar-

Partial result of "Shakespeare, William" author search, results organized by title proper
Falstaff: comedy in three acts
First part of Henry the fourth
First part of the history of Henry IV / edited by M. A. Shaaber.
First-second part of the history of Henry IV
Hamlet
Henry IV part I and Henry IV part II
Henry IV. Part one. / William Shakespeare; edited by David Bevington …
Henry the Fifth: a historical play in five acts
Henry the Fourth. Part I / general introduction by David G. Pitt.
Henry the Fourth, Part I / edited by David Bevington
History of King Henry the Fourth, part I
Julius Caesar
King Henry IV
King Henry the Eighth
King Henry the Fourth Part I
Most excellent and lamentable tragedy of Romeo and Juliet
Second part of Henry the Fourth
Second part of Henry the Sixth
Second part of the history of Henry IV
Second part of King Henry the sixth
Shakespeare's Hamlet, the second quarto, 1604
Shakespeare's second part of King Henry IV
Shakespeare's Tragedy of Hamlet

Figure 1. Two-entity model

ranges each work by title proper (representing manifestations). Copy information is again presumed to be available in single-record displays. Notice that multiple expressions are present in the display, but they are not collocated; see the two manifestations of an expression of King Henry IV, Part I, edited by David Bevington. The lack of collocation indicates that the expression entity is not recognized. In library catalogs, at least at present, collocation of editions or manifestations is what identifies the work and expression entities.

Four-Entity Model

Wilson attributes the identification of an entity he calls "text" to a 1959 article in *Libri* by Verona.[20] Texts are, according to Wilson, "[a collection of] certain words into a certain order."[21] Wilson's definition of text is similar to the FRBR conception of "expression," although much more limited, Wilson's definition excludes many nonbook materials. Even though Verona identified the "text" entity explicitly in 1959 and Wilson emphasized the importance of this entity, it has never been incorporated into a set of cataloging rules. However, the text entity is recognized in current rules in a limited way for religious texts.[22] Note that the AACR2 conception of this entity is more narrowly interpreted than the text entity or the FRBR expression entity.

In figure 3, the example from the previous two figures has been configured to illustrate a four-entity model. In this figure, identical expressions are displayed on a single line in a level one display. Thus, thirteen separate entries for Henry IV have been reduced to six. One of the great advantages of FRBR-based displays is that long displays may be made much shorter, enhancing the intelligibility and browsability of results. Note that parts have been displayed here as separate expressions, although the display could be shortened further by collapsing all editions of part one together, or by combining the parts with the whole.

In summary, while FRBR looks very new and unfamiliar, it is the culmination of cataloging models used throughout cataloging history. What *is* new and different about FRBR is the following:

- it explicitly identifies and defines four entities;
- it recognizes four entities simultaneously; and
- it presents a cataloging model using an ER modeling technique.

Viewing Group 1 Entities As Sets

Another way to clarify the definitions of the Group 1 entities is to present them as sets. In the early stages of FRBR's creation, Svenonius, a member of the IFLA Study Group on FRBR, suggested using set theory to model the bibliographic universe, a suggestion she reiterated in *The Intellectual Foundation of Information Organization*.[23] Although the study group eventually chose the ER modeling technique, viewing the FRBR Group 1 entities as sets is also possible. One of the great advantages of sets is that they facilitate the conversion of such abstractions as work and expression into physically identifiable (or imaginable) units. The easiest entity to understand is the item entity, because it is physically identifiable. But, if we imagine manifestation, expression, and work as sets of items, they become observable as groups of items in our imaginations.

In figure 4, two related works are represented at the top of the chart. These two works may be viewed as sets of the items represented at the bottom of the chart. The two works are Charles Dickens' *A Christmas Carol,* illustrated in an ER model view in figure 5, and a work that is derived from it, the movie *A Christmas Carol,* starring Alastair Sim. This division between the two as separate works reflects current cataloging rules, which consider a film version of a text to be a modification of content reflecting a change in responsibility and, thus, a new work. The film shares a derivative relationship with the text; in a catalog implementing FRBR, the derivative relationship between these two works would be made explicit. On the next level down are sample expressions of each of the two works. The textual version is embodied in three expressions: two English language versions (each with a different illustrator) and a Braille version. The film version is embodied in two expressions: one a black-and-white version dubbed into Spanish, and the other the original, black-and-white version.

At the bottom of figure 4 are items. On the left, five items comprise the Stewart, Tabori, and Chang manifestation of Dickens' work, and three items comprise the Creative Education manifestation. These two manifestations of Dickens' work share the same alphanumeric string and the same illustrations, and so together may be seen as comprising a unique English-language expression of Dickens' work. This expression is, thus, represented by a total of eight items. Adding together the items representing this expression, the Braille expression shown on the right and the English version with C. E. Brock's illustrations shown on the left, the Charles Dickens' work *A Christmas Carol* is represented as comprising fourteen items total.

Partial result of "Shakespeare, William" author search, results organized by uniform title / title proper (when title proper is the uniform title), then by title proper (title proper in brackets)
Falstaff: comedy in three acts
Hamlet
Hamlet [Shakespeare's Hamlet, the second quarto, 1604]
Hamlet [Shakespeare's Tragedy of Hamlet]
Julius Caesar
King Henry IV
King Henry IV [First part of Henry the fourth]
King Henry IV [First part of the history of Henry IV / edited by M. A. Shaaber.]
King Henry IV [First-second part of the history of Henry IV]
King Henry IV [Henry IV part I and Henry IV part II]
King Henry IV [Henry the Fourth, Part I / [edited by] David Bevington.]
King Henry IV [Henry the Fourth. Part I / general introduction by David G. Pitt.]
King Henry IV [Henry IV. Part one. / William Shakespeare; edited by David Bevington and …
King Henry IV [History of King Henry the Fourth, part I]
King Henry IV [King Henry the Fourth Part I]
King Henry IV [Second part of Henry the Fourth]
King Henry IV [Second part of the history of Henry IV]
King Henry IV [Shakespeare's second part of King Henry IV]
King Henry V [Henry the Fifth: a historical play in five acts]
King Henry VI [Second part of Henry the Sixth]
King Henry VI [Second part of King Henry the sixth
King Henry VIII [King Henry the Eighth]
Romeo and Juliet [Most excellent and lamentable tragedy of Romeo and Juliet]

Figure 2. Three-entity model

No. of records	Partial result of "Shakespeare, William" author search, results organized by uniform title / expression attribute
1	Falstaff: comedy in three acts
3	Hamlet
1	Hamlet [Shakespeare's Hamlet, the second quarto, 1604]
1	Julius Caesar
3	King Henry IV
3	King Henry IV Part 1.
1	King Henry IV. Part 1. [edited by David Bevington.]
2	King Henry IV. Part 1. [edited by M.A. Shaaber.]
1	King Henry IV. Part 1. [general introduction by David G. Pitt.]
3	King Henry IV. Part 2.
1	King Henry V
2	King Henry VI. Part 2.
1	King Henry VIII
1	Romeo and Juliet

Figure 3. Four-entity model

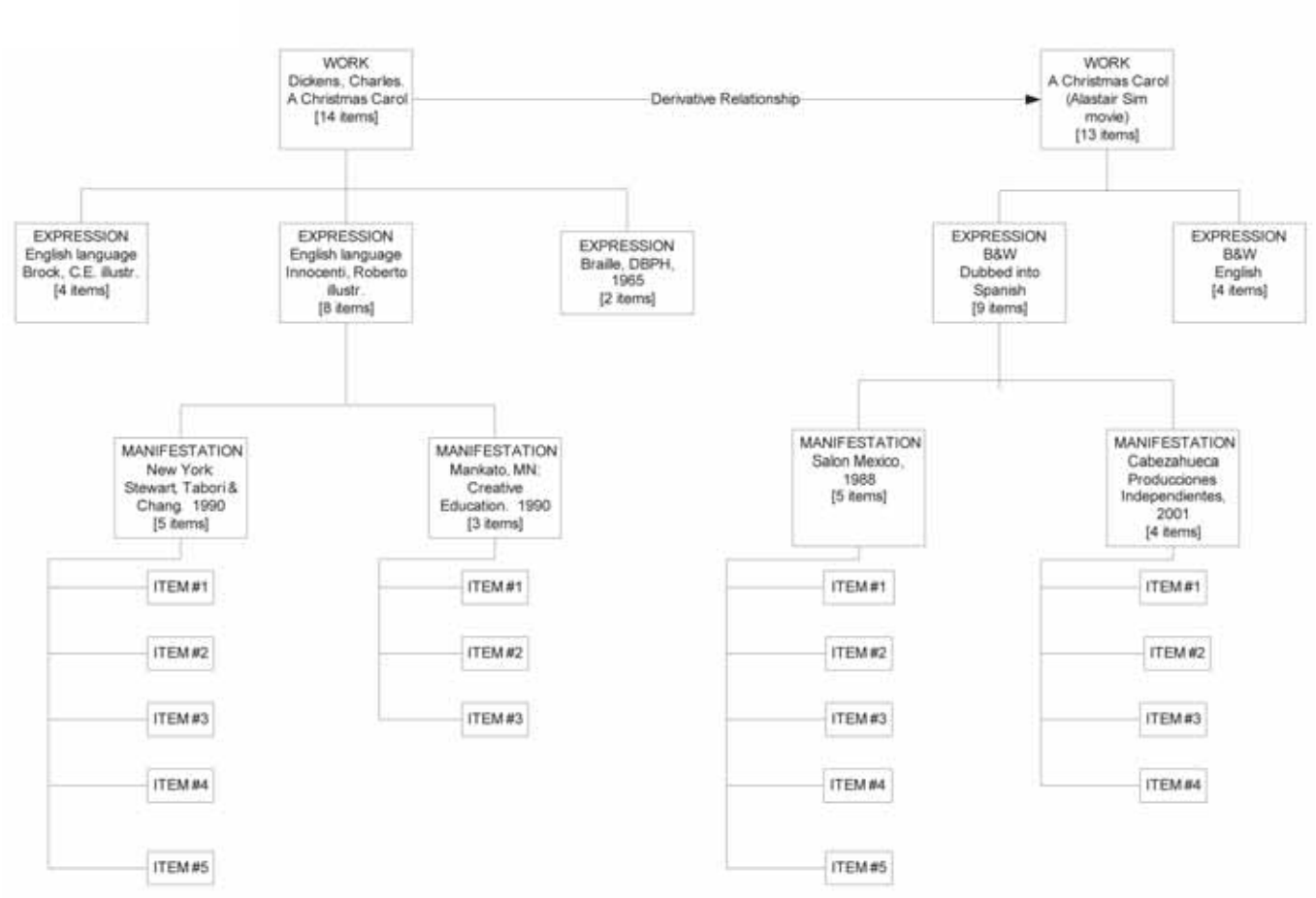

Figure 4. FRBR Group 1 entities viewed as sets of items

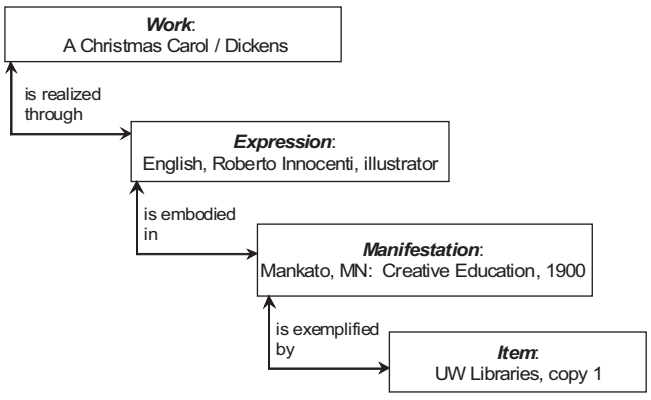

Figure 5. ER Model view of figure 4

In reality, Dickens' work is represented by a great many more items, manifestations, and expressions. The film version illustrated here is comprised of thirteen items total. A possible online catalog view of these works is presented in figure 6.

Process Model or Existential Model?

The Group 1 entities are often described as being created from a process that begins with the work entity and then moves to the other entities. The argument for this view begins with work as an idea in a creator's head, which is then expressed in some kind of symbols, published as a manifestation, and, finally, produced as individual items. However, this interpretation of the model may be dangerous, in part because cataloging something that happens before an item is produced is not possible. Another way to approach FRBR is as an

A Christmas Carol / Charles Dickens [14 copies]		WORK 1
1	English: C.E. Brock, illustrator [4 copies]	Expression 1
2	English: Roberto Innocenti, illustrator [8 copies]	Expression 2
3	New York: Steward, Tabori & Chang, 1990 [5 copies]	Manifestation 1
4	Mankato, MN: Creative Education, 1990 [3 copies]	Manifestation 2
5	Braille, DBPH, 1965 [2 copies]	Expression 3
A Christmas Carol [motion picture, 1951]		WORK 2
1	B & W / English [4 copies]	Expression 1
2	B & W / Spanish (dubbed) [9 copies]	Expression 2
3	Salon Mexico, 1988 [5 copies]	Manifestation 1
4	Cabezahueca Producciones Independientes, 2001 [4 copies]	Manifestation 2

Figure 6. FRBR-based online catalog display, based on sets displayed in figure 4

existential model, which illustrates what documents *are,* not how they are *produced*. As a cataloger, what I see and hold in my hands is an item, but when I see or hold an item, I am also seeing and holding a particular manifestation of a particular expression of a particular work. To create a cataloging record, I determine a main entry (work) citation, usually consisting of a creator's name and a title or uniform title or a title or uniform title by itself—attributes describing the work. I also transcribe information about translators of texts, scales of maps, playing times of CDs—attributes describing expressions. I transcribe places of publication, publisher names, and dates of publication—attributes describing manifestations. I create call numbers and add holdings information—attributes describing items. In creating a cataloging record, I encounter and describe each entity, because the item represents each entity simultaneously.

Implementation Challenges

One of the greatest challenges in implementing FRBR in a code of rules is to determine which items will be assigned by catalogers to which set—in other words, to implement the model. While the 1998 FRBR report provides a list of attributes that might be associated with each entity, it is not meant to be an operationalized or implementation model. Implementation models take conceptual models one or more steps further by stipulating more exact specifications of what has been proposed conceptually. They are intended to take a conceptual model from an abstract to a concrete level, providing explicit direction for implementation in an actual system. The level of detail required to make FRBR operational comes with writing cataloging rules and applying those rules to individual documents. Because room is left for interpretation and operationalization, different codes of cataloging rules produced using FRBR as a foundational conceptual model could result in different implementation models. Decisions about which items go into the sets for work, expression, and manifestation could vary from one code to another. Even the decision about what an item is could vary.

In the implementation process, decisions about the boundaries of the abstract entities work and expression must be made. For example, will a movie version of an original textual work be considered an expression of that work, or will it be considered to be a new work with a derivative relationship to the original? In the previous example, the Alastair Sim *Christmas Carol* was treated as a new work related to the original Dickens' work. It is presented in this way because under the current rules, that is how movie versions of texts are treated. However, different decisions could be made in a future code of rules that declare sets of items representing movie versions of texts (and vice versa) to be expressions of those texts, and as a result included in the original work. This would change the diagrams presented in figures 4 and 6 considerably.

One of the more lively FRBR electronic discussion list discussions of the boundary issues began with a question by Espley regarding Braille versions of texts.[24] Should a Braille version of an existing text be considered a manifestation of an existing expression of a work, or should it be considered a new expression? The definition of expression, "the intellectual or artistic realization of a work in the form of alphanumeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such forms" could be interpreted broadly, such that Braille notation is equivalent to alphabetic characters and so Braille should be treated as a manifestation of an existing expression.[25] It could also be interpreted narrowly, such that a Braille version represents a different realization and is, therefore, a new expression of an existing work. Figures 4 and 6 represent a Braille version as a separate expression, but a different interpretation of expression could make it a manifestation of a particular expression.

Considering that a Braille version could be created from multiple expressions, such as translations, regarding it as a manifestation is suggested. However, an equally compelling argument could be made that an implementation of FRBR treating Braille versions as expressions would serve users better. For example, in some new implementations of FRBR in online catalogs, patron holds are being placed at the expression entity level, assuming that if a patron wants an English-language version of *A Christmas Carol,* any

manifestation will do. Obviously, if a Braille version were treated as equivalent to other English-language manifestations instead of an expression in its own right, librarians would be confronted by very puzzled and exasperated users. This situation highlights the importance of considering user needs and expectations in the implementation stage.

Another discussion on the FRBR electronic discussion list regarding the boundary between manifestation and expression concerned unintentional changes in content from one publisher to another.[26] For example, typesetting can result in changes to a text that are unintentional. In other words, a publisher intends for an alphanumeric realization to be an exact duplicate of another, but because of these unintentional changes it often is not. Assuming that catalogers will not be asked to check new published versions of existing texts on a character-by-character basis, a decision must be made about whether catalogers should, without evidence to the contrary, assume that all new typesettings of textual works, and the equivalents of such changes in nonbook materials, are to be regarded as separate expressions or as manifestations of a single expression. The general consensus on the list seemed to favor regarding new typesettings as manifestations of a single expression. Regardless of whether decisions such as these come with rules or as a result of convergent practice, they must be made when the manifestation and expression entities are implemented.

FRBR was created in part to solve an information overload problem for catalog users. Some works are represented in the catalog by so many records that users, including reference librarians and catalogers, cannot find what they are seeking. The majority of items crossing most catalogers' desks every day do not contribute to this particular overload problem. Because of this, early implementations of FRBR have been selective. Catalogers use taste and judgment to decide when to identify all four entities; for example, identifying every expression for every work may not be necessary. As Tillett put it on the FRBR electronic discussion list, "The work/expression levels could be merged when that makes sense for an application, or even merged with manifestation when that makes sense. . . ."[27] If cataloging software applications made cataloging each of the four entities as easy as cataloging one or two, selective implementation would not be needed.

To date, little to no user research has been published investigating the usefulness of catalog displays organized around the FRBR four-entity model. The user perspective has been incorporated into the model via the defined user tasks. The assumption is that basing the model on explicitly defined user tasks will facilitate use in catalogs that implement it. FRBR implementation models, as noted above, may look different. One source of difference is the way in which the model is implemented in the cataloging rules. Another source of difference is implementation in actual catalogs. User research on which rules most facilitate use of the catalog, and what kind of displays are most effective, is highly desirable. Such research could guide the decision-making process surrounding the development of the new set of cataloging rules and the design of online catalog displays incorporating FRBR.

Conclusion

Viewing FRBR as a continuation and natural extension of cataloging models used over centuries of cataloging practice is important. All of the activities required to identify the Group 1 entities (determining work citation, transcribing information about translations and publishers, and creating holdings records) are activities that catalogers do now, every day, when they catalog. These activities will remain largely the same when FRBR is implemented, regardless of the precise nature of the implementation. The important changes that FRBR may bring are changes in cataloger consciousness and changes in online catalog displays. While AACR2 has always included the possibility of identifying works in the catalog, the current rules are somewhat obscure about how this is accomplished, and have made work identification optional.

The Joint Steering Committee for the Revision of the Anglo-American Cataloguing Rules has stated that the next revision of the rules, to be called Rules for Description and Access (RDA), will incorporate aspects of the FRBR model.[28] This new set of rules, incorporating FRBR entities, should make the process of identifying the particular entities that comprise a document much clearer for catalogers than it is now. This clarification also will make understanding why we do what we do easier, placing cataloger taste and judgment on a solid foundation. More importantly, successful implementations of FRBR will help catalog users perform successful searches by presenting information about complex works in helpful and intelligent ways.

References and Notes

1. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements of Bibliographic Records*, UBCIM Publications New Series, 19 (München: K.G. Saur, 1998). Also available at www.ifla.org/VII/s13/frbr/frbr.pdf (accessed Nov. 8, 2005). For an excellent brief introduction to FRBR, see Barbara Tillett, *What is FRBR? A Conceptual Model for the Bibliographic Universe* (Washington, D.C.: Library of Congress, Cataloging Distribution Service, 2004), www.loc.gov/cds/downloads/FRBR.PDF (accessed Nov. 8, 2005).
2. *Wordnet: A Lexical Database for the English Language*, "Model," http://wordnet.princeton.edu (accessed Sept. 30, 2005).

3. *American Heritage Dictionary of the English Language,* 4th ed. (Boston: Houghton-Mifflin, 2000).
4. *Hyperdictionary*, "Model," www.hyperdictionary.com/search.aspx?define=model (accessed July 2, 2004).
5. *American Heritage Dictionary.*
6. Marcia J. Bates, "An Introduction to Metatheories, Theories, and Models," in *Theories of Information Behavior,* ed. K. E. Fisher, S. Erdelez, and E. F. McKechnie (Medford, N.J.: Information Today, 2005), 3.
7. U. Mäki, "Models, Metaphors, Narrative, and Rhetoric: Philosophical Aspects," in *International Encyclopedia of the Social & Behavioral Sciences* (Amsterdam: Elsevier, 2001), 9932.
8. Ibid.
9. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements of Bibliographic Records*, 16.
10. Michael Buckland, "Information As Thing," *Journal of the American Society for Information Science 42*, no. 5 (1991): 355.
11. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements of Bibliographic Record*, 26.
12. Peter P. Chen, "The Entity-Relationship Model—Toward a Unified View of Data," *ACM Transactions on Database Systems* 1, no. 1 (1976): 9–36.
13. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements of Bibliographic Records, 2.*
14. INDECS Framework Ltd., INDECS, Interoperability of Data in E-commerce System, www.indecs.org (accessed Nov. 8, 2005).
15. British Museum, *Catalogue of Printed Books in the British Museum,* vol. 1 (London: Trustees of the British Museum, 1841).
16. Julia Pettee, "The Development of Authorship Entry and the Formulation of Authorship Rules As Found in the Anglo-American Code," *Library Quarterly* 6, no. 3 (1936): 270; see also Martha M. Yee, "What Is a Work?" Parts 1–4, *Cataloging & Classification Quarterly* 19, no. 1: 9–28; 19, no. 2: 5–22; 20, no. 1: 25–46; 20, no. 2: 3–24; and Richard Smiraglia, *The Nature of "A Work": Implications for the Organization of Knowledge* (Lanham, Md.: Scarecrow, 2001) for overviews of the history of the concept of work.
17. International Federation of Library Associations (Committee on Cataloguing), *Statement of Principles Adopted at the International Conference on Cataloguing Principles. Paris, October, 1961. Annotated Edition with Commentaries and Examples by Eva Verona* (London: IFLA Committee on Cataloguing, 1971).
18. Allyson Carlyle, "Fulfilling the Second Objective in the Online Catalog: Schemes for Organizing Author and Work Records into Usable Displays," *Library Resources & Technical Services* 41, no. 2 (Apr. 1997): 79–100; Allyson Carlyle, "Creating Efficient and Systematic Catalogs," in *The Future of Cataloging: Insights from the Lubetzky Symposium, April 18, 1998 University of California, Los Angeles*, eds. Tschera Harkness Connell and Robert L. Maxwell (Chicago: ALA, 2000), 42–59.
19. *Anglo-American Cataloguing Rules*, 2nd ed., 2002 rev. (Ottawa: Canadian Library Assn.; London: Library Assn. Publishing; Chicago: ALA, 2002).
20. Patrick Wilson, *Two Kinds of Power: An Essay on Bibliographical Control* (Berkeley, Calif.: Univ. of California Pr., 1968), 7; Eva Verona, "Literary Unit Versus Bibliographical Unit," *Libri* 9, no. 2 (1959): 98–99.
21. Wilson, *Two Kinds of Power,* 6.
22. *Anglo-American Cataloguing Rules*, 2nd ed., 2002 rev., rules 25.18A11 and 25.22A.
23. Elaine Svenonius, *The Intellectual Foundation of Information Organization* (Cambridge, Mass.: MIT Pr., 2000).
24. John Espley, "Expressions," online posting, May 2, 2003, FRBR electronic discussion list, 2005, www.ifla.org/VII/s13/wgfrbr/archive/FRBR_Listserv_Archive.pdf (accessed Oct. 6, 2005).
25. IFLA Study Group on the Functional Requirements for Bibliographic Records, *Functional Requirements of Bibliographic Records,* 18.
26. Mathew Beacom, "Expressions," online posting and following discussion thread, May 23, 2003, FRBR electronic discussion list, www.ifla.org/VII/s13/wgfrbr/archive/FRBR_Listserv_Archive.pdf (accessed Nov. 14, 2005).
27. Barbara T. Tillett, "Expressions," online posting, May 7, 2003, FRBR electronic discussion list, www.ifla.org/VII/s13/wgfrbr/archive/FRBR_Listserv_Archive.pdf (accessed Oct. 6, 2005).
28. Joint Steering Committee for the Revision of the Anglo-American Cataloguing Rules, *Prospectus for RDA: Resource Description and Access* (Joint Steering Committee for the Revision of the Anglo-American Cataloguing Rules, 2005), www.collectionscanada.ca/jsc/rdaprospectus.html (accessed Nov. 8, 2005).