

Building for the Future

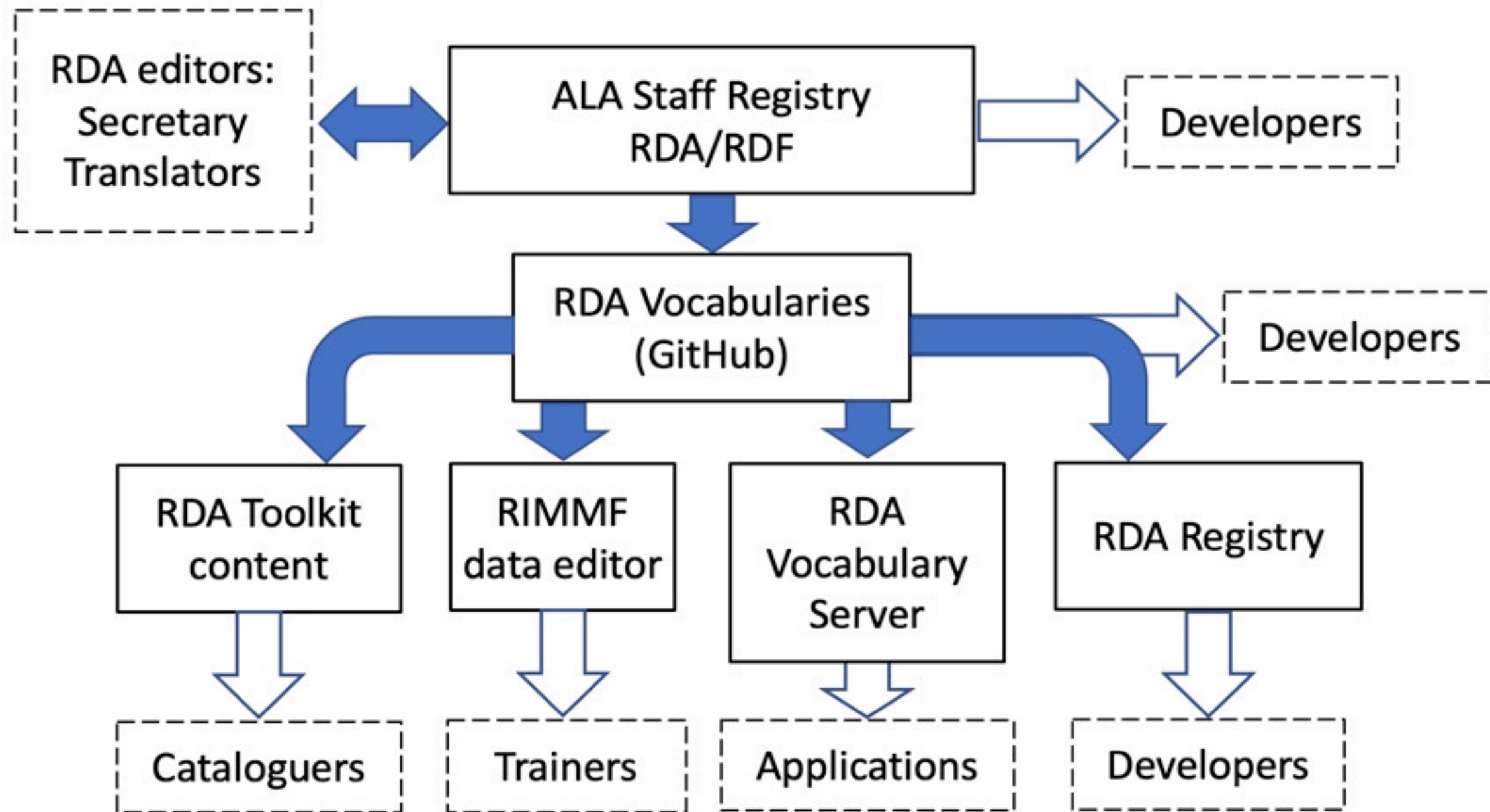
Linked Open Data and RDA

RDA Linked Data Forum, ALA Annual Conference, Washington, DC, 27 June 2022

Damian Iseminger
RSC Technical Team Liaison Officer
techo@rdatoolkit.org

RDA is a package of data elements, guidelines, and instructions for creating library and cultural heritage resource metadata that are well-formed according to international models for user-focused linked data applications—Definition of RDA, RDA Agreement 2018

The RDA Stack



ALA Staff Registry

Password-protected repository of the RDA element sets and value vocabularies

CSV files of the element sets and value vocabularies maintained offline by the Technical Team Liaison Officer and the RSC Secretary

Amended CSV files are uploaded to the Staff Registry

RDF/XML output of the Staff Registry is used to generate content in RDA Toolkit

- Labels and definitions
- Element reference
- Navigation to broader and narrower elements
- Value vocabularies
- Glossary

RDA Vocabularies

Project on GitHub: <https://github.com/RDARegistry/RDA-Vocabularies>

Provides the element sets and value vocabularies in RDF/XML, N-Triples, JSON-LD, and CSV

- Serializations, with label and definition translations, output on demand from the ALA Staff Registry

Provides maps and alignments to other vocabularies in Turtle, N-Triples, and selected maps in RDF/XML, and in CSV

- RDF/XML maps use to generate maps/alignments to MARC21, IFLA-LRM, and Dublin Core in RDA Toolkit
- Maps and alignments maintained offline

Hosts the RDA Registry Web site

RDA Registry

Linked data and Semantic Web representations of the entities, elements, and terminologies approved by the RDA Steering Committee

Provides the same content as RDA Vocabularies, but presented with context and aimed at developers of applications using RDA

Is the endpoint of RDA IRI de-referencing for elements and concepts

Use of RDF Serializations

RDF/XML files:

Used for **RDA Toolkit** production process

XML content management system

Toolkit Glossary and Element Reference sections are automatically updated

Used for **RDA Vocabulary Server**

De-referencing service for vocabulary URIs

JSON-LD files:

Used for element sets and value vocabulary display in the **RDA Registry**

Element set and value vocabulary pages are automatically updated

Javascript developed by RDA Development Team

Uses DataTables, Bootstrap, and JQuery

N-triple files:

Version is ingested into **RIMMF** (RDA in Many Metadata Formats)

RDA training and small-scale production tool

Maintained by independent developers in liaison with RDA Development Team

Element Set Structure

Canonical element set

- RDF Schema only
- Domain of elements provided, but no range
 - Values of elements may either be a literal or an IRI
- Includes properties that are intended only for RDA Toolkit
 - `rdakit:toolkitLabel`: Label of an RDA element in a non-verbalized form
 - `rdakit:toolkitDefinition`: Definition of an RDA element that does not include the domain of the element
 - `rdfs:label` and `skos:definition` provide the verbalized label and full definition of the element.
- May be used to support implementation scenarios that are not linked data

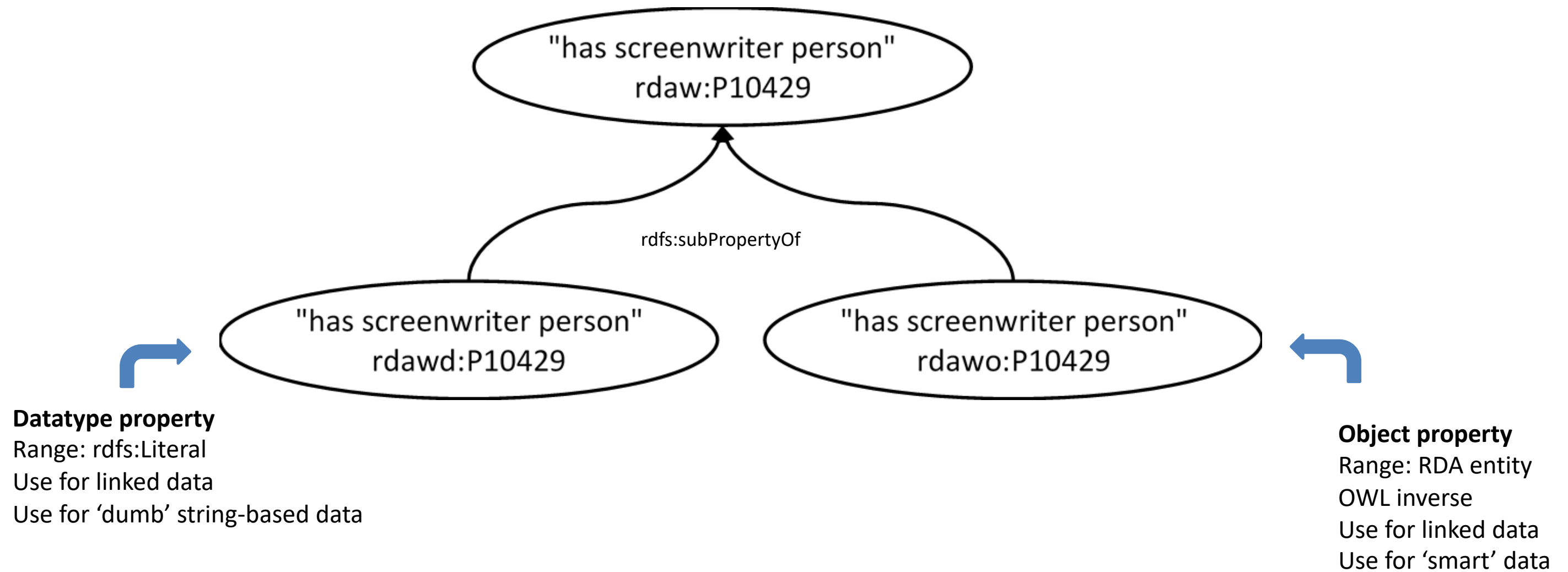
Element Set Structure

Datatype and object element sets

- Intended to support linked data applications
- Datatype element sets
 - Range: `rdfs:Literal`
 - Each datatype element linked to its canonical element via `rdfs:subPropertyOf`
- Object element sets
 - Range: an RDA entity
 - Only those RDA elements that have a range of another RDA element are in the object sets
 - OWL inverse properties provided for every element
 - Each object element linked to its canonical element via `rdfs:subPropertyOf`
- Intended to support applications that wish to make use of ‘smart’ data

Canonical property

No range
RDFS only
Supports:
RDBMS data
Bib/Authority data
Flat-file data



Element Set Maintenance

The canonical, datatype, and object element sets are maintained separately

The canonical element set serves as the basis for the other element sets

- <http://rdaregistry.info/Elements/m/> [prefix: rdam]
- <http://rdaregistry.info/Elements/m/datatype/> [prefix: rdamd]
- <http://rdaregistry.info/Elements/m/object/> [prefix: rdamo]

The element identifier for each family of properties is the same

- <http://rdaregistry.info/Elements/m/P30267>
- <http://rdaregistry.info/Elements/m/datatype/P30267>
- <http://rdaregistry.info/Elements/m/object/P30267>

This allows for an RDFS implementation of RDA to be ‘upgraded’ to OWL by substituting in the ‘smart’ paths without altering the element identifier

Value Vocabularies

Vocabularies used in RDA Toolkit to provide the values for selected elements

Represented as SKOS vocabularies

Support multiple implementation scenarios

- Labels and notations may be used as strings and support the structured and identifier recording methods
- IRIs for concepts used in linked data applications

Semantic Coherency

All RDA relationship elements exist in a semantic matrix with one another

Each of the 13 entities are related to one another through 'high-level' relationships

- has related [RDA entity] of [RDA entity]
- 169 high-level elements

Each high-level entity is the 'top' element for all other relationship elements within each entity

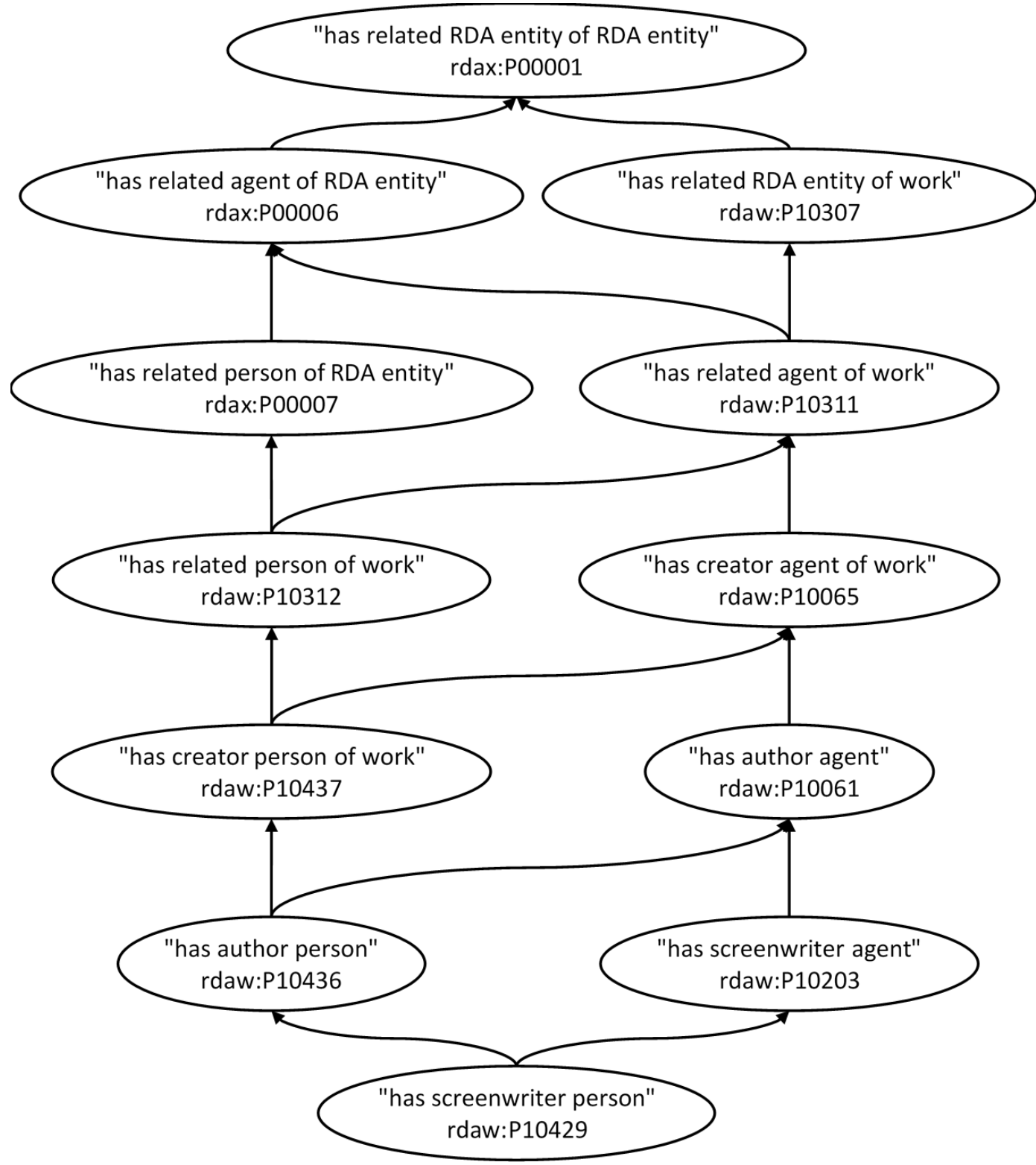
- has related work of work
 - has transformation
 - has transformation by genre
 - has derivative work
 - ◆ is abridged as work

Semantic Coherency

Agent Relationships

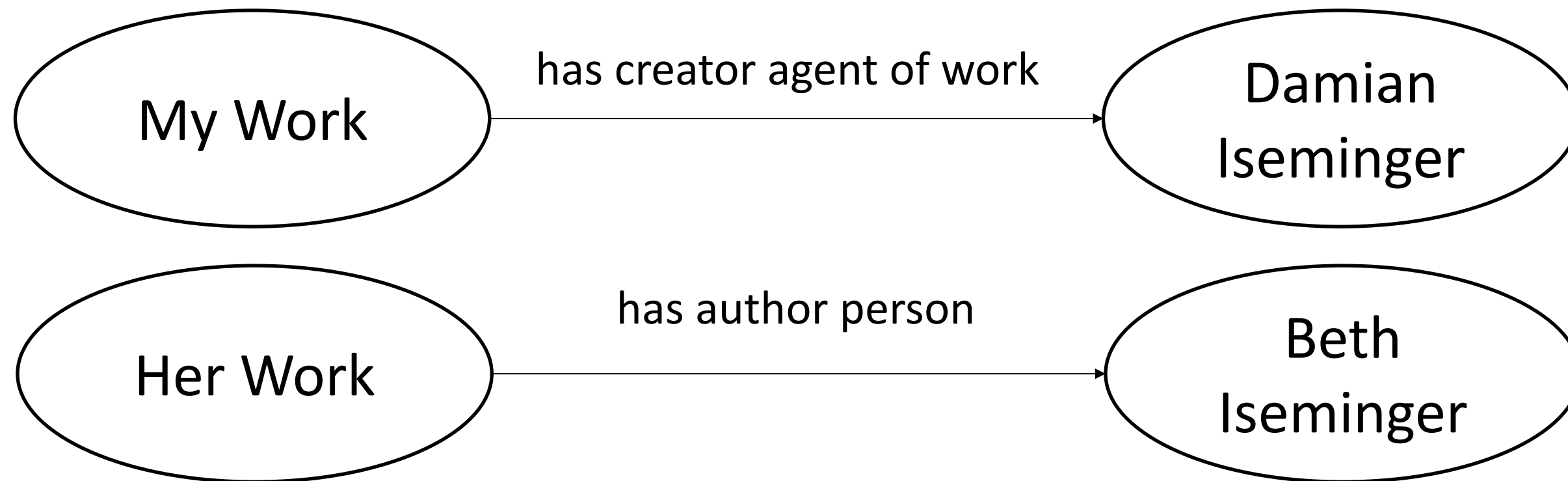
- Agent
 - Collective Agent
 - Family
 - Corporate Body
 - Person

Each agent relationship is related to its broader agent, as well as its broader relationship within a specific agent hierarchy



Semantic Coherency

Allows for different linked data applications of RDA to 'talk' to one another at different levels of granularity



author person → author agent → creator agent of work: Inference that Beth and Damian Iseminger are 1) agents that 2) are responsible for creating works

Interoperability

RDA Registry provides maps and alignments to other ontologies

- IFLA LRM
- Dublin Core Terms
- MARC21
- RDA/ONIX Framework

Interoperability

Map: A set of RDF triples representing the semantic relationship between two elements sets or vocabularies

- `rdfs:subPropertyOf` or `rdfs:subClassOf` used in mappings
 - Used even if the property or class is semantically equivalent
- Based on alignments

Alignments: A general relationship between two element sets or vocabularies that may ignore the precise semantic embedded in the vocabularies

- Tabular format
- Enables RDA metadata to be used in non-linked data applications

Transformation

The unconstrained element set allows data produced according to RDA to be used in applications that do not use the LRM semantics

- No domains or ranges
- WEMI properties from RDA ‘dumbed-up’ to generic ‘resource’ properties
 - ‘has title of work’, ‘has title of expression’ etc.
rdfs:subPropertyOf ‘has title’
- Agent, Collective Agent, Family, Corporate Body, Person properties to generic ‘agent’ properties
 - ‘has author agent’, ‘has author person’ etc.
rdfs:subPropertyOf ‘has author’

Transformation

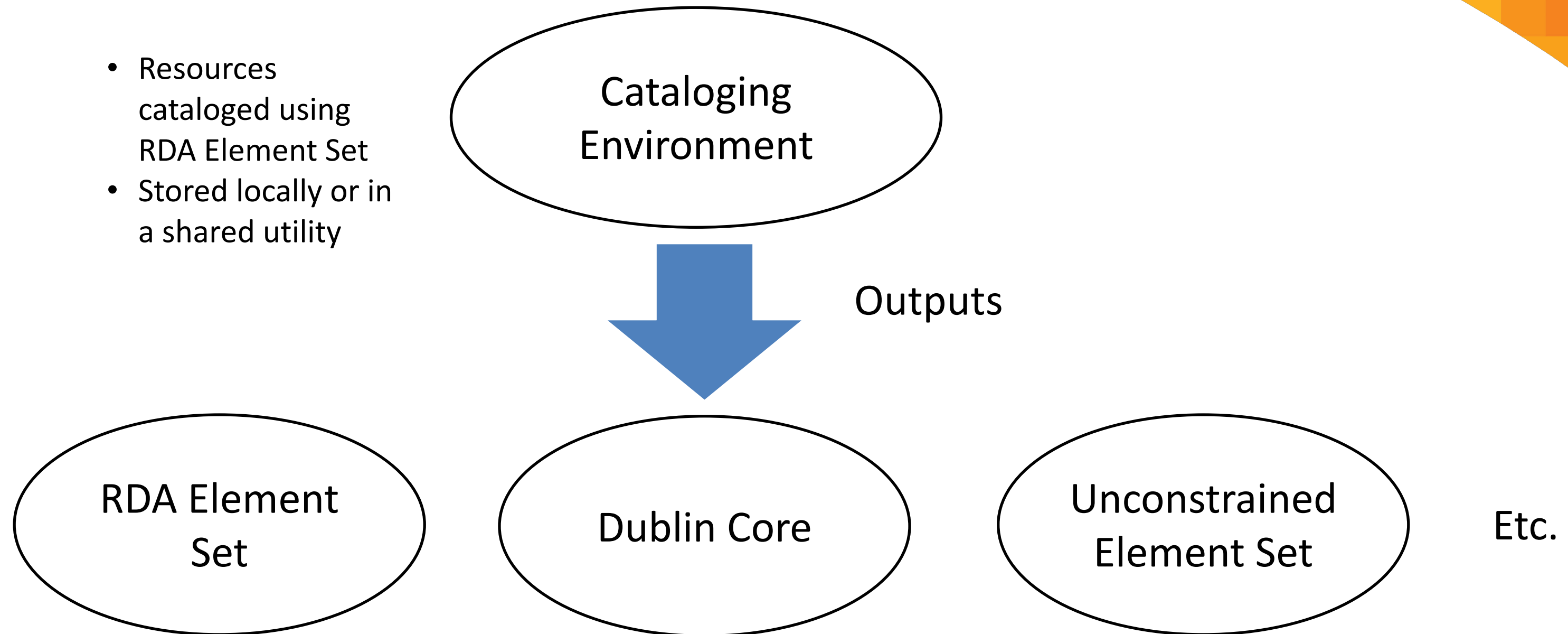
Map provided in RDA Vocabularies (GitHub) and RDA Registry from the RDA element set to the unconstrained elements

Unconstrained elements are not RDA elements

Transformation a one way street

Potential Workflows

- Resources cataloged using RDA Element Set
- Stored locally or in a shared utility



Questions and Discussion

Thank You!

Email: techo@rdatoolkit.org

RDA Toolkit: www.rdatoolkit.org

RDA Vocabularies (GitHub): <https://github.com/RDARegistry/RDA-Vocabularies>

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