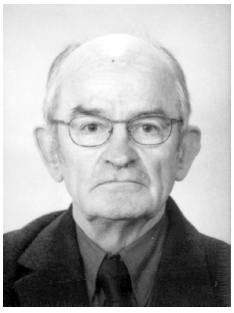
Consequences of Implementing FRBR: Are we Ready to Open Pandora's Box?

Maja Žumer*, Gerhard J.A. Riesthuis**

*Department of Library and Information Science and Book Studies, University of Ljubljana, Slovenia (e-mail: maja.zumer@ff.uni-lj.si)
**Department of Information Science, University of Amsterdam, The Netherlands (e-mail: Gerhard.Riesthuis@hum.uva.nl)

Maja Žumer is an Assistant Professor in the Department of Library and Information Science and Book Studies, University of Ljubljana. She holds a PhD from the University of Zagreb and an MLS from Kent State University. Her main research interests include information retrieval, design of user interfaces, and, more recently, implementation of the Functional Requirements for Bibliographic Records (FRBR) model in the design of bibliographic databases.



Gerhard J.A. Riesthuis is a lecturer in the Department of Information Science at the University of Amsterdam (The Netherlands). He holds a Master's Degree in Sociology from the University of Utrecht and a Doctorate from the Faculty of Humanities at the University of Amsterdam. He teaches courses in cataloguing and indexing, and in information technology. His areas of research include subject access systems and cataloguing theory. He is the Secretary of ISKO and the Literature Editor of Knowledge Organization.

Maja Žumer, Gerhard J.A. Riesthuis. (2002). **Consequences of Implementing FRBR: Are We Ready to Open Pandora's Box?** *Knowledge Organization, 29(2).* 78-86. 24 refs.

ABSTRACT: The study *Functional Requirements for Bibliographic Records* (FRBR) was commissioned by IFLA and published in 1998. It defines the core functions of a catalogue (and bibliographic records) as a gateway to information. For that purpose an abstract entity-relationship model of a catalogue is proposed. The FRBR model is revolutionary. The (computer) catalogue is not seen as a sequence of bibliographic records and a replica of the traditional card catalogue, but rather as a network of connected entities, enabling the user to perform seamlessly all the necessary functions. So far there has been some theoretical discussion of the model and some limited experiments, but there is a lack of research in how to implement this theoretical model in practice, in new-generation catalogues. In this paper some reactions to the model are analysed. The main focus is on consequences of the model for the OPAC interface design, particularly the searching functionality and display of results.

1. FRBR: re-examination of cataloguing

1.1. Background

In 1961, as a result of fundamental re-examination of cataloguing theory and practice on an international level, the so-called Paris Principles (Statement of Principles, 1971) were agreed upon. The second important step was the development of ISBDs, which started in 1971 with the International Standard Bibliographic for Monographic Publications (ISBD (M)). Thus the foundation for new and revised national and international cataloguing rules was established.

The last three decades of the last century also brought unprecedented changes to both the ways libraries operated and to their users' needs and expectations. Library automation, development of large bibliographic databases, union catalogue systems and

shared cataloguing, and new forms of publishing were some of the revolutionary developments. At the same time, libraries were faced with the need to reduce the high costs of operation, particularly for cataloguing.

IFLA sponsored the Seminar on Bibliographic Records in Stockholm in 1990 to address these issues. The Seminar acknowledged the need for libraries to reduce the cost of cataloguing, and identified a focus for further research: meeting user needs associated with the use of various types of materials and the broad range of eventual new requirements for bibliographic records. One of the resolutions of the Seminar was therefore to commission a study "to define the functional requirements for bibliographic records". The terms of reference for the study stated as its purpose and scope "to delineate in clearly defined terms the functions performed by the bibliographic record with respect to various media, various applications, and various user needs. The study was to cover the full range of functions for the bibliographic record in its widest sense – that is, a record that encompasses not only descriptive elements, but access points (name, title, subject, etc.), other 'organizing' elements (classifications, etc.), and annotations." (FRBR, 1998, p. 2)

In 1992 the Standing Committee of the IFLA Section on Cataloguing accepted the terms of reference and appointed a study group. The final report of the study was accepted at the IFLA Conference in Copenhagen in 1997 and published the following year (FRBR, 1998, p.2-3).

The study group described as its aim "to produce a framework that would provide a clear, precisely stated, and commonly shared understanding of what it is that the bibliographic record aims to provide information about, and what it is that we expect the record to achieve in terms of answering user needs." (FRBR, 1998, p.2). The study had two objectives. "The first is to provide a clearly defined, structured framework for relating the data that are recorded in bibliographic records to the needs of the users of those records. The second objective is to recommend a basic level of functionality for records created by national bibliographic agencies." (FRBR, 1998, p.7)

1.2. The catalogue described with an entity-relationship model

Entity-relationship methodology was used for the FRBR model. This means that a set of objects of interest or entities is defined, and the relations between the entities are listed. Further the important characteristics or attributes of each entity are identified.

There are three groups of entities. Group 1 entities (with no common name, but for which the authors of this article propose the term 'bibliographical entities') include *work*, *expression*, *manifestation*, and *item*. These entities represent the information traditionally reflected in the formal cataloguing part of bibliographic records. Group 2 entities ('name entities') comprise persons and corporate bodies responsible for the intellectual or artistic content, the physical production and dissemination or the custodianship of bibliographic entities. Group 3 entities ('subject entities') represent the subject of works and include *concept*, *object*, *event*, and *place*. Also the entities of the first and second group can be the subjects of works.

Relationships serve as a link between entities and enable the user to navigate within the bibliographic database (catalogue) and beyond. Relationships can link entities of different groups, different entities of the same group, and instances of entities of the same type. There is, for example, a relationship between a work and all the expressions derived from it (entities of the same group), or a relationship between the author (name) and a work as examples of entities of different groups. The relationship between all expressions of one work (e.g. translations) is a relationship of entities of the same type.

The study identifies four generic tasks that the users perform while searching: "to *find* entities that correspond to the user's stated search criteria (i.e., to locate either a single entity or a set of entities in a file or database as the result of a search using an attribute or relationship of the entity); to *identify* an entity (i.e., to confirm that the entity described corresponds to the entity sought, or to distinguish between two or more entities with similar characteristics); to *select* an entity that is appropriate to the user's stated search criteria (i.e., to choose an entity that meets the user's requirement with respect to content, physical format, etc., or to reject an entity as being inappropriate to the user's needs); and to *obtain* access to the entity described (i.e., to acquire an entity through purchase, loan, etc., or to access an entity electronically through an online connection to a remote computer)." (FRBR, 1998, p.82).

The Associazione Italiana Biblioteche (AIB, 1999) and Elaine Svenonius (2000) expressed the need for "navigation" as an additional user task. In our opinion, navigation is not a function of a catalogue but a necessary facility of an OPAC to fulfill the functions of the catalogue; not a function or goal on its own.

Admittedly, navigation is only possible when all the necessary data and the relations between entities are present in a catalogue: for example, two expressions of the same work cannot be recognized as such unless they have the same title or explicit information on the work they are derived from.

1.3. Revolution or evolution: the two parts of the FRBR

As said before, the study had two objectives: to provide a clearly defined, structured framework for relating the data that are recorded in bibliographic records to the needs of the users of those records, and to recommend a basic level of functionality for records created by national bibliographic agencies. The first objective is discussed in the chapters 2 – 6 of the FRBR and the second objective is dealt with in chapter 7.

The two parts are in many respects quite different. In the first part, discussing the structural framework, the FRBR model is revolutionary. The (computer) catalogue is not seen as a sequence of bibliographic records, ordered according to strict rules, or as a replica of the traditional card catalogue in a computer, but rather as a network of connected entities, enabling the user to perform seamlessly all the functions of the catalogue mentioned in the FRBR: "having for the first time considered a totally electronic catalogue, organized according to a network structure, and not only re-proposing in electronic form the manual catalogue, which on the contrary is organized in a linear manner". (Weston, 2000). In principle, values of all characteristics (attributes) of all entities are available as access points, without the traditional restriction to three values of each attribute for an individual description. Chapter 6 contains four tables, which discuss the importance of the characteristics (attributes) and *relations* of each of the bibliographic entities, for the four tasks mentioned. The importance is given as three grades: high, moderate and low. For example, the *title* of a *work* is said to have high value to find a work, as has the relation *dependent component*. *Intended audience* has a low value for this task, and *form of work* a moderate value. The relations between a *work* and *persons/corporations* responsible for the work are of high value for the *find* task. For the *selection task*, both the *title* of the work and the *form* of the work have a high value. The *language* of the expression has a moderate value for the *find* task but a high one for the *identify* and *select* tasks.

The model discussed in the first part of the FRBR suggests a work oriented approach, and that means that the relations between bibliographic and authority records should be re-evaluated (Eversberg, 1998). Patrick Le Boeuf (2001b) states:

> No more 'rule of three'? No more 'one book in hand, one record' principle? No more 'authority records' as such (for uniform titles at least)? Cataloging codes, ISBDs and MARCs thrown into question? Those are not 'minor changes', that is an earthquake! The entire landscape cataloguers were used to is collapsing. Actually, to be honest, FRBR does not explicitly call for such a revolution; but such a revolution logically ensues from FRBR. One might call FRBR a 'quiet revolution' – or a time bomb. (p. 18)

The second part of the FRBR study is different. It gives the basic level of functionality for national bibliographies, and contains nine tables, which specify the data elements and relationships that should be included as a minimum in the bibliographic records of a national bibliography. The list of these data elements is more or less equal to the traditional canon of most cataloguing rules, and contains only the characteristics considered of high value in the lists of chapter 6 for one of the four tasks of the catalogue. Even with this restriction there are some inconsistencies (e.g., in the role of title(s)). The discussion of this issue is beyond the scope of this paper and should be addressed separately (see Byrum and Madison, 2000, p.26-28 and 45-47).

2. Reactions to FRBR

The FRBR study prompted immediate response from librarians. Two events should be mentioned in particular. The ELAG (European Library Automation Group) held four consecutive workshops: "ELAG OO-oriented bibliographic model" at the ELAG seminar in The Hague, The Netherlands (March 25-27, 1998), "IFLA model for bibliographic records" at the ELAG seminar (April 21-23, 1999 in Bled, Slovenia) followed by another workshop titled "FRBR: time to act for ELAG" in 2000 (April 12-14, 2000 in Paris) and "What benefits do we expect from an FRBR-based automated catalogue?" (June 6-8, 2001 in Pragu, Czech Republic). The other event was the "Seminario FRBR" organized by the Cataloguing Section and the Tuscany Section of the Associazione Italiana Biblioteche in Florence, January 27-28, 2000 (Seminario FRBR, 2000). This was the first conference that was exclusively devoted to FRBR.

ELAG discussions started immediately after the study was published. They dealt with a detailed in-

vestigation of the model, judgement of its possible benefits and identification of future research and development. Among the conclusions, the most important ones were that a lot would have to change (e.g., cataloguing rules will have to be reviewed) and that the model would have to be verified in practice. The discussion in 1999 focused on detailed investigation of entities, particularly those of the first group. The conclusion was that there are in reality seven levels, because parts of works, expressions and manifestations should be introduced as separate intermediate levels. In addition, there was a recommendation for an additional highest level, a so-called "top hat", describing the original work from which other works are derived (Grinnen, 1999; Holm, 1999). The same concept was advocated by Martha Yee (2000); she introduced six hierarchical levels (superwork, work, version, edition, near-equivalent, copy). The recommendation of ELAG 1999 was withdrawn in 2000, with the comment that the same goal can be achieved introducing a horizontal relationship ("related to" or "derived from") for works. The discussion focused on comparison between two models: FRBR and ICOM/CIDOC (Crofts, 2001), the object-oriented model originating from the museum community. The conclusion was that although there are some methodological differences between the models, stemming particularly from differences in scope (libraries and museums), there are enough similarities that a future merger of models is feasible. The discussion in 2001 focused on implementation of the model in (future) library automation systems. Because of the complexity of the model, more prototyping was proposed, particularly in the area of displays and linking. An important point was also the description of two independent projects (Danish and Norwegian/Finnish) with the goal of creating automatically FRBR records from existing MARC records. The Norwegian/Finnish project is described by Knut Hegna and Eeva Murtomaa (2002).

The discussion of "Seminario FRBR" in Florence focused first on the model itself, stressing that the expression level may have to be subdivided further, because expressions can be derived from previous expressions, or, alternatively, can differ from the original expression by using only a different medium. Another conclusion was that, especially in the beginning, the implementation of the FRBR model would result in an increase of work. The participants of the Seminario also suggested that 'navigation' should be added to the four functions of the catalogue. As mentioned already, navigation is in our view, a necessary facility of an OPAC, not of a catalogue.

The early reactions, while mentioning some problems and shortcomings of the model, are in general quite favourable, emphasizing that it is a good basis for relational database design and, above all, a new conceptual view of cataloguing.

In her book *The Intellectual Foundation of Information Organization*, Svenonius (2000) discusses in a chapter called *Bibliographic Objectives*, the objectives formulated in the FRBR. Her conclusion is that:

> The IFLA statement is both timely and relevant in its generalization to embrace nonbook materials and information agencies other than libraries, in its modernization of terminology, and in its resolution of ambiguity. However, another change it makes is somewhat problematic – the collapsing of traditional finding and collocating objectives. The traditional *finding objective* specifies that what is to be found is a particular known document, while the traditional *collocating objective* specifies that what is to be found is a set of documents, defined by criteria such as author, work, and subject. (page 17, italics from Svenonius)

Documents are for Svenonius what are manifestations in the FRBR. She makes two alterations to the first objective of the FRBR. She replaces entities by documents – that is, one of the entities defined by the FRBR, manifestations – and she redefines the general finding function of the FRBR: she defines *finding* as searching for a particular document and *collocation* as searching for all documents that share common attribute values.

The find-function as defined in the FRBR comprises both the find and the collocation-function of card catalogues: "to *find* entities that correspond to the user's stated search criteria (i.e., to locate either a single entity or a set of entities in a file or database as the result of a search using an attribute or relationship of the entity)" (FRBR, 1998, p. 82).

In the context of the FRBR collocation is not mentioned at all. As seen from the perspective of catalogues as databases, collocation is only an auxiliary find function of card catalogues. Because there could not be enough access points in a card catalogue, related records were filed together to overcome the limitations. This mechanism enabled users to locate one bibliographic record using any of the access points provided, and then browse through records filed next to it to locate related records. The computer

catalogue is a database with no intrinsic order of records, thus without collocation. If enough access points are available and if searching on several criteria simultaneously is supported, users can always retrieve the relevant records.

On the other hand, the order of records is very important when displaying the results of a query. A meaningful order of resulting records enables the user to browse effectively through the list to evaluate the relevance of the result, and also to *identify, select*, and *obtain.* To summarise: in the card catalogue collocation is provided when the catalogue is created, while in a computer catalogue ordering (i.e., collocation) is performed after the query.

Finding a given manifestation of a given work that exists in many manifestations representing many expressions was – and is – a real problem in a printed bibliography or a card catalogue. In these systems the many descriptions of the many manifestations have to be ordered in a way that is understandable for the users, otherwise the user is lost. Uniform titles, work headings and also references are needed to make it possible to get such a usable order in these systems and thus to make searching possible. In a card catalogue, without order, there can be no searching. An online bibliographic file has, however, no intrinsic order and does not need it. It is an inventory with indexes, as recognized and regretted by Michael Carpenter(2000).

It would already be a big improvement if the find function as defined in Chapter 7 of the FRBR were implemented in full in our catalogues. This means among others that the "rule of three" has to be abandoned and that when a manifestation contains more than one work all the works have to be made accessible. In the description of their work on the transformation of MARC records to FRBR Hegna and Murtomaa (2002) regret the present lack of consistent use of cataloguing rules (e.g., in original title, language, relator codes, recording of separate works in a single manifestation, etc.).

3 FRBR and the users of the catalogue

3.1. FRBR and the builders of the catalogue

Interestingly, the vast majority of further work based on FRBR focused on testing the model's adequacy for describing various types and kinds of library materials. That approach was probably additionally encouraged by the fact that the second part of the FRBR study is devoted to the list of basic data required for records created by national bibliographic agencies. The list practically corresponds with current practice and can be mapped perfectly into UNIMARC structure, thus giving the impression that the model has not changed anything. But is that the case?

At the Lubetzky Symposium (Future, 2000) the FRBR were mentioned three times, but only more or less in passing. This is remarkable since one of the topics of this Symposium was "Current research in cataloging". In the papers devoted to this topic the FRBR are not mentioned at all. Yet some findings in these papers are relevant for the topics discussed in the FRBR.

Sara Shatford Layne (2000) found that six principal patterns might be desirable for access to art works. In descending order of frequency they are:

1. people attributes, including name as an attribute (one should be able e.g., to search for 'twentieth century Russian painters');
2. kind of work, subdivided or qualified by date or place;
3. subject or related literary work;
4. titles (meaning creator plus title) of specific works;
5. style;
6. technique or material.

In this context, another paper of the Lubetzky Symposium is relevant. Carpenter (2000) recognizes that "What we have with self-standing bibliographic descriptions plus 'access points' is essentially a register with an index". And further "The register-index catalog is not one that lends itself to arrangement of the entries in a way that readily fulfils the second function of the catalog. It does, however, admirably fulfil the first objective". By first and second function are meant the two functions mentioned under 2.1 and 2.2 of the so-called Paris principles[1].

He ends his paper with some remarks about the catalogue of tomorrow. It should show all works of an author in a usable arrangement when a user looks up a particular author. When searching with a title, all editions of the work should be shown if there is only one work with that title; if there are more works with the title sought, the user should choose which works he or she wants and should be shown all editions. "We will then be working with a catalog that, as a minimum, is faithful to the Paris Principles." (Carpenter, 2000) As said before, collocation by means of added entries and appropriate filing was a necessary tool only for card catalogues, because of lack of search possibilities. Giving the results of a search in a given

order is not necessary for the *find* function, but important for the *identify* and *select* function.

As long as the original title of translations is stored in the inventory and indexed, all translations can be found by searching on author and/or original title. The only alternative is keyword searching in complete records. The disadvantage is that the precision with keyword searching is much smaller. For works like Bibles, searching with combinations of subject data, languages, title words and the like can be used to find manifestations of given expressions.

We question whether the very expensive provision of uniform titles and so forth, just for display functions in an OPAC is worth the money. Who will search with the name *Goethe, Wolfgang* and then want a nicely ordered list of all the manifestations of all the expressions of all the works available in *Die Deutsche Bibliothek*? In a paper Allyson Carlyle (2001) shows that end-users often would prefer another order than the one provided by the traditional uniform heading of author plus uniform heading approach.

3.2. FRBR and the new generation catalogues

There has been very little discussion of how new catalogues, designed according to FRBR, will look and what impact that will have on end-users and the way they use library catalogues. In one example (Noerr et al., 1999), which derives from the 1999 ELAG discussions, authors list possible advantages to users: more standardization and control of various indexes, clustering and intuitive relationships among entities, enhanced navigation, and media integration.

It should not come as a surprise that librarians who were trained in traditional cataloguing find the FRBR model difficult; there are problems with terminology and definition of entities. As Kirsten Strunck (1999) reports, even students "find it unnecessarily complicated to operate with the abstract entities of the model as you cannot study these entities per se. They find the definition of the entities academic and airy."

Patrick Le Boeuf (2001a and 2001b) explains this attitude with the fact that present catalogues still rely on Paris Principles and are in fact a replica of a card catalogue, a model that is not appropriate any more in the automated context. In an overview of the work of the FRANAR (Functional Requirements And Numbering for Authority Records; this project is a follow-up of FRBR) Françoise Bourdon (2001) states that the members – all librarians – of the working group have difficulties with the entity-relation model that underlies the FRANAR and also the FRBR.

If librarians and future librarians find the FRBR model difficult, we question whether end-users will not find the model even more difficult. End-users are accustomed to present-day catalogues (with all their shortcomings, admittedly) and will find new entities and relations even stranger. The FRBR catalogue will be a very different tool.

The FRBR model is endorsed by IFLA. Goal 3 of the Strategic Plan 2001-2003 of the Section on Cataloguing is "to promote the Functional Requirements for Bibliographic records (FRBR) study and its recommendations, and take follow-up action to develop new descriptive standards for access points and to develop a new approach to the bibliographic universe" (IFLA Section on Cataloguing, 2002).

Therefore it was to be expected that developers and vendors of library automation software would see it as a necessity to incorporate FRBR into future systems. That has proven to be true: several vendors have already prepared prototypes and even more are planning to begin the development in the near future.

Therefore, there is no way back. Present catalogues are not easy to use, as Christine Borgman states in her two famous papers (1986 and 1996): "online catalogs are difficult to use because their design does not incorporate sufficient understanding of searching behavior. ...(we should) lay to rest the card catalog design model for online catalogs." End-users will be using the new catalogues and we have to make sure that these catalogues will fulfil their mission: to "respond more effectively to an increasingly broad range of user expectations and needs" (FRBR, 1998, p. 1).

4. Proposals for OPAC-design: consequences for the interface design

4.1. Goals of OPAC design

For the end-user the FRBR model has to be implemented in a transparent way, without an explicit use of terminology and/or concept. The end-users should not be faced with the problems of intricate differences between expressions and manifestations, problems of hierarchy of expressions, and the boundaries of a work.

The FRBR model actually offers more access points and, above all, the relationships really enable the most important facility of an OPAC: the navigation within the catalogue and the whole bibliographic universe.

One of the important characteristics of the FRBR model is that the traditional division between biblio-

graphic and authority records has disappeared; it has been replaced by a network of interrelated entities with relationships serving as links between entities of different groups (e.g., between bibliographic entities and names, reflecting authorship), between different levels of bibliographic entities within one group (e.g., between works and expressions). It will be interesting to see how the FRANAR project will further elaborate on these issues.

New OPACs will have to be designed. There will be important differences in searching capabilities and in the way bibliographic information is presented on the screen. But it must be noted that the formal implementation of the model itself does not change anything unless cataloguers change their practice fundamentally -- particularly by implementing all relationships. Navigation cannot be improved if relations among entities are not recorded and if retrieval of bibliographic records is not seen as the major goal of cataloguing. The present state of catalogues can be attributed to the fact that current cataloguing rules still reflect the technology of the card catalogue and are well suited for that purpose. Even MARC formats have kept the card characteristics. Especially in the beginning, the purpose of MARC records was to make the distribution of catalogue cards more effective (Hegna et al., 2002, p. 35). Too much information in the MARC records is suited for display only and cannot be searched effectively.

4.2. Searching functionality

OPACs should enable end-users to retrieve records, containing any attribute value, part of attribute value or combination of attribute values. This can be achieved (and is achieved in present catalogues) by searching on a string of characters within a particular access point, a combination of access points, or anywhere in the record. While not advocating keyword searching as a panacea, it is often the only means of accessing information that has been entered in unstructured fields such as notes. If the FRBR model is implemented in full, the need for keyword searching will be greatly reduced.

It should be possible to navigate to related information directly from the displayed (bibliographic or authority) records. Therefore a mechanism for linking related information within the catalogue and beyond has to be used; most probably that will be in the form of hyperlinks, a mechanism that has already proven as effective and intuitive and has as a result been accepted as a de facto standard. While hypertext links are a broadly used and accepted technique for linking attribute values, there should also be a mechanism for linking entities as a whole (e.g., linking a work with all its related works, or all its expressions). The user should get the information that related entities exist and have a simple way of requesting a list of these entities; probably by clicking on a button.

Although we assume that graphical interfaces will be used due to their user-friendliness and wide acceptance, some special needs of users have to be taken into account: visually impaired users and users with very slow and/or unreliable computer network connections. Both groups will still need a text-oriented interface; for the visually impaired that can enable transcription into Braille or speech synthesis, and the quantity of data transmitted over the network is drastically reduced.

The designers of future systems will therefore have to include a text-oriented interface as an option without sacrificing much of the functionality or flexibility.

4.3. OPAC displays

As we have already stated, the FRBR model is conceptually difficult – particularly because the database model behind it is unfamiliar to most cataloguers and end-users – and end-users should not be exposed to it in its complexity. The data (results of queries) should therefore be displayed in a transparent and intuitive way, while keeping all the functionality of FRBR.

One of the important requests therefore, is that only bibliographic entities of the same level should appear in any list of hits. It can be assumed for example, that a query on an author's name would result in one or more works, all expressions of these works, all manifestations of those, and all items (copies) the library owns. If all these records are displayed in a single list (even if it is ordered meaningfully), the user will be confronted with too long a list of seemingly identical data. The situation can be avoided if only one level of entities is displayed in one list: only works, only expressions, only manifestations, or only items. The user should then be able to display the next level of entities for the selected record(s).

It is intuitively easier to proceed from a higher level to a lower level, therefore the first list should be the display of the highest appropriate level of entities regarding the search statement. The level which is displayed first is determined by the attributes and/or relationships used in the search statement. If only one attribute/relationship is searched, then this attrib-

ute/relationship determines the level (as defined in FRBR: it is the highest level with this attribute/relationship). The relationship "is author of" is applicable to all bibliographic entities, but work is the highest; expression is the highest level for language attribute; manifestation for year of publication and any copy-specific details of course for item, for example, call-number.

The decision becomes more complex when the search statement contains more (i.e., a combination of) attributes/relationships. The level of entities should then be the highest level that is common to all attributes/relationships concerned. For example, when searching on a combination of publication year and language, the manifestation level should be displayed, because the publication year only exists at that level.

When the attribute cannot be determined (e.g., when searching on keywords), the lowest bibliographic entity level in the catalogue has to be displayed. That would be manifestation level in most cases and item level where copy specific details included in bibliographic records cause the finding of the records.

5. Conclusions: do we open the Pandora's box?

It is easier to put the question than to answer it. It depends a lot on which part of the FRBR one looks at, and also which reactions one takes into account.

If one looks at the second part of the FRBR and at the ISBDs proposed and decided upon since the publication of the FRBR, then the answer is simply a *No*; there is no need for it. Everything should remain as much as possible as it has been since 1876, the year Cutter published his list of functions of the catalogue, or preferably since 1961, the year of the *Paris Principles*; that hallowed separation of subject indexing and formal cataloguing. To say it differently -- the OPAC should be a mirror of the card catalogue it replaced.

If we look at FRBR as the new conceptual model, the answer is YES. We should start exploring the ways in which we could improve our catalogues. There is a lot of pressure from the vendors of library automation systems and information retrieval systems, who are aware of all the shortcomings of present catalogues and bibliographic databases as well as from informed end-users, who have been exposed to simple, seemingly more user-friendly ways of searching the electronic universe.

We may even have no choice. New catalogues will be developed. Librarians have to start seriously exploring the implementation issues of FRBR, as well as re-thinking the foundations of cataloguing in view of new technological possibilities. We also have to plan carefully for the conversion, migration and/or integration of existing catalogue records into the new-generation catalogues. Some research on that has been mentioned previously.

The vast body of traditional expertise in knowledge organisation should be used in the process. This may be the perfect opportunity to re-establish librarians as essential experts in the information chain of the future.

Notes

1. The catalogue should be an efficient instrument for ascertaining
- 2.1 whether the library contains a particular book specified by
  - a. its author and title *or*
  - b. if the author is not named in the book, its title alone, *or*
  - c. if author and title are inappropriate or insufficient for identification, a suitable substitute for the title; and
- 2.2 (a) which works by a particular author and
  (b) which editions of a particular work are in the library (Verona, 1961).

References

AIB. (1999*). Functional Requirements for Bibliographic Records Seminar (Florence, January 27-28, 2000).* Rome: Associazione Italiana Biblioteche. Retrieved June 11, 2002, from http://www.aib.it/aib/sezioni/toscana/conf/cfrbr.htm

Borgman, C.L. (1986). Why are online catalogs hard to use? Lessons learned from Information-Retrieval Studies. *Journal of the American Society for Information Science*, *37 (6),* 387-400.

Borgman, C.L. (1996). Why are online catalogs still hard to use? *Journal of the American Society for Information Science*, *47 (7),* 493-503.

Bourdon, F. (2001). Functional Requirements and Numbering of Authority Records (FRANAR): to what extent authority control can be supported by technical means. *Paper for the 67th IFLA Council and General Conference August 16-25, 2001* (Paper 096-152a-E). Retrieved June 11, 2002 from http://www.ifla.org/IV/ifla67/papers/096-152ae.pdf

Byrum, J.D., & Madison, O.M.A. (2000). Reflections on the goals, concepts and recommendations of

the IFLA Study on Functional requirements for Bibliographic Records. In M. Guerrini (ed.) *Seminar FRBR Functional Requirements for Bibliographic Records Seminar (Florence, January 27-28, 2000)* (pp. 11-51). Rome: Associazione Italiana Biblioteche. Retrieved June 11, 2002, from http://www.aib.it/aib/sezioni/toscana/conf/frbr/byrmadis.htm

Carlyle, A. (2001). Developing organized information displays for voluminous works: a study of user clustering behaviour. *Information Processing and Management*, 37 (5), 677-699.

Carpenter, M. (2000). Main and added entries. In *The Future of Cataloging: Insights from the Lubetzky Symposium April 18, 1998, University of California Los Angeles*, (pp. 60-71). Chicago: ALA.

Crofts, N. (2001). Introduction to the ICOM/CIDOC conceptual reference model. In *Archives, Libraries and Museums Convergence, 24th ELAG seminar (Paris 2000)*, (pp. 168-177). Paris: Cité des Sciences et de l'Industrie.

Eversberg, B. (1998). The part → whole relationship in German and American cataloguing data: results and suggestions. In *REUSE+ : joint project of OCLC and Niedersächsische Staats und Universitätsbibliothek Göttingen* [online]. Göttingen: Niedersächsische Staats und Universitätsbibliothek Göttingen, 1998. Retrieved June 11, 2002, from http://www.biblio.tu-bs.de/allegro/formate/reusep.htm

FRBR. (1998). *Functional Requirements for Bibliographical Records: Final report* / IFLA study group on the functional requirements for bibliographical records *;* Approved by the Standing committee of the IFLA Section on Cataloguing. München : Saur. Retrieved June 11, 2002, from http://www.ifla.org/VII/s13/frbr/frbr.htm

The Future of Cataloging: Insights from the Lubetzky Symposium, April 18, 1998, University of California Los Angeles (2000). Chicago: ALA.

Grinnen, E.B. et al. (1999). IFLA model for bibliographic records ELAG OO edition II. Discussion paper In *Managing Multimedia Collections, 23rd ELAG seminar (Bled, 1999)*, (pp. 110-119) Ljubljana: National and University Library.

Hega, K., & Mutomaa E. (2002). Data mining Marc to find: FRBR. *68th IFLA Council and General Conference, Glasgow, August 18-24, 2002. Nr053-133-E*. Retrieved June 11, 2002, from http://www.ifla.org/IV/ifla68/papers/053-133e.pdf .

Holm, L. (1999). IFLA model for bibliographic records: ELAG OO edition II. In: *Managing Multimedia Collections, 23rd ELAG seminar (Bled, 1999*, (pp. 120-124) Ljubljana: National and University Library.

Layne, S.S. (2000). Modelling relevance in art history. In *The Future of Cataloging: Insights from the Lubetzky Symposium*, *April 18, 1998 University of California Los Angeles, (pp. 33-41)*. Chicago: ALA.

Le Boeuf, P. (2001a). The impact of the FRBR model on the future revisions of the ISBDs: a challenge for the IFLA section on cataloguing. *Paper for the 67th IFLA Council and General Conference August 16-25, 2001. Nr 095-1521a-E*. Retrieved June 11, 2002, from http://www.ifla.org/IV/ifla67/papers/095-152ae.pdf

Le Boeuf, P. (2001b). FRBR and further. *Cataloging and Classification Quarterly, 32(4)*. 15-52

Noerr, P., Goossens, P., & Matei, D. (1999). User benefits from a new bibliographic model: follow-up of the IFLA Functional Requirements study. *International Cataloguing and Bibliographic Control. 28(3).* 80-81

Petrucciani, A. (2000). New requirements for new catalogues. In M. Guerrini (ed.) *Seminar FRBR Functional Requirements for Bibliographic Records Seminar (Florence, January 27-28, 2000)*, (pp. 138-146). Rome: Associazione Italiana Biblioteche.

Strunck, K. (1999). About the use of 'Functional Requirements for Bibliographic Records' in teaching cataloguing. *IFLA 1999 Bangkok Conference Proceedings (Code Number 1089-131-E)* Retrieved June 11, 2002, from http://www.ifla.org/IV/ifla65/papers/108-131e.htm

Svenonius, E. (2000). *The Intellectual Foundation of Information Organization*. Cambridge: The MIT Press.

Verona, E. (1961). *Statement of Principles, annotated ed. with commentary and examples by Eva Verona. International Conference on Cataloguing Principles, 1961, Paris. 1971.* London: IFLA Committee on Cataloguing.

Weston, P. G. (2000). FRBR and the user: considerations on research. In M. Guerrini (ed.) *Seminar FRBR Functional Requirements for Bibliographic Records Seminar (Florence, January 27-28, 2000).* Rome: Associazione Italiana Biblioteche.

Yee, M. (2000). Lubetzky's work principle. In: The Future of Cataloging: Insights from the Lubetzky Symposium April 18, 1998, University of California Los Angeles, (pp.72-104). Chicago: ALA.