RDA cataloguing and linked data

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RDA and linked data

2006: DCMI, Colima, Mexico

2007: “London meeting” with linked data communities

   Committee of Principals for RDA agrees to develop linked data representation of RDA

2014: v1.0.0 of RDA Vocabularies on GitHub

2015: RDA Board strategy includes linked data communities
RDF

Resource Description Framework (RDF)
Designed for machine-processing of metadata at global scale (Semantic Web)
24/7/365
Trillions of operations per second

Everything must be dis-ambiguated
Machines are dumb
A simple approach helps!
Require machine-readable identifiers
RDF triple

Simple, single, “atomic” statement in 3 parts

subject – predicate (property) – object

This slide – has title – “RDF triple”

Subject and predicate must be identified by a URI or IRI*

Unambiguous machine identification (a thing)

Object may be an IRI or a literal

Literal: human-readable string

* Internationalized resource identifier
RDF graph

Graphical representation of one or more triples

Subject IRI → Property IRI → Object IRI

Subject IRI → Property IRI → “Literal”

Subject1 → Property1 → Object1 = Subject2

Object1 = Subject2 → Property2 → Object2

Object1 = Subject2 → Property3 → “Literal”
RDA in RDF

RDA uses RDF to represent **RDA Reference** (entities, elements, and controlled vocabularies)

- Provides data for **RDA Toolkit** (Glossary, element reference, navigation)
- Available from **RDA Registry** for external applications
  - open license: CC0 BY
## Toolkit element page

### Definition and Scope

### Element Reference

### Prerecording

### Recording

- Recording an unstructured description
- Recording a structured description
- Recording an identifier
- Recording an IRI

### Related Elements
RDA Vocabularies

*RDA Reference*: entities (classes), elements (properties), and terms (concepts)

Includes translations (12+ languages)

Published via GitHub and RDA Registry
open license: CC0 BY
https://github.com/RDARegistry/RDA-Vocabularies/releases
RDA Releases

Semantic versioning
Break.Bend.Minor (n.n.n)

GitHub pre-releases used to test production infrastructure for new Toolkit

Warning: unstable!
RDA Releases

2.7.3: Original Toolkit (April 2017)

Pre-releases: 3.0.1 – 3.0.11

3 !!!: Breaks semantics of 2.7.3
Re-definition of Person entity (LRM)

3.1.0: real soon now (December 2018?)
RDA Registry

- RDA Registry (Home)
- Elements (RDA element sets)
  - Classes
  - Agent properties
  - Expression properties
  - Item properties
  - Manifestation properties
  - Nomen properties
  - Place properties
  - Time-span properties
  - Work properties
  - RDA Entity properties
  - Meta-element properties
  - Unconstrained properties
  - RDA/ONIX Framework elements
- Values (value vocabularies)
  - RDA values
  - RDA/ONIX Framework values
• **Data** (Linked data using RDA vocabularies)
  - Curie prefixes (Abbreviations for compact URIs, XML namespaces, etc.)
  - Examples (Single resource)
  - R-Balls (Multiple resources)
  - Datasets (Multiple resources)

• **Tools**
  - Maps (RDF maps between RDA vocabularies and other namespaces)
  - Alignments (Alignment tables for RDA vocabularies and other namespaces)
  - Profiles (Application profiles using RDA vocabularies)
  - RIMMF (RDA data editor)

• **About** (More about the RDA vocabularies)
  - RDA Reference data (Data maintenance and flow)
  - Issues (Raise issues and make comments)
  - Versions (Version control)
  - Deprecation (Removal of vocabulary entries)
  - RDA/ONIX Framework (Basis of carrier and content categories)

• **FAQ** (Answers to frequently asked questions)
• **Guide** (Guide to RDA vocabularies for technical communities)
RDA element sets

Work properties

The Work property has domain and relationships of:

Each property in RDA is:

- has a domain
- is linked from

rdfs:subPropertyOf

- is linked from

rdfs:subPropertyOf

Number of elements

Namespace:

Suggested properties:

Example curies:

Example curies:

Changelog features:

*All RDA URIs have been an immutable canonical form and a “readable”, lexical form, which is subject to change (changes will be redirected).

Downloads

- HTML (Open Metadata Registry)
- Turtle (text/turtle)
- Notation 3 (text/rdf+n3)
- N-Triples (text/rdf+nt)
- RDF/XML (application/rdf+xml)
- RDFa
- Microdata (text/microdata+html)
- JSON-LD (application/json | application/json+ld) (see the Readme)
- RDF/JSON (application/rdf+json)

Languages

Catalan  Danish  English  Finnish  French  German  Norwegian  Spanish  Swedish  Vietnamese
The map consists of mappings that can be combined with the Map from unconstrained ISBD properties to unconstrained RDA properties to entail property equivalence in OWL.

For example:

```
# from this map:
# from map of unconstrained ISBD to unconstrained RDA:
isbdu:P1003 rdfs:subPropertyOf rdau:P60050 .
# entails:
```

The map is given in a terse triple language (ttl) serialization.
Property domain & range

Property domain specifies the expected entity (class) of a triple subject

Property range specifies the expected entity (class) of a triple object

No domain or range = no expectations
Recording methods

- **canonical property (no range)**
  - **Datatype property (literal range)**
    - **unconstrained property (no domain, no range)**
      - **external property (non-LRM)**
        - "Unstructured description"
        - "Structured description"
        - "Identifier"
        - IRI
      - subPropertyOf
        - subPropertyOf
          - IRI

- subPropertyOf
  - IRI
Maps to related linked data

ISBD and RDA
- Map from ISBD properties to unconstrained RDA properties
- Map from unconstrained ISBD properties to unconstrained RDA properties
- Map from unconstrained RDA properties to unconstrained ISBD properties

ISBD and RDA/ONIX Framework
- Map from ISBD content forms to RDA/ONIX Framework
- Map from ISBD media types to RDA/ONIX Framework

MARC Relator Codes
- Map from RDA properties to MARC Code List for Relators
- Map from MARC Code List for Relators to RDA properties

New!: Dublin Core Terms
RDA maps

Map from RDA properties to MARC Code List for Relators

```plaintext
@prefix mrc: <http://id.loc.gov/vocabulary/relators/>.
@prefix rdau: <http://rdaregistry.info/Elements/u/>.
@prefix skos: <http://www.w3.org/2004/02/skos/core#>.
#
# This is a map from RDA relationship elements and designators to MARC relat
# 10 January 2017
#
rdau:P60045 skos:closeMatch mrc:rsp .
rdau:P60060 skos:closeMatch mrc:dgg .
rdau:P60061 skos:closeMatch mrc:his .
rdau:P60061 skos:broadMatch mrc:sht .
rdau:P60062 skos:closeMatch mrc:prn .
rdau:P60065 skos:closeMatch mrc:cou .
rdau:P60066 skos:closeMatch mrc:col .
rdau:P60067 skos:closeMatch mrc:cor .
rdau:P60068 skos:closeMatch mrc:dpt .
rdau:P60084 skos:closeMatch mrc:fmd .
```
Audio disc (performed music) from Complete examples – bibliographic records

```xml
@prefix ex: <http://example.com/> .
@prefix rdaa: <http://rdaregistry.info/Elements/a/> .
@prefix rdabm: <http://rdaregistry.info/termList/RDAbaseMaterial/> .
@prefix rdaco: <http://rdaregistry.info/termList/RDAContentType/> .
@prefix rdact: <http://rdaregistry.info/termList/RDACarrierType/> .
@prefix rdae: <http://rdaregistry.info/Elements/e/> .
@prefix rdaef: <http://rdaregistry.info/termList/encFormat/> .
@prefix rdaft: <http://rdaregistry.info/termList/encFormat/> .

ex:W12
  rdaw:P10002 "Amos, Tori. Me and a gun" .

ex:W13
  rdaw:P10002 "Amos, Tori. Little earthquakes (Song)" .
  rdabm:1014 skos:prefLabel "plastic"@en .
  rdaco:1011 skos:prefLabel "performed music"@en .
  rdact:1004 skos:prefLabel "audio disc"@en .
  rdact:1013 skos:prefLabel "computer disc"@en .
  rdami:1001 skos:prefLabel "single unit"@en .
  rdamt:1001 skos:prefLabel "audio"@en .
  rdamt:1003 skos:prefLabel "computer"@en .
```

# Example: Audio disc – Simple example
# 11 May 2016
#
ex:A1
  rdaa:P50103
  rdaa:P50117
ex:E1
  rdae:P20001 rdaco:1011 ;
  rdae:P20006 "English"@en ;
  rdae:P20025 ex:A1 ;
```
Conclusion

RDA provides a complete package for linked data applications
- RDF elements
- Content instructions
- Maps to related standards
- Extension mechanism for local applications
Muchas gracias!

RDA Registry
http://www.rdaregistry.info/

RDA Vocabularies
https://github.com/RDARegistry/RDA-Vocabularies

RDA Steering Committee
http://www.rda-rsc.org/

RDA Toolkit:
https://www.rdatoolkit.org/