

**A Conceptual Model Giving Primacy to Text-level Bibliographic
Entity in Cataloging: A Detailed Discussion**

Shoichi TANIGUCHI

*Institute of Library and Information Science
University of Tsukuba*

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Abstract

This paper proposes a conceptual model for cataloging which gives primacy to a text-level bibliographic entity, with the aim of approaching critical issues involved in current cataloging practice, such as the so-called 'multiple versions' and 'content versus carrier' issues. Although several models proposed by researchers contain a text-level entity (or object), including the model by the IFLA Study Group on Functional Requirements for Bibliographic Records, the role and function of the entity in each model is not necessarily clear. In this paper, first, a viewpoint on which entity is given primacy among bibliographic ones in a model is introduced and applied to the examination of certain models. Second, a new model that gives primacy to a text-level entity is proposed using the E-R modeling language. At the same time, by applying the concept 'user tasks' to the model and also creating a scenario on how entities are used by users, the implication of such a model is clarified within the scope of conceptual modeling. Furthermore, the features of cataloging practice in accordance with the proposed model is clarified to the extent possible. In addition, some examples of bibliographic record equivalents in line with the model are shown.

Introduction

In recent years several researchers have endeavored to develop models for cataloging at the conceptual level in order to re-examine the current framework of bibliographic records/databases and also the current practice based on the framework, and then to propose an alternative framework. The reason why they have adopted a conceptual modeling approach is that it naturally leads to a re-examination at the most fundamental level and thus may bring fruitful results. We are in the situation where the volume and complexity of materials to be bibliographically controlled continue to grow. We are also under pressure to curb both cataloging costs and efforts as well as the pressure to adapt cataloging codes and practices to a more computerized environment. Conceptual modeling is expected to be one of the useful and fruitful approaches to cope with such a situation--to begin with, recognizing issues we are facing at the conceptual level, next trying to find a way for resolving some of these issues at that level, and lastly trying to implement this solution at the practical level. That modeling usually employs modeling language and analysis technique, such as the entity-relationship (E-R) model and the object-oriented models.

The most prominent is the conceptual model that has been developed by the IFLA (International Federation of Library Associations and Institutions) Study Group on the Functional Requirements for Bibliographic Records (1998), which will be called 'IFLA FRBR model' here. This is also the most comprehensive and detailed in almost all respects, being designed to serve as a framework for relating bibliographic data to user needs by using the entity-relationship analysis technique. There are several other models that have been proposed by researchers such as Green (1996), Heaney (1995), Leazer (1993), O'Neil & Visine-Goetz (1989), Svenonius (1992), and Taniguchi (1990, 1993, 1997); all of which are brief though having their own significance. We can find models in areas other than cataloging, such as archives, rights management, record keeping, and museums.

Re-examining the current cataloging framework at the conceptual level and seeking an alternative desirable framework at that level impose on us inevitably a structural view of material (i.e., a resource), which is a basic constituent of the bibliographic universe. As a natural consequence of a structural view of material, various models have introduced a text-level entity or object as one of the bibliographic entities or objects within the models.

The term 'text' has several meanings even in the cataloging field, but here it is used with the following meaning: "The words of the author, or the signs and symbols used in place of words by the author, in a written or printed work." This is one of the definitions shown in the *ALA Glossary of Library and Information Science* (Young, 1983) that contains five definitions in total for the term. Or, more formally it can be defined as "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" (IFLA Study Group, 1998, p. 18)--this was borrowed from the definition of the entity *expression* in the IFLA FRBR model, while in this case the term 'work' means an intellectual or artistic creation itself (i.e., an abstract entity). It is easy to find similar definitions of the term 'text' within the cataloging and bibliographic control field, such as a study by Wilson (1968). He is probably the first researcher who introduced the term to describe something independent from both an intellectual/artistic content that he called a 'work,' and its physical manifestation that he called an 'exemplar.' In conceptual modeling, following a given modeling language, an entity or object corresponding to the text as defined above can be set up--this is the text-level entity or object.

It is not necessarily clear, however, what role or function the text-level entity/object has (or is expected to have), and what relative position the entity/object has vis-a-vis others in a model, even in the FRBR model.

The aim of the present study is first to introduce a viewpoint regarding which entity/object (or entities/objects) is to be given primacy among bibliographic entities/objects in a conceptual model. Another aim is to show an outline of a conceptual model in which text-level entity/object takes priority. Let us give the name 'a model giving primacy to text-level entity' (or 'a text-prioritized model' in short) to such a model. Broadly speaking, such models imply that the text is regarded as being more substantial than ever, and the bibliographic description of an item is made mainly based on the text, or at least on both the text and the physical medium of the item.

First, in this study I re-examine the FRBR model from the viewpoint of giving primacy to text-level entity. At the same time, I show the outline of a new model giving primacy to that entity, by indicating differences from the FRBR model in (a) defining the entity and (b) associating attributes with the entity. The FRBR model as a whole is inclined to give primacy to manifestation-level entity, as will be

shown later. Second, by applying the concept of 'user tasks' found in the FRBR model to the new model outlined in this paper, I create a scenario on how entities are used by users. Third, some examples of bibliographic record equivalents in line with the new model are shown.

No conceptual models have ever been developed with attention to which entity is prioritized, let alone giving primacy to text-level entity. Rather, the core of this viewpoint can be found in discussions on record structures, attributed to matters concerning the implementation level subsequent to the conceptual level--for example, discussion by Howarth (1998) and Multiple Versions Forum (1990).

In this study, the entity-relationship (E-R) model is used as a modeling language and analysis technique. The basic E-R model consists of three classes of constructs: entities, relationships, and attributes. Each entity, relationship, and attribute indicate a set of things of the same kind, a type of associations among one or more entities, and a set of characteristics of entities, respectively. A particular occurrence of an entity, a relationship, and an attribute, is called an entity instance, a relationship instance, and an attribute value, respectively. The reason why the E-R model is adopted is that (a) it is widely used as shown by the fact that the IFLA FRBR model adopted it, and (b) it is simple and sufficient to deal with our current theme.

Significance of Models Giving Primacy to Text-level Entity

The significance or necessity of a model giving primacy to text-level entity are as follows:

1. An identical text appears frequently in more than one medium or form--reproductions or others. This has imposed critical problems in current cataloging practice; we make a new record for a new text, and do the same (make a new record) for the same text in a different format. As a result, we choose to communicate to users the difference in manifestation rather than the identity in text. Users are often perplexed to encounter very similar records (in some cases, a large number of similar records), whose interrelations are not clear. We have called it the 'format variations' or 'multiple versions' issue.

Within the current framework, there have been numerous efforts to solve

this problem; for instance, Multiple Versions Forum (1990), the development of *Guidelines for Bibliographic Description of Reproductions* by ALCTS CCS CC:DA (Association for Library Collections and Technical Services. Cataloging and Classification Section. Committee on Cataloging: Description and Access)(1995), etc. However, no complete solutions have yet been found nor implemented. By contrast, a model of this type should be capable of providing a complete solution, since it makes us grasp each individual item at its text level and thus represent items sharing an identical text at that level, with the result of sufficient control of those items. Consequently, users will be able to have an OPAC which generates a display of the bibliographic data of those items in a form being intelligible to them.

ALCTS CCS CC:DA and also the Joint Steering Committee for Revision of AACR (Anglo-American Cataloguing Rules) have been recently discussing the issue of creating 'expression-based records' as one of the options to deal with format variations (ALCTS CCS CC:DA, 1999, 2000; Joint Steering Committee for Revision of AACR, 2001, 2002). Their discussion has something in common with that of the present study; for example, creating 'expression-based records' can possibly lead to implementation of a text-prioritized model. Their investigation, however, seems to be still at the initial stage and appears to cover only the practical aspect of the approach. This study, however, deals with its theoretical aspect.

2. It has been pointed out numerous times that almost all users are usually concerned with a text or a work (i.e., the intellectual/artistic aspect of an item) and not a physical manifestation (i.e., the physical aspect). For instance, in three main working papers prepared for the International Conference on Cataloguing Principles in 1961, Lubetzky (1963), Verona (1963), and Jolley (1963) all agreed on this point. A method of providing more detailed information on the text and work involved in an item is required. A model of this type will have the capability of satisfying such a requirement--at least a requirement toward a text--in a straightforward manner.

3. There exists a wide variety of texts derived from a single text. Reflecting user needs for representing relationships among texts and/or works, in recent years there has been renewed interest in analyzing and categorizing those relationships (Leazer & Smiraglia, 1999; Smiraglia & Leazer, 1999; Tillett, 1991a, 1991b, 1992a, 1992b; Vellucci, 1997, 1998). A method is needed for indicating such relationships in a catalog or bibliographic database. A model of that kind would also be capable of meeting this requirement.

4. Electronic resources on a network (typically on the Internet) force us to neglect the physical medium in which they are fixed--their physicality is minimized. There is little need to provide information on the medium/carrier in their bibliographic descriptions. It is feasible to connect discussions on cataloging with those on metadata, which is defined here as structured data only about a networked resource, provided we adopt a strategy of shifting from physical manifestations to texts. It would also be feasible to have interoperability, to some extent, between bibliographic data made by following the model of this type and metadata created in agreement with one of the proposed schema, like Dublin Core.

Examining Typical Models Containing Text-level Entity

Two Methods of Defining Bibliographic Entity

According to the IFLA FRBR model, entities forming a conceptual model are divided into three groups. The first group comprises “the products of intellectual or artistic endeavour that are named or described in bibliographic records” (IFLA Study Group, 1998, p. 12). The entities belonging to this group are usually called ‘bibliographic entities.’ If we focus on these entities, we realize that there are two methods of defining an entity: the hierarchical way and the parallel way (Taniguchi, 1999b). It is thus necessary to review these methods in brief before examining existing models and proposing new ones.

One method is to define an entity in a hierarchical manner--a lower-level entity encapsulates its upper-level one. This method implies that each entity--except the top in a hierarchy--involves the properties of its upper-level entity and those of its own. At the same time, this method involves viewing an item from the aspect of an instantiation process; an item in hand is understood to result from the stepwise instantiation process from an idea itself that is the most abstract to a physical item. For example, it is possible to assume that, to begin with, a person has composed or invented an idea itself, next she/he has ordered certain words into a certain sequence, and lastly she/he has produced marks and inscriptions on a given medium that produces a physical manifestation. If in accordance with this view, an item can be modeled with entities such as a work-level, a text-level, and a physical manifestation-level entity, each of which is defined as being inclusive of the preceding. An ‘is-a’ relationship exists between

an entity and its subordinates. We call this method of defining an entity the 'hierarchical way.' A typical example of the adoption of this method is the IFLA FRBR model.

The other method is to define a bibliographic entity in a mutually exclusive manner--entities do not share anything. This method implies that we can conceptualize an item in hand with mutually exclusive entities. It also leads to the view from an item's structural aspect. It allows us to model an item with entities such as a work-level, a text-level, and a medium-level entity, each of which is defined as being mutually exclusive. A 'part-of' relationship therefore exists between an item and each of the defined entities, if the whole item is regarded as one entity. We call this method the 'parallel way.' A typical example of this method can be found in the 'three-layered model' (Taniguchi, 1990, 1993, 1997).

These two methods of defining an entity are not contradictory. Although it seems impossible to apply these methods together, it is possible at least to combine them in a model. Or rather, both aspects on which the methods are based are required in order to grasp and represent an item more completely; the methods are only different in which aspect takes precedence over the other. They should therefore be considered complementary to each other (Taniguchi, 1999b).

The 'cardinality' of a relationship between entities refers to the maximum (and sometimes also the minimum) number of instances of one entity associated with a single instance of the other entity, and thus describes a constraint on the relationship. According to the hierarchical way, entity instances construct a tree structure from the top-level instance to the bottom-level ones--the cardinality is one-to-many. Many-to-many cardinality also occurs in entities defined in the hierarchical way, when more than one tree of entity instances share the identical node (i.e., the same instance). But with such cases, there is a need to confirm the validity in a bibliographical sense of applying the many-to-many cardinality to entities. On the contrary, with the parallel way where entities are defined as being exclusive, there is no constraint on the number of entity instances that are associated through the relationship. This indicates a bipartite structure and its cardinality is many-to-many.

Attention should also be paid to the 'inheritance' characteristic of entities defined by either method. Defining entities in the hierarchical way presupposes in principle the inheritance of attributes from an entity to its subordinates. Defining entities in the parallel way, on the other hand, does not provide any view

on the inheritance of attributes between entities; it is necessary to define attributes at each entity repeatedly where the sharing of attributes among entities is required.

Modeling Current Practice at Conceptual Level

Current cataloging practice, represented typically by ISBD (International Standard Bibliographic Description), AACR, and MARC formats like MARC 21, is conceptualized roughly with three bibliographic entities--*work*, *manifestation*, and *item*--and other types of entities such as *person* and *corporate body*. Although it is possible to construct several models for current practice, the simplest and thereby the most fundamental would be better to understand it, especially in an initial stage of the examination.

The entity *work* can be defined as “a distinct intellectual or artistic creation,” as shown by the IFLA FRBR model, whereas AACR 2nd ed. (AACR2)(American Library Association et al., 1978) and its latest edition AACR2R (Joint Steering Committee for Revision of AACR, 1998) do not contain any formal definition of the term ‘work.’ Through a close examination of the concept ‘work,’ it can be realized that it has been interpreted in various ways even within the history of AACR (Yee, 1998).

Let us argue the relative weight of the entity *work* in current cataloging practice by referring to the current record framework. *Work* apparently does not perform a key role in describing an item being cataloged, although its existence is supposed to be a prerequisite in making a bibliographic description. By contrast, *work* is the key presupposition in selecting and assigning headings for an item. Almost all of the headings, however, do not represent *work* itself.

Work itself is only represented with a uniform title and its corresponding authority record that contains some data elements assisting in catalogers’ judgement on works. It is important to stress that uniform titles are optional and applied not to all items but to restricted ones, although their application depends finally on the policy of a cataloging agency. Current AACR2R, for example, does not allow for assigning a uniform title when it is the same as the title proper; it seems to be an economical decision in card catalogs not in current OPACs. Or, it is possible to consider that, in addition to a uniform title and its authority record, *work* is manifested in a ‘name-title added entry’ heading and a ‘name-title reference,’ where the title in these cases usually indicates the title proper, not a

uniform title. Such a heading and reference are also used in restricted cases. All these things clarify that (a) a work-level entity instance is not necessarily created for every item and hence (b) *work* is not given primacy in the model for current practice.

The second entity is *manifestation*. It is usually defined as the “physical embodiment of a *work*”, this being a slightly modified definition of that in the IFLA FRBR model. When a *work* is realized in a form of text, the resulting text is embodied finally in a medium--this is a *manifestation*. In current practice, it is evident that an item is captured and described mainly at this manifestation-level. Hence *manifestation* seems to be predominant for bibliographic description, conforming to the above examination of *work*. The term ‘document’ or sometimes ‘book,’ instead of *manifestation*, is used as being opposed to *work*; for example, ‘works versus documents’ and ‘work-document distinction.’

This argument is valid at least in AACR2, more precisely, in AACR 1st ed. (AACR1)(American Library Association et al., 1967) after it adopted the first ISBD and was revised in 1974 (American Library Association et al., 1974). Before then, the role and relative position of *work* was more significant than that in current practice, as Howarth (1998a) pointed out. Strictly speaking, current practice in itself has a wide range of variations, and the weight of *work* depends on a particular cataloging code.

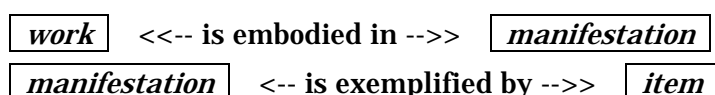
It should also be added that in current practice the text of an item is usually dealt with as being contained in either *work* or *manifestation*. To put it in another way, in some cases a text is regarded as the concrete aspect of *work*, and in other cases it is dealt with as the intellectual or artistic aspect of *manifestation*. A text-level entity independent of the above two therefore is not required for modeling current practice.

The third entity *item* is defined as “a single exemplar of a *manifestation*,” this definition being borrowed from the IFLA FRBR model. Similarly, AACR2R defines it as “a document or set of documents in any physical form, published, issued, or treated as an entity, and as such forming the basis for a single bibliographic description” (Joint Steering Committee for Revision of AACR, 1998, p. 619). As being understood with these definitions, *item* appears as a physical piece in hand that serves as a starting point for cataloging. However, two slightly different meanings are embedded in the definitions. One is to regard *item* as the whole entity that contains a work, its text, its medium, and others. The other is to

see it as distinct from *manifestation* in containing characteristics that separately identify an individual copy of the manifestation. In this sense, the entity can instead be called ‘copy,’ as suggested by Vellucci (1998). These two meanings can be drawn from either of the two methods of defining an entity and hence they do not conflict with the methods.

In the case of published materials where all copies are produced from the same master copy and which occupy principal position in cataloging, properties peculiar to the entity *item* (i.e., the characteristics of a copy) are usually represented only in the note area of the bibliographic description and other data elements like a location mark. Or, in some systems, all information on a copy is recorded in a holdings or item record separate from a bibliographic record. Although the entity *item* is a starting point for making a bibliographic description and thus a bibliographic record, the description is made mainly based on not *item* but *manifestation*, and the relative weight of *item* in cataloging practice is less than that of *manifestation*.

These three bibliographic entities seem to be defined in the hierarchical way mentioned above. A *work* may be embodied in one or more than one *manifestation*; likewise a *manifestation* may embody one or more than one *work*. A *manifestation*, in turn, may be exemplified by one or more than one *item*. The diagrammatic representation on these is:

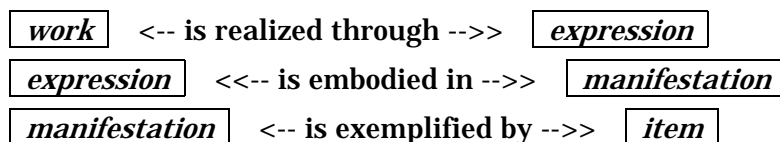


The ‘<--’ and ‘-->’ in the diagram indicate ‘1’ cardinality; the ‘<<--’ and ‘-->>’ indicate ‘many.’

It would be possible, at the same time, to re-define these entities as those by the parallel way and to conceptualize current practice with redefined entities. The reason is that *work* is just an abstract entity and thus there is no substantial difference between *manifestation* that includes *work* and *manifestation* after the *work* is removed from it. An additional reason is that the two meanings of *item* do not conflict with either of the two ways of defining an entity, including the parallel way as already mentioned.

IFLA FRBR Model

The IFLA FRBR model proposed by the IFLA Study Group seems to be the most prominent and influential, and has been referenced to many times even beyond the cataloging field. The model contains four bibliographic entities defined in the hierarchical way--*work*, *expression*, *manifestation*, and *item*. The diagrammatic representation of the entities and relationships among them is:



First, it is worth noting that an independent text-level entity named *expression* is introduced, its definition was already quoted as that of a 'text' at the beginning of the present paper. Defining a text-level entity in a model provides a means of reflecting the distinctions in intellectual or artistic content that may exist between one realization and another of the same *work* and also a means of drawing relationships between them, as the IFLA FRBR model pointed out. Consequently, a model would enable us to accomplish more elaborate bibliographic control by inserting the new entity between *work* and *manifestation*, both of which are already set up in modeling current practice.

We should also notice that this model keeps in principle the framework of current cataloging practice; *manifestation* occupies the predominant position and the bibliographic description of an item is made mainly based on *manifestation*, whereas *work* and *expression* are subordinate to *manifestation*. That is to say, *expression*, as being similar to *work*, can be interpreted as an intermediary entity leading users to *manifestation*, and is not expected to play a major role in identifying and describing an item.

Such an interpretation is derived from some evidences. One of the evidences is that in this model it is not obvious nor at least declared explicitly whether an *expression* instance exists for every item. Another evidence is that all label information including titles, statements of responsibility, and edition designations that all appear in an item, is associated with *manifestation* and none of that information is associated with *expression*--the role of label information will be discussed later. And at the same time the model is not able to show what the title of *expression* means in practice (i.e., to identify properly the title with any

known data element), although that title is set up for the entity.

We may note, in passing, that the model enumerates exhaustively the inherent characteristics of a text as the attributes of *expression* and lists many sorts of relationships between *expressions*, as will be seen in later sections. This fact may imply that the model has features to lead to a model giving primacy to a text-level entity.

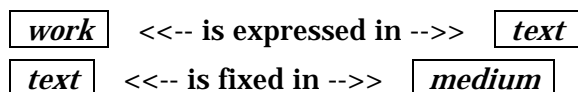
Regarding the cardinality of relationships between the entities, the model specifies that a one-to-many relationship exists either between the *work* and the *expression* or between the *manifestation* and the *item*. Similarly, the model specifies that a many-to-many relationship exists between *expression* and *manifestation*. This means that, in addition to that an *expression* instance may be embodied in one or more *manifestations*, a *manifestation* instance may embody one or more *expressions*, which is called 'collection' in the current AACR2. There is no mention of the inheritance issue of attributes.

Taniguchi's Three-layered Model

Since 1990 I have been proposing a three-layered model to understand the implications of critical issues involved in current practice and to seek a possible alternative framework for resolving those issues (Taniguchi, 1990, 1993, 1997). The model at the beginning did not clearly differentiate conceptual level arguments from those at the implementation level, thus containing both the conceptual modeling of an item and a practical record structure representing the item. After proposing the initial model, I realized that the two or more levels of arguments had to be differentiated. I consequently proposed a model focusing only on conceptual level modeling (Taniguchi, 1997, 1999).

As its name indicates, the three-layered model conceptualizes an item with a three-layer structure: work, text, and medium. In other words, an item can be decomposed into these three layers. The text-layer corresponds to a text defined at the beginning of this paper. It is however considered not to involve a work, but just to be interrelated with a work, which is the intellectual or artistic content of an item; the text expresses the work. The medium-layer denotes what corresponds to a physical manifestation, but after the text has been removed from it--the physical medium or carrier itself. These imply that every layer of this model is constructed to be mutually exclusive, i.e., in the parallel way. No problems will occur if we consider each layer of the model to be an entity in E-R modeling, although the

model does not use any formal conceptual modeling language and thus the role of a layer would be somewhat ambiguous. With this assumption, it is possible to reveal the model with the following diagrammatic representation of the entities and relationships among them.



One of the major characteristics of the model is the aim of making a bibliographic description of an item which gives primacy to the text-layer (i.e., a text-level entity), by applying the three-layer structure to an item. This can be explained by several reasons. One reason is that some label information, such as titles, statements of responsibility, and edition designations that appear in an item, but not label information related only to the physical medium or physical embodiment of a text, is associated with the text-layer not the medium-layer. Another reason is that every layer, including the text-layer, has an instance of its own in every item. The preceding reason causes the mandatory occurrence of a text-layer instance as well as that of the medium-layer, for accepting such label information.

In connection with the work-layer, the layer accepts the name headings of the authors or creators of a work and a uniform title for a work, if any. An instance of the work-layer is thus needed in every item. Nevertheless, the work-layer is thought to be an intermediary to the text-layer that takes a major role in identifying and describing an item.

The three-layered model, strictly speaking, did not contain any arguments on the cardinality issue of relationships between the layers, but it did contain some discussion on the unit of each layer instance for choosing an appropriate unit, in particular, that for the text-layer--this is indirectly related to the cardinality issue. The conclusion, in short, is that the cardinality of a relationship between two adjacent layers is many-to-many, being consistent with the basic nature of the relationship between the layers (i.e., to be mutually exclusive to each other). A fuller discussion on the cardinality of the relationship between the work-layer (i.e., a work-level entity) and text-layer (i.e., a text-level entity) will be attempted later.

It should also be noted that the model did not contain a layer corresponding to an individual copy below the medium-layer.

Defining Text-level Entity and Other Entities

Entities Forming the Model Giving Primacy to Text-level Entity

Requisite entities forming a new conceptual model giving primacy to a text-level entity are proposed next; requisite attributes of the text-level entity and relationships between instances of the entity will be shown in later sections. Requisite entities can be proposed on the basis of the integration of the IFLA FRBR model and the three-layered model. A close look at these two models leads to the conclusion that the new model must consist of four bibliographic entities, two entities involved in 'responsibility' relationships (i.e., *person* and *corporate body*), and some additional ones involved in 'subject' relationships. And it also leads to the conclusion that each bibliographic entity must be constructed according to both methods of defining an entity. It is possible and also necessary to construct each entity in a combined way so that an entity can be viewed from either aspect (i.e., the structural and instantiation aspects), depending on the situation.

The four indispensable bibliographic entities, when defined in the hierarchical way, are identical to those defined in the IFLA FRBR model: *work*, *expression*, *manifestation*, and *item*. These are built on conforming with the instantiation process from an abstract work to an item in hand. These are depicted in the upper part of Figure 1.

At the same time, the entities, when defined in the parallel way, equal those--to be precise, those transferred from the layers--in the three-layered model: *work*, *text*, and *medium*. We have to add an entity corresponding to the *item* in the former set of entities, for representing characteristics at the level of an individual copy. The entity added is named *copy* here, while it may be called 'copy's characteristics' to be more precise. These entities are built to be resulted from the division of an item into components that are mutually exclusive. These are depicted in the lower part of Figure 1.

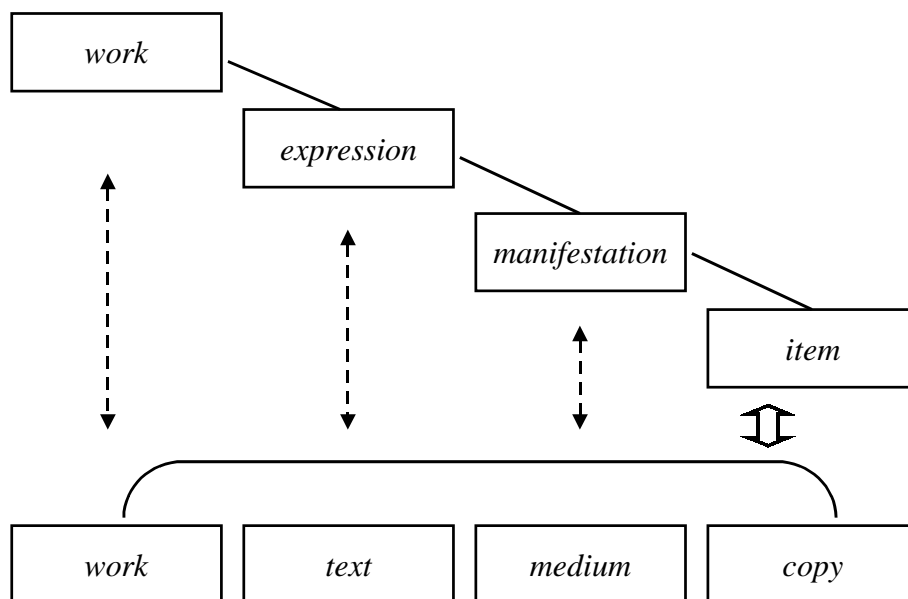
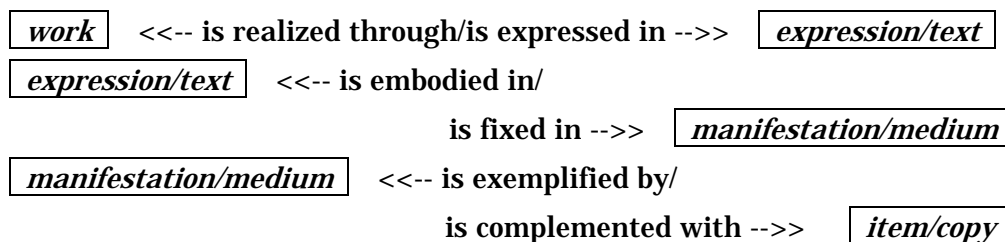


Figure 1. Bibliographic entities defined in the two methods.

These two series of entities can be integrated into one series, resulting in the structure shown in Figure 2. *Work* is the same if it is defined in either the hierarchical or parallel way. *Expression* is considered to be an entity which combines *work* with *text* defined in the parallel way. *Manifestation*, likewise, is an entity which combines *expression* in the hierarchical way and *medium* in the parallel way. *Item*, in turn, is an entity which joins *manifestation* with *copy*. The resultant entities for the model to be proposed are called *work*, *expression/text*, *manifestation/medium*, and *item/copy*, respectively, in a convenient manner. The diagrammatic representation of these entities and relationships among them is as follows:



These entities as a whole intend to demonstrate a conceptual modeling where the text-level entity *expression/text* is given primacy; this model differs from the IFLA FRBR model in this regard. The other bibliographic entities are inevitably subordinate to *expression/text*; *manifestation/medium* is subordinate to *expression/text* and *item/copy*, in turn, is subsidiary to *manifestation/medium*, while *work* is an intermediary to access *expression/text*.

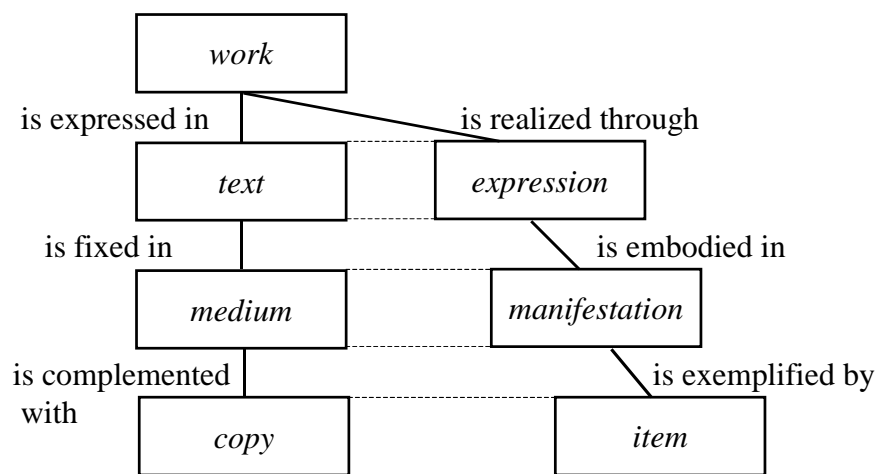


Figure 2. Bibliographic entities and their relationships in the proposed model.

Implications of Proposed Framework

This section examines what the proposed framework implies or imposes at the conceptual (or, in certain cases, implementation) level.

1. An instance of the text-level entity *expression/text* is created for every item to be described; this includes the cases where an *expression/text* instance corresponds to more than one item. It is similar to the three-layered model. If we consider this matter rigorously, it belongs to the cardinality issue on relationships associated with a text-level entity; the minimum cardinality is 1 (not zero) on the *expression/text* side of the relationship either between it and *work* or between it and *manifestation/medium*. This is an inevitable result deduced from

the premise that the text-level entity was chosen to be given primacy. It leads to associating necessary attributes that enable us to identify and describe an item at the text level, with a text-level entity; this point will be examined later. It also leads to creating instances of the bibliographic entities below *expression/text* (i.e., *manifestation/medium* and *item/copy*) for every item.

2. A bibliographic description and also a record must be created based on the unit of the entity *expression/text*, if the policy of creating each record based on one bibliographic entity is adopted. This is also a natural result from the premise that the text-level entity is specified to be predominant. This matter, however, seems to be beyond the scope of conceptual modeling and to be an issue in the implementation stage. It reminds us of the controversy between Lubetzky and Verona on 'literary unit versus bibliographical unit' (Verona, 1959).

The issue does not arise, when we select another policy of creating a record at every level of bibliographic entities, where the resulting records representing an item as a whole are linked to each other.

3. A detailed investigation is required to establish criteria for deciding the unit of (in other words, the boundaries for) *expression/text*. We need such criteria before making a description and also a record based on that entity if we adopt the policy noted above. This issue is equivalent to that on the criteria of identity for a text-level entity (and also a text itself), since that unit consolidates a range of texts which share a certain identity into one text at the conceptual level.

From the conceptual definition of a text and a text-level entity, aspects of physical format such as typeface and page layout are excluded from and irrelevant to the identity of a text and its corresponding entity. Hence verifying the identity between texts should be done by character-by-character comparison. From the viewpoint of operational aspect, on the other hand, it is not feasible to compare texts, character by character, in most cases, except for some electronic resources which are texts in the form of alpha-numeric or other notation (not in the form of sound, image, etc.). Another problem is that, if we adopt the above criteria, each individual physical manifestation will probably be judged as having its own unique text different from all others, except for the cases of facsimile reproduction, microform reproduction, etc. Perfect identical texts but different physical manifestations have seldom occurred in practice, except for certain types of reproduction. Rather, there have been plenty of very similar but slightly different texts--those contain trivial or negligible variation for most users other than

bibliographers or textual scholars.

It follows from what has been said that it would be practical and valid to suppose that texts are identical unless some clues external to, and accompanied to, the texts show their differences. We need to elaborate proper criteria of identity for a text-level entity, while considering balance between the desirable granularity of identity and the applicability of the criteria; this is beyond the scope of conceptual modeling.

4. The cardinality of the relationship between *work* and *expression/text* should be considered to be many-to-many, not one-to-many, since these entities are defined in the parallel way as well as in the hierarchical way. The many-to-many cardinality allows the creation of *work* instances in a flexible manner; for example, more than one *work* instance can be created against a single *expression/text*, when necessary. I have argued that, in the course of discussion on the three-layered model, it is sometimes difficult to create an instance of the work-layer (i.e., the entity *work*) in such a manner that general consensus is obtained on it, since creating a *work* instance depends finally on the individual cataloger's judgement on works (Taniguchi, 1990, 1993, 1997). Likewise, the following passage is found in the description of the IFLA FRBR model (IFLA Study Group, 1998, p. 16):

Because the notion of a *work* is abstract, it is difficult to define precise boundaries for the entity. The concept of what constitutes a *work* and where the line of demarcation lies between one *work* and another may in fact be viewed differently from one culture to another. Consequently the bibliographic conventions established by various cultures or national groups may differ in terms of the criteria they use for determining the boundaries between one *work* and another.

From these arguments one may say that it is difficult to create *work* instances in a stable and widely accepted way covering "various cultures or national groups," or sometimes even within a culture or a nation. Meanwhile, one may say that it is necessary to permit the creation of various *work* instances against the identical text, if we take into account from the beginning the possibility of the exchange or sharing of bibliographic information among "various cultures or national groups." Reflecting this makes the cardinality of the relationship between *work* and *expression/text* many-to-many.

5. We may, in addition to the point just mentioned, note that the minimum cardinality on the *work* side of the relationship from it to *expression/text* should be considered to be either 1 or zero. This means that the proposed framework should also permit to create a *work* instance for every item, or alternatively to create a *work* in limited cases. In other words, I postulate that a *work* instance can be created in a flexible manner.

In cases where the minimum cardinality is 1, one *work* instance at least must be created for every item. It does not contradict the argument that the *work* is not chosen to be predominant. It intends to provide users with some information on *work* but not with core information to identify and describe an item. *Work* may accept some attributes, such as the name headings of the authors or creators of a work, and a uniform title assigned to a work or the title proper of an item containing the work if no uniform title is assigned. It is in accord with the fact that some researchers have insisted that uniform titles must be constructed and applied consistently for all works so as to expand the role of uniform titles in OPACs of the future (Hagler, 1998; Ridley, 1998; Vellucci, 1998).

If the minimum cardinality is zero, it means to create a *work* in limited cases. According to the current AACR, and thus, in modeling this current practice, for example, uniform title authority records apply to restricted cases or types of items, a *work* instance is created in restricted cases.

Correlation With Other Relevant Models

(a) Discussion on metadata

The framework proposed in this paper can easily be applied to electronic resources on the Internet. Giving primacy to a text-level entity enables us to connect our discussion on models with that of metadata, since physical medium is ignored in networked resources and it is improper to make bibliographic records and metadata in a way based on a manifestation-level entity.

If we want to adapt more properly the proposed framework to electronic resources, it is probably reasonable to decompose the manifestation-level entity *manifestation/medium* into a format-level and a carrier-level entity. The 'format' here indicates the formatting of a text, including typeface and page layout. It also indicates the so-called 'logical format' independent from physical carriers in which a text is fixed and stored. On the other hand, the 'carrier' is a physical medium itself, excluding the above 'format,' but involving the so-called 'physical format'

dependent on a medium. Adopting these two entities, instead of the manifestation-level entity, leads to the conclusion that for networked resources only the format-level entity is applicable but the carrier-level entity is not.

If we turn to the examination of discussion on metadata, it is realized that most conceptual models for metadata have so far been deficient in viewpoint to grasp an electronic resource as a structure which consists of more than one constituent like an entity. Exceptions are the model provided by INDECS (Interoperability of Data in E-Commerce Systems) and that of DOI (Digital Object Identifier), both working on metadata and identifier issues of digital resources from the standpoint of rights management (Paskin & Rust, 1999; Rust & Bide, 1999). Both models define bibliographic entities, referring to the IFLA FRBR model, but do not touch on any issue on which entity is given primacy. The reason is that, from the standpoint of rights management, it would be sufficient to manage each resource at one level of entities, which is specified in an individual application system or domain, and the requirement of managing each resource with more than one entity level has not been recognized.

(b) Delsey's model on logical structure of AACR2

Delsey attempted to apply an approach used in the IFLA FRBR model to the current AACR2 in order to “develop a formalized schema to reflect the internal logic of the AACR” (Delsey, 1998). The resulting schema (i.e., model) is exhaustive and fairly complicated so that it fully reflects how the current AACR2 views and deals with the bibliographic universe.

What has to be noticed in his model are the following:

1. He noted that “item is defined relative to the cataloguer’s decision in choosing an entity as the object of description” and “the item may equate to any one of a number of candidate entities: *document*, *document part*, *copy*, *content part*, or *collection*.” The *item* in his model is thus defined as an entity that contains the characteristics of both the manifestation-level and copy-level, and at the same time can be regarded as either level entity, depending on the class of materials or situation. It would be better to say that *item* is defined as an entity resulting from selection as the object of bibliographic description. This *item* would be more proper if we emphasize the ability of reflecting current practice. *Item* and *work* form the basic framework of the model.

2. Various additional bibliographic entities are defined in the model. For

example, when *item* equates to *document* (which is a manifestation-level entity), entities *content*, *infixion*, *physical carrier*, and *container* are additionally introduced, resulting from the decomposition of *document*. They are considered to be defined in the parallel way and correspond to a text-level, a format-level, a carrier-level, and a container-level entity, respectively; but we have not defined any container-level entity in the present study.

From this point one may say that his model shows some features deduced from the combination of the IFLA FRBR model and the three-layered model, thus providing a possible pathway to our proposed model. It contains some bibliographic entities defined in the hierarchical way and others in the parallel way. It is however important to bear in mind that his model pursues the modeling of the internal structure of the current AACR2 (i.e., current practice) not the modeling of its alternatives, including a way which gives primacy to a text-level entity.

(c) Howarth's linked four-tiered record model

This is not a conceptual model inherently intended for conceptual level examination but a record structure, as Howarth herself called it, which is attributed to matters of the implementation level or at least logical level subsequent to the conceptual level (Howarth, 1998b). It also intends to require only the minimum change from the current record structure so that its implementation would be easy. It refers to the IFLA FRBR model, but contains an important difference--this is the reason why her model is taken up here.

The model is a record structure which consists of four sorts of linked records, as its name indicates. They are work-level, authority-level, manifestation-level, and item-level records, which are linked in this order. The authority-level record of this model equals our conventional authority record like that of a personal or corporate author, or that of a uniform title. If we limit our view to a uniform title authority record, this record corresponds to the work-level entity in the IFLA FRBR model and also our proposed model. But one may notice that this record occupies the second-tier, not the first-tier, of the whole record structure--the reason for which is not clear.

On the other hand, her work-level record contains "elements which provide a framework of intellectual/artistic or 'content' information common to any work (title, statement of responsibility, series, generic notes about bibliographic or intellectual content)" (Howarth, 1998b, p. 154) and access points, including subject

headings, class numbers from classification schemes. From this point, one may consider that her work-level record does not correspond to the work-level entity in either the IFLA FRBR model or our text-prioritized model. Or rather, the work-level record of her model agrees roughly with the text-level entity in the three-layered model and our model, although some elements (e.g., subject headings, class numbers) are dealt with differently between her model and the other two; I shall be examining the attributes of a text-level entity in later sections. I want to emphasize here that her work-level record is different from the work-level entity of other models or the *expression* of the IFLA FRBR model.

Similarly, her manifestation-level record has “descriptions of unique physical properties or of format-specific details,” such as edition statement, publication and distribution information, and physical description. The record is different from the *manifestation* of the IFLA FRBR model, but is roughly equivalent to the medium-layer of the three-layered model and, in a sense, to the *manifestation/medium* of our model.

These observations allow us to conclude that there are exclusive relationships among those records of four levels, and thus each constituent of Howarth’s model is thought to be defined in the parallel way, like the three-layered model. The two models in fact have something in common on the assignment of data elements. It is therefore possible to regard her model as one of the models giving primacy to a text-level entity, although she does not touch on it.

(d) Others

We can find several other models incorporating a text-level entity or its equivalent; for example, a model proposed by Green (1996), Heaney (1995), O’Neill and Visine-Goetz (1989), or Svenonius (1992). Incorporating a text-level entity seems to be the result of attempts to view an item to be catalogued in a more structured way, as mentioned at the beginning of this paper. All those models, however, have been briefly described in their studies. Furthermore, they do not give any viewpoint on which entity is given primacy, much less give primacy to a text-level entity.

Associating Attributes With Text-level Entity

Titles and Statements of Responsibility that Appear in Item

It is very important to consider how to associate titles and statements of responsibility that appear in an item with any of the bibliographic entities defined in a conceptual model. In this study I have already used this point as one of clues to judge which entity is given primacy or whether a text-level entity is given primacy. The reason why these elements are important is that they play a significant role in finding and identifying an item; namely, they are the most useful and are actually used for that purpose. Of course, the elements contribute sometimes, for example, to indicate the scope and contents of an item and to provide information on an item's bibliographic relationships to others, although such functions cannot be satisfied with those elements alone.

There are at least two methods of associating those elements with entities as attributes of an entity: one is to associate them with a manifestation-level entity and the other is to associate them with a text-level one. Although it seems to be natural and valid to associate the elements (or a major part of them) with an entity given primacy in a model, we will examine each method in depth respectively and characterize a proper method for our text-prioritized model.

Before examining each method, it is useful to confirm that the IFLA FRBR model indicates the relative significance of each attribute (and also data element) in supporting a task being performed by users. I will use this in the course of examining the validity of the methods. The tasks defined in the model are 'find,' 'identify,' 'select,' and 'obtain.' Those seem to be identified as a result of the articulation of the process carried out by users when searching and making use of bibliographic records--a user generally performs first finding entity instances that correspond to her/his stated search criteria, and then either identifying entity instances or selecting entity instances that are appropriate to her/his needs, and finally obtaining access to the entity instances being identified or selected. In the IFLA FRBR model, there are 14 sub-tasks in total extracted from the combination of the above four tasks and the four bibliographic entities; the task 'obtain' is applicable only to instances of the entities *manifestation* and *item*, which are physical entities.

Method Shown in IFLA FRBR Model--Associating Attributes With Manifestation-level Entity

The first method is to associate such titles and statements of responsibility

with a manifestation-level entity as its attributes. This method is conformable with both the model for current practice and that of Delsey's analysis of AACR2. The IFLA FRBR model also adopts this method, and it is taken as a typical example of showing the method. Figure 3 sketches out at the left the method in the model. All titles that appear in an item, except ones that are uniquely associated with an individual copy, and all statements of responsibility, regardless of entity levels to which persons or corporate bodies represented in those statements have actually contributed, are associated with *manifestation*. These titles, for example, are then mapped to data elements like the title proper, parallel titles, and other title information, according to a cataloging code such as AACR2 or to the ISBDs.

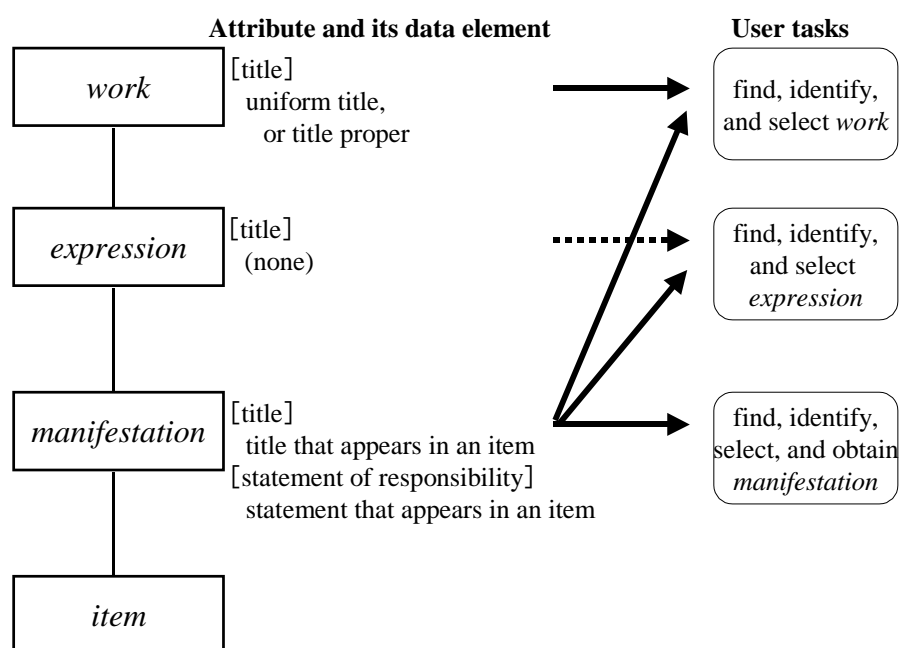


Figure 3. Mapping attributes to user tasks in the IFLA FRBR model.

In the IFLA FRBR model an attribute 'title of the *expression*' is defined to the entity *expression*, but no substantial content of that attribute is indicated--there is no ISBD or GARE (Guidelines for Authority and Reference Entries) data element which can be mapped to the attribute, according to the

explanation in the model itself. At the *work* level, on the other hand, an attribute 'title of the *work*' is defined, being mapped to a uniform title heading (assigned by a cataloger) or the title proper (found on an item) if a uniform title is not applied.

The figure exhibits at the right user tasks (to be precise, sub-tasks) that would be attained with the above attributes--in other words, user tasks for which the attributes are assessed to be important. It shows, with the arrows from the attributes of entities to user tasks, that the attribute 'title' associated with each entity (except *item*) is assessed to be significant for supporting the user tasks of each entity level. We should, at the same time, remember that the 'title' of *expression* has no substantial content; an arrow with a dotted line in the figure denotes this. It also indicates that the attributes 'title' and 'statement of responsibility' of *manifestation* are needed to fulfill user tasks related to *work* and *expression*, while these attributes are of course significant for supporting user tasks of *manifestation*. To put it more precisely, several other attributes of *manifestation*, like edition designation, place of publication/distribution, etc., are also assessed to be requisite attributes to fulfill some user tasks related to *work* and *expression*; this is not depicted in the figure because of its complexity.

Regarding the attribute 'statement of responsibility,' it must be noted that (a) the IFLA FRBR model develops other non-bibliographic entities (e.g., *person* and *corporate body*) for persons and corporate bodies recorded in the attribute 'statement of responsibility' of *manifestation* and (b) the model links those entities to the bibliographic ones in question (e.g., *work* or *expression*) through relationships such as 'is created by' or 'is realized by.' Moreover, the entities *person* and *corporate body* have an attribute to record their names (e.g., 'name'), which can record more than one name and form of name that probably include names described in the 'statement of responsibility' of *manifestation*.

The points to observe are the following:

1. At first glance, the whole structure shown in the figure appears to be complicated rather than simple. This is caused by what I will call 'upward pseudo-assignment' of attribute values of *manifestation*--i.e., 'title' and 'statement of responsibility'--to the upper-level entities *expression* and *work*. The inheritance of attribute values from an upper-level to a lower-level entity can easily be understood, but the converse, and pseudo-assignment of attribute values, is more complex. Such 'upward pseudo-assignment' makes the distinction vague between the fulfillment of tasks related to *manifestation* with these attribute values and

that of *work* or *expression* with the same attribute values. In the case of the task 'find,' in particular, the distinction cannot be made if only these attributes are used to carry out the task. In the case of the tasks 'identify' and 'select,' it is possible to distinguish those of different levels since they need other attributes in addition to these--in other words, they cannot be accomplished without attributes other than these.

2. If we focus on the text-level entity *expression*, it is evident that the task 'find' *expression* has no sufficient basis to carry out that task and depends heavily on the attributes of *manifestation*. According to the explanation in the IFLA FRBR model, some other attributes are useful for supporting this task, such as language and other distinguishing characteristics, which are attributed to *expression*. They can, however, be expected only to complement the major data elements, like the title and statement of responsibility 'upward pseudo-assigned' from *manifestation*. On the other hand, although the tasks 'identify' and 'select' *expression* can be accomplished using various attributes of that entity, they have to be carried out subsequent to tasks related to other entities (i.e., *manifestation* or *work*), since the task 'find' *expression* is not self-attainable as mentioned above.

3. User tasks related to *manifestation* are fully accomplished with the attributes of the entity itself without any support from the attributes of other level entities. This is consistent with the point that the IFLA FRBR model gives primacy to *manifestation*.

Method for Text-prioritized Model--Associating Attributes With Text-level Entity

The second method is to associate titles and statements of responsibility that appear in an item with a text-level entity. This method implies that in most cases without any problem such titles and statements of responsibility can be regarded and dealt with as the attribute values of the title and responsibility designation of a text-level entity as they are. In only the cases where this supposition is not appropriate, we need additional treatment as will be touched on later. Also, the method corresponds to the fact that in most cases users are not aware of the difference between titles and statements of responsibility to be attributed to a text-level entity and those to be attributed to a manifestation-level entity. Based on the fact, for example, Bradford OPAC that will be taken up in a later section was probably designed and would be useful to some extent.

This method can be observed in the three-layered model and Howarth's. In the three-layered model, those elements (except statements of responsibility which are only related to the medium-layer) are associated with the text-layer. Edition statements (except ones relating only to a difference in form) are also associated with the text-layer. On the other hand, data elements such as place of publication, name of publisher, date of publication, etc., are all attributed to the medium-layer. Similar assignment of attributes is found in the linked four-tier record structure of Howarth; but some minor differences exist between the two models.

Next an appropriate method for the entities proposed in this paper is characterized, while referring to the methods shown in the above two models (three-layered and Howarth's). This method must result in giving primacy to a text-level entity; for example, all tasks related to a text-level entity must be accomplished with attributes of that entity. It also must be able to solve issues involved in the method for the IFLA FRBR model. Figure 4 demonstrates the method for our text-prioritized model in a manner similar to Figure 3.

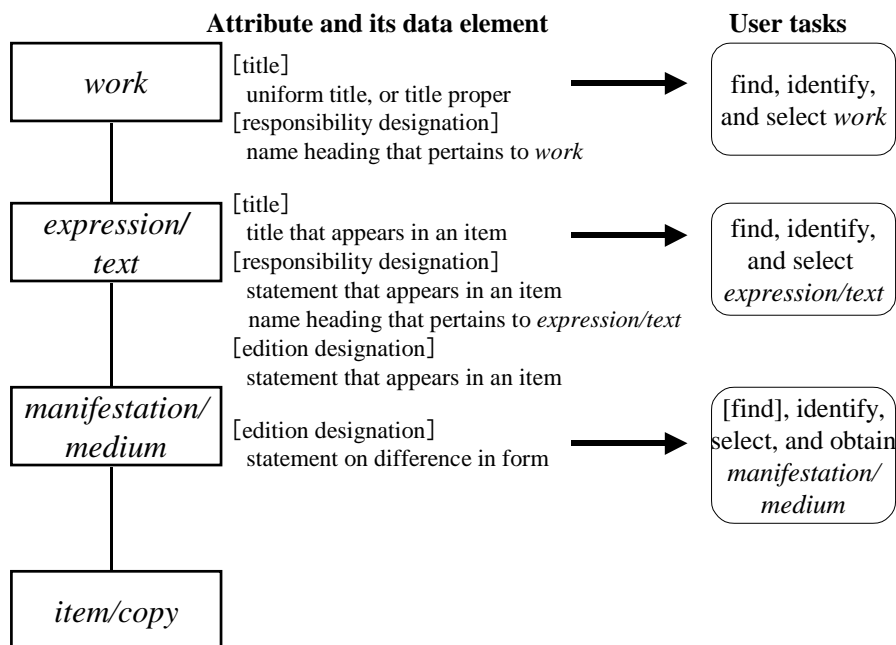


Figure 4. Mapping attributes to user tasks in the proposed model.

The figure shows that titles, statements of responsibility, and edition

statements that appear in an item are associated with the text-level entity *expression/text*, excepting edition statements which are related only to *manifestation/medium*. The elements not associated with *expression/text* are consequently associated with *manifestation/medium*, together with other elements like place of publication, name of publisher, etc. On the other hand, the entity *work* has its title, such as a uniform title or a title proper when a uniform title is not applied.

The method demonstrated in the figure requires some further explanation.

1. If we focus on tasks related to *expression/text*, it is concluded that these tasks, including 'find,' can be accomplished with attributes and data elements associated with the entity, assuming that several other attributes characterizing the entity (e.g., form, date, language) are also assigned to it. The reason for this conclusion is that sufficient data elements to accomplish the tasks are assigned to *expression/text*; it is evident if we compare the method with that shown in Figure 3.

2. We know the fact that there are some manifestations with the same text but different titles from each other--different titles may be assigned by the same or different publishers. According to our text-prioritized model, in such cases a single instance of *expression/text* is created for those manifestations, thus accepting more than one title that appear in them as its 'title' attribute values. That seems not to cause any problem in conceptual models including ours. We can deal with it in any convenient way at the implementation stage. For example, if necessary, we can choose one title from those as the 'title proper' attribute value of the *expression/text* instance. Furthermore, we can also record any of titles not chosen as the 'title proper' value of the *expression/text* instance in each individual instance of *manifestation/medium* which corresponds to that title.

3. Let us think about the cases where a *manifestation/medium* instance embodies more than one *expression/text*. When an item corresponding to such a manifestation does not bear a collective title that covers the whole item, each *expression/text* instance should have a 'title' value for its own text, usually extracted from titles that appear in the item. On the other hand, if an item bears a collective title in the above case, each *expression/text* instance would have that collective title as well as a title corresponding to its own text. This seems to be beyond the scope of conceptual modeling.

4. Consistent with the preceding points, the task 'find'

manifestation/medium is not accomplished with only data elements associated with the entity, since those elements are not enough for finding tasks. That task is enclosed in square brackets in the figure so as to indicate this. This fact implies that we usually reach a *manifestation/medium* instance only through an *expression/text* when we attribute the item's title and statement of responsibility to the latter entity.

5. With respect to the attribute 'title' of *work*, we assigned it a uniform title or the title proper if no uniform title is applied to the work; the title proper means in this case a title which is selected from titles appearing in an item according to the instructions in a cataloging code. This title and other characterizing data elements, like form, date, etc., associated with *work* would be enough to attain tasks related to the entity. Moreover, we assume that in our model the entities *person* and *corporate body* are developed and linked to bibliographic entities including *work*, as is the same as that in the IFLA FRBR model. In addition, it is assumed provisionally that *work* has an attribute 'responsibility designation' represented with name headings (or their equivalents) of *person* and *corporate body* linked to *work* in question; the figure contains this attribute and its data element.

The IFLA FRBR model, on the contrary, regards titles and statements of responsibility that appear in an item as vital data elements to attain tasks related to *work*, as we have seen earlier. It is not certain which of the two methods is valid for the work-level tasks; we need further investigation.

6. We arrive at the conclusion that the whole structure of mapping attributes and data elements to user tasks, shown in the figure, is simple, on the grounds that user tasks at each entity level are in principle satisfied with the attributes of the entity's own.

Examples of Other Attributes Associated With Text-level Entity

It is obviously necessary to associate several other attributes, in addition to the title, responsibility designation, and edition designation that we examined in the preceding sections, with the entity *expression/text*, in order to designate fully the characteristics of texts and support the user tasks of that entity level. The IFLA FRBR model, for example, listed relatively comprehensive attributes (and also data elements) of *expression*, whereas it lacks some crucial ones if seen from the viewpoint of giving primacy to the text-level entity, as discussed. It is thus

possible to show an example of an attribute set that should be associated with a text-level entity, referring to the conclusion in the preceding section and the IFLA FRBR model.

The following are logical attributes (not data elements defined in cataloging codes or others) which are expected to be associated with *expression/text* and be generally applicable to any kind of text; those that are applicable only to a specific type of text (e.g., in the form of musical notation) are excluded. Asterisks indicate those attributes are borrowed from the IFLA FRBR model.

- title of *expression/text*
- responsibility designation
- edition designation (when not pertaining to format/medium)
- form of *expression/text**
- date of *expression/text**
- language of *expression/text**
- other distinguishing characteristic*
- extensibility of *expression/text**
- revisability of *expression/text**
- extent of *expression/text**
- summarization of content*
- context for *expression/text**
- critical response to *expression/text**
- use restrictions on *expression/text**

Relationships Between Instances of Text-level Entity

Bibliographic relationships between items are modeled as relationships between instances of the same bibliographic entity at the conceptual level. Each relationship between given items is actually unique in an individual case, to be exact. It is thus important to study how to categorize them into logical types of relationships that may operate between instances of the same entity class, including a text-level entity. Several very useful studies have been made by scholars to show such relationship types (Green, 1996; Vellucci, 1997; Tillett, 1991a, 1991b, 1992a, 1992b), as well as the IFLA FRBR study.

The IFLA FRBR model, for example, identifies the following relationship types between instances of the text-level entity *expression*: (a) abridgement,

revision, translation, and musical arrangement between *expression* instances of the same *work* instance, (b) successor, supplement, complement, summarization, adaptation, transformation, and imitation between *expression* instances of different *work* instances, and (c) whole-part relationships. Each type of relationship has been further divided into sub-types in the model.

It is obvious that a comprehensive arrangement is required for logical relationship types between instances of a text-level entity in the pursuit for a model giving primacy to that entity. For example, the arrangement shown in the IFLA FRBR model seems to be relatively comprehensive as a whole. I would therefore like to borrow these relationship types and apply them to the entity *expression/text* in our text-prioritized model.

Creating Scenario on How Bibliographic Entities Are Used

What Is a Scenario?

As we have seen, the user tasks which the IFLA FRBR model defines can be understood as a sequence of actions performed by users--in other words, a process conducted by users--when they are searching and making use of bibliographic records. If we consider the execution order of the sub-tasks (which are tasks defined at each bibliographic entity level) by users in usual cases, we may be able to depict the outline of the whole process conducted by users. I call it a 'scenario,' which represents a possible but main sequence of events that might take place at the conceptual level.

Such a scenario results in showing which bibliographic entity is predominant in a conceptual model, as well as showing the whole process conducted by users. This is because an entity can be regarded as being predominant in a model if the following conditions are satisfied: (a) users begin their search with the entity in most cases, and (b) the entity is necessarily identified or selected in the process.

Any scenario of this type at the conceptual level becomes that of a practical level as it is if we assume that a bibliographic record is created for each instance of bibliographic entities at different levels and the resulting records are linked to each other. At the same time it is necessary to recognize the risk of over-simplification of actual usage process, which would be more complex and inherently

trial-and-error (not linear) process. In fact a series of user tasks could be interrupted and ended at any point, or jumps to any other different tasks could happen suddenly.

The scenarios shown below do not contain tasks related to either the entities *person* and *corporate body* or those that serve subject searching (e.g., concept, object, etc., in the IFLA FRBR model) so as to make the scenarios simple. They postulate, however, that these non-bibliographic entities are developed and used in the case of access through authors or subjects; they presuppose the involvement of tasks related to the non-bibliographic entities, such as 'find' *person*, 'identify' *person*, etc., in the scenarios.

Scenario Deduced from Modeling of Current Practice

Figure 5 demonstrates an abridged scenario of how bibliographic entities developed by modeling current cataloging practice are used in a user's search process. The figure indicates the following:

1. The tasks 'find' *manifestation* and 'find' *work* are first carried out, but the latter task is less frequently performed since *work* instances exist only in the restricted cases as confirmed earlier.

2. After the task 'find' *manifestation* is performed and the resultant set of *manifestation* instances is created, another task 'identify' or 'select' *manifestation* is usually carried out for any of those *manifestation* instances.

3. And then, if one or more *manifestation* instances are 'identified' or 'selected' as being appropriate for the user's needs, they are finally 'obtained' by the user.

4. Or, if one or more appropriate *manifestation* instances are 'identified' or 'selected,' *item* instances linked to any or each of those *manifestation* instances are either 'identified' or 'selected' and finally 'obtained' by the user.

It is reasonable to consider this series of tasks to be the mainstream in using bibliographic entities (and also bibliographic records), as well as to consider the entity *manifestation* to be predominant in the model. Most current OPACs are designed while supposing this series of tasks.

5. After appropriate *manifestation* instances are 'identified' or 'selected,' the user can move to *work* instances, if any, that are linked to those *manifestation* instances. If a proper *work* instance, as a result, is 'identified' or 'selected,' *manifestation* instances linked to the *work* instance are collocated and thus we will

return to the task ‘identify’ or ‘select’ *manifestation*. Some OPACs enable us to carry out such tasks with uniform title authority records linked to bibliographic records.

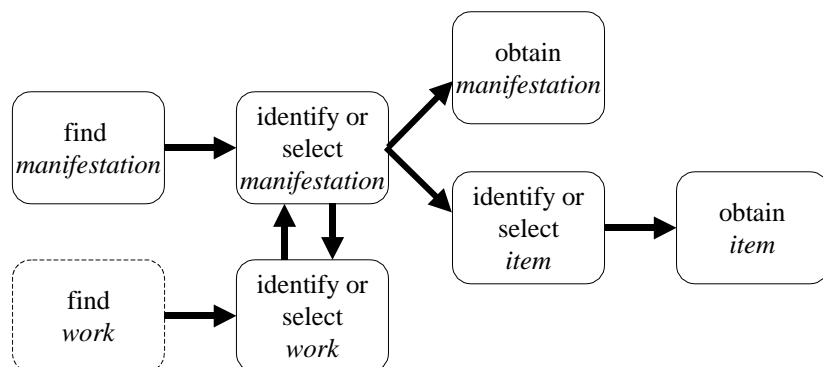


Figure 5. A scenario derived from the modeling of current practice.

Scenario for IFLA FRBR Model

We can create a scenario of using bibliographic entities defined in the IFLA FRBR model as manifested in Figure 6. The most important difference between this scenario and that represented in Figure 5 is that the tasks ‘find’ *expression* and ‘identify’ or ‘select’ *expression* are inserted in this scenario. But the task ‘find’ *expression* does not have solid basis for its accomplishment without titles and statements of responsibility that are ‘upward pseudo-assigned’ from *manifestation* as discussed earlier; a dotted line enclosing the task shows this in Figure 6. These tasks, as well as ‘find’ *work* and ‘identify’ or ‘select’ *work*, are additional and hence subordinate to the mainstream of tasks from ‘find’ *manifestation* to ‘obtain’ *manifestation* or *item*. They play an intermediary function to navigate users to the tasks ‘identify’ or ‘select’ *manifestation*.

In this scenario, the problem involved in the ‘upward pseudo-assignment’ of attribute values could be reduced to the minimum. On the contrary, if we

consider another scenario where the task ‘find’ *work* or ‘find’ *expression* is first carried out--instead of the task ‘find’ *manifestation*--as a part of the mainstream of tasks, that problem is critical.

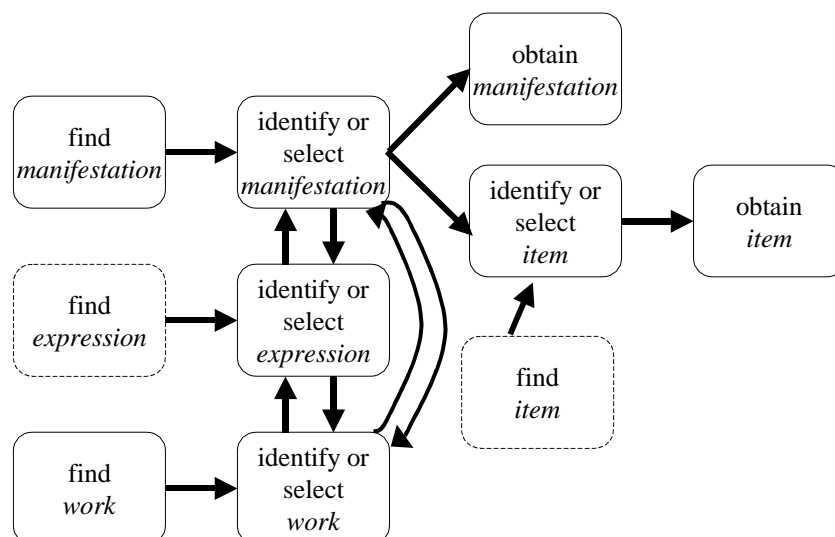


Figure 6. A scenario for the IFLA FRBR model.

Scenario for Text-prioritized Model

Figure 7 illustrates a scenario that is harmonious with the model proposed in this paper. The most important difference between this and the above two can be observed in a series of tasks regarded as the mainstream of using bibliographic entities. In the scenario for our text-prioritized model, a series of tasks thought to be the mainstream begins with the task ‘find’ *expression/text* and then ‘identify’ or ‘select’ *expression/text*. After that, one or more *manifestation/medium* instances that are linked to each of those *expression/text* instances are ‘identified’ or ‘selected’ by the user as appropriate. Then subsequent tasks equivalent to those shown in the above two scenarios are performed in turn. Being consistent with the change that arose in the mainstream of tasks, the task ‘find’ *manifestation/medium* drops from, and is subordinate to, the mainstream. The tasks ‘find’ *work* and ‘identify’ or ‘select’ *work* remain in principle at the position shown in the scenario for the IFLA FRBR model.

It is emphasized that a new type of OPAC is needed to assist users in performing a series of tasks illustrated on the scenario in Figure 7, when bibliographic records are created in line with a structure that consists of the four bibliographic entities.

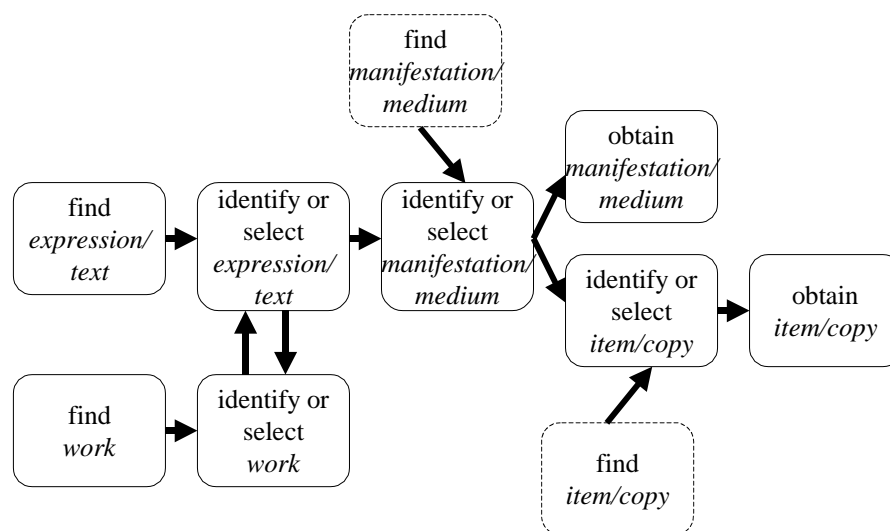


Figure 7. A scenario for the proposed model.

Showing Examples of Bibliographic Records in Line with Text-prioritized Model

The following attempts to illustrate a few examples of bibliographic records created in line with the model proposed in this paper. However, only a conceptual model for cataloging, not a way of cataloging, is proposed in this paper. It is thus impossible to create records while referring only to the model. For creating records, it seems necessary at least to define a record format at the logical level subsequent to the conceptual level, and also to construct a set of rules to record each individual data element. Equivalents of bibliographic records will therefore be illustrated in line with the conceptual model in order to provide a clearer image of this model.

The expedients are adopted of (a) using an existing USMARC Bibliographic Record, (b) transferring the data elements of the MARC record to the attributes of the bibliographic entities, and (c) supplying data values to nearly mandatory attributes (i.e., data elements) if no data value is found in the MARC record. Also adopted is the way of creating an individual bibliographic record for each entity instance and linking the resulting records to each other to show an item as a whole. Moreover, it is assumed that other kinds of records corresponding to non-bibliographic entities, such as *person* and *corporate body*, must be created and linked to some of the bibliographic records, but all such records are omitted here. Instead, headings assigned to the MARC records, such as personal names (USMARC field tag 700), corporate names (tag 710), subject headings (tag 650), and others, remain as the data elements of the newly created bibliographic records to support their 'identify' and 'select' tasks.

Case 1: Book

Figure 8 demonstrates a set of bibliographic records representing as a whole a book *Maxwell's handbook for AACR2R* published in 1997 when chosen as a material to be cataloged. The set is composed of five records: a *work*, an *expression/text*, a *manifestation/medium*, and two *item/copy* records--the Library of Congress holds two copies of the book. Each record consists of (a) several data elements and their data values transferred from the MARC bibliographic record with LC control number 97001449--they are preceded by the MARC tags--and (b) data values supplied for this illustration--they are preceded by '+'.

A single *work* record (i.e., a single instance of the entity *work*) is developed so as to cover the book *Handbook for AACR2* by Margaret Maxwell and its revised editions. Instead, we can create a single *work* record for an individual edition, depending on the policy of developing an instance of *work*. The model proposed in this paper can accept either of the ways.

Data element values contained in the *work* record are roughly divided into some groups: (a) titles of *work*, (b) names of persons and corporate bodies responsible for *work* (i.e., some name headings like tags 100, 700), (c) subject terms or codes assigned to *work* (tags 050, 082, 650), and (d) other characteristics of *work*, like date, form, etc.

Data element values in the *expression/text* record are: (a) titles and statements of responsibility that appear in an item (tags 245, 246), (b) names of

persons and corporate bodies responsible for *expression/text* (i.e., name headings), (c) date and language of *expression/text* (a part of tag 008), (d) other characteristics (tag 504), and (e) descriptions of bibliographic relationships (tags 500, 700 with subfield code #t). Subject terms or codes can be assigned to the *expression/text* record in lieu of the *work*, if we adopt an alternative policy.

Being consistent with the data elements of the *expression/text* record, the data elements of the *manifestation/medium* record in this example are: (a) publisher, place and date of publication (tag 260), (b) physical medium and extent of the carrier (tag 300), and (c) manifestation identifier like ISBN (tag 020). Each *item/copy* record has only one data field (i.e., tag 991); but it could contain some administrative data for the particular copy, like a local call number, a location mark, etc.

The whole bibliographic family of the above *work* is illustrated as follows:

[W1] Margaret Maxwell's *Handbook for AACR2*, 1980-

[E1] *Handbook for AACR2* by Margaret Maxwell, 1980

[M1] book published in 1980

[E2] *Handbook for AACR2, 1988 revision* by Margaret Maxwell, 1989

[M1] book published in 1989

[E3] *Maxwell's handbook for AACR2R* by Robert Maxwell with Margaret Maxwell, 1997

[M1] book published in 1997

Each line indicates one instance of a bibliographic entity (as well as one bibliographic record in the way adopted for the illustration in Figure 8), denoting only its brief title, responsibility designation, and date. '[W]' stands for a *work* instance; '[E]' for an *expression/text*; and '[M]' for a *manifestation/medium*. Accordingly, [W1], its subordinate [E3], and [M1] are entity instances that were illustrated in the figure. There are 'revision' relationships among [E1], [E2], and [E3].

Case 2: Book

Figure 9 shows another example of a book, that is, 'AACR2' published in 1978. The MARC bibliographic record with LC control number 78013789 was used in this case.

There are several ways of developing *work* records for this example, depending on the policy. One way is to create a single *work* record (i.e., a single instance of the entity *work*) for AACR2 and its additional editions like 1988 Revision and 1998 Revision--we adopted this way provisionally. Another is, for example, to create a single *work* record for the whole AACR family containing all its editions like AACR1 and AACR2.

In the figure, we developed two *manifestation/medium* records, since hardbound and softbound should be dealt with as different manifestations. It is different from LC's current practice. It is obviously possible to deal with such a book as one *manifestation/medium* in line with LC's practice. We also developed four *item/copy* records, but there is no information in the MARC record about which *manifestation/medium* each *item/copy* is linked to.

The whole bibliographic family of the *work* AACR2 and its preceding family AACR1 are illustrated as follows, assuming that they are different works all derived from the 'superwork' AACR:

[W0] AACR

[W1] AACR1, 1967-1977

[E1] North American text, 1967

[M1] book published in 1967

[E2] British text, 1967

[M1] book published in 1967

[E3] North American text. Chap. 6 revised, 1974

[E4] British text. Chap. 6 revised, 1974

[E5] North American text. Chap. 12 revised, 1975

[E6] ...

[W2] AACR2, 1978-

[E1] AACR2, 1978

[M1] book in hardbound published in 1978

[M2] book in softbound published in 1978

[M3] book in binder published in 1978

[E2] Revisions 1982

[M1] book published in 1982

[E3] Revisions 1983

[E4] Chap. 9, draft revision, 1987

[E5] 1988 revision
[E6] Amendments 1993
[E7] ...

Each line indicates one instance of a bibliographic entity (and also one bibliographic record in the figure) in a manner similar to Case 1. [W2], its subordinate [E1], and [M1], [M2] are entity instances that were illustrated in the figure. Regarding *manifestation/medium* instances, all but some [M1] are omitted because of the limit of space. There is a 'successor' relationship between the *work* instances [W1] and [W2]. Likewise, there are 'revision' relationships between "[E1] AACR2, 1978" and each of other *expression/text* instances under the *work* [W2]. In reality, however, for example, [E2], [E3], and [E4] are updates to parts of the whole work [W2], and thus alternatively they can be viewed and dealt with as separate works in 'whole-part' relationship to the whole work.

Case 3: Sound Recording

Figure 10 shows an example of a musical sound recording, using the same manner as that of Case 1 and 2; the MARC bibliographic record with LC control number 99583364 was chosen as a base record. In the case of musical sound recordings, a *work* record represents a musical work itself, while an *expression/text* record represents the performance of the work at a certain point in time (i.e., musical sounds resulting from a performance), and a *manifestation/medium* represents the sound recorded in the given format and carrier. In this example, the *manifestation/medium* contains two different *expressions/text*, each of which has its corresponding *work*.

If we take some bibliographic records illustrated in the figure (i.e., the *work* record 1, *expression/text* 1, and *manifestation/medium* 1), the bibliographic family including the sound recording and some others related to the work 'Ernest Bloch's Schelomo' is depicted as follows, assuming that [W1], its subordinate [E2], and [M1] correspond to the above records, respectively:

[W1] Ernest Bloch's *Schelomo*

[E1] a performance by Gregor Piatigorsky, Boston Symphony Orchestra, and Charles Munch recorded in 1958?

[M1] recordings released on 33 1/3 rpm sound discs in monaural in

1958 by RCA Victor

[M2] recordings released on 33 1/3 rpm sound discs, in stereophonic in 1964 by RCA Victor

[M3] ...

[E2] a performance by Mstislav Rostropovich, Orchestre national de France , and Leonard Bernstein recorded in 1977

[M1] recordings released on 33 1/3 rpm sound discs in quadraphonic in 1977 by Angel

[M2] recordings released on 33 1/3 rpm sound discs in quadraphonic in 1984 by Musical Heritage Society

[M3] ...

[E3] ...

Additional Discussions

This section discusses only some points that have insufficiently examined in previous sections.

Implication of Cataloging Physical Object in Hand

As Tillett (1996) pointed out, “for the vast majority of monograph cataloguing, the point is not really to describe the particular physical instance in hand for its own sake, but rather to use it to arrive at a general physical description that will apply to all other instances.” And she goes on to say: “In terms of the conceptual model, we are starting with an ITEM, ..., and using it to arrive at information about MANIFESTATION.” This implies generalization from a physical object in hand to the manifestation involving that object.

When we adopt a model that gives primacy to a text-level entity, we must use a physical object in hand to arrive at a general text description (i.e., information about a text-level entity) that will apply to all manifestations containing the identical text, in addition to a general physical description that will apply to all other instances of copy-level. Even in the case of remote access electronic resources, this holds true; we must use an electronic resource being accessed with a given mode of access and address to arrive at a general text description that will apply to all resources containing the identical text but with

different modes of access and/or addresses. It implies generalization from a physical object in hand to both the text and the manifestation. It is equivalent to when we consider a text to be more substantial (not just abstract), since, if not, it is impossible to treat a text in a stable manner.

Such a model, involving ours, forces us to record attribute values of a text-level entity instance, like titles, statements of responsibility, and others, in such a manner that they cover in principle all manifestation-level instances subordinate to the text-level one, while usually referring to only one instance of the copy-level. The gap of levels, in a sense, between what we actually have in hand and what we intend to describe would be bigger than before and more subject to revision and extra cataloging work as subsequent manifestations appear. This seems to be an interesting possible consequence from an approach to prefer content over carrier.

Implication of Text-prioritized Model with Single Record Approach

In the implementation stage of our text-prioritized model, we can choose a way where a single bibliographic record is created that describes both the entity *expression/text* and the *manifestation/medium* so as to keep the whole record structure compatible with that of the current way of cataloging with AACR2 and MARC 21, which consists of three records--a uniform title authority, a bibliographic, and a holdings record. It reminds us of a current topic on 'single-record approach,' which is a way of creating a single bibliographic record for electronic resources that are available in different types of carriers or in different output medium or formats but have the same content. This approach, to put the matter simply, allows multiple physical descriptions within a single bibliographic record. It is specified as one of the choices for dealing with electronic resources in *ISBD(ER)* (IFLA, 1997) and other cataloging guidelines and manuals. It is also considered to be one of the possible ways to implement 'expression-based records' by ALCTS CCS CC:DA and Joint Steering Committee for Revision of AACR (ALCTS CCS CC:DA, 1999, 2000; Joint Steering Committee for Revision of AACR, 2001, 2002).

Thus we should examine what our text-prioritized model implies when we employ the single record approach. This raises the question of what is an important difference between our model with the single record approach and current practice with that approach. Based on the discussion pursued in this paper, the answer to that question consists of the following:

1. The unit of bibliographic record creation (and also bibliographic description creation) should be based on the unit of the entity *expression/text*, not the unit of *manifestation/medium*, in the case of our model. Current cataloging with the single record approach, on the contrary, adopts the unit of *manifestation*, inconsistently resulting in a bibliographic description involving more than one physical manifestation by chance in certain cases.

2. The first, second, and third areas of a bibliographic description which are defined in ISBDs, AACR, etc. and also have a key role in identifying and describing an item should intend in principle to describe *expression/text*, if a record is created in line with our model. In other words, those areas must be redefined so as to represent the characteristics of the text of an item sufficiently. This involves an implication that data elements making up those areas should be dealt with so as to cover all *manifestation/medium* instances subordinate to an *expression/text* in question.

3. Relationships between texts--in particular, relationships that are important for most users--should be indicated in any manner, such as record links between bibliographic records, and links between bibliographic records and uniform title authority records, when bibliographic records are created in accordance with our model. The current framework of a bibliographic record and also record link structure must be rearranged in order to implement them.

Examples of Existing Relevant Systems

(a) LS/1 Online Catalog System

This system was developed at the Kunitachi College of Music Library, Japan, taking into account certain intrinsic characteristics of music resources (Matsuura, 1996, 1997). It has some interesting features, but only one point closely related to the present study is taken up.

With this system, a conventional bibliographic record is divided into two records--a 'bibliographic record' and a 'medium record' in their terms--and these records are linked to one another. The 'medium record' contains the data elements of ISBD Area 4 (publication, distribution, etc. information), Area 5 (physical description), some elements of Area 7 (notes), and a part of coded information. Consistent with this, the 'bibliographic record' of this system comprises the remaining part of a conventional bibliographic record: the data elements of ISBD Area 1, 2, and 3, and some other elements. When we have an item different only

in, for example, publication information or physical carrier from another already cataloged, with this system we need only to make a 'medium record' and link it to the 'bibliographic record' that was created for the other and already stored in the system. This implies that the system intends to make a record corresponding to a text-level entity, being separate from a record corresponding to a manifestation-level entity.

We should acknowledge first the fact that such a system already exists and is at work, and then examine the limits of this system. Dividing a conventional bibliographic record into these two has been mechanically done. Hence the identity of texts cannot be reflected with this division in some cases. For example, if two items contain identical text but have different data values at one or more data elements associated with the 'bibliographic record,' two different 'bibliographic records' are created and not integrated into one record in the system. This limit seems to be inevitable, since the system should be well operable under current cataloging environment; it is necessary to import records created outside the system efficiently and sometimes to export records with a conventional MARC format. Another limit of the system is that the current OPAC developed at that library is unable to make use of this record structure sufficiently yet.

(b) Bradford OPAC (BOPAC)

BOPAC developed at the University of Bradford, U.K., was an experimental prototype OPAC that contained some new design concepts. One of the prominent features of BOPAC during the first phase of the research project was that, when loading bibliographic records represented in a conventional MARC format into BOPAC which was constructed on a relational database management system, records are divided and stored in two relation tables: 'manifestation set' and 'manifestation' table (Ayres, Nielsen & Ridley, 1996, 1997; Ayres, Nielsen, Ridley & Torsun, 1995).

The former table has fields for title (whose data values were extracted from the title proper and a uniform title, if any, of each record) and author (whose values were extracted from name headings of each record). If the data values of these fields are the same between more than one instance (i.e., bibliographic record), these instances are merged into one instance, being represented with one tuple within the table. On the other hand, the remaining data other than the above fields of a bibliographic record is stored in the latter table, each of whose

tuple denotes an individual manifestation and also an item. And the two tables are linked; each tuple of the former table is linked to one or more tuples of the latter.

Any initial search on title or author uses the former table within this OPAC. After an initial search is carried out and any of the resulting instances (i.e., tuples) of that table is selected by the user, all instances of the latter table are displayed which are linked to each of the selected instances of the former table. The system at this phase does not use any authority records (i.e., uniform title authority and name authority records), thus the using process is simple.

We may be able, in a sense, to regard an instance of the former table as a text-level record equivalence. We may also be able to regard the OPAC as an initial version of systems that make use of such multi-level record structures. It is, however, important to recognize that the table is created automatically from bibliographic records made under current cataloging practice, which takes texts into little consideration.

Conclusion

A new viewpoint on whether a text-level entity is given primacy among bibliographic ones in a conceptual model was introduced to examine the role and function of that entity in each model. As a result, it was found that almost all models including the IFLA FRBR model does not deal with a text-level entity as a predominant one, with some exceptions like the three-layered model and the linked four-tiered record model.

A new model giving primacy to a text-level entity was also proposed using the E-R modeling language. By chiefly integrating the IFLA FRBR model with the three-layered model, the model was developed; it comprises necessary bibliographic entities including that of text-level, their attributes, their relationships, and other entities. The text-level entity, its main attributes, and relationships between instances of the entity were examined in particular.

Furthermore, both clarification of the implication of that model within the scope of conceptual modeling and clarification of the features of a way of cataloging in accordance with the model were attempted as much as possible.

As a result, for example, the following was clarified on the implication of

giving primacy to a certain bibliographic entity in a model:

1. An instance of the entity which was given primacy must be created for every item.

2. Bibliographic records must be created based on the unit of the entity given primacy, when adopting the policy of creating each record based on a bibliographic entity.

3. Titles, statements of responsibility, and others that appear in an item (excluding some exceptions) must be associated with the entity given primacy. Other attributes (and also data elements) fully characterizing the entity must be associated with it as well.

4. Important relationships between instances of the entity given primacy must be identified and represented in any manner.

5. User tasks related to the entity given primacy are accomplished with the attributes associated with the entity itself and relationships between instances of the entity. This can be deduced from the above 3 and 4.

6. A scenario showing the whole process conducted by users begins with a task related to the entity given primacy (e.g., 'find' that level entity). Also instances of the entity are necessarily 'identified' or 'selected' in the process shown in the scenario.

In the next step of this study, investigations on the feasibility of a way of cataloging in accordance with the model proposed in this paper are planned. We examined in this study a limited scope of issues that may arise in a way of cataloging in line with the model. We need to examine a wide variety of instances in order to verify and validate the model, and also to clarify issues accompanied by the implementation of the model.

In addition, further investigations on the fulfillment of the points may be required, enumerated at the beginning of this paper as the significance and necessity of a model of that kind. Developing a prototype system to make full use of records created in line with such a model may be another issue to be addressed.

Or, investigation of possibilities may be an issue in which we can apply the orientedness analysis of cataloging rules (Taniguchi, 1995, 1996), or apply a prototype system for analyzing the internal structure of rules and relationships among them (Taniguchi, 1999a), to the detailed modeling of current cataloging practice, like Delsey's endeavor (Delsey, 1998). Based on such detailed and exhaustive modeling of current practice, an elaborate modeling would be possible

toward an alternative framework for current practice, including the modeling of giving primacy to a text-level entity, which we have pursued in this study.

Acknowledgment

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[*work* record 1]

+title: Handbook for AACR2
700 1_ #a Maxwell, Margaret F., #d 1927-
+date: 1980-
050 00 #a Z694.15.A56
082 00 #a 025.3/2 #2 21
630 00 #a Anglo-American cataloguing rules #x Handbooks, manuals, etc.
650 _0 #a Descriptive cataloging #x Rules #x Handbooks, manuals, etc.

[*expression/text* record 1]

245 10 #a Maxwell's handbook for AACR2R : #b explaining and illustrating the Anglo-American cataloguing rules and the 1993 amendments / #c Robert L. Maxwell with Margaret F. Maxwell.
246 30 #a Handbook for AACR2R
100 1_ #a Maxwell, Robert L., #d 1957-
700 1_ #a Maxwell, Margaret F., #d 1927-
008 ...s1997 ...eng
504 __ #a Includes bibliographical references and index.
500 __ #a Rev. ed. of: Handbook for AACR2, 1988 revision / by Margaret Maxwell.
700 1_ #a Maxwell, Margaret F., #d 1927- #t Handbook for AACR2, 1988 revision.

[*manifestation/medium* record 1]

260 __ #a Chicago, IL : #b American Library Association, #c 1997.
300 __ #a xii, 522 p. : #b ill. ; #c 26 cm.
020 __ #a 0838907040 (alk. paper)

[*item/copy* record 1]

991 __ #b c-GenColl #h Z694.15.A56 #i M393 1997 #t Copy 1 #w BOOKS

[*item/copy* record 2]

991 __ #b r-MRR #h Z694.15.A56 #i M393 1997 #t Copy 2 #m Ref Desk #w GenBib

Figure 8. Case 1. An example of a set of bibliographic records in line with the proposed model.

[*work record 1*]

+title: Anglo-American cataloguing rules. 2nd ed.
+title: AACR2
710 20 #a American Library Association.
+responsibility: British Library
+responsibility: Canadian Committee on Cataloguing
+responsibility: Library Association
+responsibility: Library of Congress
700 10 #a Gorman, Michael, #d 1941-
700 10 #a Winkler, Paul W. #q (Paul Walter)
+date: 1978-
500 __ #a Originally published (1967) in two versions under the following titles:
Anglo-American cataloguing rules. North American text; Anglo-American cataloguing
rules. British text.
050 00 #a Z694 #b .A5 1978
082 00 #a 025.3/2
650 0_ #a Descriptive cataloging #x Rules.

[*expression/text record 1*]

245 00 #a Anglo-American cataloguing rules / #c prepared by the American Library
Association ... [et al.] ; edited by Michael Gorman and Paul W. Winkler.
250 __ #a 2d ed.
008 ...s1978 ...eng
504 __ #a Includes bibliographical references and index.

[*manifestation/medium record 1*]

260 0_ #a Chicago : #b ALA, #c 1978.
300 __ #a xvii, 620 p. ; #c 26 cm.
020 __ #a 083893210X.

[*manifestation/medium record 2*]

260 0_ #a Chicago : #b ALA, #c 1978.
300 __ #a xvii, 620 p. ; #c 26 cm.
020 __ #a 0838932118 #b pbk.

[*item/copy record 1*]

991 __ #b c-GenColl #h Z694 #i .A5 1978 #t Copy 1 #w BOOKS

[*item/copy record 2*]

991 __ #b c-GenColl #h Z694 #i .A5 1978 #p 00015187050 #t Copy 8 #w CCF

[*item/copy record 3*]

991 __ #b r-BusRR #h Z694 #i .A5 1978 #t Copy 11 #w GenBib bi 87-010521

[*item/copy record 4*]

991 __ #b r-MicRRRef #h Z694 #i .A5 1978 #t x copy #w GenBib bi 87-010521

Figure 9. Case 2. An example of a set of bibliographic records in line with the proposed model.

[*work record 1*]

100 1_ #a Bloch, Ernest, #d 1880-1959.
240 10 #a Schelomo
650 _0 #a Violoncello with orchestra.

[*work record 2*]

700 12 #a Schumann, Robert, #d 1810-1856. #t Concertos, #m violoncello, #n op.
129, #r A minor.
650 _0 #a Concertos (Violoncello)

[*expression/text record 1*]

245 10 #a Schelomo : #b Hebrew rhapsody / #c Bloch.
511 0_ #a Mstislav Rostropovich, violoncello ; Orchestre national de France ; Leonard
Bernstein, conductor.
008 ...s1977
+form: musical sound
500 __ #a Durations: 22:46.
700 1_ #a Rostropovich, Mstislav, #d 1927- #4 prf
700 1_ #a Bernstein, Leonard, #d 1918- #4 prf
710 2_ #a Orchestre national de France. #4 prf

[*expression/text record 2*]

245 10 ...Concerto in A minor, op. 129 / Schumann.
511 0_ #a Mstislav Rostropovich, violoncello ; Orchestre national de France ; Leonard
Bernstein, conductor.
008 ...s1977
+form: musical sound
500 __ #a Durations: 25:25.
700 1_ #a Rostropovich, Mstislav, #d 1927- #4 prf
700 1_ #a Bernstein, Leonard, #d 1918- #4 prf
710 2_ #a Orchestre national de France. #4 prf

[*manifestation/medium record 1*]

245 10 ... #h sound recording
260 __ #a Hollywood, CA : #b Angel, #c p1977.
300 __ #a 1 sound disc : #b analog, 33 1/3 rpm, quad. ; #c 12 in.
007 ssubqme-----
028 02 #a SQ 37256 #b Angel
500 __ #a Program notes by P. Andry and E. Mason on container.

[*item/copy record 1*]

050 00 #a Angel SQ 37256

Figure 10. Case 3. An example of a set of bibliographic records in line with the proposed model.

References

- ALCTS CCS CC:DA. (1995). *Guidelines for bibliographic description of reproductions*. Chicago: American Library Association.
- ALCTS CCS CC:DA. (1999). *Overview and recommendations concerning Revision of Rule 0.24* [On-line]. Available:
<http://www.ala.org/alcts/organization/ccs/ccda/tf-024h.pdf>
- ALCTS CCS CC:DA. Task Force on Recommendation 2 in 4JSC/ALA/30. (2000). *Task Force Report* [On-line]. Available:
<http://www.ala.org/alcts/organization/ccs/ccda/tf-rec2.html>
- American Library Association, et al. (1967). *Anglo-American cataloging rules. North American text*. Chicago: ALA.
- American Library Association, et al. (1974). *Anglo-American cataloging rules. Chapter 6: Separately published monographs, North American text*. Chicago: ALA.
- American Library Association, et al. (1978). *Anglo-American cataloging rules* (2nd ed.). Chicago: ALA.
- Ayres, F. H., Nielsen, L. P. S., & Ridley, M. J. (1996). Bibliographic management: A new approach using the manifestations concept and the Bradford OPAC. *Cataloging & Classification Quarterly*, 22, 3-28.
- Ayres, F. H., Nielsen, L. P. S., & Ridley, M. J. (1997). Design and display issues for a manifestation-based catalogue at Bradford. *Program*, 31, 95-113.
- Ayres, F. H., Nielsen, L. P. S., Ridley, M. J., & Torsun, I. S. (1995). *The Bradford OPAC: A new concept in bibliographic control* (British Library R & D report 6183). London: British Library Research and Development Department.
- Delsey, T. (1998). *The logical structure of the Anglo-American cataloging rules. Part I* [On-line]. Available: <http://www.nlc-bnc.ca/jsc/aacr.pdf> *Part II* [On-line]. Available: <http://www.nlc-bnc.ca/jsc/aacr2.pdf>
- Green, R. (1996). The design of a relational database for large-scale bibliographic retrieval. *Information Technology and Libraries*, 15, 207-221.
- Hagler, R. (1998). Access points for works. In J. Weihs (Ed.), *The principles and future of AACR: Proceedings of the International Conference on the Principles and Future Development of AACR, 1997* (pp. 214-228). Chicago: American Library Association.
- Heaney, M. (1995). Object-oriented cataloging. *Information Technology and*

Libraries, 14, 135-153.

- Howarth, L. C. (1998a). Key lessons of history: Revising the foundations of AACR. In B.E.C. Schottlaender (Ed.), *The future of the descriptive cataloging rules* (pp. 6-18). Chicago: American Library Association.
- Howarth, L. C. (1998b). Content versus carrier. In J. Weihs (Ed.), *The principles and future of AACR: Proceedings of the International Conference on the Principles and Future Development of AACR, 1997* (pp. 148-156). Chicago: American Library Association.
- IFLA. (1997). ISBD(ER): *International standard bibliographic description for electronic resources*. Munchen: K.G. Saur. Also available on-line:
<http://www.ifla.org/VII/s13/pubs/isbd.htm>
- IFLA Study Group on the Functional Requirements for Bibliographic Records. (1998). *Functional requirements for bibliographic records: Final report*. Munchen: K.G. Saur. Also available on-line:
<http://www.ifla.org/VII/s13/frbr/frbr.pdf>
- Joint Steering Committee for Revision of AACR. (1998). *Anglo-American cataloguing rules* (2nd ed., 1998 revision). Chicago: American Library Association.
- Joint Steering Committee for Revision of AACR, Format Variation Working Group. (2001). *Interim report* [On-line]. Available:
<http://www.nlc-bnc.ca/jsc/forvarwg3.pdf>
- Joint Steering Committee for Revision of AACR, Format Variation Working Group. (2002). *Third interim report* [On-line]. Available:
<http://www.nlc-bnc.ca/jsc/forvarwg3rep3.pdf>
- Jolley, L. J. (1963). The function of the main entry in the alphabetical catalogue: A study of the views put forward by Lubetzky and Verona. In A.H. Chaplin & D. Anderson (Eds.), *IFLA International Conference on Cataloguing Principles, Paris, 9th-18th, October, 1961: Report* (pp. 159-163). London: The Organizing Committee.
- Leazer, G. H. (1993). *A conceptual plan for the description and control of bibliographic works*. Doctoral dissertation, Columbia University. (University Microfilms No.9333810)
- Leazer, G. H. & Smiraglia, R. P. (1999). Bibliographic families in library catalog: A qualitative analysis and grounded theory. *Library Resources & Technical Services*, 43, 191-212.

- Lubetzky, S. (1963). The function of the main entry in the alphabetical catalogue: One approach. In A.H. Chaplin & D. Anderson (Eds.), *IFLA International Conference on Cataloguing Principles, Paris, 9th-18th, October, 1961: Report* (pp. 139-143). London: The Organizing Committee.
- Matsuura, J. (1996). KOPAC: Kunitachi College of Music Library Online Public Access Catalog. *Joho Kanri: Journal of Information Processing and Management*, 39, 22-39. [in Japanese]
- Matsuura, J. (1997). Significance of authority control in online public access. In H. Matsushita (Ed.), *Electronic information environment and academic libraries* (pp. 199-213). Tokyo: Kinokuniya.
- Multiple Versions Forum. (1990). *Multiple Versions Forum report: Report from a meeting held Dec. 6-8, 1989, Airlie, Virginia*. Washington, DC: Library of Congress.
- O'Neil, E. T., & Visine-Goetz, D. (1989). Bibliographic relationships: Implications for the function of the catalog. In E. Svenonius (Ed.), *The conceptual foundations of descriptive cataloging* (pp. 167-179). San Diego: Academic Press.
- Paskin, N. & Rust, G. (1999). *The Digital Object Identifier initiative: Metadata implications* (Version 3) [On-line]. Available: <http://www.doi.org/P2VER3.PDF>
- Ridley, M. (1998). Beyond MARC. In J. Weihs (Ed.), *The principles and future of AACR: Proceedings of the International Conference on the Principles and Future Development of AACR, 1997* (pp. 229-239). Chicago: American Library Association.
- Rust, G. & Bide, M. (1999). *The indecs metadata schema: Building blocks* (WP1a-006-1.0) [On-line]. Available: <http://www.indecs.org/pdf/schema.pdf>
- Smiraglia, R. P. & Leazer, G. H. (1999). Derivative bibliographic relationships: The work relationship in a global bibliographic database. *Journal of the American Society for Information Science*, 50, 493-504.
- Svenonius, E. (1992). Bibliographic entities and their uses. In R. Bourne (Ed.), *Seminar on bibliographic records: Proceedings of the Seminar held in Stockholm, 15-16 August 1990* (pp. 3-18). Munchen: K.G. Saur.
- Taniguchi, S. (1990). A three-layered conceptual model for descriptive cataloging. *Annals of Japan Society of Library Science*, 36, 149-166. [in Japanese]
- Taniguchi, S. (1993). A comparative study of bibliographic descriptions between descriptive cataloging and abstracting-and-indexing services based on the

- three-layered conceptual model. *Annals of Japan Society of Library Science*, 39, 97-118. [in Japanese]
- Taniguchi, S. (1995). A system for analyzing cataloging rules: Expansion of an inter-rule relationship analysis. *Annals of Japan Society of Library Science*, 41, 111-129. [in Japanese]
- Taniguchi, S. (1996). A system for analyzing cataloging rules: A feasibility study. *Journal of the American Society for Information Science*, 47, 338-356.
- Taniguchi, S. (1997). Reevaluation of the three-layered model in descriptive cataloging. *Annals of Japan Society of Library Science*, 43, 1-18. [in Japanese]
- Taniguchi, S. (1999a). An analysis of orientedness in cataloging rules. *Journal of the American Society for Information Science*, 50, 448-460.
- Taniguchi, S. (1999b). Two ways to construct a bibliographic entity in conceptual modeling: Re-examination of the three-layered model and the IFLA FRBR model. *Journal of Japan Society of Library and Information Science*, 45, 45-60. [in Japanese]
- Tillett, B. B. (1991a). A taxonomy of bibliographic relationships. *Library Resources & Technical Services*, 35, 150-158.
- Tillett, B. B. (1991b). A summary of the treatment of bibliographic relationships in cataloging rules. *Library Resources & Technical Services*, 35, 393-405.
- Tillett, B. B. (1992a). The history of linking devices. *Library Resources & Technical Services*, 36, 23-36.
- Tillett, B. B. (1992b). Bibliographic relationships: An empirical study of the LC machine-readable records. *Library Resources & Technical Services*, 36, 162-188.
- Tillett, B. B. (1996). *Cataloguing rules and conceptual models* [On-line]. Available: <http://www.ifla.org/documents/libraries/cataloging/tilb1/htm>
- Vellucci, S. L. (1997). *Bibliographic relationships in music catalogs*. Lanham, MD: Scarecrow Press.
- Vellucci, S. L. (1998). Bibliographic relationships. In J. Weihs (Ed.), *The principles and future of AACR: Proceedings of the International Conference on the Principles and Future Development of AACR, 1997* (pp. 105-146). Chicago: American Library Association.
- Verona, E. (1959). Literary unit versus bibliographic unit. *Libri*, 9, 79-104.
- Verona, E. (1963). The function of the main entry in the alphabetical catalogue: A second approach. In A.H. Chaplin & D. Anderson (Eds.), *IFLA International*

Conference on Cataloguing Principles, Paris, 9th-18th, October, 1961: Report (pp. 145-157). London: The Organizing Committee.

Wilson, P. (1968). *Two kinds of power: An essay on bibliographic control*. Berkeley: University of California Press.

Yee, M. M. (1998). What is a work? In J. Weihs (Ed.), *The principles and future of AACR: Proceedings of the International Conference on the Principles and Future Development of AACR, 1997* (pp. 62-104). Chicago: American Library Association.

Young, H. (Ed.)(1983). *The ALA glossary of library and information science*. Chicago: American Library Association.