

FRBR in RDF: a proof-of-concept model

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The FRBR conceptual model

Introduction

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- “Functional Requirements for Bibliographic Records”
- Released in 1998 by the International Federation of Library Associations and Institutions (IFLA)
- A conceptual model of the bibliographic universe
 - Models a set of ten entities, their attributes and relationships to each other (“Entity-relationship model”)
 - Entities represent the products of artistic or intellectual endeavor, from the abstract “Work” to the concrete “Item”, as well as those responsible for the creation of the entities, and the subjects of works.
 - Addresses four user tasks: find, identify, select and obtain
 - “Makes no *a priori* assumptions about the bibliographic record itself, either in terms of content or structure” (FRBR Final Report, 1998)

The FRBR conceptual model

Visual representation

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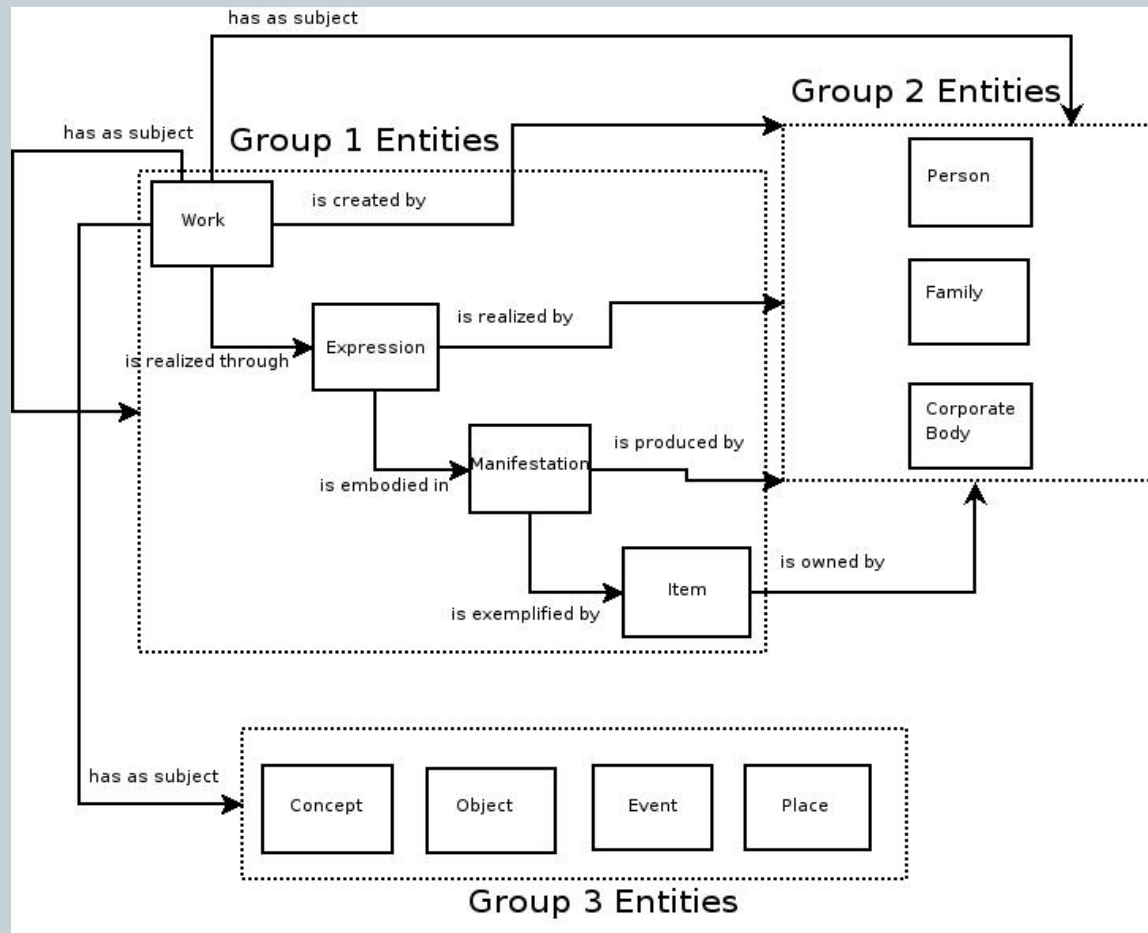


Diagram created by William Denton. Retrieved from: <http://www.miskatonic.org/library/2008ola/>

The FRBR conceptual model

Applications

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- FRBR terminology used in the forthcoming metadata content standard, “Resource Description and Access” (RDA)
- Several experiments test the model. None yet use it in a production environment
- RDF expression of FRBR developed in 2005 by Ian Davis and Richard Newman (<http://vocab.org/frbr/frbr-core-20050810#sec-schema>)
 - Basis of this project
 - Serialized in XML
 - Defines classes and object properties (FRBR “relationships”) but no data properties
 - No instances (i.e. actual bibliographic data) created using this schema

FRBR in RDF

Original schema – definition of “Work” class

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```
<owl:Class rdf:about="http://purl.org/vocab/frbr/core#Work">
  <rdfs:label xml:lang="en">work</rdfs:label>
  <skos:definition xml:lang="en">An abstract notion of an artistic or intellectual
  creation.</skos:definition>
  <rdfs:comment xml:lang="en">This class corresponds to the FRBR group one entity
  'Work'.</rdfs:comment>
  <rdfs:isDefinedBy rdf:resource="http://purl.org/vocab/frbr/core#"/>
  <rdfs:subClassOf rdf:resource="http://purl.org/vocab/frbr/core#Endeavour"/>
  <rdfs:subClassOf rdf:resource="http://xmlns.com/wordnet/1.6/Work~2"/>
  <owl:disjointWith rdf:resource="http://purl.org/vocab/frbr/core#Expression"/>
  <owl:disjointWith rdf:resource="http://purl.org/vocab/frbr/core#Manifestation"/>
  <owl:disjointWith rdf:resource="http://purl.org/vocab/frbr/core#Item"/>
  <dct:issued>2005-07-15</dct:issued>
  <skos:changeNote rdf:value="Added isDefinedBy property referring to FRBR core namespace"
  dc:date="2005-08-08" dc:creator="Ian Davis"/>
  <skos:changeNote rdf:value="Added comment" dc:date="2005-08-08" dc:creator="Ian Davis"/>
  <skos:historyNote rdf:value="Made subclass of wordnet:Work~2" dc:date="2005-08-08"
  dc:creator="Ian Davis"/>
  <skos:changeNote rdf:value="Extracted definition from existing comment" dc:date="2005-08-09"
  dc:creator="Ian Davis"/>
</owl:Class>
```

Full schema document located at: <http://vocab.org/frbr/frbr-core-20050810#sec-schema>

FRBR in RDF

Deriving a “simpler” RDF schema

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- **Omissions**

- OWL and SKOS elements
- Classes representing Group 3 entities (Concept, Object, Event, Place)
- Most of the object properties

- **Additions**

- Data properties defined by the RDA element vocabulary (URI: <http://RDVocab.info/Elements>)
- Data properties defined ad hoc, using the URI <http://ella.slis.indiana.edu/~mullinca/frbr#>
 - ✦ URL property (for Items)
 - ✦ nameOfResponsibleEntity (for Persons and Corporate Bodies)

FRBR in RDF

Simplified schema – definition of “Work” class

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```
<?xml version="1.0" encoding="UTF-8"?>
  <!DOCTYPE rdf:RDF
  [
    <!ENTITY frbr "http://purl.org/vocab/frbr/core#" >
    <!ENTITY frbrext "http://ella.slis.indiana.edu/~mullinca/frbr#" >
    <!ENTITY rda "http://rdvocab.info/Elements/" >
  ]>

  <rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:dc="http://dublincore.org/2008/01/14/dcterms.rdf#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

    <rdfs:Class rdf:about="&frbr;Work">
      <rdfs:label>Work</rdfs:label>
      <rdfs:comment>An abstract notion of an artistic or intellectual
        creation.</rdfs:comment>
      <rdfs:subClassOf rdf:resource="&frbr;Endeavor"/>
    </rdfs:Class>
```

Full schema document located at: <http://ella.slis.indiana.edu/~mullinca/S636/frbrRDFSubset.rdf>

FRBR in RDF

A corpus of bibliographic data

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- Selected five sound recordings of Western art (“classical”) music
- Converted data from MARC bibliographic and authority records into XML format
- Created instances of FRBR classes based on data in these records
 - 12 Works (representing creation of the composer)
 - 12 Expressions (representing performance event)
 - 5 Manifestations (representing manufactured CD)
 - 5 Items (representing copy owned and digitized by IU Music Library)
 - 18 Persons (representing composers, performers)
 - 6 Corporate Bodies (representing performers)
- Upon validation: 325 triples!
 - Significant amount of data available to query using SPARQL, based on only 5 physical resources

FRBR in RDF

Instance RDF document -- sample

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```
<rdf:Description rdf:about="http://authorities.loc.gov/2390318">
  <rdf:type rdf:resource="&frbr;Work"/>
  <rda:preferredTitleForTheWork>Sonatas, piano, D. 960, B ♭ major</rda:preferredTitleForTheWork>
  <rda:variantTitleForTheWork>Sonatas, piano, no. 21, B ♭ major</rda:variantTitleForTheWork>
  <rda:formOfTheWork>Sonata</rda:formOfTheWork>
  <rda:dateOfWork>1828</rda:dateOfWork>
  <rda:mediumOfPerformance>piano</rda:mediumOfPerformance>
  <rda:numericDesignation>D. 960</rda:numericDesignation>
  <rda:numericDesignation>no. 21</rda:numericDesignation>
  <rda:key>B ♭ major</rda:key>
  <frbr:realization rdf:resource="&frbr;Expression/3"/>
  <frbr:creator rdf:resource="http://orlabs.oclc.org/identities/lccn-n50-561"/>
</rdf:Description>

<rdf:Description rdf:about="&frbr;Expression/3">
  <rdf:type rdf:resource="&frbr;Expression"/>
  <rda:dateOfExpression>1986</rda:dateOfExpression>
  <rda:contentType>Recorded sound</rda:contentType>
  <frbr:realizer rdf:resource="http://orlabs.oclc.org/identities/lccn-n81-147251"/>
  <frbr:embodiment rdf:resource="http://www.worldcat.org/oclc/16351222"/>
</rdf:Description>

<rdf:Description rdf:about="http://www.worldcat.org/oclc/16351222">
  <rdf:type rdf:resource="&frbr;Manifestation"/>
  <rda:title>Sonate en si-bémol majeur, D 960 [sound recording] ; 3 pièces pour piano, D 946</rda:title>
  <rda:placeOfProduction>Paris, France</rda:placeOfProduction>
  <rda:publisher>Harmonic Records</rda:publisher>
  <rda:dateOfCopyright>1986</rda:dateOfCopyright>
  <rda:identifierForTheManifestation>H/CD 8610</rda:identifierForTheManifestation>
  <rda:carrierType>Compact Disc</rda:carrierType>
  <frbr:exemplar rdf:resource="http://www.music.indiana.edu/cgi-bin/var/access?BFJ7196"/>
</rdf:Description>

<rdf:Description rdf:about="http://www.music.indiana.edu/cgi-bin/var/access?BFJ7196">
  <rdf:type rdf:resource="&frbr;Item"/>
</rdf:Description>
```

Full instance document located at: <http://ella.slis.indiana.edu/~mullinca/S636/frbrInstances.rdf>

FRBR in RDF

Conclusions

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- RDF is an effective method to express bibliographic data using the FRBR model
- For electronic resources, URLs can be used as URIs of subjects and objects
- Creation of the instances is time consuming
- Further experimentation could include an XSLT style sheet to convert from MARCXML to RDF/XML instances
- Questions/comments?