Introducing the *Functional Requirements for Bibliographic Records* and Related IFLA Developments

by Pat Riva

Functional Requirements for Bibliographic Records

The *Functional Requirements for Bibliographic Records* (FRBR) study [1] was published by the International Federation of Library Associations (IFLA) in 1998, the final report of a study group reporting to the Cataloguing Section. Much more has been written on the origins and context for the study [2]. The IFLA FRBR study was begun in 1992 in a context of much questioning about how bibliographic records and catalogs would work in changing technology, questions that continue to be relevant even now as technology continues to evolve and reveal new possibilities.

The concept of defining functional requirements is user-focused at its center; knowledge of the uses (and users) of the information system to be designed provides a basis for making informed decisions on design options. In daily work this reasoning is often implicit; the FRBR study sought to make these considerations explicit.

When applied to bibliographic records, this functional requirements concept emphasizes the importance of understanding the function of the data elements being recorded and how these elements each contribute to meeting user needs. Once the fundamental question "Why?" has been answered, there is a sound and principled basis for making recommendations on what should be implemented and how.

Users of bibliographic systems include both the end-users of information retrieval systems and the information workers who assist end-users and maintain the databases. The needs of both groups were considered by the FRBR study group as they worked to understand how resource discovery systems are used. Uses which may seem infinitely varied on the surface do have common elements. The IFLA Study Group on the functional requirements for

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bibliographic records (1998) concluded that, in their most general form, there are four basic user tasks:

- to *find* entities that correspond to the user's stated search criteria (i.e., to locate either a single entity or a set of entities in a file or database as the result of a search using an attribute or relationship of the entity);
- to *identify* an entity (i.e., to confirm that the entity described corresponds to the entity sought or to distinguish between two or more entities with similar characteristics);
- to *select* an entity that is appropriate to the user's needs (i.e., to choose an entity that meets the user's requirements with respect to content, physical format, etc., or to reject an entity as being inappropriate to the user's needs);
- to acquire or *obtain* access to the entity described (i.e., to acquire an entity through purchase, loan, etc., or to access an entity electronically through an online connection to a remote computer).

(FRBR Report, section 6.1, p. 82)

This statement of the user tasks is interesting because it shifts focus away from individual bibliographic records seen in isolation, towards the catalog as a whole and to the navigation of the catalog. At first glance, it seems to be a list of the minimal, most fundamental needs, but on reflection, it also allows room to dream of the ideal information retrieval system.

Seymour Lubetzky once said [3] that "the catalog has to tell you more than what you asked for." Lubetzky meant that it is not enough to simply confirm whether a known item is held by the library, but that the user needs to be shown the item in the context of the catalog and be presented with opportunities not initially imagined that, once seen, are recognized as relevant. If a user starts a search with one idea in mind and is presented with additional options, the user may prefer an alternative resource that he or she did not know existed and, therefore, would not have asked for directly. >

Methodological Framework for FRBR

FRBR uses entity-relationship modeling. This is a standard technique, borrowed from computer science, used to analyze the structure of data prior to programming, particularly for database design. The modeling is independent of any specific program, code or standard.

The entity-relationship modeling process isolates the key objects of interest within bibliographic records: these are the entities, defined as generally as possible. Next, the attributes of each entity are listed, and the relationships between the entities are identified. This process is reflected in the organization of the FRBR final report. Although the results are described in some detail, FRBR does not claim that the attributes and relationship types given in the report are exhaustive.

Finally, each entity, attribute and relationship was mapped and assessed in relation to its contribution towards accomplishing each of the user tasks. This process led to practical recommendations regarding which data elements should be required in basic-level national agency bibliographic records, which subsequently led to revisions to the International Standard Bibliographic Descriptions (ISBDs) involving making some data elements optional. Since the ISBD data elements were all found to contribute to the user tasks, only those judged to have low importance for all the tasks were made optional. Previously, most "core" or minimal level standards were devised in a void; this process of assessing elements against user tasks provides a principle-based approach to the question.

The FRBR Model

The 10 entities are divided into three groups.

Group 1 Entities: Work, Expression, Manifestation, Item. The entities in the first group represent the products of intellectual or artistic endeavor. These entities are the focus of the bibliographic record and the heart of the model.

The first two are entirely abstract and reflect intellectual or artistic content:

- work (a distinct intellectual or artistic creation)
- expression (the intellectual or artistic realization of a work)

The next two are (more or less) concrete and reflect physical form (although *physical* should not be taken too literally, as it includes remote electronic resources):

- manifestation (the physical embodiment of an expression of a work)
- item (a single exemplar of a manifestation)

Although the Group 1 entities are usually illustrated from the top down, when working with real bibliographic data, they are built from the bottom up by a process of abstraction.

The way these relate to each other is expressed in a well-known diagram which shows their "primary" or inherent relationships.

Note (Figure 1) that the links go both ways, and that they are not always 1:1. As the study was intended to model bibliographic data, the Group 1 entities are treated in the most detail both in listing their attributes and in analyzing the relationships among them.

FIGURE 1. Group 1 Entities and Primary Relationships
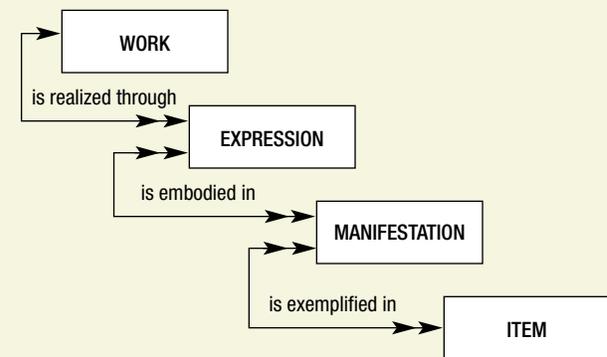
(Source: Figure 3.1 from the FRBR Report, p. 13.)

Group 2 Entities: Person, Corporate Body. The Group 2 entities are those responsible for the intellectual or artistic content, the physical production and dissemination, or the custodianship of the entities in the first group.

- person (an individual)
- corporate body (an organization or group of individuals and/or organizations)
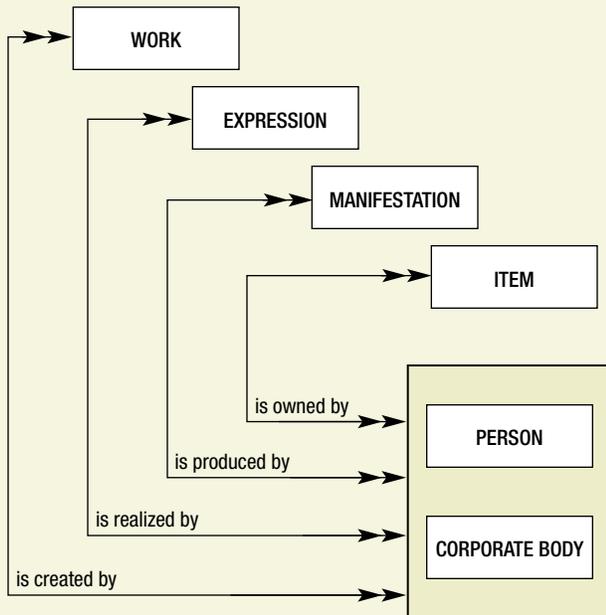
Group 2 entities are relevant to modeling bibliographic data because they enter into responsibility relationships with the entities in the first group (Figure 2). For instance, a work may be created by one or more than one person and/or one or more than one corporate body. An expression may be realized, a manifestation produced or an item owned by a person or corporate body.

FRBR includes only the attributes of Group 2 entities relevant from this point of view, and FRBR does not discuss the relationships of Group 2 entities among themselves but only those relationships that involve Group 1 entities.

Group 3 Entities: Concept, Object, Event, Place. The Group 3 entities represent an additional set of entities that serve as the subjects of *works*. >

FIGURE 2. Group 2 Entities and "Responsibility" Relationships

WORK

EXPRESSION

MANIFESTATION

ITEM

is owned by

PERSON

is produced by

is realized by

CORPORATE BODY

is created by

(Source: Figure 3.2 from FRBR Report, p. 14.)

Works are linked to other works that may supplement them, may be adaptations of them or may be parts of a larger work.
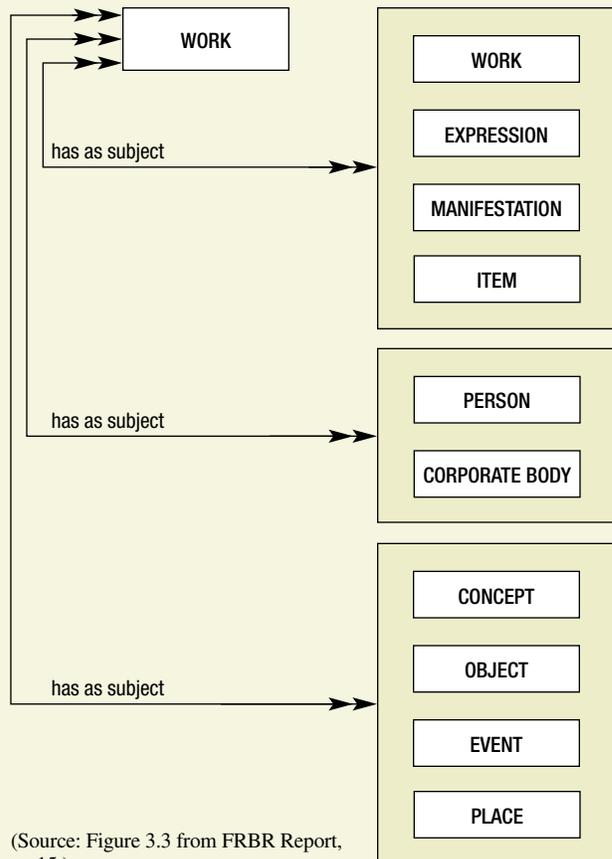
Expressions of a single work also display relationships to each other, with some expressions being more alike than others. Expressions can be related as revisions, translations or musical arrangements.

Manifestations of a single expression of a work can be related to each other as reproductions, alternate formats or simultaneously released editions. Manifestations of the same expression are more like each other than they are like manifestations of other expressions of the same work.

Impact of FRBR on Cataloging Standards

Since the release of FRBR in 1998, there has been a growing reflection in the bibliographic community around the ideas it represents. FRBR has provided a unifying framework and a common terminology for discussion. Theoretical work on the principles underlying cataloging had been going on prior to FRBR, but authors had to >

The group includes the following:
- concept (an abstract notion or idea)
- object (a material thing)
- event (an action or occurrence)
- place (a location)

The Group 3 entities are briefly modeled in FRBR as they stand in the subject relationship with the work entity in the first group (Figure 3). It is significant that the subject relationship is expressed at the level of the work. If a work is about a given subject, wouldn't all of the expressions and manifestations of that work be about the same subject? In a database structure that can take advantage of this fact, each manifestation of the same work could link to the subjects already recorded for the work, providing complete bibliographic records for all manifestations without repeating the process of subject analysis.

Note that the subject relationship can also link a work to entities in Group 1 and Group 2. That is, a work may have as its subject a person or corporate body, another work or a specific expression, manifestation or even an item of another work.

Relationships. In addition to the basic relationships already described, FRBR identifies a multitude of intellectual relationships among Group 1 entities. These relationships are significant in that they build up, through a network of links, the fabric of the bibliographic universe.

FIGURE 3. Group 3 Entities and "Subject" Relationships

WORK

has as subject

WORK

EXPRESSION

MANIFESTATION

ITEM

has as subject

PERSON

CORPORATE BODY

has as subject

CONCEPT

OBJECT

EVENT

PLACE

(Source: Figure 3.3 from FRBR Report, p. 15.)

invent/define their own terms (particularly for entities in FRBR Group 1). No system of terms had entered into common use, and, for example, the word *work* had different meanings depending on who was using it [4]. Since FRBR, most theoretical studies and applications have been using FRBR terminology, and this makes it easier for one study to build on another.

FRBR has had a growing impact on standards for cataloging. As an IFLA study, its first impact was on the ISBDs in terms of applying recommendations about which data elements should be mandatory and which data elements should be optional. That was an easy first step. As more and more people internalized the richness of the model, its potential in providing principles to guide cataloging rule revision was felt.

The author was privileged to be involved first-hand in seeing FRBR influence the rule revision process for the Anglo-American Cataloging Rules (AACR). In 2001, the joint steering committee (JSC) created the Format Variation Working Group (FVWG) to examine issues relating to the expression entity in AACR. The expression entity was the Group 1 entity least explicit in AACR2. The FVWG engaged in a three-year journey of reflection that eventually prompted proposals about headings for works and expressions that could serve as citations or identifiers for those entities, to clarify the structure among manifestations of a single work. The committee also considered how to provide a meaningful basis for grouping manifestations by form of expression or basic type of content; this work was intended to provide background towards reassessing the role, function and form of the General Material Designation (GMD). As a spin-off from the FVWG's first report, the author undertook a project to examine terminology in AACR when it was not compatible with FRBR. This turned out to be merely a first step in the larger journey of revision of AACR, which is now being transformed as RDA, a content standard firmly based on principles so that it can be more easily applied to all types of resources not only in libraries but also in other information contexts.

FRBR also influenced the *Statement of International Cataloguing Principles* (2007) [5] being refined by successive IME-ICC meetings (IFLA Meetings of Experts on an International Cataloguing Code).

Ongoing Developments

The scope of FRBR is bibliographic records. The first and most natural desire for cataloging librarians was to extend the modeling to the entities, attributes and relationships found in authority data. The Functional Requirements and Numbering of Authority Records (FRANAR) working group, chaired by Glenn Patton, started in 1999 and is now nearing completion of its work. The resulting model, responding to the first element of their charge, is titled Functional Requirements of Authority Data (FRAD) and is undergoing world-wide review from April to July 2007. The first version of the model was released in July 2005 for worldwide review under the title Functional Requirements of Authority Records (FRAR); however, the responses received clarified that the focus of the model is authority data, rather than the whole of the authority record, triggering the name change. The focus is on authority information needed to support catalogs that incorporate the concept of authority work. FRANAR was particularly aware of relevant work carried out in the archival community, which pointed out that the entity family was lacking from Group 2 in FRBR.

Building a conceptual model of the Group 3 entities as they relate to the aboutness of works is the scope of the Functional Requirements of Subject Authority Records (FRSAR) project chaired by Marcia Lei Zeng, which started in 2005.

The goal is that the three models, when put together, will provide a complete view of the bibliographic universe.

FRBR is not intended to be a one-time document but rather a living model that is maintained and kept up-to-date. When the FRAD and FRSAR models are completed, FRBR will be kept consistent with them. The FRBR Review Group, which was first created in 2002 as a working group and became a review group in 2003, has the mandate of maintaining the FRBR model, developing guidelines and interpretative documents, and promoting the model and maintaining links with other relevant groups. One area of active work, undertaken by the Working Group on the Expression Entity, is the clarification of the interpretation of the expression entity leading to the first amendment proposal to the 1998 text of FRBR. Another important area, the task of the Working Group on Aggregates, is to further investigate the modeling of >

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aggregations of all sorts (for example, serials, collections of stories or essays and other whole/part situations).

A working group of the FRBR Review Group has been meeting for several years with the International Committee for Documentation of the International Council of Museums' Conceptual Reference Model (ICOM-CIDOC CRM) group to harmonize FRBR with the CRM, with the purpose of creating an expression of FRBR in an object-oriented formalism and enriching the model with concepts arising from the description of museum objects, particularly the situation of single-item manifestations. CRM is event-based, and this is a valuable perspective for the further development of FRBR.

Note: This article is based on "Functional Requirements for Bibliographic Records (FRBR) and its application to resource discovery," an invited plenary address given at INTEGRAR, 2o Congresso Internacional de Arquivos, Bibliotecas, Centros de Documentação e Museus in São Paulo, Brazil on June 25, 2006.

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Resources

Further information about ongoing FRBR developments is always available via IFLANET (www.ifla.org/VII/s13/wgfrbr/wgfrbr.htm).

Mentioned in the Article

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