Application of the FRBR/LRM Model to Continuing Resources

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Abstract:

The Functional Requirements for Bibliographic Records (FRBR) and its successor the IFLA Library Reference Model (LRM) do not fully explain how to model continuing resources. Applying the FRBR/LRM Work-Expression-Manifestation-Item (WEMI) model to continuing resources such as magazines, journals, and newspapers has been difficult and controversial and many serialists remain unconvinced that the FRBR model is appropriate for serials. This study examines the challenges of modelling continuing resources. LRM introduced a number of changes to the WEMI model to accommodate continuing resources. Particularly notable was the introduction of the serial work and the serial manifestation and establishment of the created by relationship linking a manifestation to an agent that created the manifestation.

Although serials and integrating resources are both considered to be continuing resources, they are distinct and require different modelling approaches. Integrating resources are complete bibliographic units that are frequently revised while serials are aggregates of discrete parts collected and issued over time. Because they are complete bibliographic units, integrating resources, regardless of how or how frequently they are updated, can be modelled as monographs. LRM introduced the serial work to recognize the intellectual effort of compilers, editor, and other similar agents. However, LRM's new 'created by' relationship between agents and manifestation also provides a means to recognize this effort and makes serial works redundant. In spite of the LRM accommodations, modelling serials remains problematic. Treating the serial as a whole as a manifestation is inconsistent with the view of manifestations as static entities. An entity for serials that functions equivalently to the monographic item also remains elusive. Further changes to the WEMI model will likely be necessary before the WEMI model can accommodate serials.

Introduction

The *Functional Requirements for Bibliographic Records* (FRBR) and its successor the *IFLA Library Reference Model* (LRM) do not fully explain how to model continuing resources such as magazines, journals, and newspapers. Applying the Work-Expression-Manifestation-Item (WEMI) model to such resources is difficult and has only been superficially examined. Continuing resources are complex and raise modelling issues beyond those encountered with monographs and many serialists remain unconvinced that the WEMI model is appropriate. Jones noted that, "Continuing resources have been conspicuously absent from these early [FRBR] experiments, primarily because they have proved to be problematic" (Jones, 2005). It has been particularly challenging to pair the terminology traditionally used to describe continuing resources with the WEMI entities and their associated relationships.

Library resources traditionally have been split between monographs and continuing resources. Joudrey and Taylor (2009) explain that "A monograph is a complete bibliographic unit or information resource" (books, reports, theses, etc.) while a continuing resource is "a bibliographic resource issued over time without a predetermined conclusion." Kuhagen (2005) further divided continuing resources into serials and integrating resources defining a serial as a "continuing resource issued in a succession of discrete parts, usually bearing numbering, that has no predetermined conclusion" and an integrating resource as a "bibliographic resource that is added to or changed by means of updates that do not remain discrete and are integrated into the whole".

The WEMI Entities

The four group 1 entities originally defined in FRBR were redefined in IFLA Library Reference Model (2017, p. 21-27) as:

- **Work**: The intellectual or artistic content of a distinct creation.
- **Expression**: A distinct combination of signs conveying intellectual or artistic content.
- **Manifestation**: A set of all carriers that are assumed to share the same characteristics as to intellectual or artistic content and aspects of physical form. That set is defined by both the overall content and the production plan for its carrier or carriers.
- **Item**: An object or objects carrying signs intended to convey intellectual or artistic content.

The WEMI entities are connected with relationships as illustrated in Figure 1. It is important to note that *is embodied in* between expression and manifestation is the only many-to-many relationship.

The LRM revisions were made to provide the flexibility necessary to accommodate a wider variety of resources including digital resources. As the scope note for items explains: "An *item* is in many instances a single physical object, but in other cases, an *item* may consist of multiple physical pieces or objects. An *item* may be a part of a larger physical object, for example, when a file is stored on a disc which also contains other files, the portion of
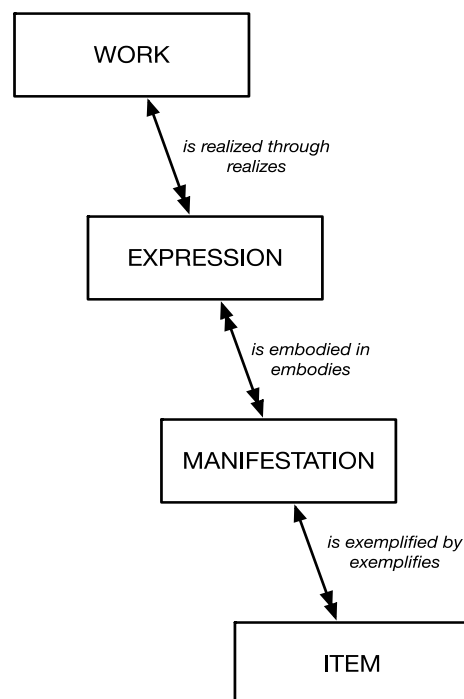

Figure 1. WEMI Relationships.

the disc holding the file is the physical carrier or item" (IFLA Library Reference Model, 2017, p. 27).

Integrating Resources

Loose-leaf publications are the classic example of integrating resources. Prior to online publishing, loose-leaf publications were commonly used for manuals and other documents requiring frequent updates. As changes were made, only the revised pages needed to be reprinted and distributed. Today, loose-leaf publications have largely been replaced by online equivalents that are cheaper and easier to use and maintain. Unlike print publications, for online publications it's often unclear what updating methodology was employed since, in either case, the earlier iterations are likely to remain available in some form. Despite of the fact that integrating resources are recognized as one of the major types of library resources, they are not mentioned in either FRBR or LRM.

The MARC 21 Format for Bibliographic Data is an example of an integrating resource. It was initially published in 1999 as a consolidation of several media centric loose-leaf manuals and is available on the Library of Congress's website. Since its 1999 publication, there have been 23 separate updates, averaging approximately nine months between updates. Each update typically resulted in multiple changes of varying significance such as the addition or revision of fields, subfields, and codes. In spite of being categorized as an integrating resource, the MARC manual is a "complete bibliographic unit".

Gray's Anatomy is an example of a resource considered to be a monograph that has also undergone numerous revisions; its latest revision is the 41st edition. While each new edition supersedes the previous edition, it does not eliminate it. Is *Gray's Anatomy* fundamentally different from the MARC manual?

Many successful non-fiction monographs need to be periodically revised to remain current. For print documents, the result is either a new edition (a monograph) or a new section in a loose-leaf publication (an integrating resource). As publishing moved online, updating an expression by integrating the changes became a practical way to keep a work current. Further blurring the distinction, virtually all online systems retain backup copies ensuring that earlier versions remain available even if access is limited. How an online resource is revised depends more on the publishing technology than on the attributes of the resource.

Although few readers care about, or are even aware of, how a work is revised, this has been a critical distinction for cataloguers. Hinger & Lin (2008), citing LCRI 1.0, summarize the cataloguing difference as "If the resource is complete, but may be corrected in some parts, treat it as a monograph. If it is likely to be updated over time, treat it as a serial or integrating resource". This implies that determining whether a work is a monograph, or an integrating resource should be based on the likelihood of future revisions. All expressions have the potential to be revised and each revision creates a new expression of the same work (as long as the changes result in a new expression and not in a new work, but that is always true).

Integrating resources, regardless of how or how frequently they are updated, are complete bibliographic units and therefore can be modelled in the same way as monographs using a single work realized as potentially multiple expressions which are embodied in manifestations. The distinction between revised manifestations and expressions, and the decisions of when a new work should be introduced, is a question of cataloguing practice but does not require any specific changes to the model.

Serials

The library community has traditionally treated serials differently than monographs. Serials include magazines, journals, newspapers, annuals, yearbooks, newsletters, conference proceedings, and similar publications that are issued as a succession of discrete parts. Most serials grow through the addition of new parts while leaving the previous parts unaltered. Another distinction is that serials generally are acquired by subscription. The serials challenge is that both the serial as a whole and its individual parts must be described and indexed.

As important as the parts of the serial are, there is no general term to describe them. A wide variety of terms are used to describe these parts in context: *Articles* for scholarly journals, *Papers* for conference proceedings, *Stories* for newspapers, etc. Analytical entry is a common cataloguing term which Taylor and Joudery (2009, p. 442) define as "An entry made for each of the works in a volume, as opposed to making only one entry for the entire volume. Belford (2014) referred to "analytic access points for a work or expression contained completely in the resource described". Analytical entries are associated with the description of works or, more precisely, of expressions embodied within a larger bibliographic unit. We will use the term *analytic* to describe an individual expression embodied in a serial.

Serials are diverse resources with a complex structure of volumes, issues, sections, and pages. They can be analog (print) or digital and can reside on a variety media such as paper, microforms, magnetic media, or optical media and may online or offline. O'Neill and Žumer (2018) reviewed the variety of ways that textual documents can be encoded and embodied in diverse types of media. Using analytics, Kuhagen's definition can be reworded: *A serial is a collection of analytics that are added sequentially over an indefinite period*. For print journals, the new articles may be grouped and added as a new issue. For online journals, articles may be added individually as they become available. The key aspect is that the serial has no predetermined conclusion and the added analytics are intended to remain indefinitely.

The creation of metadata for serials has traditionally been shared by libraries and abstracting and indexing (A&I) services; indexers creating metadata for the analytics and cataloguers creating metadata for the serial as a whole. More recently, a number of search engines such as Google also began creating analytical level metadata and many publishers now also index their journals and provide access through their websites. Although libraries continue to catalog serials, cataloguers play only a minor role in the creation the metadata for the analytics.

LRM and Serials

One of the changes that LRM made was to expand the family of relationships between the group 1 entities and agents. These relationships hold between the agent entity and the group 1 entities to "capture responsibility for the processes of creation, manufacture, distribution, ownership or modification" (IFLA Library Reference Model, p. 84). In FRBR, the *created by* relationship was only allowed between works and agents (IFLA Study Group on the Functional Requirements for Bibliographic Records). LRM expanded its scope by also authorizing the *created by* relationship between agents and expressions or manifestations. The created by relationship shown below is particularly relevant to serials because it can represent the intellectual contribution of an agent such as an editor.
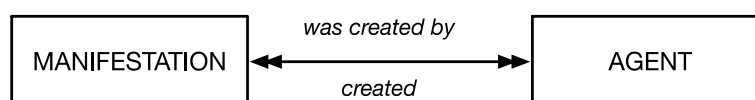

Figure 2. The Manifestation-Agent *Created by* Relationship.

LRM confirmed that serials are aggregates and introduced the term *serial works*. The serial work is a subtype of aggregating work representing the idea of bringing expressions together. The aggregating work concept was originally introduced by the IFLA Working Group on Aggregates (2011). The working group observed that "The process of aggregating the expressions itself is an intellectual or artistic effort and therefore meets the criteria for a work. In the process of creating the aggregate manifestation, the aggregator produces an aggregating work." LRM extended the aggregating work to serials stating, that for serials, "the corresponding *aggregating work* is termed a *serial work*. In the model, the term serial work is restricted to this specific type of aggregating work; this usage differs from common library usage in which the term "serial work" is used interchangeably with the term 'serial' to refer to the resulting sequence of *aggregate manifestations*" (IFLA Library Reference Model, p. 95).

In what appears to be an unintended consequence, by authorizing the *created by* relationship between manifestations and agents, LRM authorized two distinct methods for recognizing the intellectual contribution of an editor or similar agent. In Figure 3 below the dashed path that includes the *serial work* was the method proposed by the Working Group on Aggregates and later incorporated into LRM. A more direct method, shown by the dotted path, was also authorized when LRM expanded the scope of the *created by* relationship. While both approaches are valid, the direct path is simpler and eliminates the need for both the serial work and its expression. It is unlikely that the Working Group on Aggregates would have proposed the aggregating work if the *created by* relationship between an agents and manifestations had been available at the time.
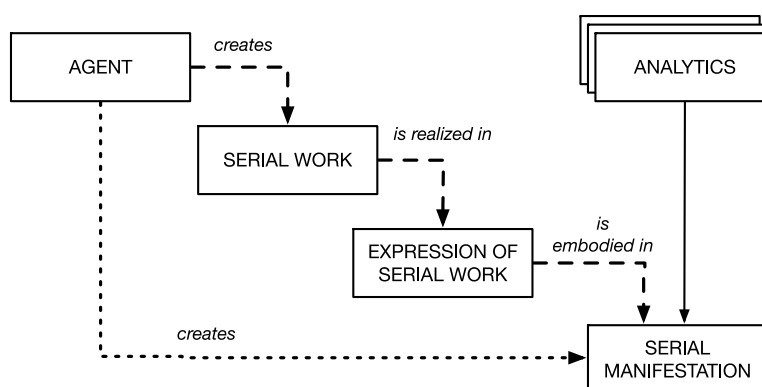

Figure 3. Alternate Methods for recognizing an Agent.

LRM also introduced the term serial manifestation observing that "the complete serial *manifestation* has a whole/part relationship to its individual issues published over time …" (IFLA Library Reference Model, p. 94). This seems to imply that the *serial manifestation* embodies the entire serial. However, because the term *serial manifestation* occurs only once in LRM, it is difficult to speculate on the exact intent.

Serial work as a separate subtype of work has been further explored in the FRBRoo model (Working Group on FRBR/CRM Dialogue, 2016) and is also implicit in the PRESSoo model (2016), although neither of these models suggest any special constructs for modelling the actual aggregation.

Modelling Serials

The challenge in applying the WEMI model to serials is identifying how the serial as a whole and its embodied analytics correspond to the LRM concepts of work, expression, manifestation and item. For the analytics, there is good alignment between traditional serials terminology and works and expressions but identifying the manifestations that embody these expressions and the items exemplifying the manifestations has been difficult. When the physical characteristics are the primary

consideration, a serial issue is often considered to be a manifestation. However, if the issue is a manifestation, what is the serial as a whole? If the serial is an aggregate, it logically would follow that the serial as a whole is a manifestation but that does not align well with the WEMI notion of a manifestation because serials are dynamic while manifestations are static.

The relationships between the group 1 entities is also problematic because it is questionable if the relationship chain from work to item is valid. The *realizes* relationship between works and expressions seems valid for analytics. The *embodies* relationship also holds for expressions of analytics but it is difficult to make the link between the serial as a whole (as a manifestation) and the individual analytic. The *exemplifies* relationship between manifestation and item is neither valid because items rarely exemplify an entire journal.

Although we have indicated that treating entire serial as manifestation is questionable, there would be advantages in doing so. The manifestation representing the serial as a whole allows the use of the *created by* relationship to recognize the editor's responsibility and to record the serial title, publisher, availability, and any other relevant metadata. What is unique about serials is that it is an aggregate that is continuously changing; growing through the successive addition of new analytics. The embodied analytics themselves are static expressions of monographic works.

Conclusions

Integrating resources are complete bibliographic units and should be modelled as monographs. Most integrating resources are single works realized as a sequence of updated expressions. Distinguishing between revised expressions is a question of cataloguing practice but does not pose any specific modelling challenges beyond what the model already provides for monographs.

Aggregating works no longer are necessary for the WEMI model. For serials, the *aggregating work* subtype, *serial work*, is not required since the recognition of the intellectual contribution of editors and similar contributors is better served by LRM's *created by* relationship between agents and manifestations.

What is unique about serials is that they are aggregates but an aggregate that is continuously changing; growing through the successive addition of new analytics. The embodied analytics themselves are static expressions of monographic works. LRM's view of works and expressions aligns well for serials but its view of manifestations and items is problematic. Although treating the entire serial as manifestation is questionable, doing so could be advantageous. A manifestation representing the serial as a whole would allow the use of the *created by* relationship to recognize the editor's responsibility and to record the serial title, publisher, availability, and any other relevant metadata. The *exemplifies* relationship between manifestation and item is also problematic because items rarely exemplify the complete serial. Further extensions and modifications to LRM, particularly at the manifestation and item level, will be needed to fully accommodate serials.

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