The IFLA LRM Model: An Introduction

Thomas M. Dousa
The University of Chicago Library

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A Little about the Presenter

Thomas “Tom” M. Dousa

Metadata Analyst Librarian at the University of Chicago Library

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Agenda

* Background: LRM and the family of FR (Functional Requirements) models
* LRM User Tasks
* LRM Entities
  -- WEMI redefined
  -- The definition of Person
  -- The Nomen
* Attributes
  -- The Representative Expression as Work-level attribute
  -- The Manifestation statement as Manifestation-level attribute
  -- The Nomen String as Nomen-level attribute
[* Relationships]

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The IFLA Library Reference Model (LRM)

* A Reference Model is:

“an abstract framework for understanding significant relationships among the entities of some environment, and for the development of consistent standards or specifications supporting that environment. A reference model is based on a small number of unifying concepts .... A reference model is not directly tied to any standards, technologies or other concrete implementation details, but it does seek to provide a common semantics that can be used unambiguously across and between different implementations.”

The FR Family of Models

IFLA LRM is a harmonization of three different models for “Functional Requirements”:

• FRBR = Functional Requirements for Bibliographical Requirements (1998/rev. 2009)
• FRAD = Functional Requirements for Authority Data (2009/rev. 2013)
• FRSAD = Functional Requirements for Subject Authority Data (2010)

All are conceptual models constructed according to Entity-Relationship (ER) modeling techniques.

There is overlap between these three models with regard to entities treated but significant differences as well.
The FRBR Model

Source: https://cataids.wordpress.com/2009/06/24/frbr-do-you-understand-it/

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THE FRAD Model (Reduced Form)

Bibliographic Entities

Known by

Names and/or Identifiers

Basis for

Controlled Access Points

Source: IFLA Working Group on the Functional Requirements and Numbering of Authority Records (FRANAR), 2013, p. 4, Figure 1.
THE FRAD Model (Full Form)

Source: IFLA Working Group on the Functional Requirements and Numbering of Authority Records (FRANAR), 2013, p. 7, Figure 2
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**Thema** ≈ subject; can include any FRBR entities

**Nomen** ≈ name; attributes include: type; scheme; reference source, language, script, script conversion, form; time of validity; audience; status
FRSAD Model in relation to FRBR

Figure 3.1  FRSAD’s relation to FRBR (with the addition of FRAD entity *family*)

Source: IFLA Working Group on the Functional Requirements for Subject Authority Records (FRSAR), 2010, p. 15, Figure 3.1.

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LRM User Tasks

The LRM is intended to enable users to carry out the following tasks within a bibliographical system:

* **Find** [<FRBR, FRAD, FRSAD]
  “To bring together information about one or more resources of interest by searching on any relevant criteria.”

* **Identify** [<FRBR, FRAD, FRSAD]
  “To clearly understand the nature of the resources found and to distinguish between similar resources.”

* **Select** [<FRBR, FRSAD]
  “To determine the suitability of the resources found, and to be enabled to either accept or reject specific resources.”

* **Obtain** [<FRBR]
  “To access the content of the resource.”

* **Explore** [<FRSAD; cf. “contextualize” in FRAD]
  “To discover resources using the relationships between them and thus place the resources in a context.”

Sources: Riva, Le Boeuf, & Žumer, 2017, p. 15; IFLA Working Group on the Functional Requirements for Subject Authority Records (FRSAR), 2010, p. 35, Fig. 6.4.

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LRM Entities

* Res [<FRSAD ("Thema")]
* Work [<FRBR]
* Manifestation [<FRBR]
* Expression [<FRBR]
* Item [<FRBR]
* Agent [New; based on FRBR, Group 2]
* Person [<FRBR, FRAD]
* Collective Agent [<FRBR, FRAD ("Corporate Body" + "Family")]
* Nomen [<FRSAD ("Nomen"), FRAD ("Name", “Identifier”, “Controlled Access Point”)]
* Place [<FRBR]
* Time-Span [New: treated as attribute(s) in FRBR, FRSAD, FRAD]

Sources: Bianchini, 2017, 90, Tabella 1; Riva, Le Boeuf, & Žumer, 2017, pp. 20-36.
“Is-A” Hierarchy of LRM Entities

* Res [Top-level category]
  ** Work [is a Res]
  ** Manifestation [is a Res]
  ** Expression [is a Res]
  ** Item [is a Res]
  ** Agent [is a Res]
    *** Person [is an Agent]
    *** Collective Agent [is an Agent]
  ** Nomen [is a Res]
  ** Place [is a Res]
  ** Time-Span [is a Res]


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The WEMI Stack

In FRBR

WORK

is realized through

EXPRESSION

is embodied in

MANIFESTATION

is exemplified by

ITEM

In LRM

WORK

is realized through realizes

EXPRESSION

is embodied in embodies

MANIFESTATION

is exemplified by exemplifies

ITEM


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The Work in LRM

* Definition in FRBR:

“A distinct intellectual or artistic creation”


* Definition in LRM:

“The intellectual or artistic content of a distinct creation”


Further specifications in LRM scope note:

* “[T]he constellation of concepts and ideas that form the shared content of what we define to be expressions of the same work.”

* “A work comes into existence simultaneously with the creation of its first expression, no work can exist without there being ... at least one expression of the work.”
The Expression in LRM

* Definition in FRBR:

“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.”


* Definition in LRM:

“A distinct combination of signs conveying intellectual or artistic content.”


Further specifications in LRM scope note:

* “An expression comes into existence simultaneously with the creation of its first manifestation, no work can exist without there being ... at least one expression of the work.”
The Manifestation in LRM

* Definition in FRBR:

“The physical embodiment of an expression of a work.”


* Definition in LRM:

“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.”


Further specifications in LRM scope note:

* “A manifestation results from the capture of one or more expressions onto a carrier or set of carriers.”

* “A manifestation is recognized from the common characteristics exhibited by the items resulting from the same production process.”

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The Item in LRM

* Definition in FRBR:
  “A single exemplar of a *manifestation* ... a concrete entity”

* Definition in LRM:
  “An object or objects carrying signs intended to convey intellectual or artistic content.”
  Riva, Le Boeuf, & Žumer, 2017, p. 27.

Further specification in LRM scope note:
* “In terms of intellectual or artistic content and physical form, an *item* exemplifying a *manifestation* normally reflects all the characteristics that define the *manifestation* itself.”
The Definition of Person in LRM

* Definition in FRBR:
  “An individual ... deceased as well as ... living.”

* Definition in FRAD:
  “An individual or a persona or identity established or adopted by an individual or a group ... includes literary figures, legendary figures, divinities, and animals as literary figures, actors, and performers.”

* Definition in LRM:
  “An individual human being.”
  Riva, Le Boeuf, & Žumer, 2017, p. 27.

Further specification in LRM scope note:
* “The entity person is restricted to real persons who live or are assumed to have lived. [F]igures generally considered fictional ..., literary ..., or purely legendary ... are not instances of the entity person.”
The Nomen in LRM

* Definition in LRM:

“An association between an entity and a designation that refers to it.”


Further specifications in scope note:

* “An arbitrary combination of signs or symbols cannot be regarded as an appellation or designation until it is associated with something in some context. In that sense, the nomen entity can be understood as the reification of a relationship between an instance of res and a string.”

* The string of characters composing a name is a nomen string and is an attribute of the nomen: the string itself acquires its meaning as a name only in virtue of its association to a particular res (i.e., thing) through the act of naming.

* “Any entity referred to in the [bibliographical] universe of discourse is named through at least one nomen.”

Attributes in LRM

* Attributes serve to characterize individual instances of entities.

* No attribute is required by the model; may be used in particular implementations of LRM if applicable and easily ascertainable.

* Each entity type, save for "Collective Agent", has its own (set of) attributes.

* Attributes of superordinate entity classes in the “is-a” hierarchy of LRM entities are inherited by subordinate classes:

  e.g.,
  Attributes of top-level category “Res” (“category”, “note”) are inheritable by all other classes
  Attributes of “Agent” category (e.g., “contact information”, “field of activity”, “language”) are inheritable by “Person” and “Collective Agent”.

* Attributes listed in LRM are representative, not exhaustive; additions can be made within individual implementations of LRM

Representative Expression: An Attribute of Works (I)

* Definition in LRM:

“An attribute which is deemed essential in characterizing the work and whose values are taken from a representative or canonical expression of the work.”


Motivation for the category:

“Research with end-users indicates that they consider certain characteristics as inherent in works and that expressions that reflect those characteristics can be felt to best represent the intention of the creators of that work. ... For many purposes, end-users seek out expressions that display “original” characteristics and are particularly interested in manifestations of these expressions.”

The values of expression attributes that reflect a canonical expression of a work “can be notionally “transferred” to the work and used in work identification, although strictly speaking these attributes concern expression characteristics and not work characteristics. ... “[T]he ... representative expression attribute records the values of those attributes that are imputed to the work level through this mental process.”

Riva, Le Boeuf, & Žumer, 2017, p. 91
Representative Expression: An Attribute of Works (II)

* Examples of Representative Expression attributes:

--- Language (for textual works):
  e.g., Greek is the language of the “canonical” expression of Homer’s *Ilias* [= *Iliad*].

--- Genre (for textual works)
  e.g., Poetry is the genre of the “canonical” expression of Homer’s *Ilias* [= *Iliad*].

--- Key (for musical works):
  e.g., D minor is the key of the “canonical” expression of Beethoven’s 5th Symphony.

--- Medium of performance (for musical works):
  e.g., symphony orchestra is the medium of performance for the “canonical” expression of Beethoven’s 5th Symphony.
Manifestation Statement: An Attribute of Manifestations

* Definition in LRM:

“A statement appearing in exemplars of the *manifestation* and deemed to be significant for users to understand how the resource represents itself.”

Riva, Le Boeuf, & Žumer, 2017, p. 49.

Consists of imprint information *as it appears* on items exemplifying a manifestation; e.g., statement of place of publication, statement of publisher name, statement of date of publication, edition statement.

Included because self-representation of a manifestation is an important means of identifying it and distinguishing it from other manifestations of the same work.

Manifestation statement concerns *transcribed data* in contradistinction to “real-world” data: with regard to the latter, place of publication, publisher, and date of publication can be expressed as separate entities (place, collective agent, and time-span) placed into relation with a manifestation by means of relationships.
The Nomen String: An Attribute of Nomens

* Definition in LRM:
  “The combination of signs that forms an appellation associated with an entity through the nomen.”


Further specification in LRM scope note:
“The string involved in a nomen can be expressed as a notation in any form, such as a combination of signs within a writing system, chemical structure symbols, mathematical notation, or by any other kind of sign, such as sounds.”

-- Examples:
* “Pocahontas”
* “C₄H₆O”
* “978-08-87907-264-3”
* “https://www.ifla.org/publications/node/11412”

Relationships in LRM (I)

* 36 Relationships declared in all: list considered non-exhaustive.

* Typically take the form:

  [Entity A]<Relationship>[Entity B]

  where “Entity A” comes from a specified domain and “Entity B” from a specified range.

* Each relationship has an inverse relationship, in which the domain becomes the range and the range becomes the domain:

  [Entity A]<Relationship>[Entity B]    e.g., [Agent]<created>[Work]
  [Entity B]<Inverse Relationship>[Entity A]    [Work]<was created by>[Agent]

* Each relationship has a cardinality specifying how many instances of the entities belonging to the domain and the range can stand in relationship to one another:

  one-to-one [1-1]    [Not in LRM]
  one-to-many [1-M]    [Work]<is realized through>[Expression]
  many-to-one [M-1]    [Nomen]<is derivation of>[Nomen]
  many-to-many [M-M]    [Work]<has as subject>[Res]
Relationships in LRM (II)

*Relationships can be combined into compound relationships to form “paths”:

[Entity A]<Relationship 1>[Entity B]     e.g., [Work]<has as subject>[Res]
[Entity B]<Relationship 2>[Entity C]     [Res]<has appellation>[Nomen]

* “Is-A” relationships among entities can form part of a path; e.g.:

[Person]<is an>[Agent]
[Agent]<created>[Work]

* Frequently used paths can be declared as shortcuts:

  e.g.,

[Person]<is an [Agent]<created>[Work] → [Person]<created>[Work]

* Top-level relationship is: [Res]<is associated with>[Res]

  -- All other relationships are refinements of this general relationship.

* Relationships among the various WEMI entities continue to form the core of the model. In addition to the WEMI stack relationships, these include:

  -- Work-to-Work relationships
  -- Expression-to-Expression relationships
  -- Manifestation-to-Manifestation relationships
  -- Item-to-Manifestation relationship

* Expanded use of “creation”, which applies to the following relationships:

  -- [Work] <was created by>[Agent]    covers: authorship, composition, etc.
  -- [Expression]<was created by>[Agent]    covers: editorship, translation, etc.
  -- [Manifestation]<was created by>[Agent]    covers: publication.


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Relationships in LRM (IV)

* Nomen relationships include:

  -- [Res]<has appellation>[Nomen]
  -- [Agent]<assigned>[Nomen]
  -- [Nomen (1)]<is equivalent to>[Nomen (2)]       NB: A “shortcut” for a “path”
  -- [Nomen]<has part>[Nomen]
  -- [Nomen]<is derivation of>[Nomen]

* Space and Time-span entities contract relationships to Res entity:

  -- [Res]<is associated with>[Place]
  -- [Res]<is associated with>[Time-Span]

Prospects and Challenges for IFLA-LRM Implementation

* Because of its treatment of Nomen, Place, and Time-Span as entities and its distinction between Manifestation Statements and the entities responsible for Manifestations, IFLA-LRM is well suited for the Linked Data environment.

* The four-tier WEMI stack of IFLA-LRM does not align exactly with the three-tier Work-Instance-Item framework of the BIBFRAME ontology.
  
  ** Language is attribute of Expression in IFLA-LRM; Work in BIBFRAME
  ** The Representative Expression attribute is a step towards rapprochement.

* New IFLA-LRM attributes, such as Representative Expression and Manifestation Statements, are not currently accommodated within MARC.

* The new definition of the Person Entity does not align with current NACO/SACO practice in treatment of fictitious characters.

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Thank you for your attention!

Questions or Comments?
Please contact me at:

tdousa@uchicago.edu
References


