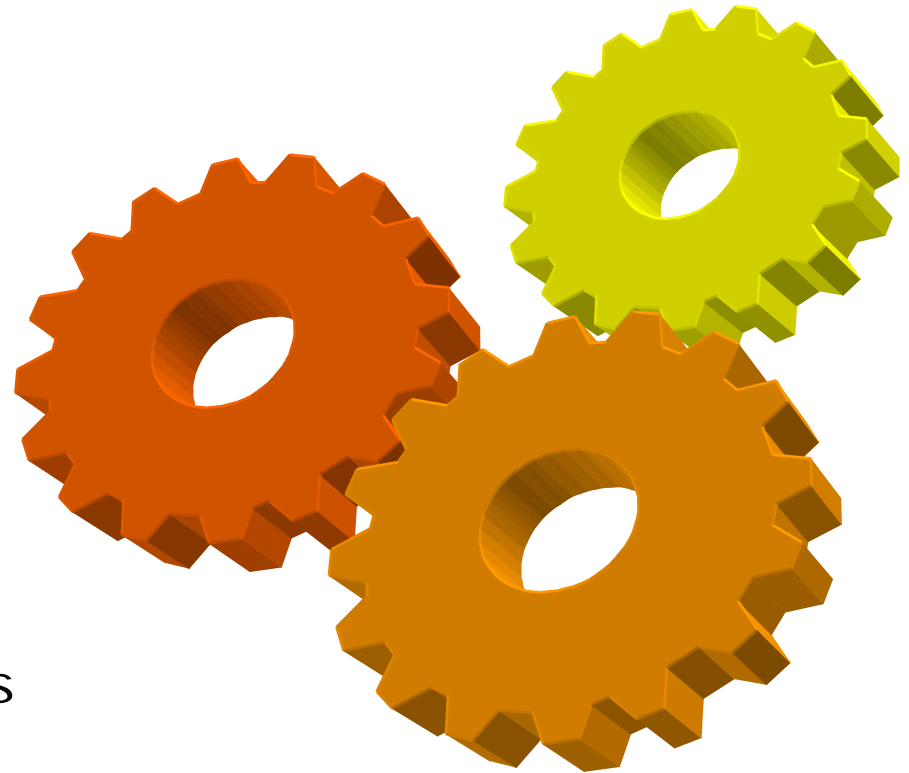


Alexander Haffner

RDA and the Semantic Web

Internationalisation and Interoperability

- interoperability of information and library systems
- internationalisation in descriptive cataloguing and subject cataloguing
- join all kinds of catalogues
- understanding user needs
 - find, identify, select, obtain, explore
- cost-effectiveness

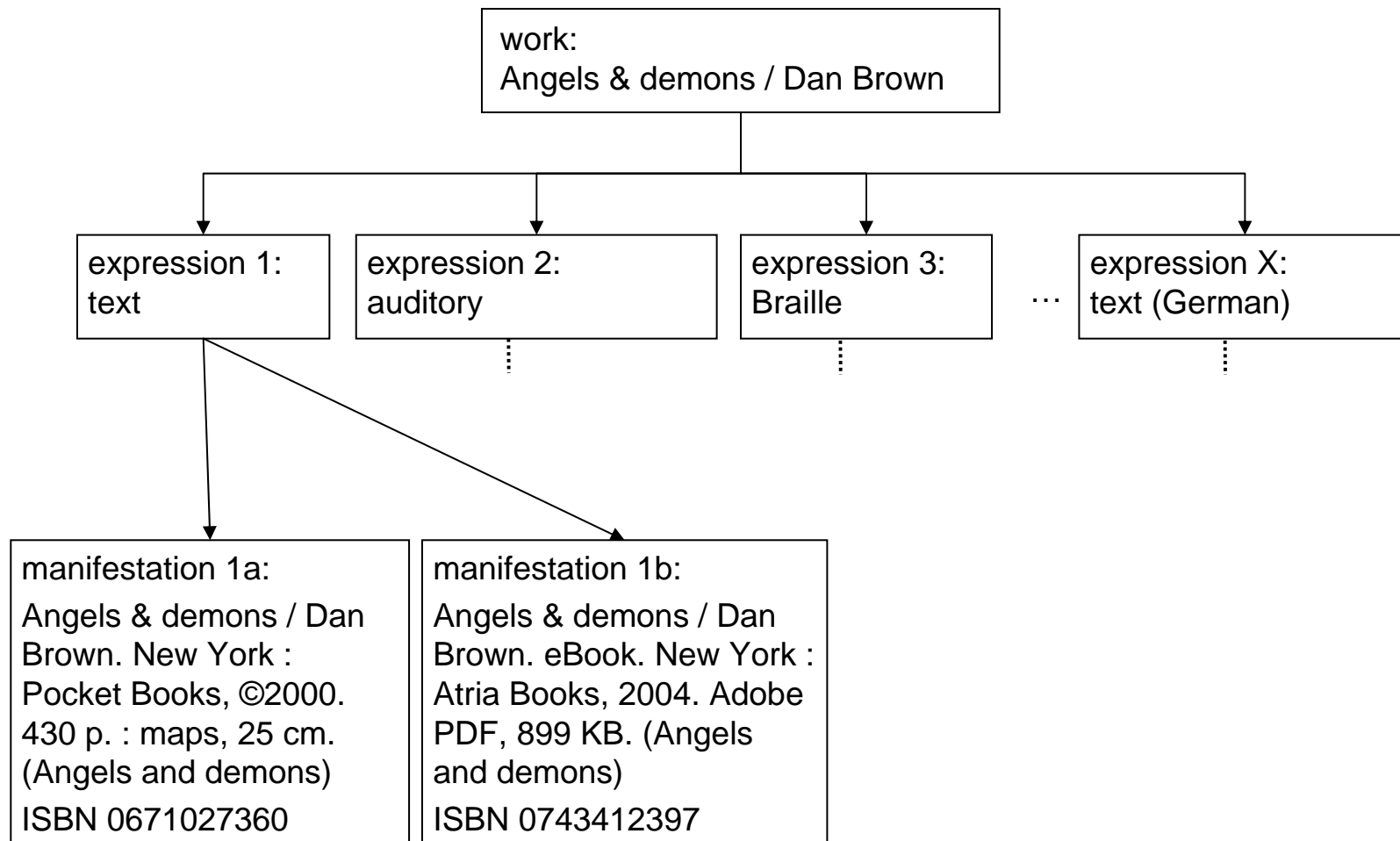


Functional Requirements for Bibliographic Records (FRBR)

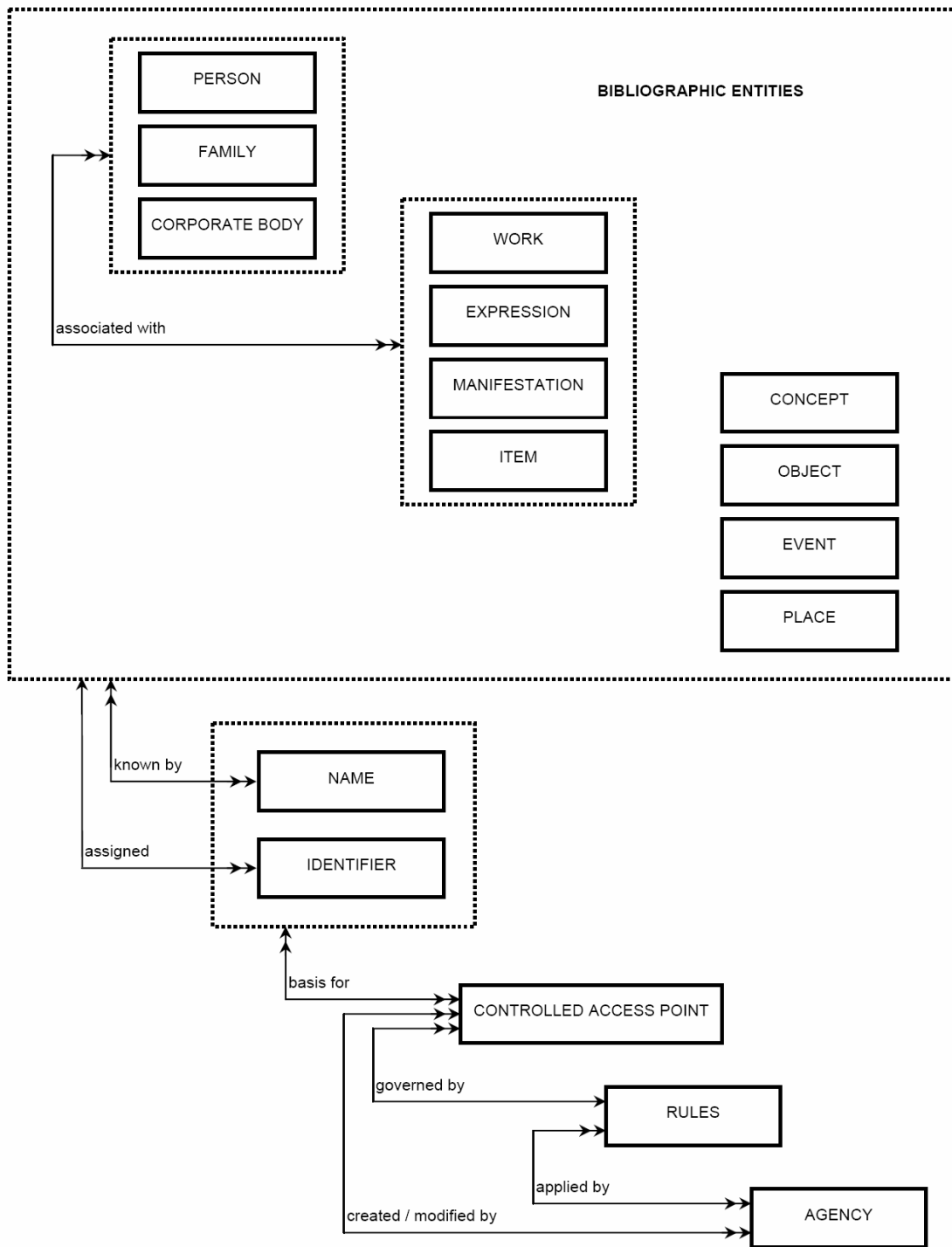
- A model for cataloguing has to identify and clearly define
 - entities of interest to users by bibliographic records
 - the attributes of each entity
 - and the types of relationships that operate between entities

- Entities of the FRBR Model:
 - group 1: work, expression, manifestation, item
 - group 2: person, corporate body
 - group 3: concept, object, event, and place

Functional Requirements for Bibliographic Records (FRBR)



Functional Requirements for Authority Data (FRAD)



Resource Description and Access

- upcoming user-focused content standard
 - changes perspectives of cataloguing
 - guiding librarians and non-librarians in how to describe entities and their relationships
- re-use of FRBR, FRAD, and FRSAD
- RDA is intended to replace AACR2
 - cover all types of media (non-digital and digital; textual, visual, auditory, tactile etc.)
- first release of RDA is announced for November 2009
 - RDA will be published as an online product
- independent of technical metadata formats
 - but definitely upcoming metadata records in MARC 21 and RDF
 - RDA has been developed explicitly to take advantage of the Semantic Web

Linked Data and the Semantic Web

- linking associate resources and related data in the web
 - linked data as prerequisite for the semantic web
- key technologies
 - URIs as generic means to identify entities and concepts
 - RDF as a data model to describe things as instances
(subject-predicate-object expressions)
- subsequent use of data
 - public data network of structured information
 - avoidance of redundant information and efforts
 - How do you know that a dataset is reliable and trustworthy?
- semantic networking and the library scene
 - bibliographies and authority data in libraries will receive the status of reliable and trustworthy data
 - re-use by a variety of service providers

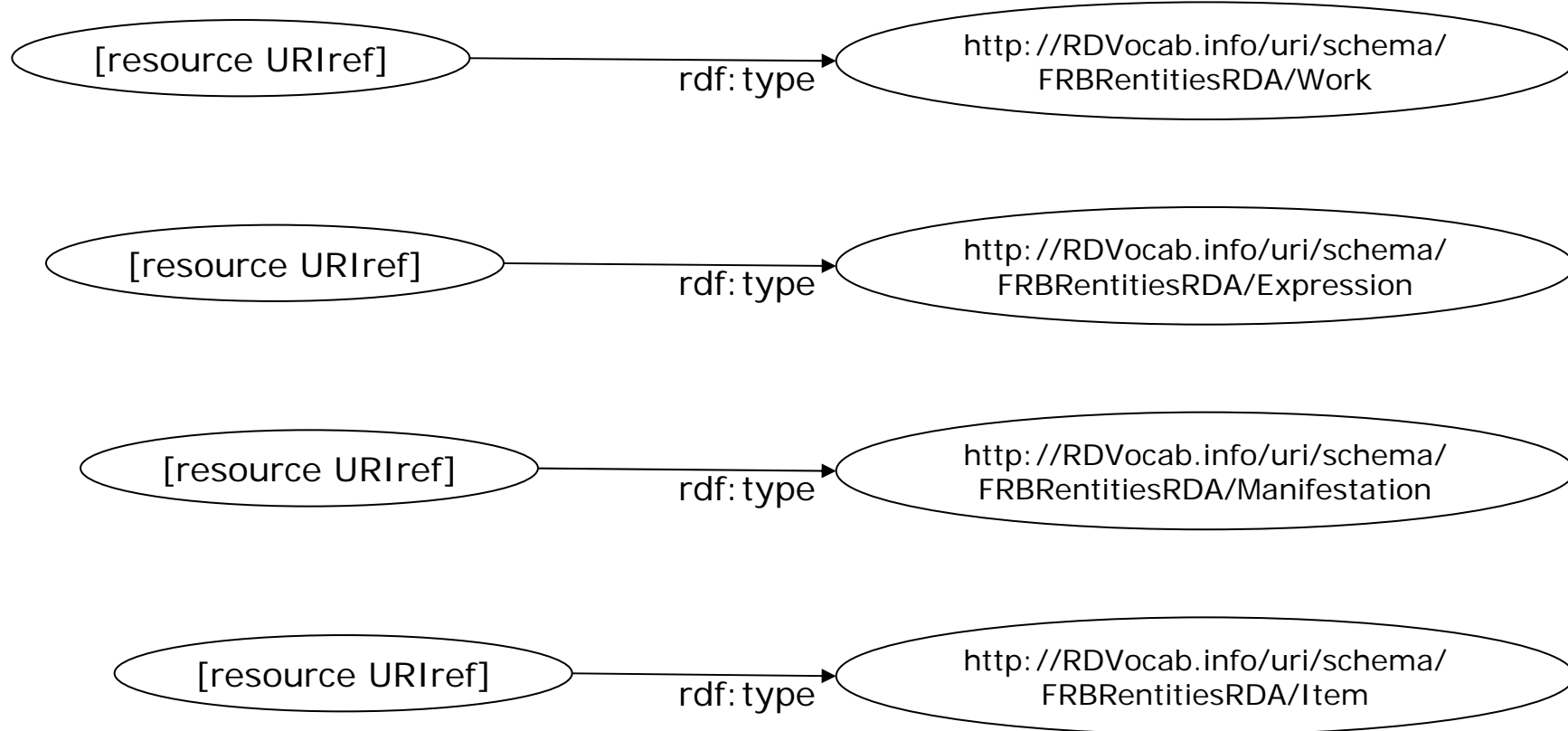
Linked Data and the Semantic Web

- RDF Schema (RDFS)
 - expresses the structure of metadata classes and properties
 - lightweight ontology representation
- Simple Knowledge Organization System (SKOS)
 - expresses the basic structure and content of concept schemes such as thesauri and other types of controlled vocabularies
- Web Ontology Language (OWL)
 - explicitly represents the meaning of terms in vocabularies and the relationships between them
 - complex ontology representation:
 - optimized for reasoning

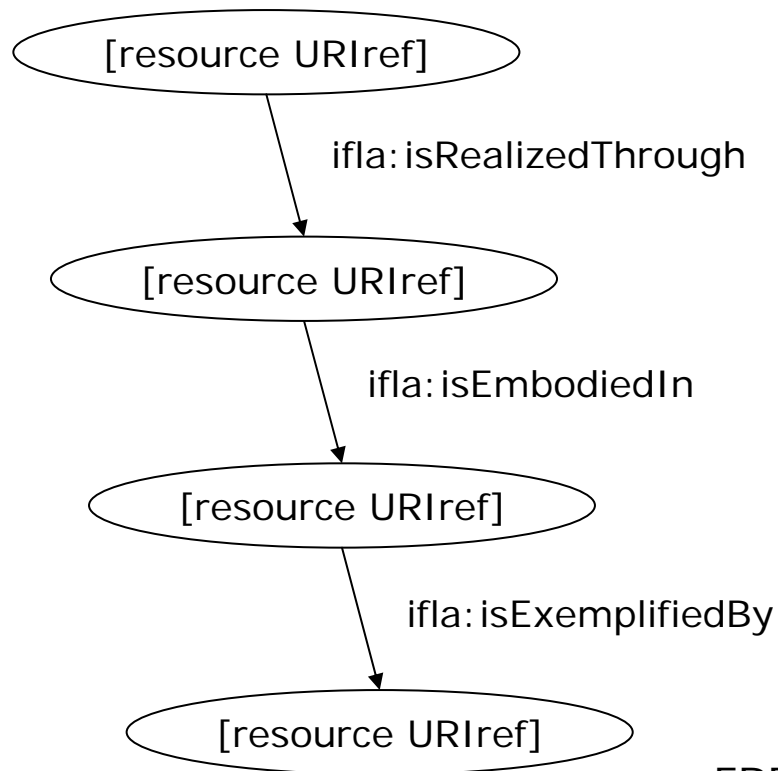
DCMI /RDA Task Group

- define vocabularies in Semantic Web formats
 - using NSDL Metadata Registry tools
 - two types of vocabularies:
 1. metadata entities (elements, attributes)
e.g. "Title", "Content type";
represented as RDF-Schema
 2. metadata content (controlled terms)
e.g. "spoken word" (instance of Content type);
represented in SKOS
- FRBR Review Group re-affirmed its desire to liaise with DCMI/RDA Task Group
 - register RDFS representations of FRBR entities and relationships
- element registration approaches RDA Element Analysis

FRBR entities



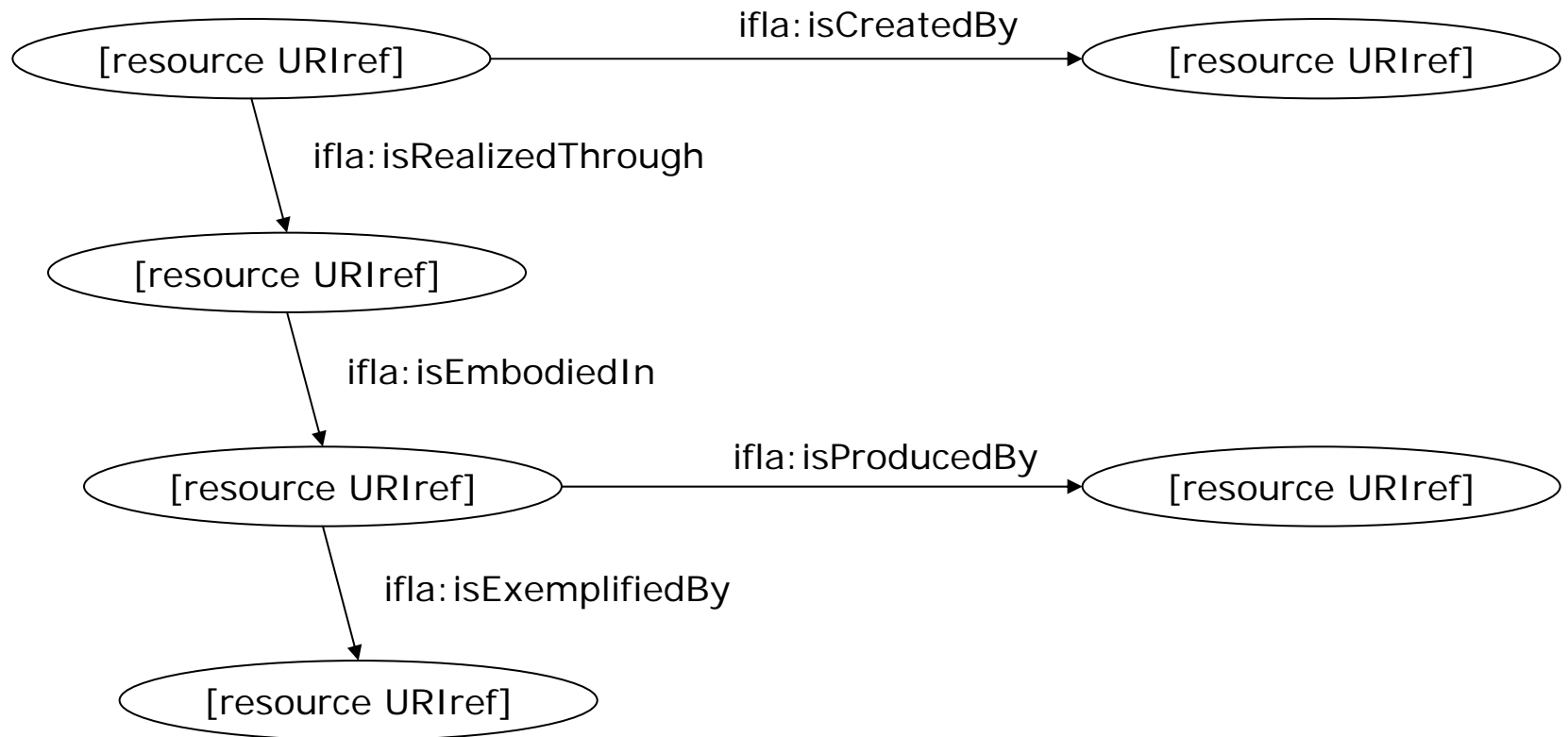
FRBR relationships



FRBR Relationships (Sandbox version)

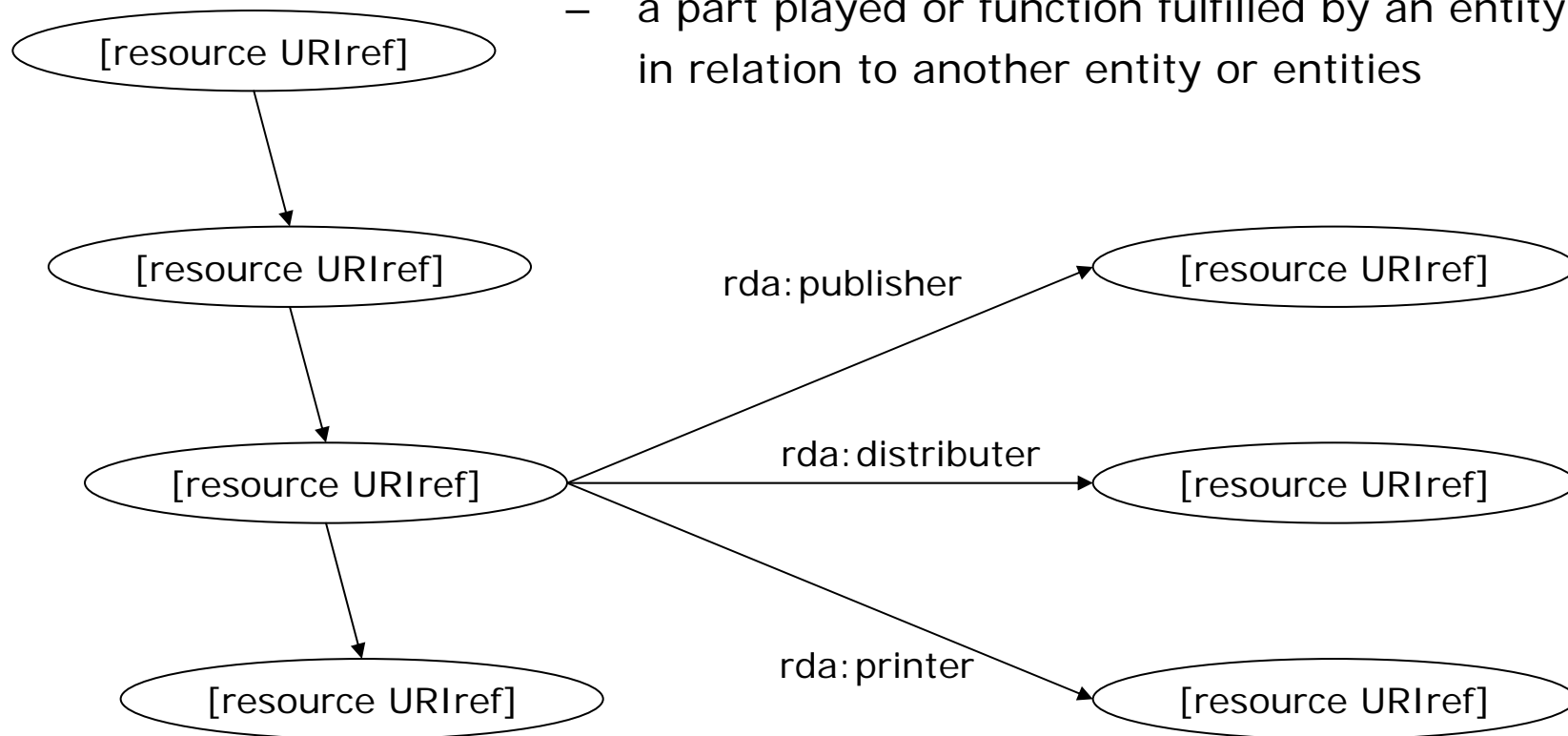
<http://sandbox.metadataregistry.org/vocabulary/show/id/90.html>

FRBR relationships

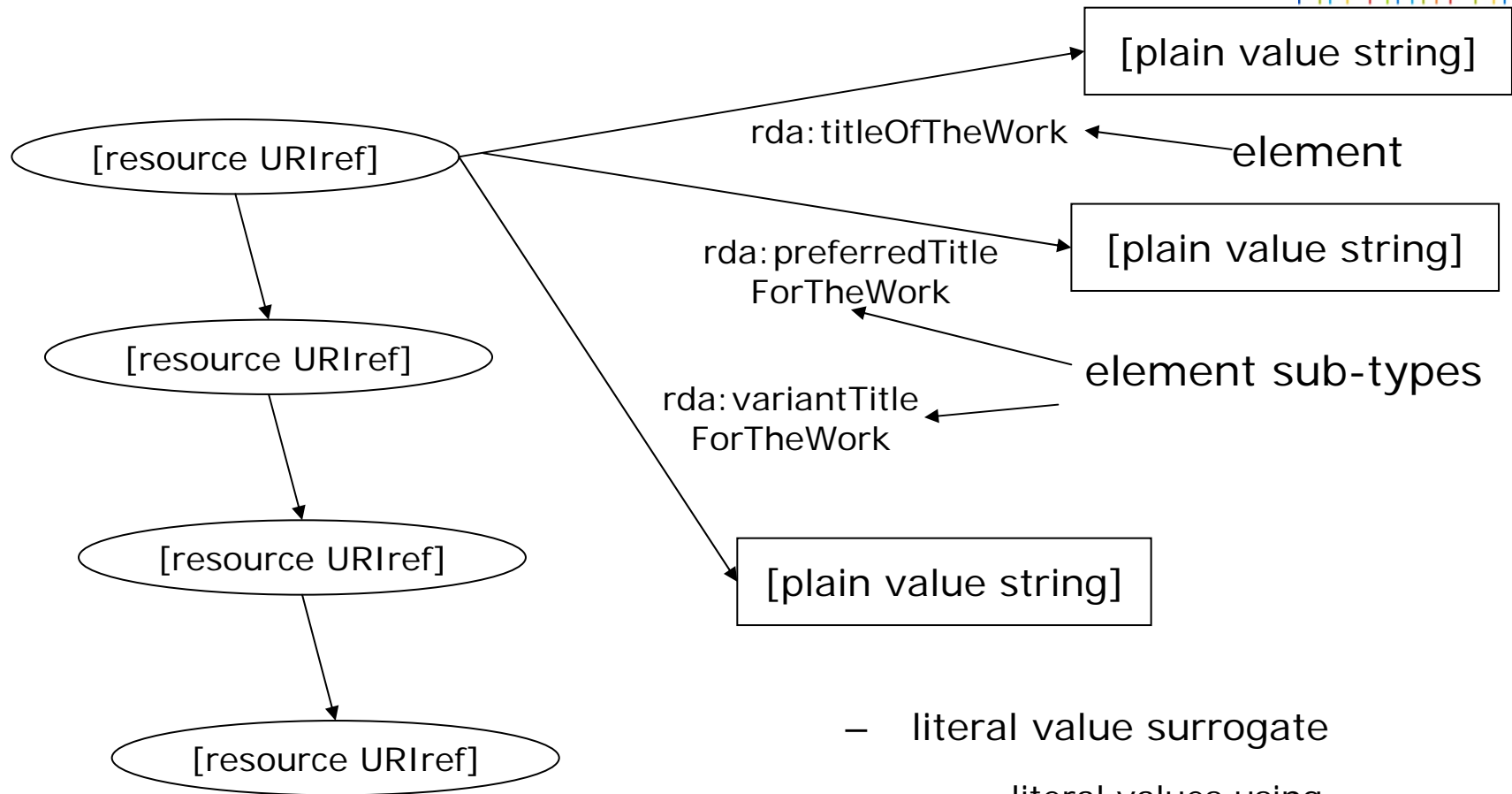


RDA roles to concretize relationships

- a part played or function fulfilled by an entity in relation to another entity or entities



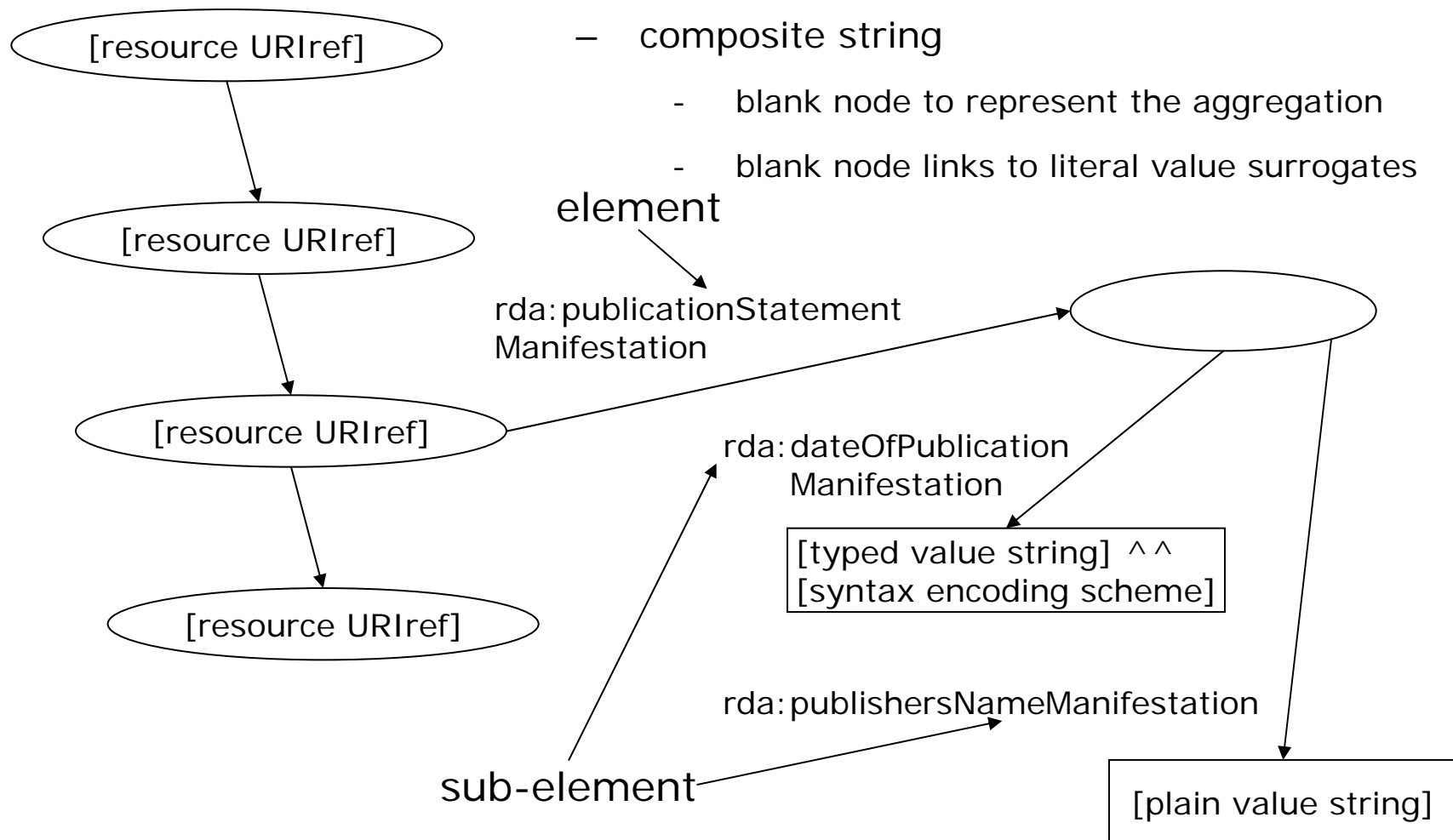
RDA label



- literal value surrogate
 - literal values using plain or typed value

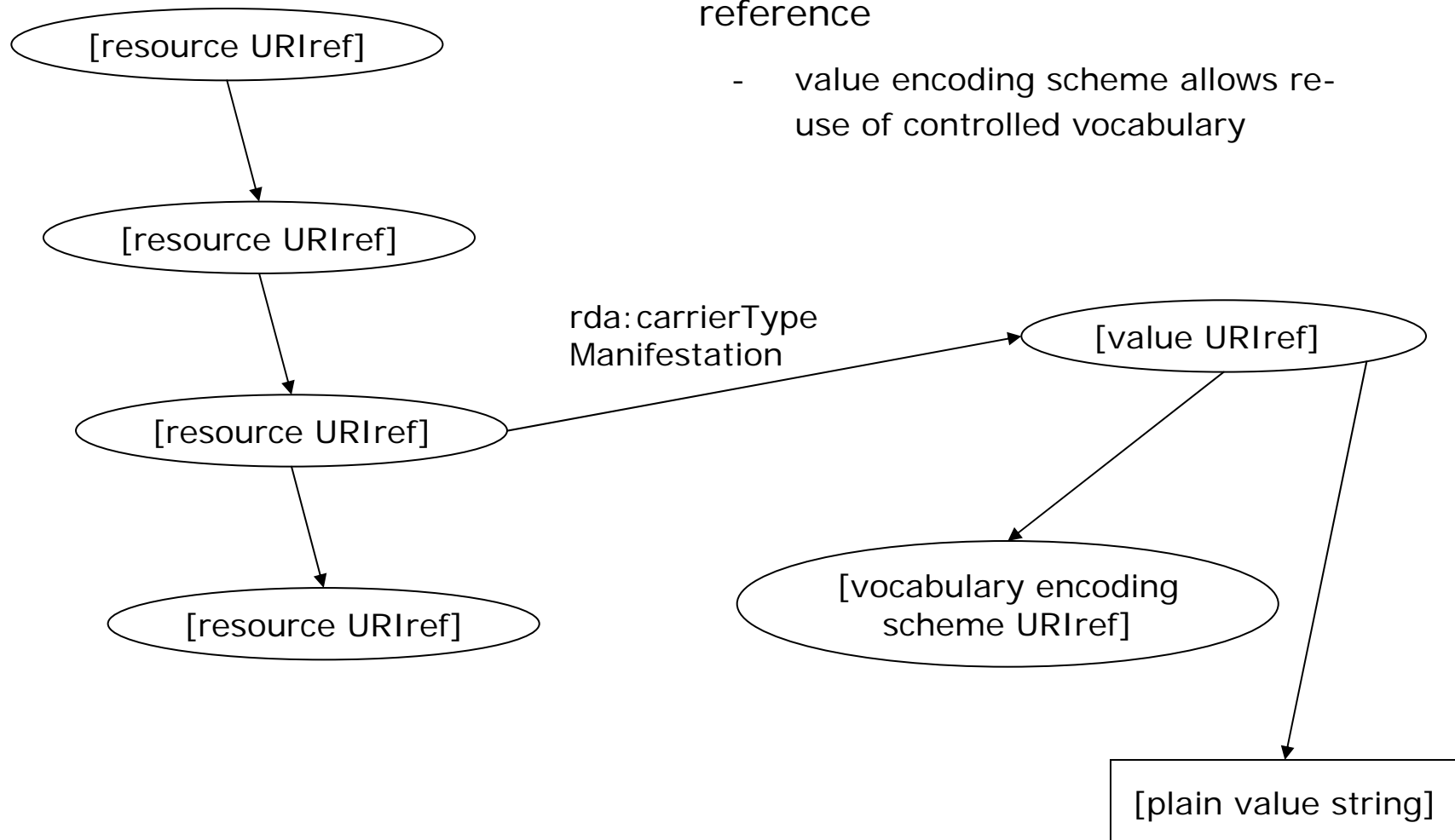
RDA label

- for any RDA *element* or *element sub-type*, one or more *sub-elements* may be defined
- composite string
 - blank node to represent the aggregation
 - blank node links to literal value surrogates



RDA types

- represented by a non-literal value surrogate using a value URI reference
 - value encoding scheme allows re-use of controlled vocabulary

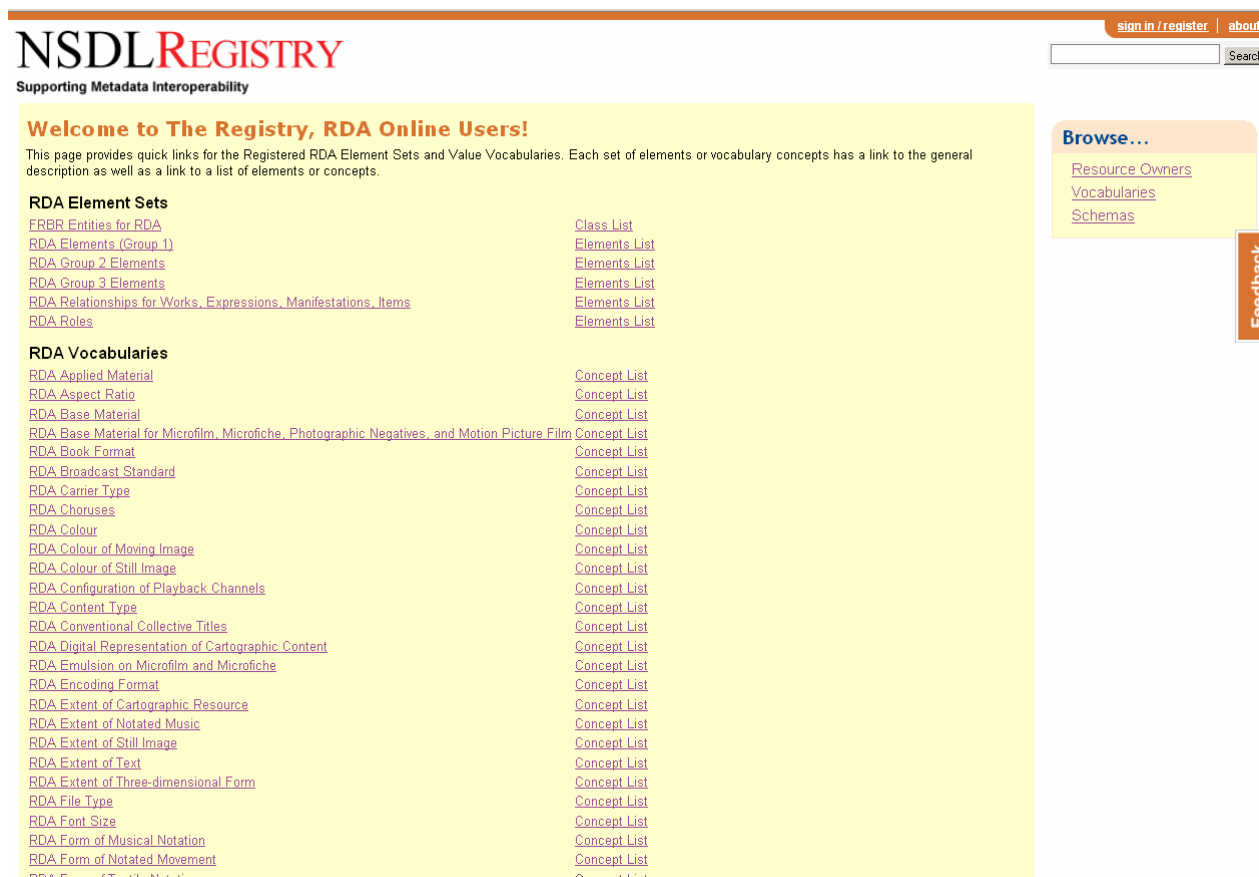


NSDL Registry

- definition of RDF-Schemas to represent RDA elements, sub-elements, and element sub-types in an ontology
- environment to assign URIs to RDA elements and vocabularies
- DCMI/RDA Task Group finalizes the registration of the
 - RDA Element Sets and RDA Vocabularies
 - completion date aimed soon
- sustainability of the registry by use of elements and vocabularies in RDA online tools
- registry is open for contribution
 - non-RDA elements and vocabulary are also welcome

NSDL Registry

- to browse single RDA elements and vocabulary see:
<http://metadataregistry.org/rdabrowse.htm>



The screenshot shows the NSDL Registry website interface. At the top left is the logo "NSDL REGISTRY" with the tagline "Supporting Metadata Interoperability". To the right of the logo is a navigation bar with links for "sign in / register" and "about", and a search box. Below the logo is a yellow banner with the heading "Welcome to The Registry, RDA Online Users!" and a paragraph explaining that the page provides quick links for Registered RDA Element Sets and Value Vocabularies. The main content area is divided into two columns: "RDA Element Sets" and "RDA Vocabularies". Each column lists various RDA categories with links to their respective "Elements List" or "Concept List". On the right side of the page, there is a "Browse..." section with links for "Resource Owners", "Vocabularies", and "Schemas", and a vertical "Feedback" button.

NSDL REGISTRY
Supporting Metadata Interoperability

sign in / register | about

Search

Welcome to The Registry, RDA Online Users!

This page provides quick links for the Registered RDA Element Sets and Value Vocabularies. Each set of elements or vocabulary concepts has a link to the general description as well as a link to a list of elements or concepts.

RDA Element Sets

FRBR Entities for RDA	Class List
RDA Elements (Group 1)	Elements List
RDA Group 2 Elements	Elements List
RDA Group 3 Elements	Elements List
RDA Relationships for Works, Expressions, Manifestations, Items	Elements List
RDA Roles	Elements List

RDA Vocabularies

RDA Applied Material	Concept List
RDA Aspect Ratio	Concept List
RDA Base Material	Concept List
RDA Base Material for Microfilm, Microfiche, Photographic Negatives, and Motion Picture Film	Concept List
RDA Book Format	Concept List
RDA Broadcast Standard	Concept List
RDA Carrier Type	Concept List
RDA Choruses	Concept List
RDA Colour	Concept List
RDA Colour of Moving Image	Concept List
RDA Colour of Still Image	Concept List
RDA Configuration of Playback Channels	Concept List
RDA Content Type	Concept List
RDA Conventional Collective Titles	Concept List
RDA Digital Representation of Cartographic Content	Concept List
RDA Emulsion on Microfilm and Microfiche	Concept List
RDA Encoding Format	Concept List
RDA Extent of Cartographic Resource	Concept List
RDA Extent of Notated Music	Concept List
RDA Extent of Still Image	Concept List
RDA Extent of Text	Concept List
RDA Extent of Three-dimensional Form	Concept List
RDA File Type	Concept List
RDA Font Size	Concept List
RDA Form of Musical Notation	Concept List
RDA Form of Notated Movement	Concept List
RDA Form of Textile Notation	Concept List

Browse...

- [Resource Owners](#)
- [Vocabularies](#)
- [Schemas](#)

Feedback

NSDL Registry – class example

```
<?xml version="1.0" encoding="UTF-8"?><rdf:RDF xmlns="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:base="http://example.org/uri/schema/FRBRentitiesRDA"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:skos="http://www.w3.org/2004/02/skos/core#"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:dct="http://purl.org/dc/terms/"
  xmlns:owl="http://www.w3.org/2002/07/owl#"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:reg="http://metadataregistry.org/uri/profile/RegAp/">
```

namespaces

<!-- Element Set: FRBR Entities for RDA -->

```
<rdf:Description rdf:about="http://example.org/uri/schema/FRBRentitiesRDA">
```

URI for FRBR entities

```
  <dc:title xml:lang="en">FRBR Entities for RDA</dc:title>
  <skos:note xml:lang="en">Provisional registration of FRBR entities for use in RDA.
  Official FRBR entity registrations with working URIs will be substituted when available.</skos:note>
</rdf:Description>
```

<!--Property: Work-->

```
<rdf:Description rdf:about="http://RDVocab.info/uri/schema/FRBRentitiesRDA/Work">
  <rdfs:isDefinedBy rdf:resource="http://example.org/uri/schema/FRBRentitiesRDA" />
  <reg:status rdf:resource="http://metadataregistry.org/uri/RegStatus/1002" />
  <reg:name xml:lang="en">Work</reg:name>
  <rdfs:label xml:lang="en">Work</rdfs:label>
  <skos:definition xml:lang="en">A distinct intellectual or artistic creation.</skos:definition>
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class" />
</rdf:Description>
```

description for
the class work

<!-- Status properties used in this document -->

```
  <skos:Concept rdf:about="http://metadataregistry.org/uri/RegStatus/1002">
    <skos:prefLabel xml:lang="en">New-Proposed</skos:prefLabel>
  </skos:Concept>
</rdf:RDF>
```

```
<rdfs:Class rdf:about="http://RDVocab.info/uri/schema/FRBRentitiesRDA/Work">
  <rdfs:label xml:lang="en">Work</rdfs:label>
</rdfs:Class>
```

NSDL Registry – property example

title of the work

```
<rdf:Description rdf:about="http://RDVocab.info/Elements/titleOfWork">
  <rdfs:isDefinedBy rdf:resource="http://RDVocab.info/Elements" />
  <reg:status rdf:resource="http://metadataregistry.org/uri/RegStatus/1002" />
  <reg:name xml:lang="en">titleOfWork</reg:name>
  <rdfs:label xml:lang="en">Title of the work</rdfs:label>
  <rdf:type rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#Property" />
  <skos:definition xml:lang="en">A word, character, or group of words and/or characters by
    which a work is known.</skos:definition>
  <rdfs:domain rdf:resource="http://RDVocab.info/uri/schema/FRBREntitiesRDA/Work" />
  <rdfs:subPropertyOf rdf:resource="http://RDVocab.info/Elements/title" />
</rdf:Description>
```

the subject
has to be a
class of
type work

sub-property
of title

preferred title for the work

```
<rdf:Description rdf:about="http://RDVocab.info/Elements/preferredTitleForTheWork">
  <rdfs:isDefinedBy rdf:resource="http://RDVocab.info/Elements" />
  <reg:status rdf:resource="http://metadataregistry.org/uri/RegStatus/1002" />
  <reg:name xml:lang="en">preferredTitleForTheWork</reg:name>
  <rdfs:label xml:lang="en">Preferred title for the work</rdfs:label>
  <rdf:type rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#Property" />
  <rdfs:subPropertyOf rdf:resource="http://RDVocab.info/Elements/titleOfWork" />
  <skos:definition xml:lang="en">The title or form of title chosen as the basis for the authorize
    access point representing that work.</skos:definition>
  <skos:scopeNote xml:lang="en">Definition source: RDA 6.2.0.1.1</skos:scopeNote>
  <rdfs:domain rdf:resource="http://RDVocab.info/uri/schema/FRBREntitiesRDA/Work" />
</rdf:Description>
```

sub-property of
titleOfWork

NSDL Registry – property example

publication statement (manifestation)

```

<rdf:Description rdf:about="http://RDVocab.info/Elements/publicationStatementManifestation">
  <rdfs:isDefinedBy rdf:resource="http://RDVocab.info/Elements" />
  <reg:status rdf:resource="http://metadataregistry.org/uri/RegStatus/1002" />
  <reg:name xml:lang="en">publicationStatementManifestation</reg:name>
  <rdfs:label xml:lang="en">Publication statement (Manifestation)</rdfs:label>
  <skos:definition xml:lang="en">A statement identifying the place or places of publication,
    publisher or publishers, and date or dates of publication of a resource.</skos:definition>
  <rdf:type rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#Property" />
  <rdfs:subPropertyOf rdf:resource="http://RDVocab.info/Elements/publicationStatement" />
  <rdfs:domain rdf:resource="http://RDVocab.info/uri/schema/FRBREntitiesRDA/Manifestation" />
  <rdfs:range rdf:resource="http://RDVocab.info/Elements/PublicationStatementEncodingScheme" />
</rdf:Description>

```

sub-property of
publicationStatement

the subject
has to be a
class of type
manifestation

publisher's name (manifestation)

```

<rdf:Description rdf:about="http://RDVocab.info/Elements/publishersNameManifestation">
  <rdfs:isDefinedBy rdf:resource="http://RDVocab.info/Elements" />
  <reg:status rdf:resource="http://metadataregistry.org/uri/RegStatus/1002" />
  <reg:name xml:lang="en">publishersNameManifestation</reg:name>
  <rdfs:label xml:lang="en">Publisher's name (Manifestation)</rdfs:label>
  <skos:definition xml:lang="en">The name of a person, family, or corporate body responsible
    for publishing, releasing, or issuing a resource.</skos:definition>
  <rdf:type rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#Property" />
  <rdfs:subPropertyOf rdf:resource="http://RDVocab.info/Elements/publishersName" />
  <rdfs:domain rdf:resource="http://RDVocab.info/uri/schema/FRBREntitiesRDA/Manifestation" />
</rdf:Description>

```

sub-property of
publishersName

NSDL Registry

- no 1-to-1 structure reflection of RDA elements, sub-elements, and element sub-types
- BUT complete functional coverage by the schemas
- registry provides form-based ingest of elements and vocabularies



The screenshot shows the NSDL Registry interface for creating a new concept. The page title is "NSDL REGISTRY" with the tagline "Supporting Metadata Interoperability". In the top right corner, there are links for "Leibrecht profile", "sign out", and "about", along with a search box. The main content area is titled "Creating new concept" and contains a "Detail" section with the following fields:

- Preferred Label:** A text input field. Below it, a note states: "This is the SKOS:prefLabel property of this Concept and is required for every Concept".
- URI:** A text input field containing "http://RDVocab.info/termList/RDACarrierType/1064". Below it, a note states: "This URI has been generated by the system, but you may override it".
- Top Concept?:** A checkbox labeled "Is this a Top Concept?".
- Status:** A dropdown menu currently set to "New-Proposed". Below it, a note states: "This is the overall status of this Concept. Individual properties may have a different status".
- Language:** A text input field containing "English". Below it, a note states: "This is the default language for this vocabulary and can't be edited here. To change the language of the prefLabel for this concept you must edit the property directly".

At the bottom of the form, there are buttons for "List", "Save", "Save and add", and "Cancel". To the right of the form, there is a "Browse..." section with links for "Resource Owners (Add)", "Vocabularies (Add)", "Element Sets (Add)", and "SPARQL". A vertical "Feedback" button is also present on the right side.

Conclusion

- raising awareness in librarians for the next era in information distribution
 - minimizing cataloguing efforts in each library
- National Libraries as forerunner
 - approaching workflows resulting from the application of the RDA online tools
 - proof of concept
 - transferring bibliographic records and authority data held in country specific form into proper RDA records
- non-librarian world web community benefits of our comprehensive reliable and dependable metadata
- new business models for metadata providers and service providers

Thank you!

discussion is welcome...