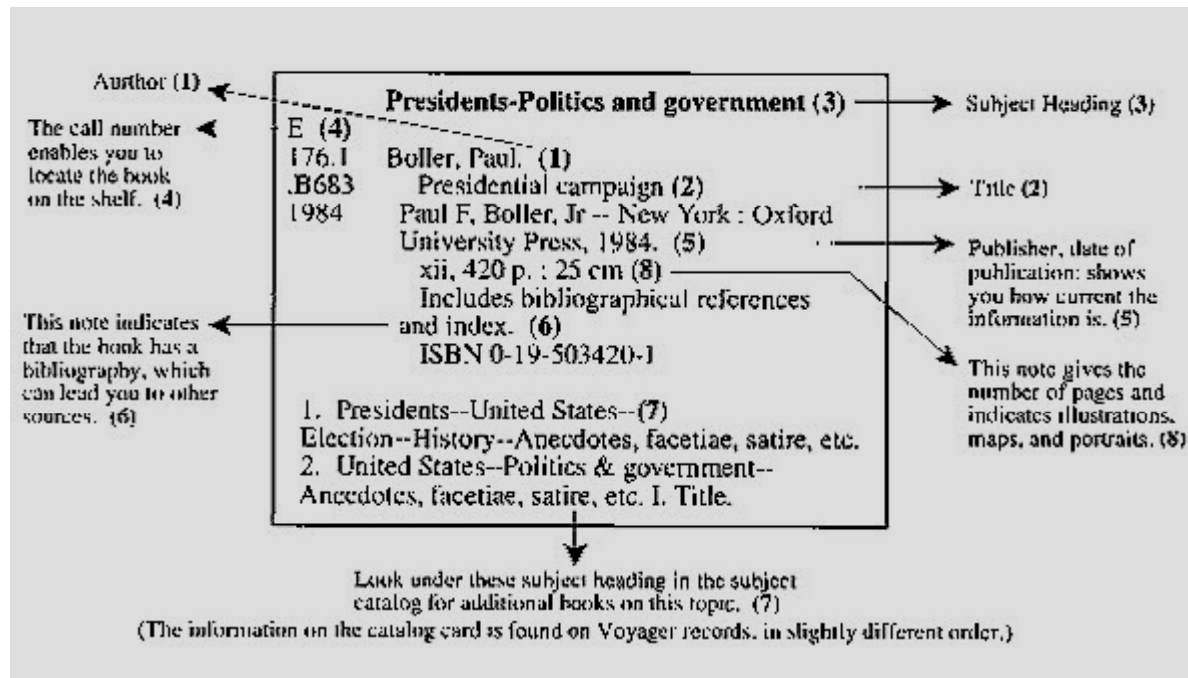A Brief Introduction to

RDF/Linked Data and

RDA Registered Properties

Kimmy Szeto

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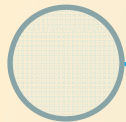We built ISBD, AACR2 and MARC when most libraries kept their own set of catalog cards

Today, library users expect online searches to reach everywhere in the world instantaneously.

Problems with ISBD, AACR2 and MARC:

- form their own separate bibliographic universe

- not enough globally unique identifiers

- fosters inconsistencies due to insufficient control

MARC Bibliographic Data

Solution?

- design a structure that is part of the data universe

- build standards and practices around networked users

- build in increased consistency, comprehensibility and extensibility

RDF

Resource Description Framework is

- an abstract data model

- domain-neutral and application-neutral

- provides structure to draw relationships between things
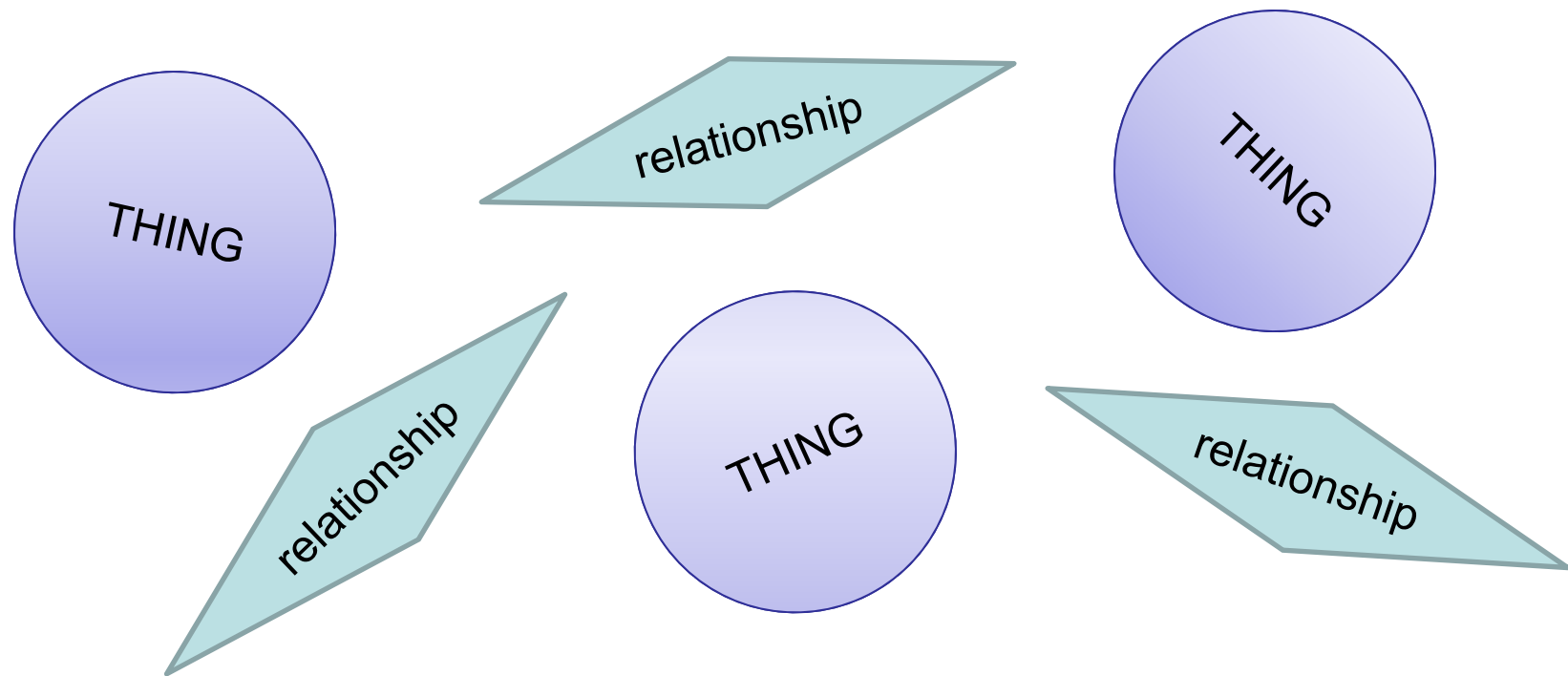
The RDF Triple

In RDF…

- a statement, a "triple" is made of three ordered parts

- triples are "directed" and "labeled"

- triples are best visulaized as directed, labeled graphs

entity	relationship	entity
node	arc / edge	node
subject	predicate	object
resource	has property	value
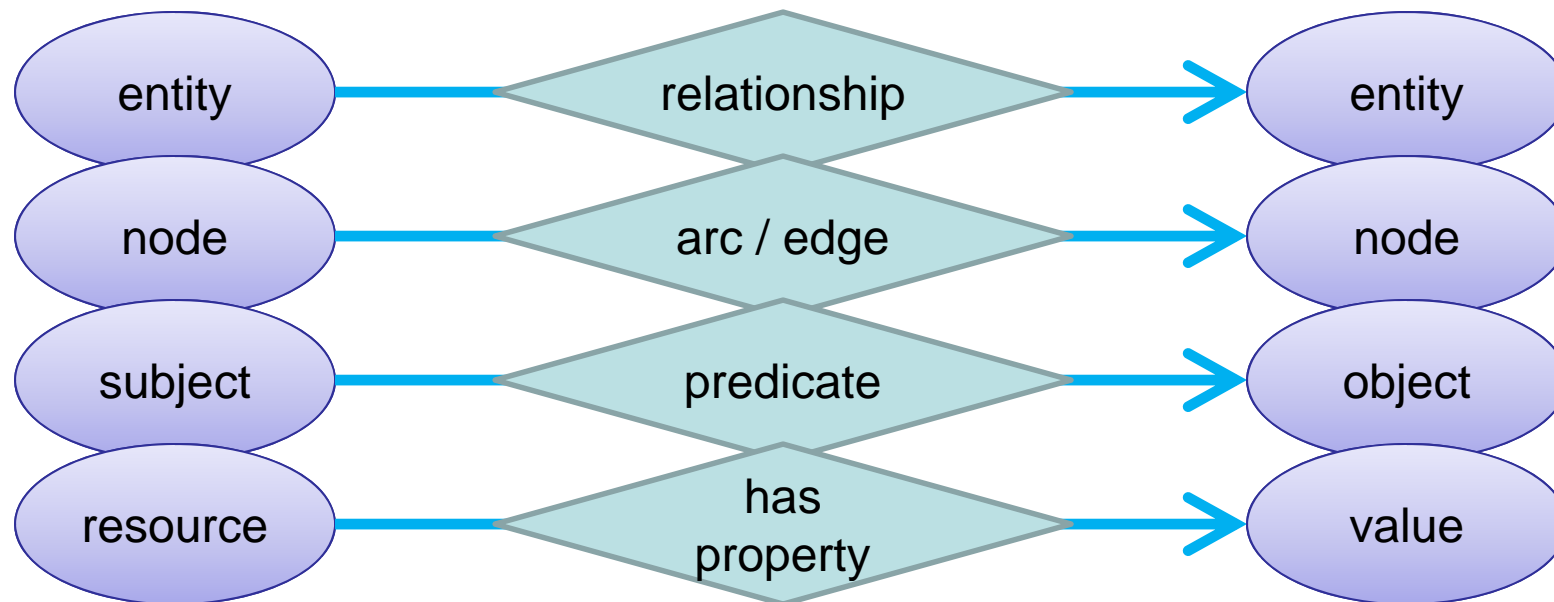
The RDF Triple

Each thing and each relationship has a "name" in the form of

- a "reference" – uniform resource identifier (URI)

- a blank / placeholder

- a "literal" – a actual character string, only used in objects for convenience

Sample URIs

- http://www.w3.org/1999/02/22-rdf-syntax-ns

- http://RDVocab.info/roles/author

- urn:isbn:0-8389-3594-X

The RDF Triple

URI references can refer to a thing, a class of things, or a property

http://id.loc.gov/authorities/names/n79107741.html — refers to the name authority file for "Beethoven, Ludwig van, 1770-1827"

http://rdvocab.info/uri/schema/FRBRentitiesRDA/Manifestation — refers to the FRBR class of objects "Manifestation"

http://rdvocab.info/uri/schema/FRBRentitiesRDA/Name — refers to the FRBR class of objects "Name"

http://rdvocab.info/ElementsGr2/name — refers to RDA property "Name"

http://marc21rdf.info/elements/1XX/M1001_a — refers to the MARC 21 property labeled "Personal name in Main Entry-Personal Name (Surname)" i.e. Field 100 1# subfield a

The RDF Triple

URIs have human-readable "Labels"

Ludwig van Beethoven   refers to the name authority file for "Beethoven, Ludwig van, 1770-1827"

Manifestation   refers to the FRBR class of objects "Manifestation"

Name   refers to the FRBR class of objects "Name"

Name   refers to RDA property "Name"

Personal name in Main Entry-Personal Name (Surname)   refers to the MARC 21 property labeled "Personal name in Main Entry-Personal Name (Surname)" i.e. Field 100 1# subfield a

Actual data values – "literals"

TRUE

"Romeo and Juliet"

"Lugwig van Beethoven"

Imagine a spreadsheet with information about books.

The rows and columns represent classes of things.

Each row is a "resource"

Title	Author	Standard ID
Romeo et Juliette	Peter Ilich Tchaikovsky	0-4862-5217-5
The holy sonnets of John Donne	Benjamin Britten	0
Romeo and Juliet	William Shakespeare	0

works

has author

name

Each column header is a "property" followed by a list of "values"

Title	Author	
Romeo et Juliette	Peter Ilich Tchaikovsky	
The holy sonnets of John Donne	Benjamin Britten	
Romeo and Juliet	William Shakespeare	
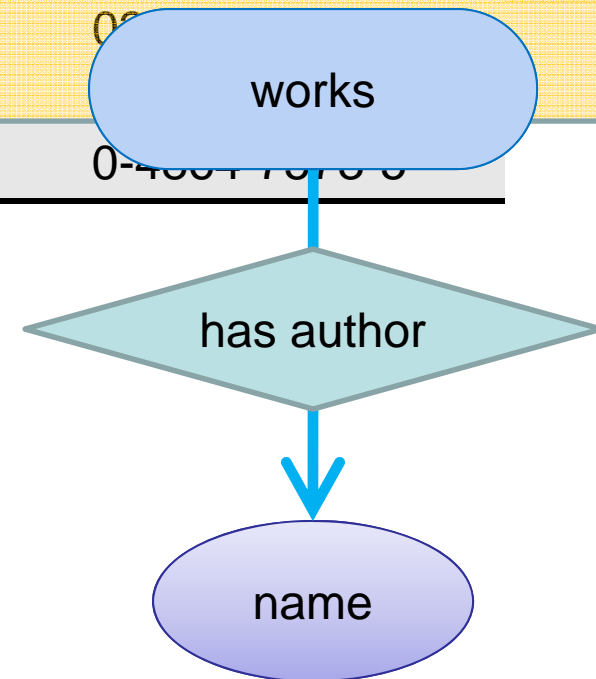
RDF Triple

Each cell is a RDF triple

Title	Author	Standard ID
Romeo et Juliette	Peter Ilich Tchaikovsky	0-4862-5217-5
The holy sonnets of John Donne	Benjamin Britten	028941742827
Romeo and Juliet	William Shakespeare	0-4864-7573-5

This work → has title → "The holy sonnets of John Donne"

This work → has author → "Benjamin Britten"
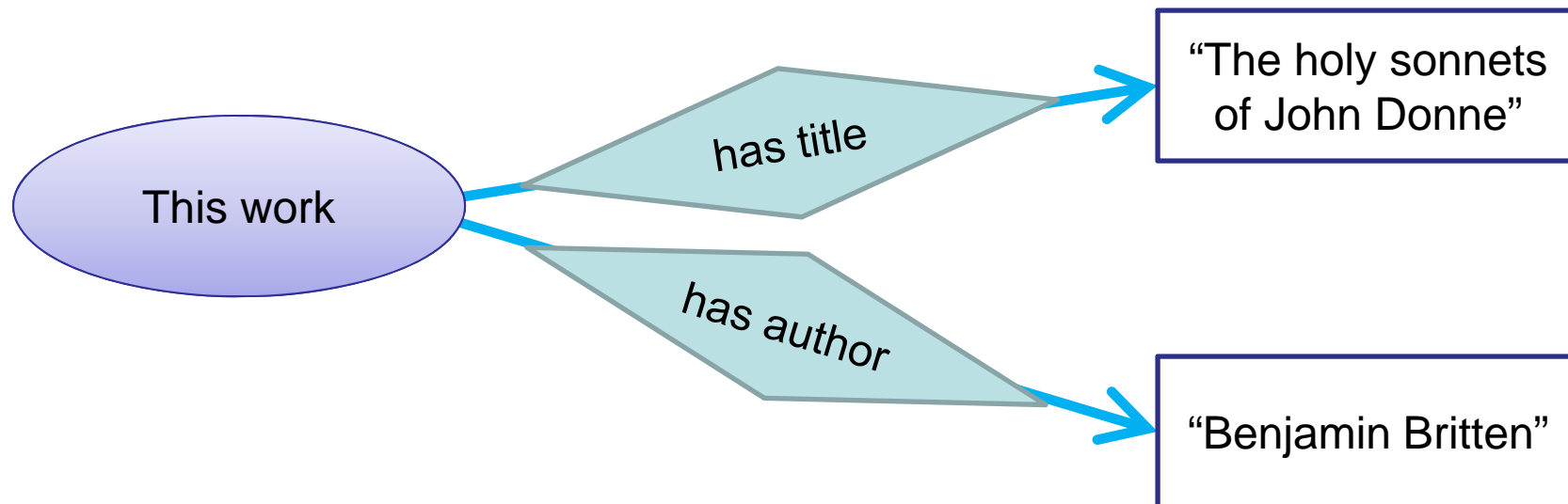
RDF graph for a work, showing labels

work → (has preferred title) → "The holy sonnets of John Donne"

work → (has author) → person

person → (has name) → "Britten, Benjamin"

person → (has birth date) → "1913"
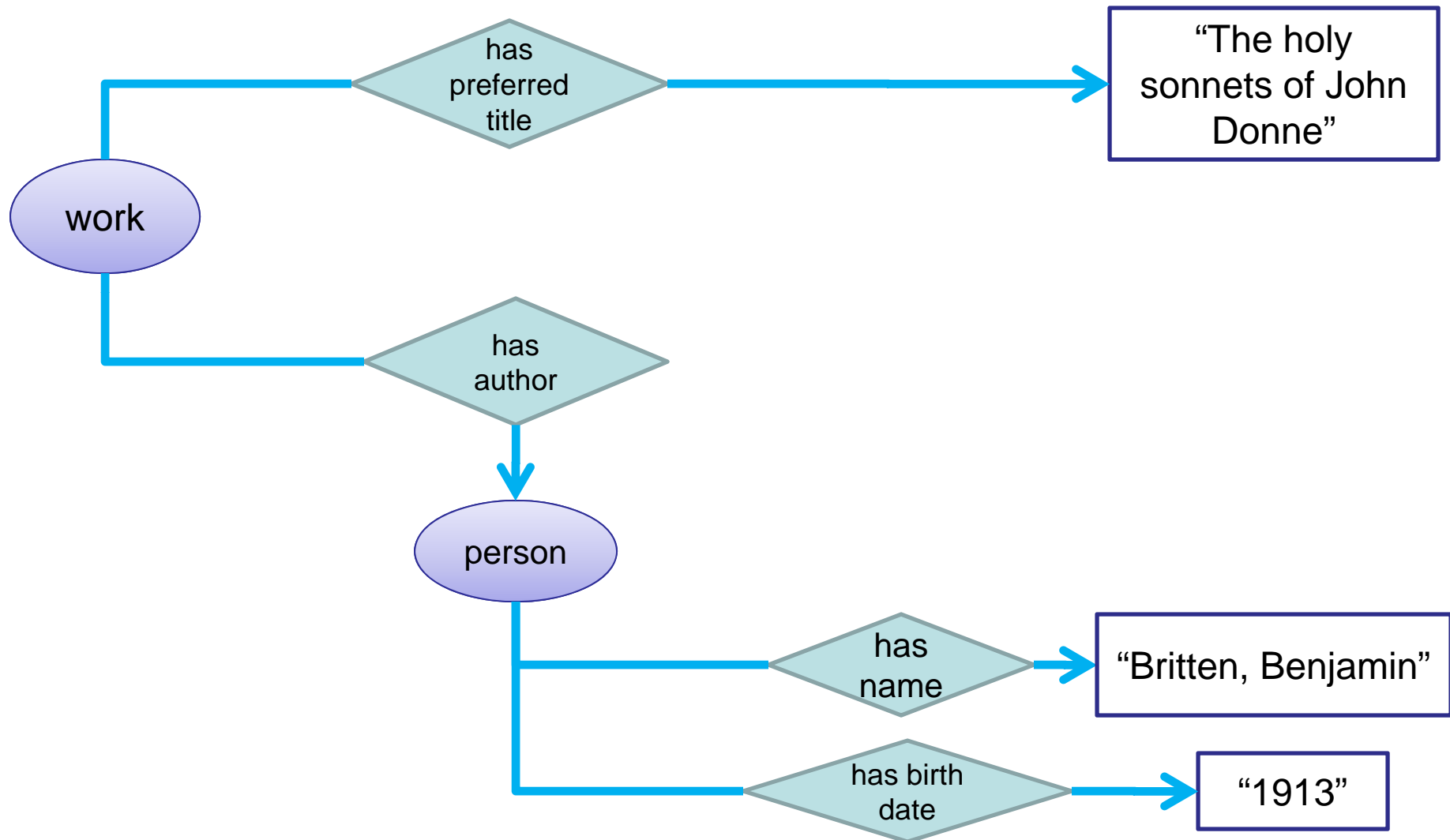
RDF Triple

The same graph using URIs

http://rdvocab.info/Elements/preferredTitleForTheWork

"The holy sonnets of John Donne"

http://lccn.loc.gov/2004268202

http://rdvocab.info/roles/authorWork

http://id.loc.gov/authorities/names/n96042036

http://rdvocab.info/ElementsGr2/nameOfThePerson

"Britten, Benjamin"

http://rdvocab.info/ElementsGr2/dateOfBirth

"1913"
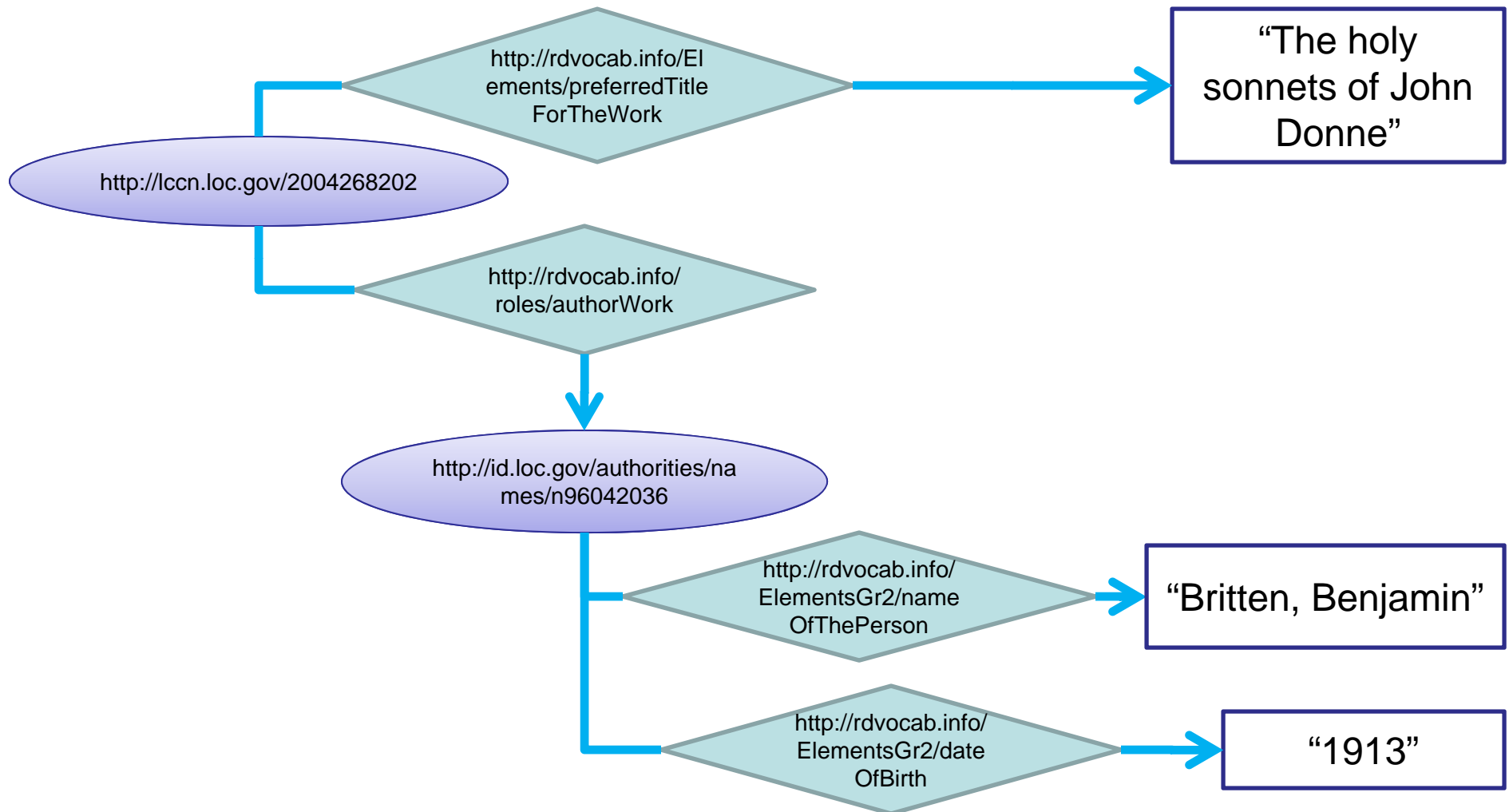
Some more properties added, using labels


```
[has preferred title] → "The holy sonnets of John Donne"
(work) → [has agent] → (person) → [has name] → "Britten, Benjamin"
                                   [has birth date] → "1913"
(work) → [is realized through] → (expression)
(expression) → [has language] → "en"
             → [has content type] → "performed music"
(expression) → [is embodied in] → (manifestation)
(manifestation) → [has media type] → "audio"
                → [has carrier type] → "audio disc"
```
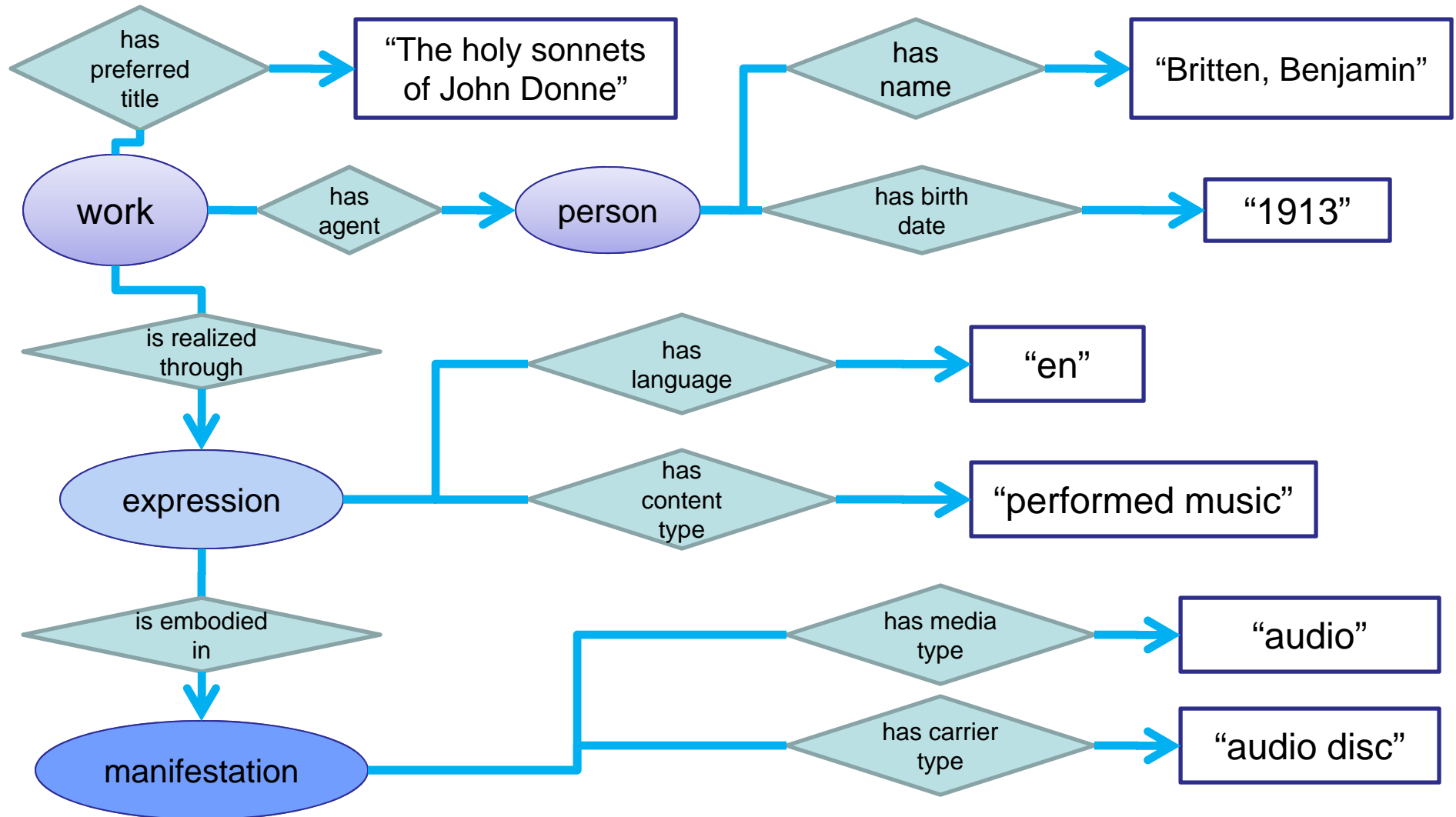
Linked Data

Yet more properties added – involving other works
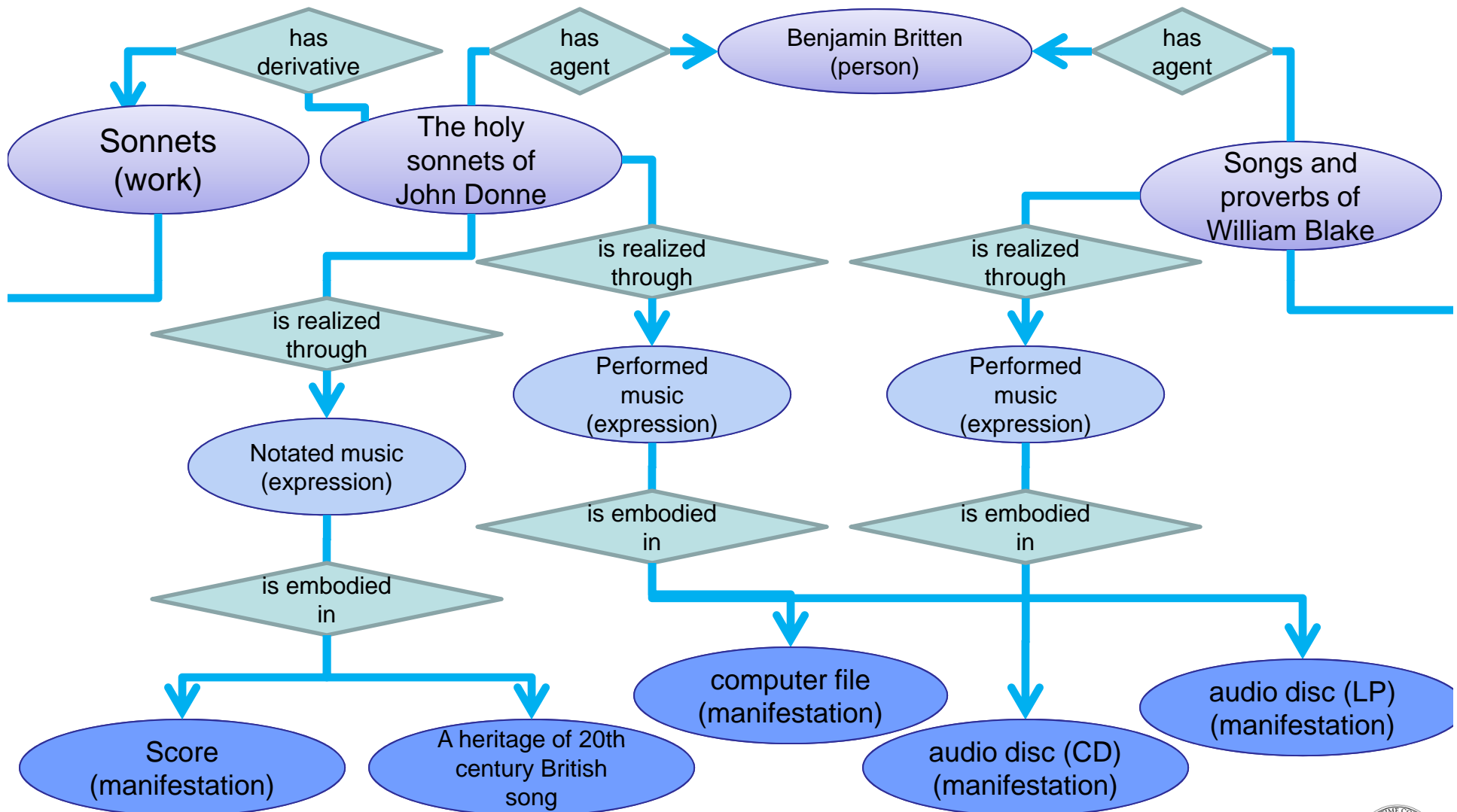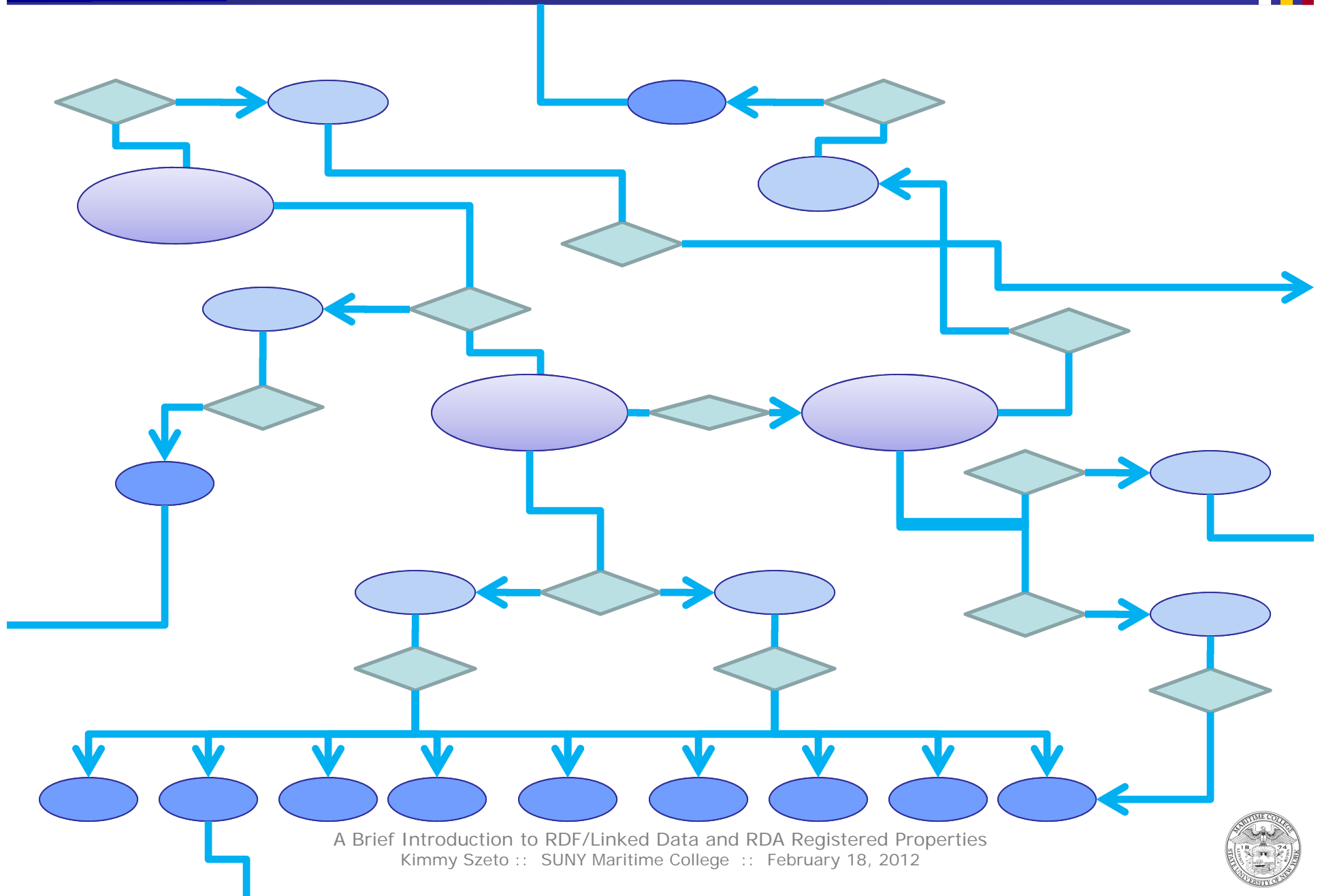
Linked Data
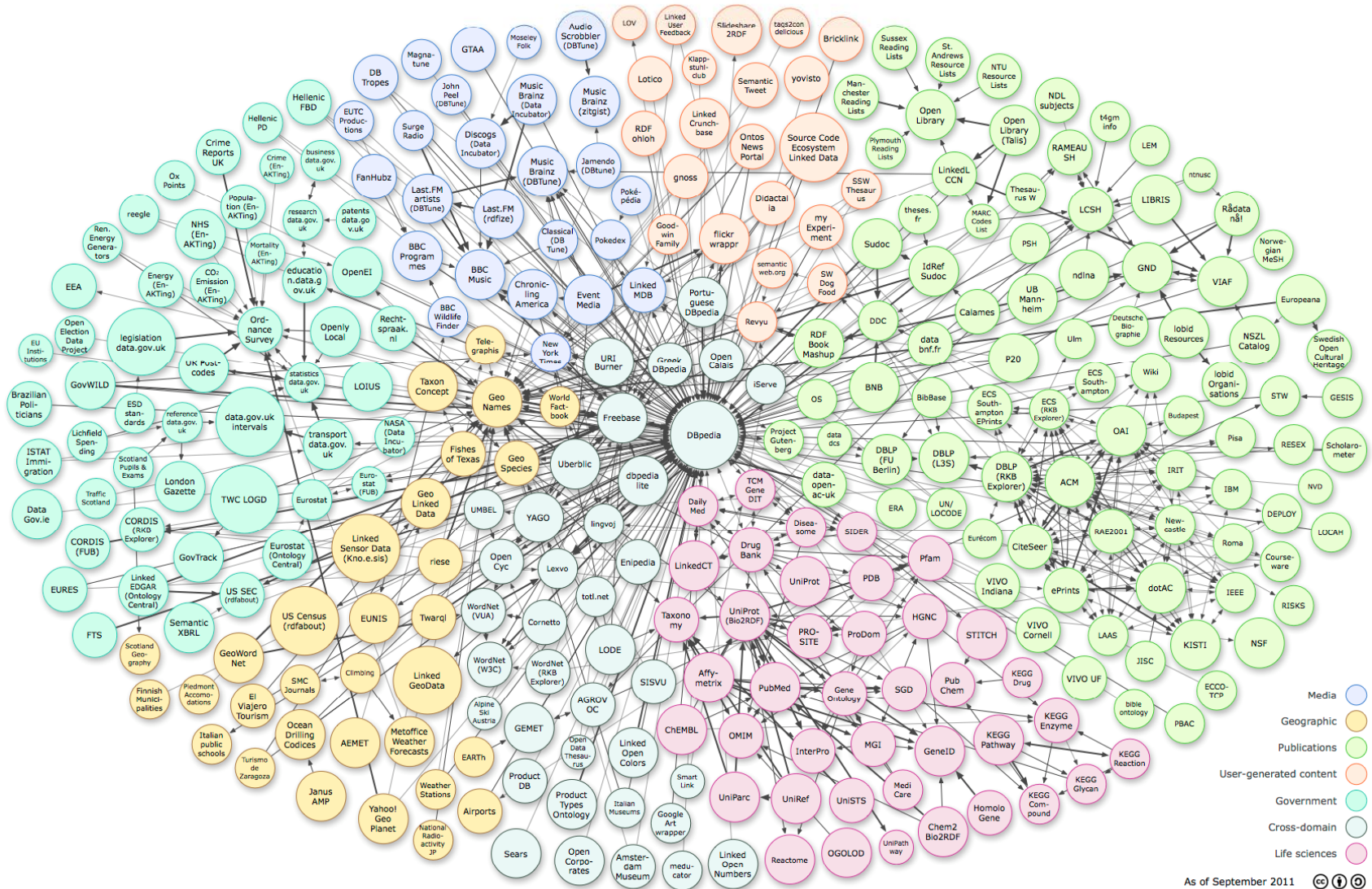
A Brief Introduction to RDF/Linked Data and RDA Registered Properties
Kimmy Szeto :: SUNY Maritime College :: February 18, 2012

RDA in MARC and RDF

RDA …

- is a descriptive standard

- standardizes how metadata contents are identified, transcribed, and structured

- provides for the use of controlled vocabulary

- is independent of metadata encoding

MARC and RDF…

- are encoding standards

- both can be used to encode, or "express" RDA

RDA elements are expressed in RDF as "properties"

RDA properties are designed to work with FRBR entities

Some FRBR entities for RDA

FRBR	RDF Label	URI
	Work	http://rdvocab.info/uri/schema/FRBRentitiesRDA/Work
	Expression	http://rdvocab.info/uri/schema/FRBRentitiesRDA/Expression
	Manifestation	http://rdvocab.info/uri/schema/FRBRentitiesRDA/Manifestation
	Item	http://rdvocab.info/uri/schema/FRBRentitiesRDA/Item
	Subject	http://rdvocab.info/uri/schema/FRBRentitiesRDA/Subject
	etc…	

RDA's RDF Properties

Some RDA properties are specific to the FRBR entity

Note correspondence with MARC

MARC	RDF Property	URI
245a	Title (Manifestation)	http://rdvocab.info/Elements/titleManifestation
245a 240a	Title of the work	http://rdvocab.info/Elements/titleOfTheWork
245b 245c	Parallel title proper (Manifestation)	http://rdvocab.info/Elements/parallelTitleProperManifestation
245c	Statement of responsibility relating to title proper	http://rdvocab.info/Elements/statementOfResponsibilityRelatingToTitleProper
246a	Variant title (Manifestation)	http://rdvocab.info/Elements/variantTitleManifestation

RDA's RDF Properties

Some are more straightforward …

MARC	RDF Label	URI
336a	Content type (Expression)	http://rdvocab.info/Elements/contentTypeExpression
337a	Media type (Manifestation)	http://rdvocab.info/Elements/mediaTypeManifestation
336a	Carrier type (Manifestation)	http://rdvocab.info/Elements/carrierTypeManifestation

```
010        2011567207
040     DLC ǂe rda ǂb eng ǂc DLC
028 32 5903 ǂb Marjer Publishing
050 00 M482.W55 ǂb O68 2009
100 1  Williams, John, ǂd 1932-
245 10 La Jolla quartet / ǂc John Williams.
260     [Place of publication not identified] : ǂb Marjer Publishing,
ǂc [2010]
300     1 score (82 pages) ; ǂc 43 cm
336     notated music ǂ2 rdacontent
337     unmediated ǂ2 rdamedia
338     volume ǂ2 rdacarrier
500     For clarinet, harp, violin, and cello.
546     ǂb Staff notation.
505 0  Introduction -- Aubade -- Scherzo -- Cantando -- Finale.
650  0 Quartets (Clarinet, harp, violin, violoncello) ǂv Scores.
```

RDA in RDF: Example

preferred title → "La Jolla quartet"

La Jolla quartet (Work)

- agent → Williams, John, 1932-
  - name → "Williams, John, 1932-"
  - birth date → 02-08-1932

is realized through → expression

- corresponding subject term or classification number → Quartets (Cla... violin, violoncello)   M482.W55
- content type → notated music
- medium of performance → "clarinet, harp, violin, violoncello"**
- form of musical notation → staff notation

is embodied in → manifestation

- extent → "1 score (82 pages) ; 43 cm"
- publisher's number for music → "5903"
- media type → unmediated
- carrier type → volume
- Publication date → [2010]
- Publisher's name → "Marjer Publishing"

RDA in RDF: Example

```
040    RBN ‡c RBN ‡d OCL ‡d IUL ‡d OCL ‡d JNA ‡d OCL ‡d NZCPL ‡d
JTA ‡d BTCTA ‡d ORX ‡d YQU ‡d OCLCG ‡d OCLCA ‡d MTG ‡d OCL ‡d IK2
‡d EUX
028 00 417 428-2 ‡b London
050  4 M1500.B827 ‡b H6
100 1  Britten, Benjamin, ‡d 1913-1976.
240 10 Vocal music. ‡k Selections
245 14 The holy sonnets of John Donne ‡h [sound recording] ; ‡b
Songs and proverbs of William Blake ; Billy Budd / ‡c Britten.
260    London : ‡b London, ‡c [1989]
300    3 sound discs : ‡b digital, stereo. ; ‡c 4 3/4 in.
500    Compact discs; analog recordings.
505 0  The holy sonnets of John Donne, op.35 -- Songs and proverbs
of William Blake, op.74 -- Billy Budd, op.50.
650  0 Songs (High voice) with piano.
650  0 Songs (Medium voice) with piano.
650  0 Operas.
600 10 Donne, John, ‡d 1572-1631 ‡v Musical settings.
600 10 Blake, William, ‡d 1757-1827 ‡v Musical settings.
700 10 Donne, John, ‡d 1572-1631.
700 10 Blake, William, ‡d 1757-1827.
etc.
```

RDA in RDF: Example

preferred title → "The holy sonnets of John Donne"

agent → Britten, Benjamin, 1913-1976

name → "Britten, Benjamin, 1913-1978"

birth date → "1913"

The holy sonnets of John Donne (Work)

corresponding subject term or classification number → M1500.B827 H6

Songs (Hig... with piano

content type → performed music

medium of performance → "tenor, piano"**

is realized through

expression

form of musical notation → analog

extent → "3 sound discs"

publisher's number for music → "417 428-2 "

media type → audio

carrier type → audio disc

Publication date → [1989]

Publisher's name → "London"

is embodied in

manifestation

RDA in RDF: Example

```
                                                   form of
                                                   musical
                                                   notation         exte

                         performer    expression  publisher's
                                                   number for
    Pears,                                          music           med
   Peter, Sir                        is embodied                   type
                                          in
    Britten,                                        carrier
   Benjamin,                         manifestation   type
   1913-1976                                                      Publica
                                                                    date
                                                   Publisher's
                         performer    expression     name

  Fischer-
  Dieskau,                           is realized
  Dietrich, 1925-                     through
                                                   preferred
                                                     title
                         Songs and                                "Songs and
                         proverbs of                            proverbs of William
                          William                                    Blake"
                           Blake
```
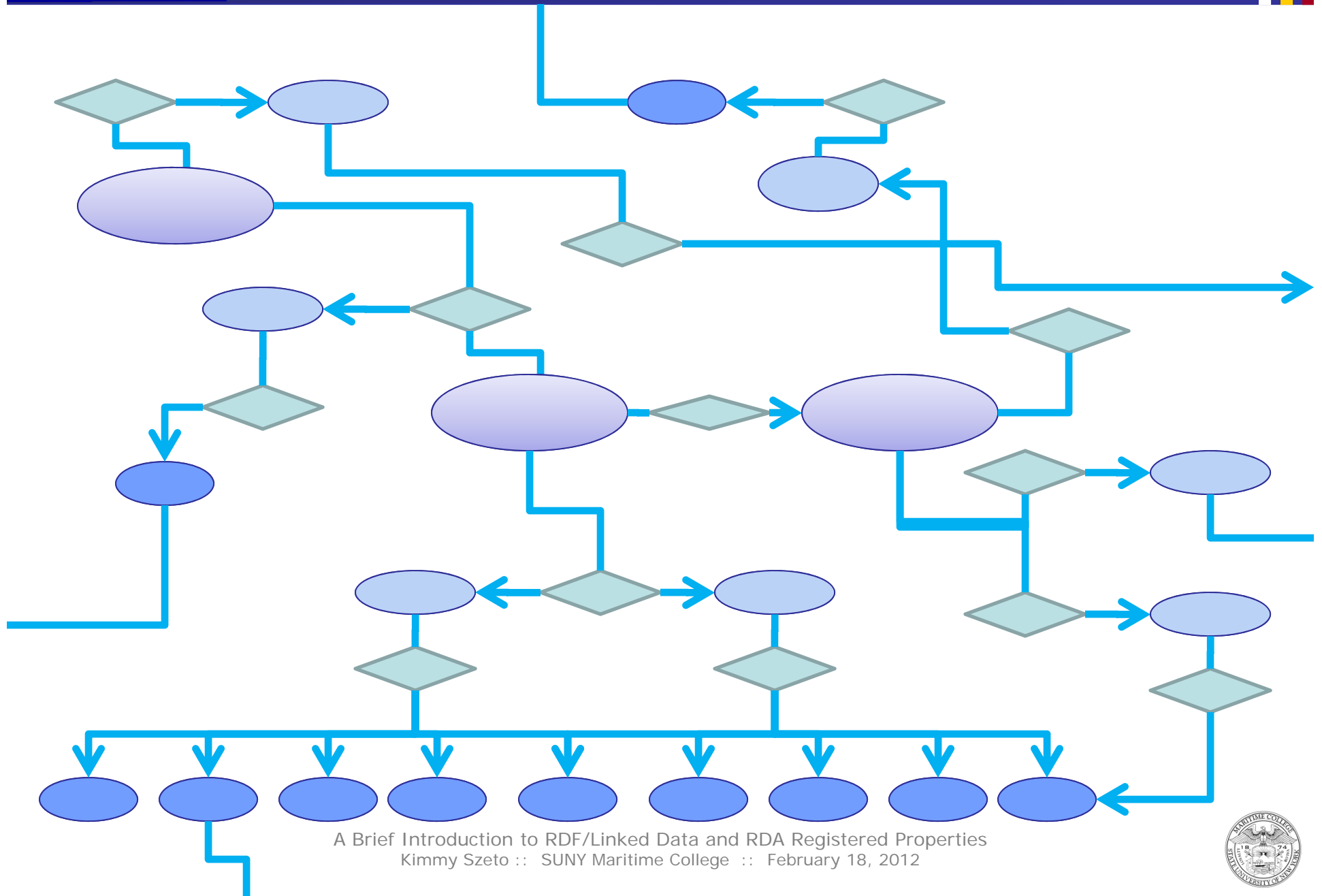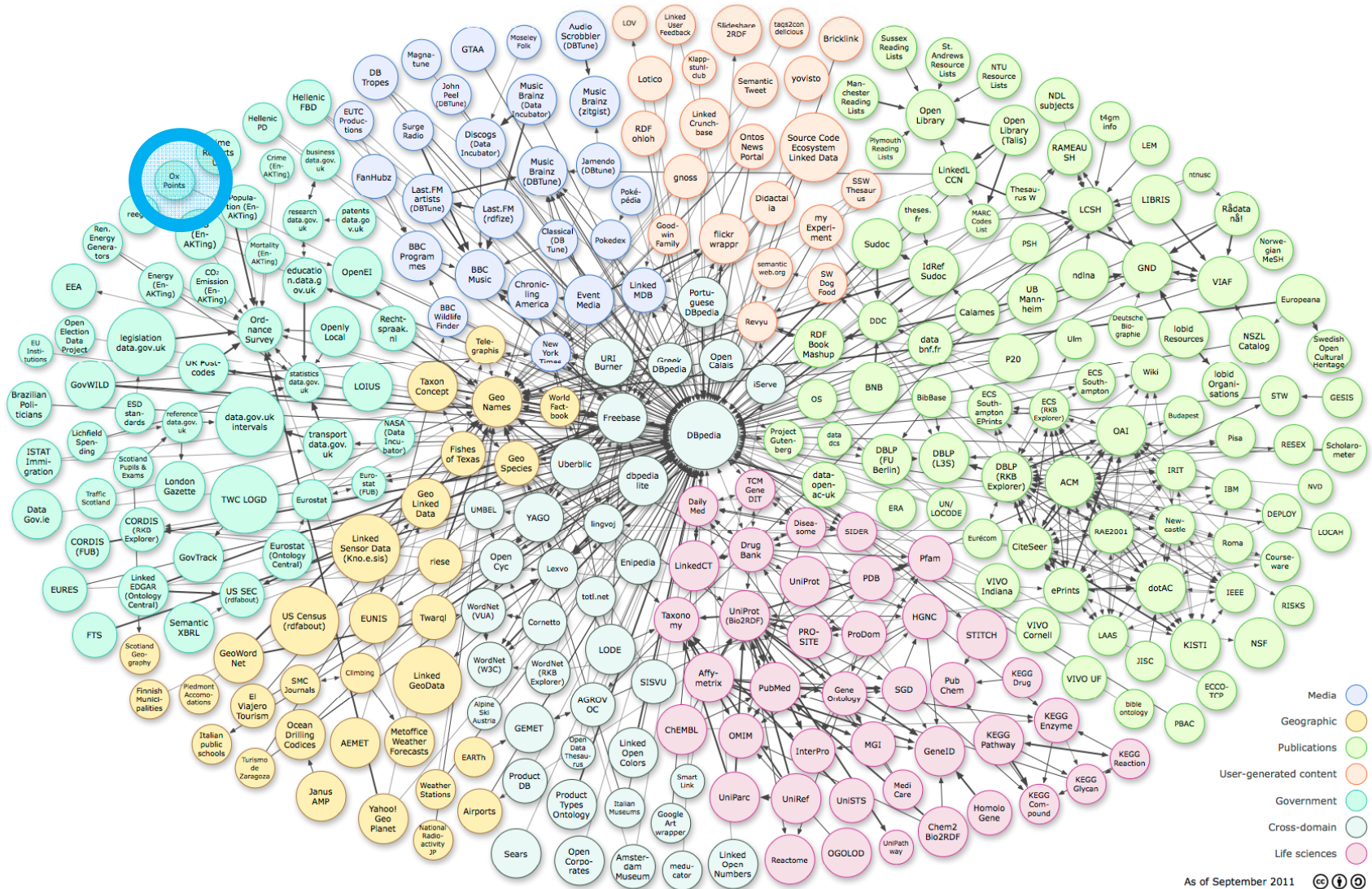
Linked Data

RDA in RDF

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