Automatically generating citation text from queries

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Web Conference Data Citation WG
Webinar, 07 November 2017

Outline

What's data citation: a very brief introduction

Citing RDF: The eagle-i case

Citing XML: The digital archives case

Citing RDB: The IUPHAR/BPS case

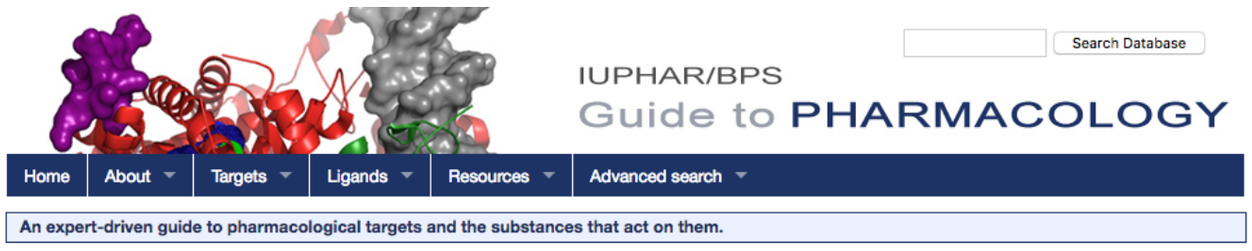
Conclusions

What's Data Citation

Check [JASIST2017b] for a survey about theory and practice of data citation

Publication is changing

- Information is increasing published on the web.
- Much of this information is in curated databases – crowd- or expert-sourced data
- These datasets are complex, structured, and evolving, and contributors need to be acknowledged



G. Silvello - Automatically generating citation text from queries

Data citation desiderata

- The generation of human- and machine-readable citations should be automatic

- Cited data should be uniquely identified: e.g., DOI

- Citing data should be easy: click, generate, copy and paste

- Setting up and maintaining a citation system should require low (no) effort to data creators/curators

Citation snippets

We've focused on the automatic creation of citation texts/snippets

- A collection of information: authors, title, date, etc. and some kind of access mechanism

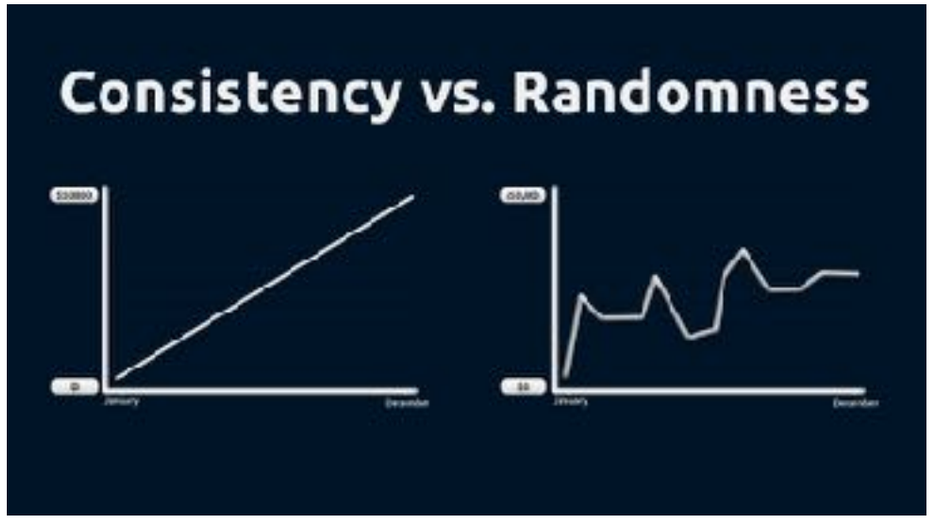
- Not exactly provenance

- Self contained, immutable (to within some choice of format)

- Needed for a variety of reasons: kudos, currency, authority, recognition, access…

Why citation snippet generation should be automatic?

- Consistency



https://www.investorsunderground.com/wp-content/uploads/2015/05/consistencyfeatured.jpg

- Simplicity

https://speckyboy.com/wp-content/uploads/2016/01/simplicity-equals-sanity.png

- Completeness

https://newsletter.echa.europa.eu/image/image_gallery?uuid=b0ed090d-03ab-46b6-bdbf-39ee615dd6fe&groupId=6362380&t=1442480673121

Data citation as a computational problem

- Principles and standards for data citation are unlikely to be used unless the process of extracting information is coupled with that of providing a citation for it.

- We need to automatically generate citations as the data is extracted.

- Data citation is a computational problem.

Buneman, Davidson, Frew:
Why data citation is a computational problem.
Commun. ACM 59(9): 50-57 (2016)

Data models heterogeneity

Models

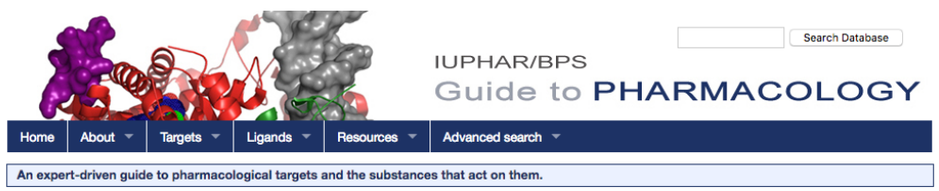
RDF

Relational model

eXtensible Markup Language XML

Applications

eagle-i



Digital ARCHIVES

Citing RDF Using Named Graphs/Views

Application: Eagle-i

Check DLib2015 and JCDL2017

Joint work with Abdu Alawini, Leshang Chen and Susan Davidson

Eagle-i

- A “resource discovery” tool built to facilitate translational science research.

- Developed by a consortium of universities under NIH funding, headed by Harvard.

- End users: researchers who wish to share information about research resources (Core Facilities, iPS cell lines, software resources).

- Data is stored and distributed as RDF files (graph database).

- Resources have a “Cite this resource” button!

Eagle-i: Cite me button

eagle-i

Search for resources across the eagle-i Network

Go

Top Categories | Explore All

ABOUT GET INVOLVED NEWS + EVENTS FAQ CONTACT US HELP

Back to Search Results

Mouse anti-mouse Gamma-protocadherin-C4

Monoclonal antibody reagent

Send message to resource contact

Cite this resource

SC Special Collections

Reagent Additional Name	anti-PCDH-gamma-C4
Location	UC Davis/NIH NeuroMab Facility
Related Technique	Immunocytochemistry
Source Organism Type	Mus musculus
▶Antibody Target(s)	
▶Immunogenic Material	
Isotype	IgG1
Antibody Registry ID	http://antibodyregistry.org/AB_10671301 http://antibodyregistry.org/AB_2159730
Catalog Number	73-231 75-231
Clone ID	N193A/13
Exchange facilitator	**Order from the NeuroMab Facility**
Website(s)	http://neuromab.ucdavis.edu/datasheet/N193A_13.pdf

Eagle-i: Cite me button

eagle-i

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Explore All

ABOUT GET INVOLVED NEW

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Monoclonal antibody reagent

Send message to resource contact

Cite this resource

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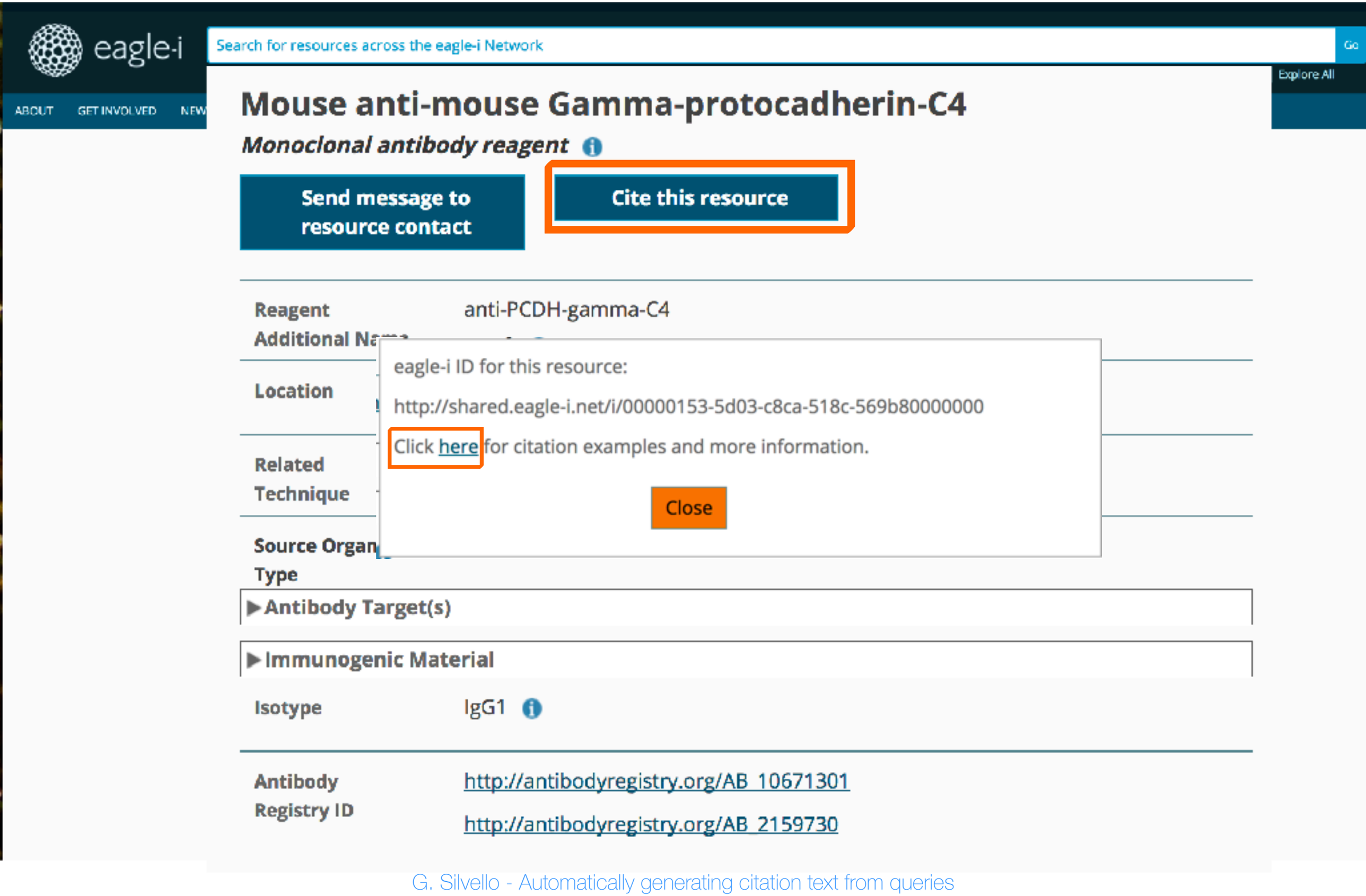
Location	UC Davis/NIH NeuroMab Facility
Related Technique	Immunocytochemistry
Source Organism Type	Mus musculus

▶ **Antibody Target(s)**

▶ **Immunogenic Material**

Isotype	IgG1
Antibody Registry ID	http://antibodyregistry.org/AB_10671301 http://antibodyregistry.org/AB_2159730

Eagle-i: Cite me button



Eagle-i: Cite me button

eagle-i

Search for resources across the eagle-i Network

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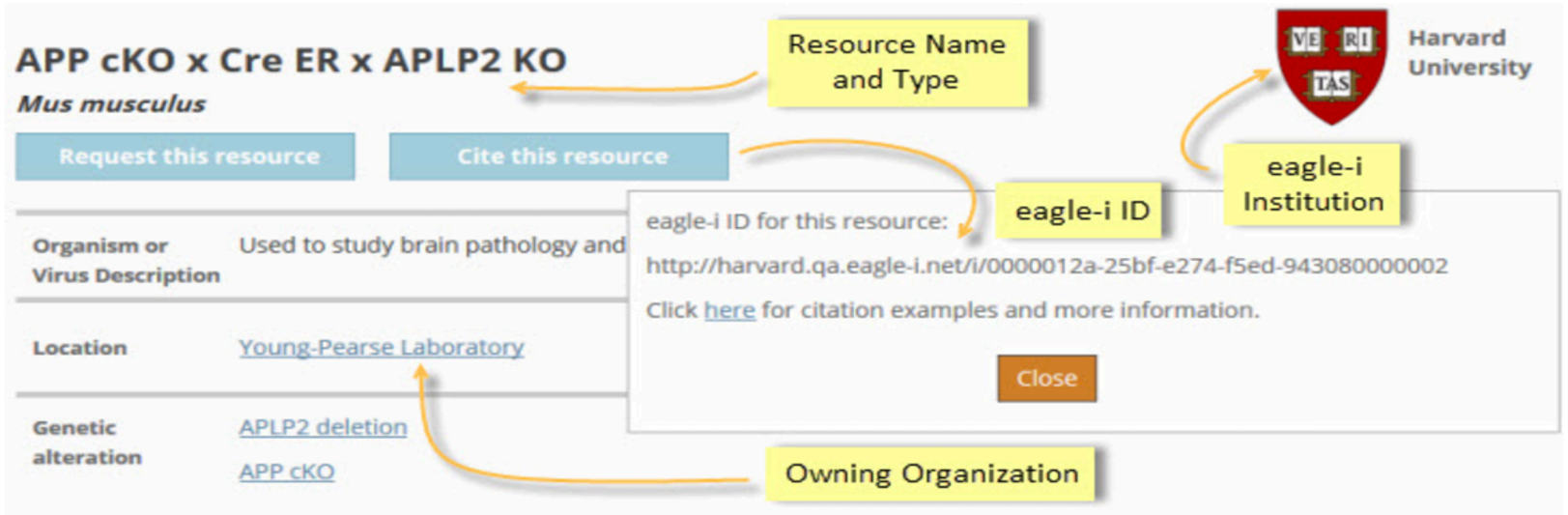
Citing an eagle-i Resource

Citing eagle-i resources is an easy way to give credit.

The formats suggested below provide the minimum information necessary to identify and credit the resource provider, and are designed to provide a traceable, durable, and unambiguous reference for the resource being cited. These suggestions can and should be used along with those from other resource identifiers (i.e. Antibody Registry ID, Addgene, DSHB, RRID) or from the journal publishing your work.



Note that for all types, the names of Core Facilities or other ambiguously named organizations should be followed by the name of the affiliated eagle-i institution in order to disambiguate them (e.g. *Flow Cytometry Core. Montana State University vs. Flow Cytometry Core. Dartmouth College*).

Manual construction of the citation

eagle-i

Search for resources across the eagle-i Network

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ABOUT GET INVOLVED NEWS + EVENTS FAQ CONTACT US HELP

Back to Search Results

Title

Mouse anti-mouse Gamma-protocadherin-C4

Monoclonal antibody reagent

Send message to resource contact

Cite this resource

Institution

Special Collections

Reagent Additional Name	anti-PCDH-gamma-C4
Location	UC Davis/NIH NeuroMab Facility
Related Technique	Immunocytochemistry
Source Organism Type	Mus musculus

▶ Antibody Target(s)

▶ Immunogenic Material

Isotype	IgG1

Location

eagle-i ID for this resource:

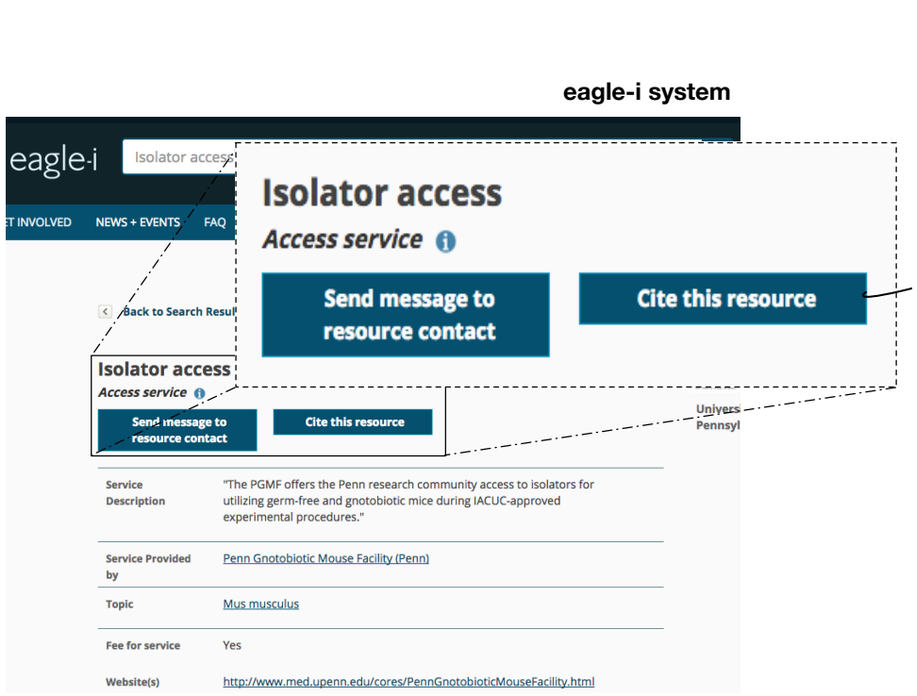
Eagle-i ID

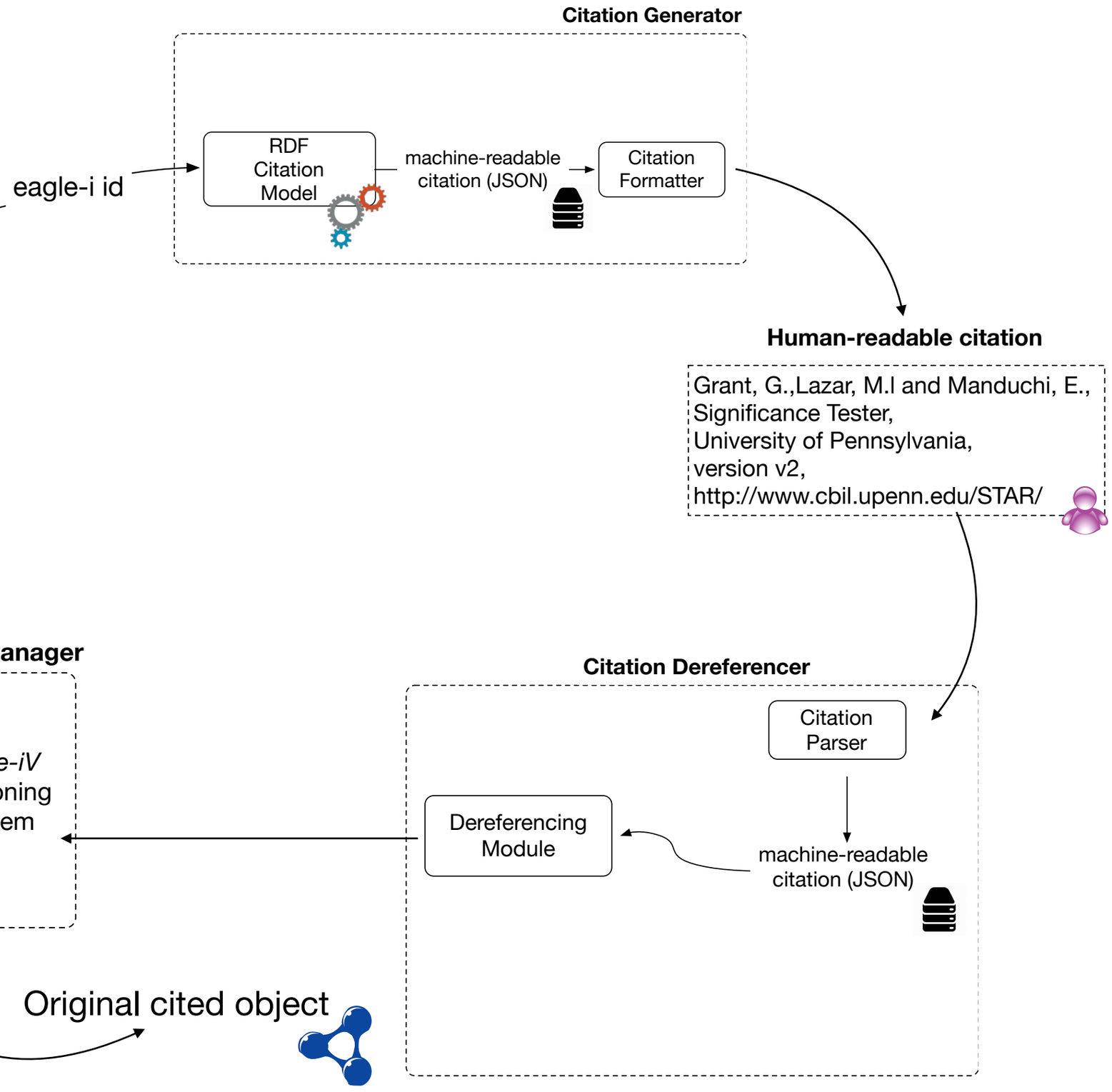
http://shared.eagle-i.net/i/00000153-5d03-c8ca-518c-569b80000000

Click here for citation examples and more information.

Close

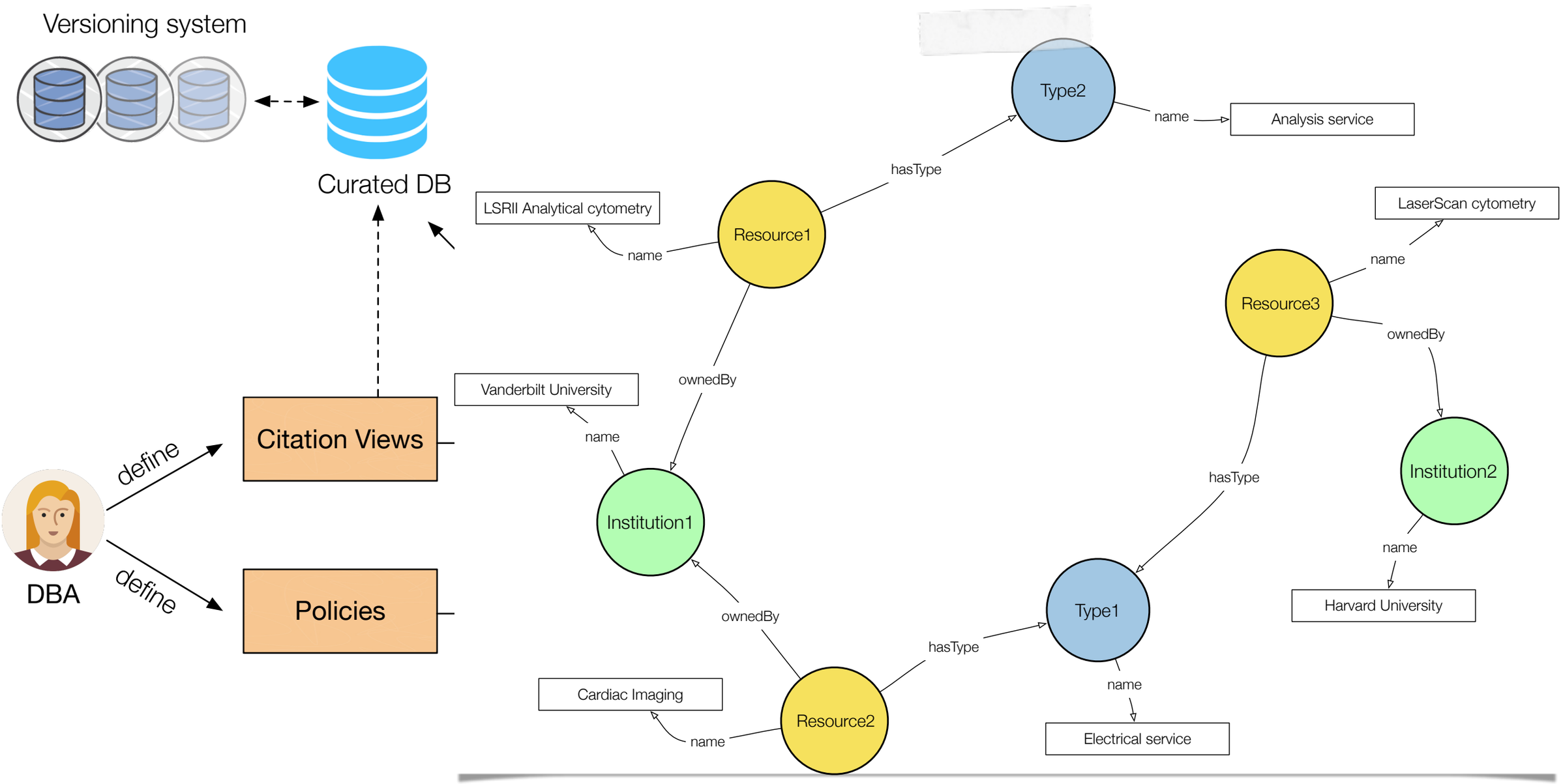
The eagle-i citation service



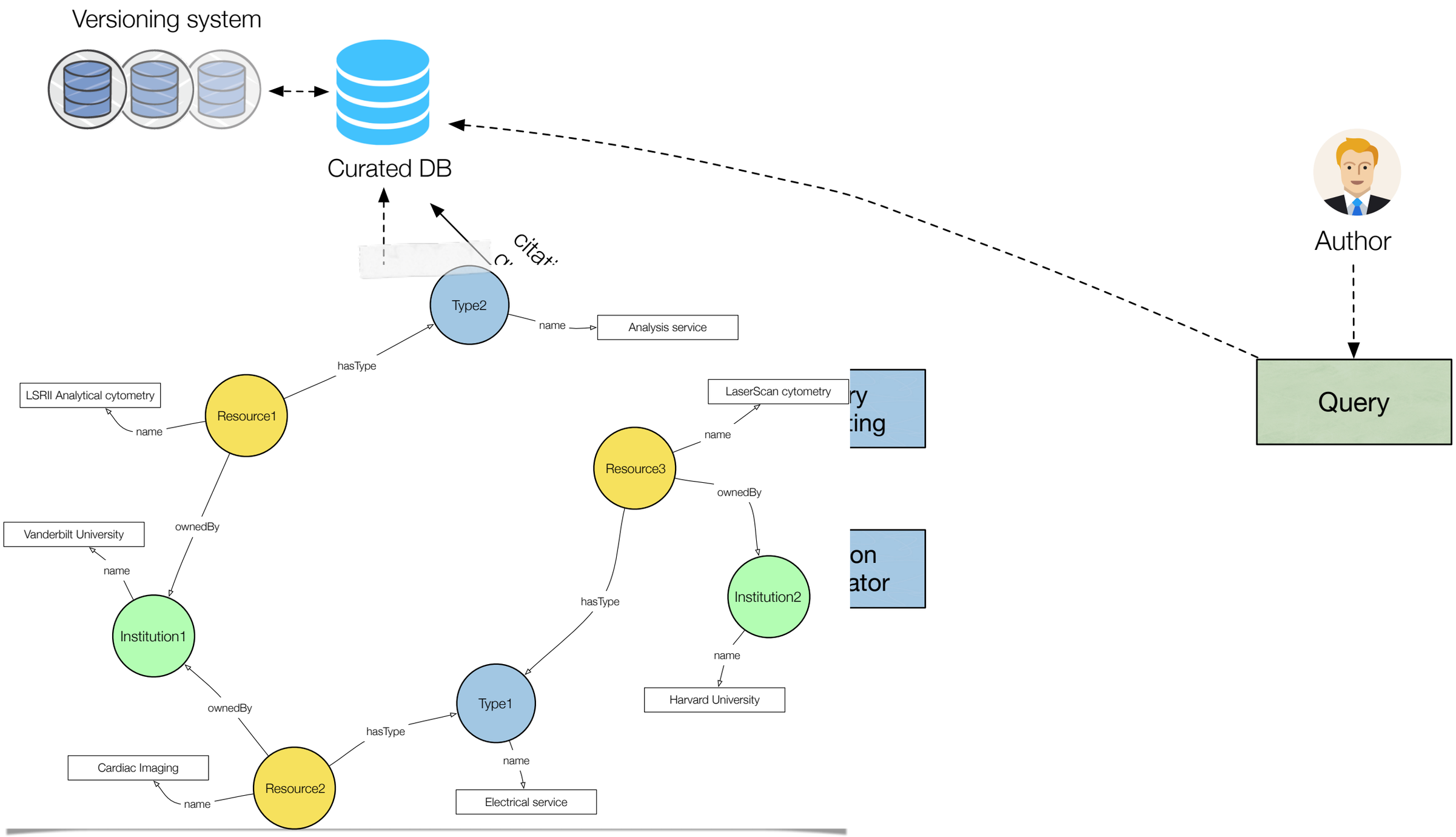


The citation system

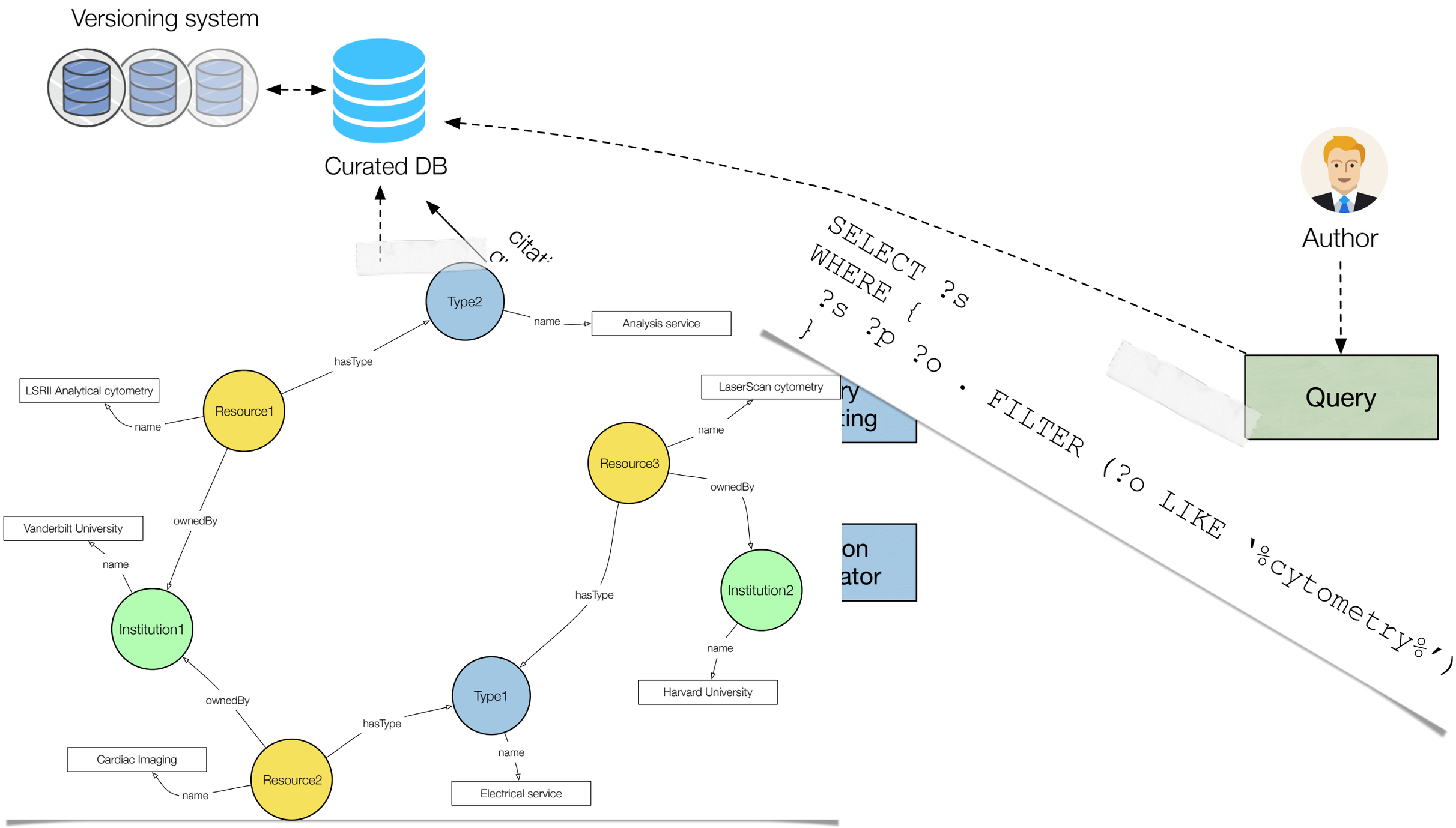
Creating a citation



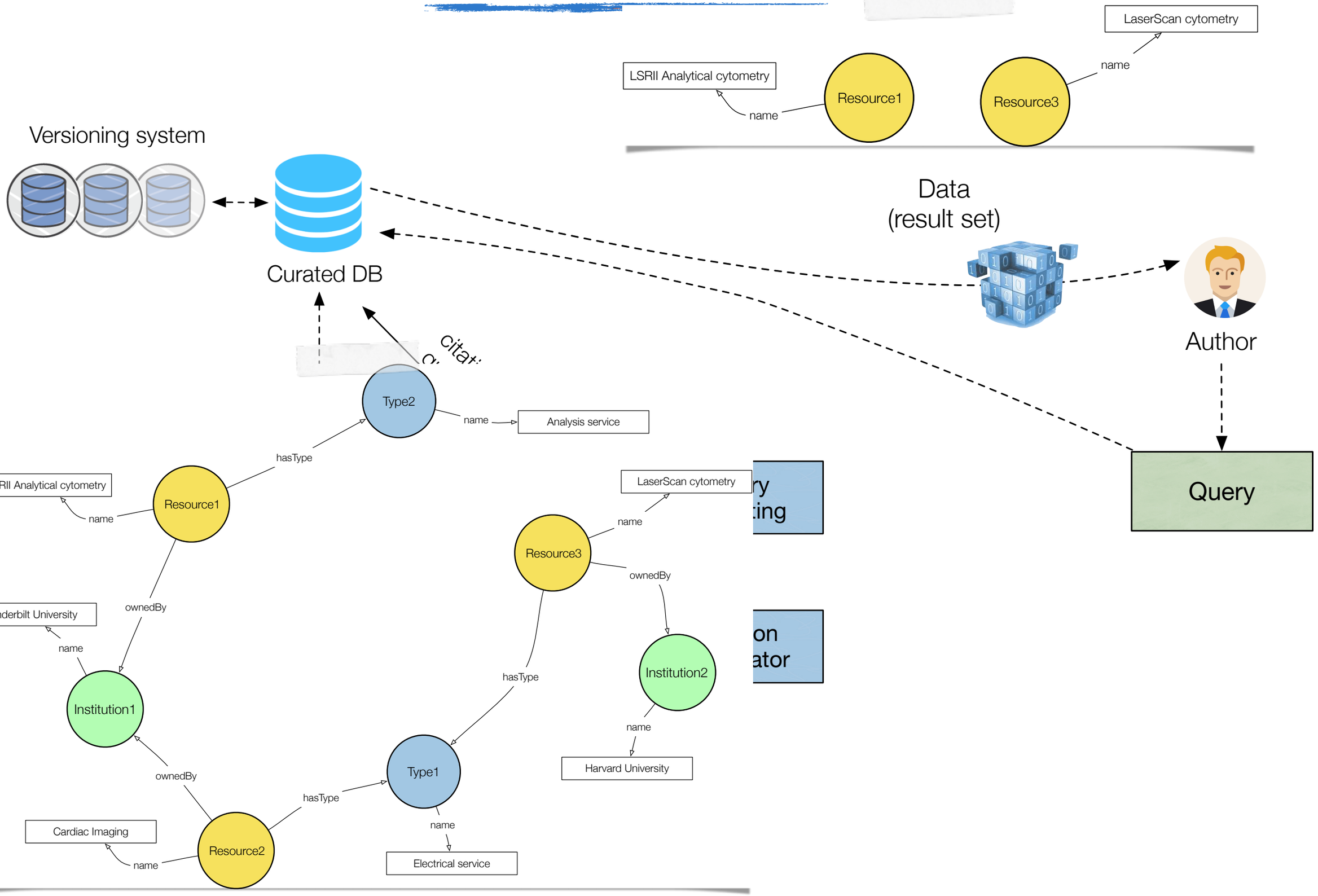
Creating a citation



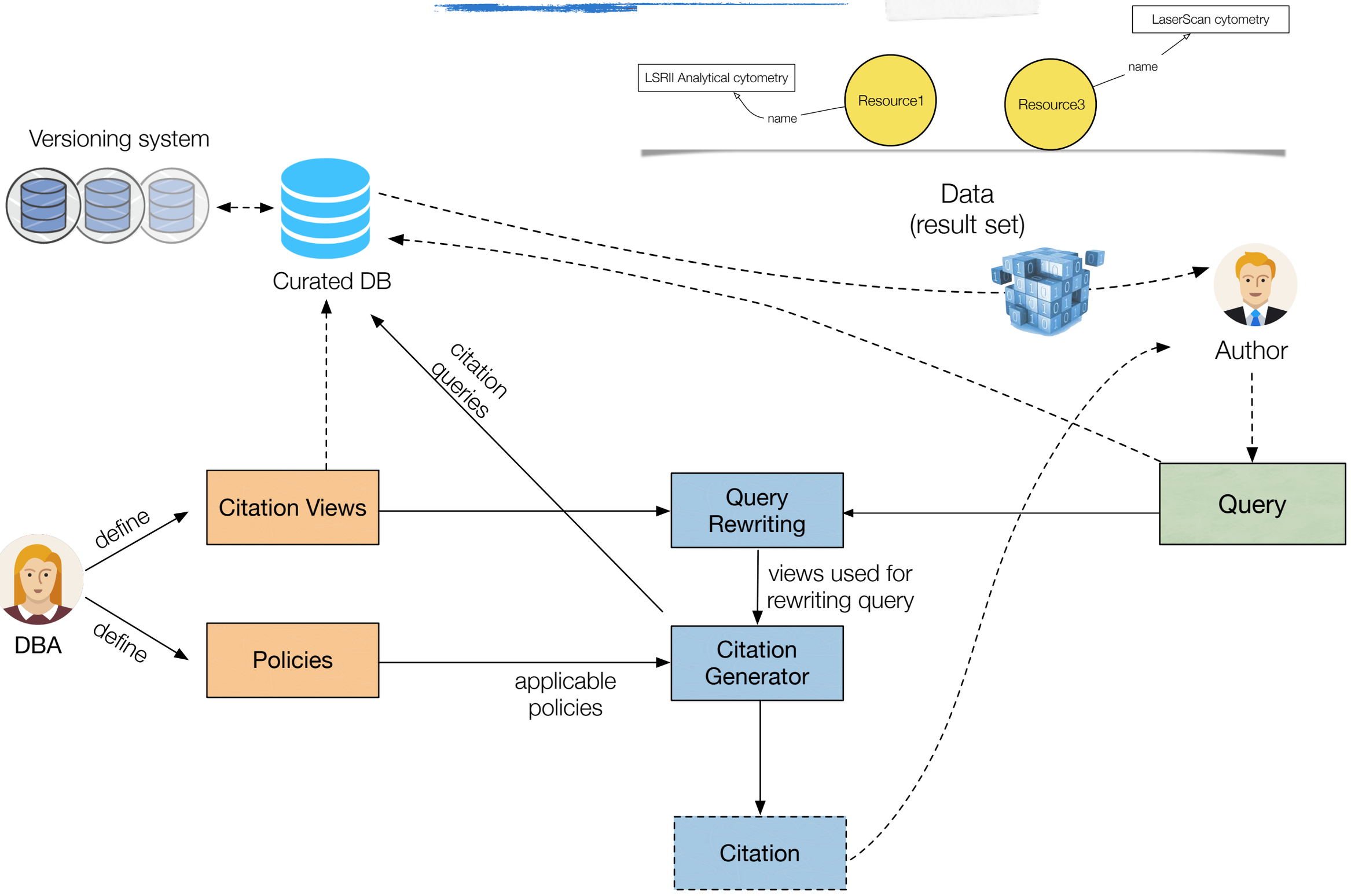
Creating a citation



Creating a citation



Creating a citation



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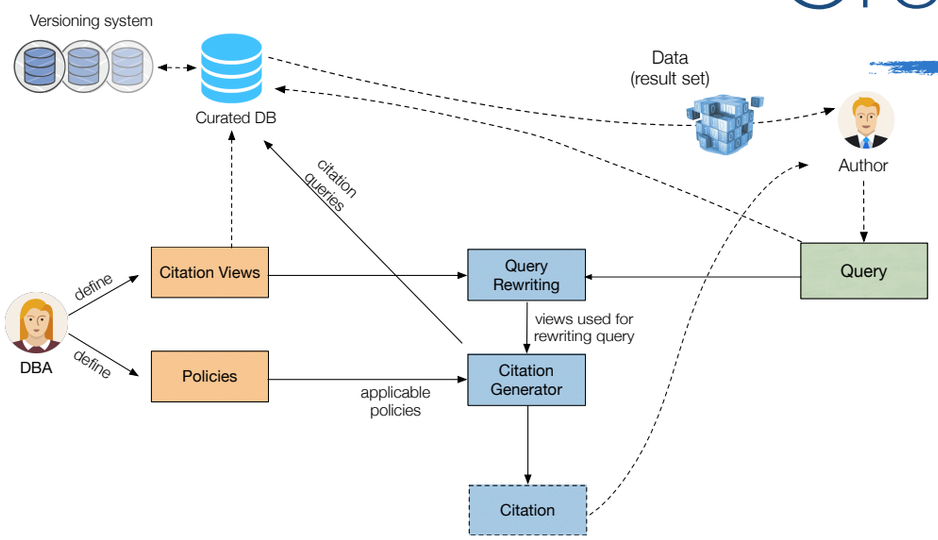
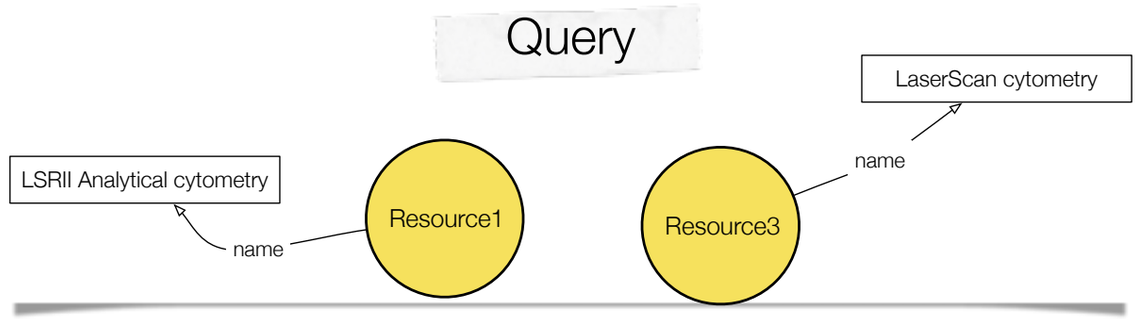
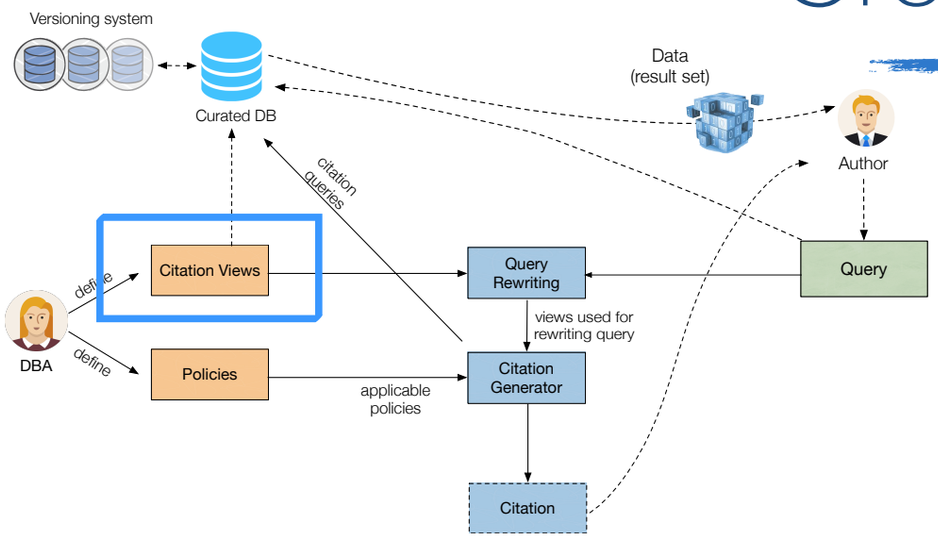
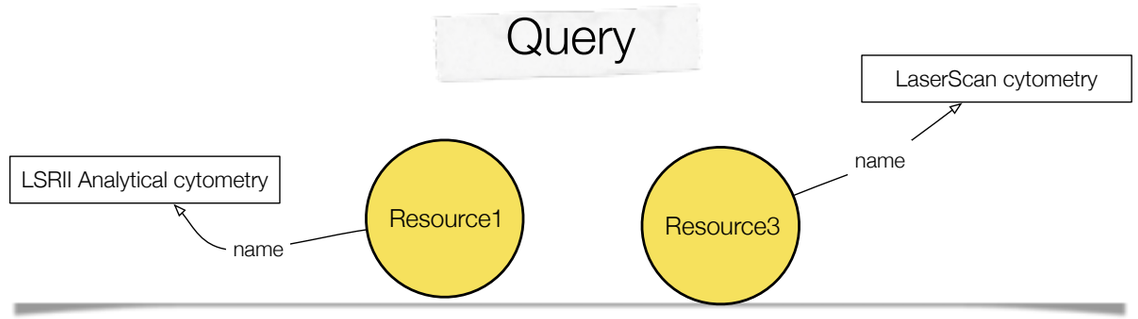


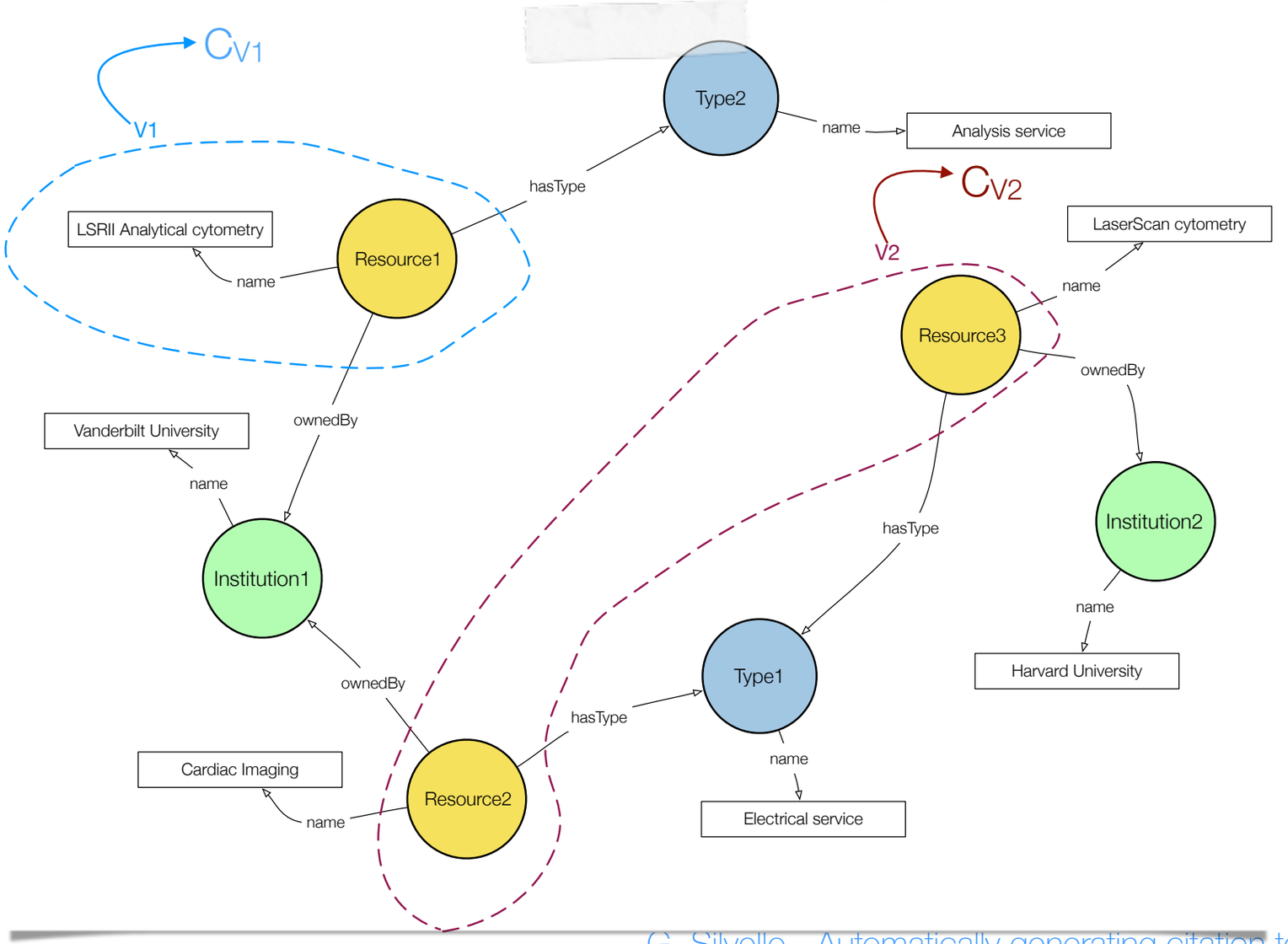


Creating a citation

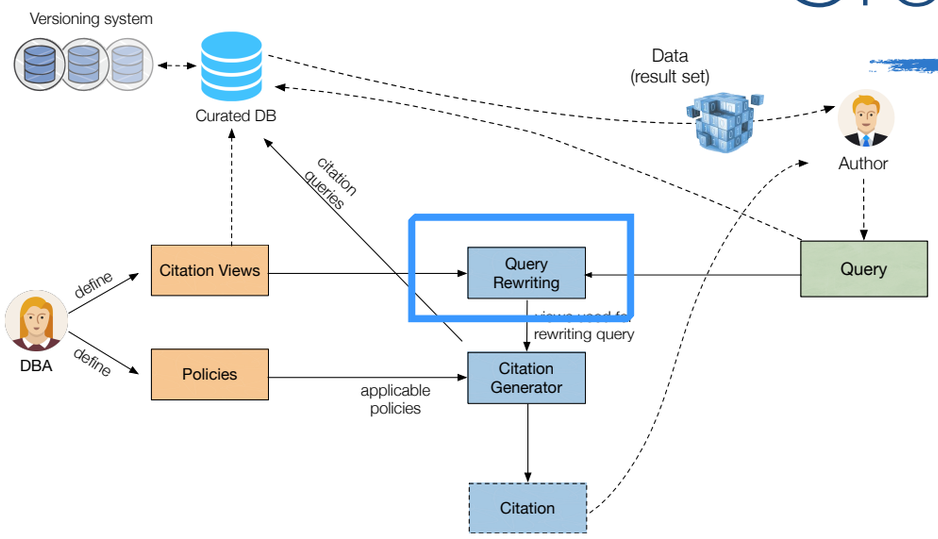


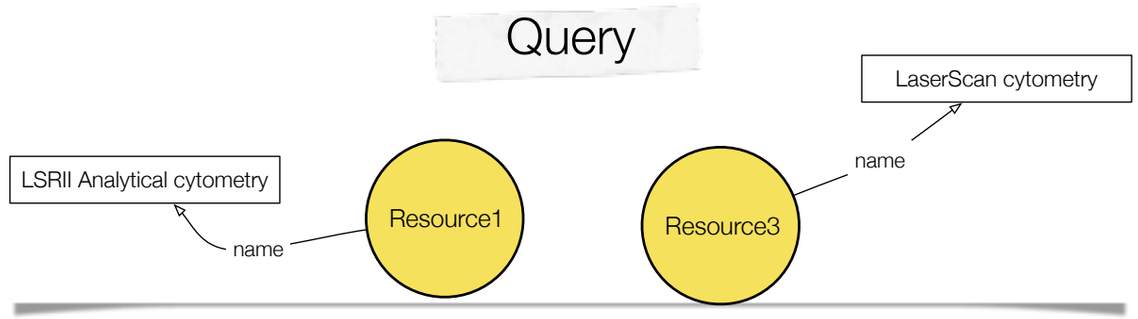


Definition of the citation views



Creating a citation





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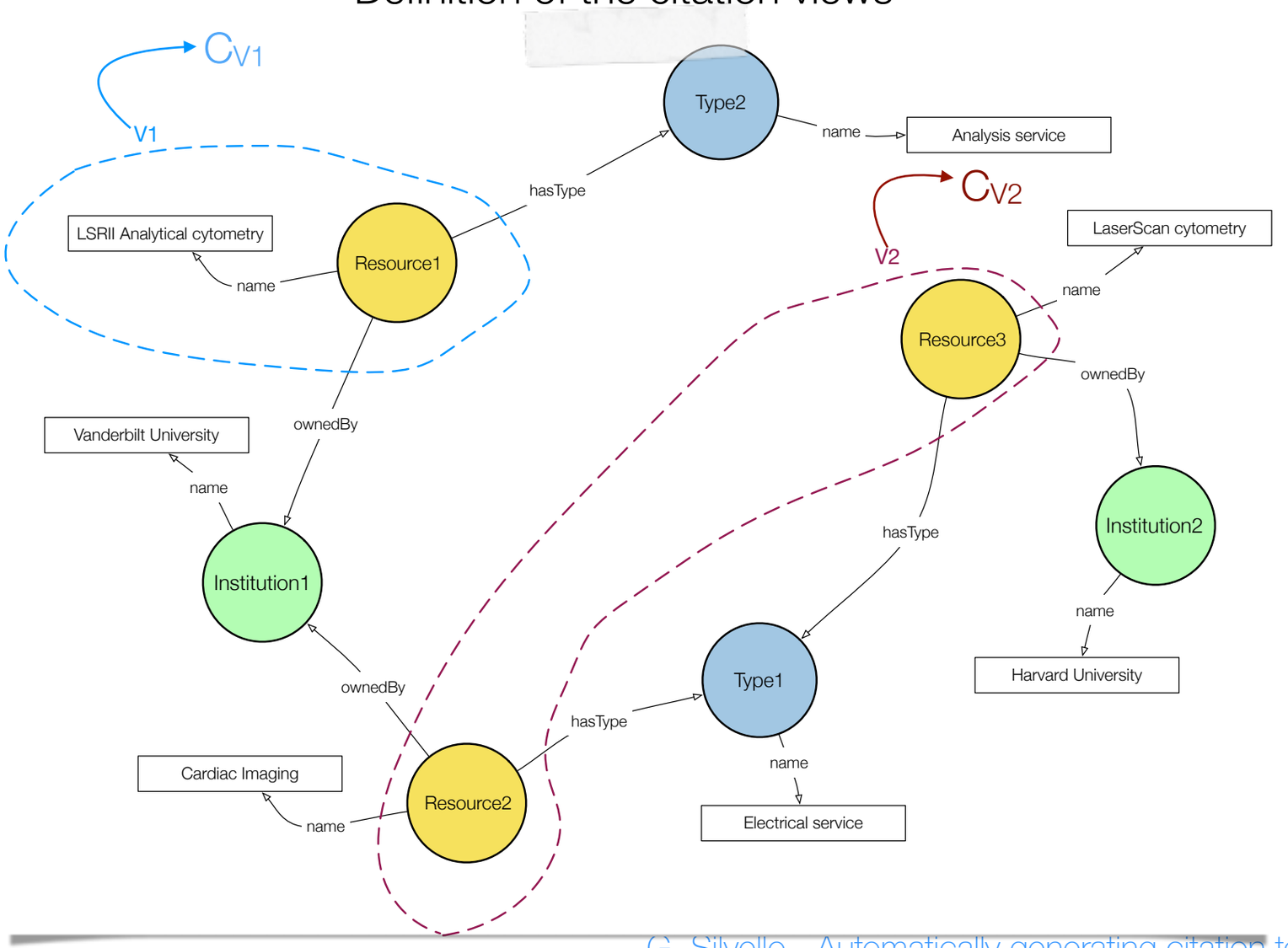
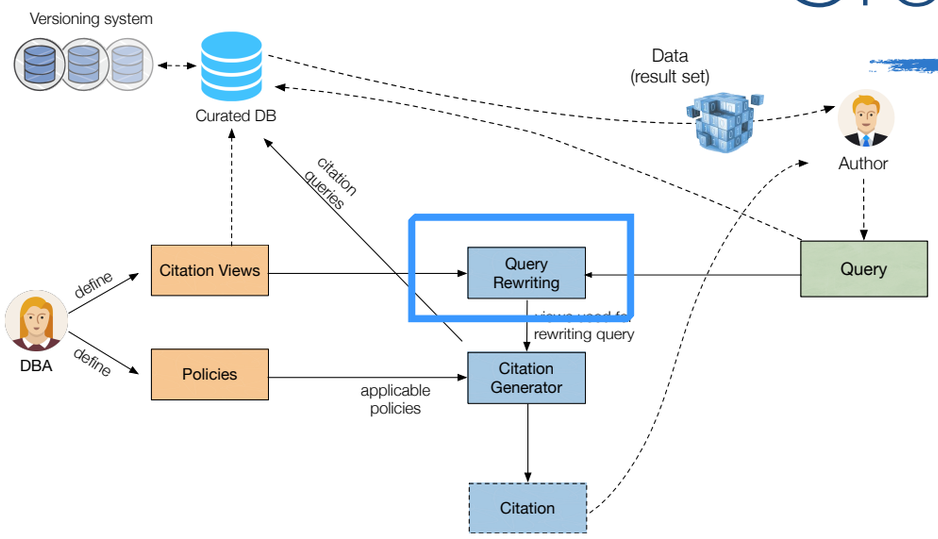
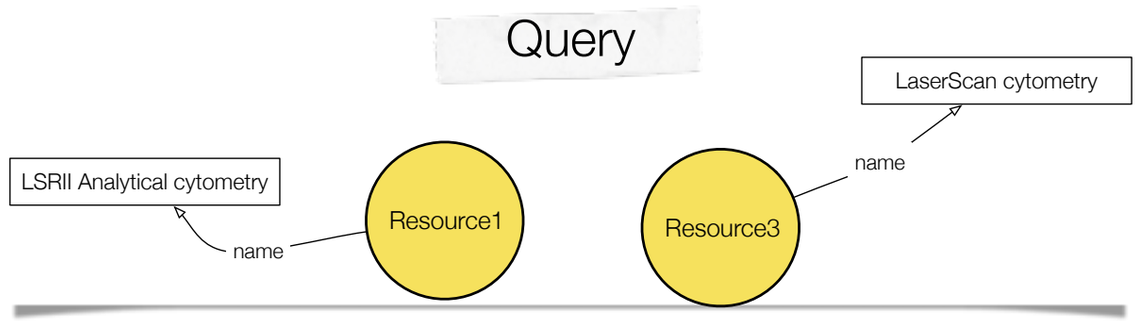


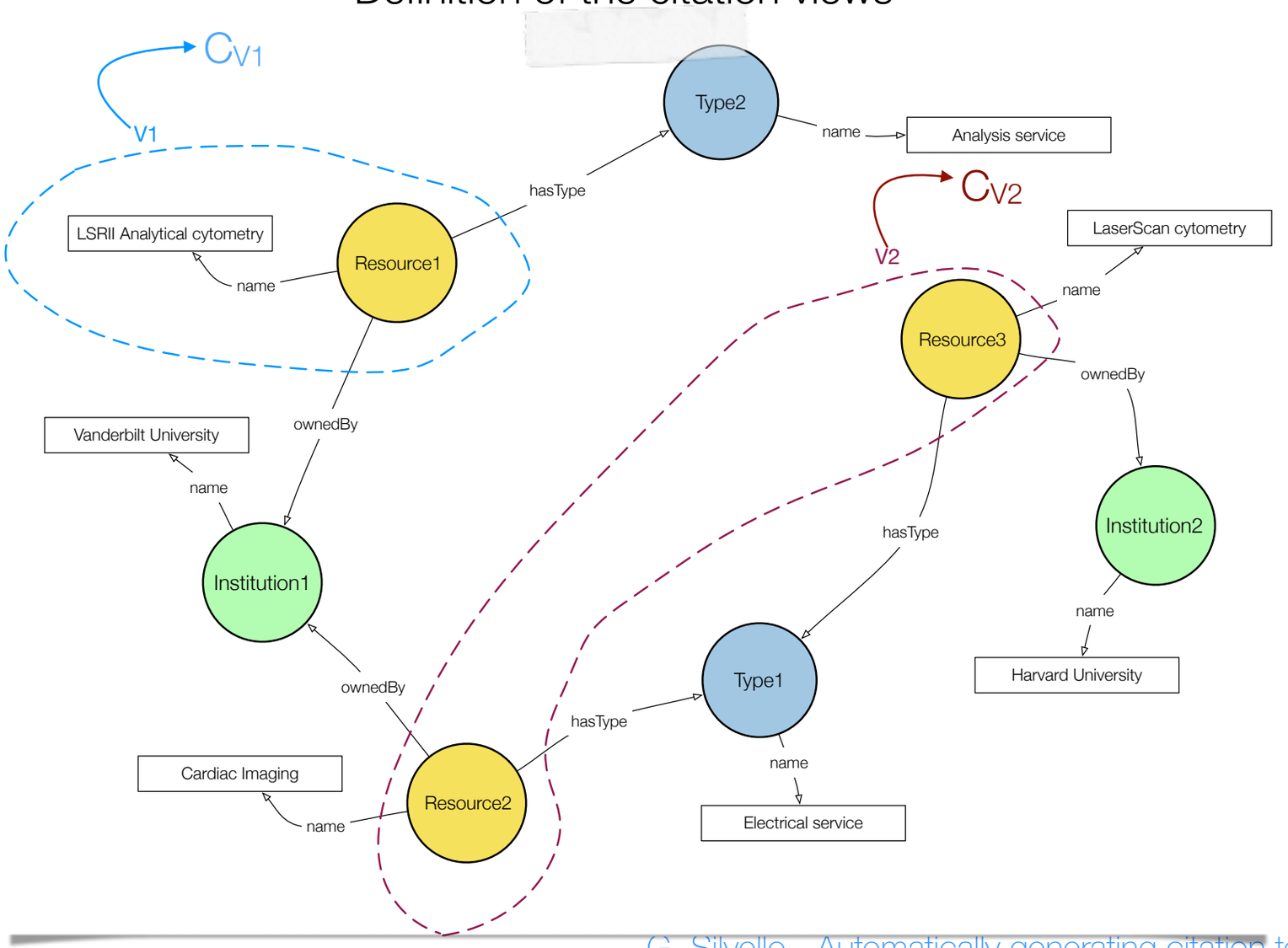
The query is rewritten using the views and the citation texts are created

Creating a citation





Definition of the citation views

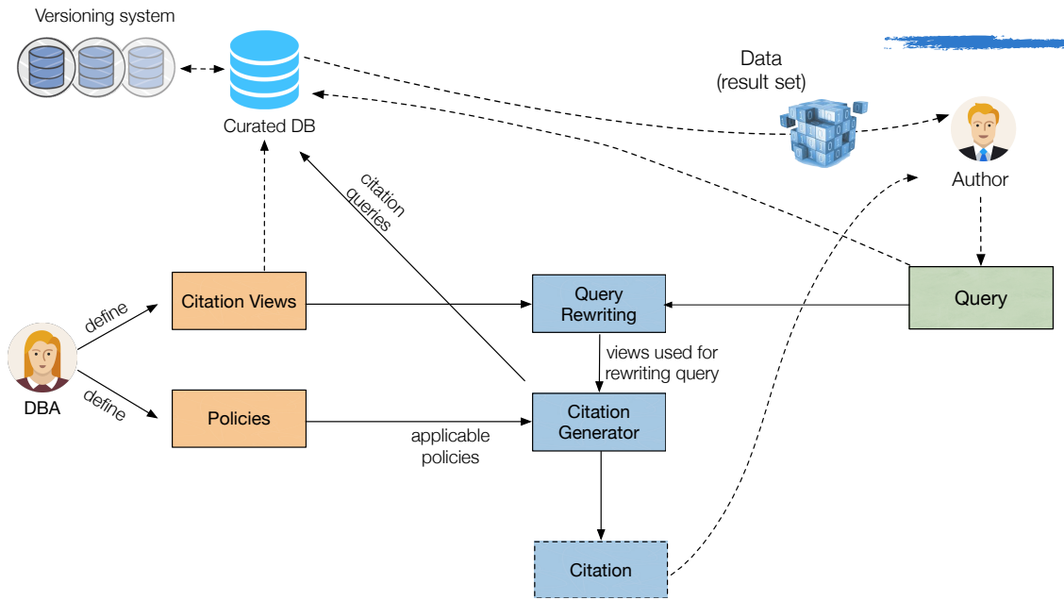


The query is rewritten using the views and the citation texts are created

V1(Resource1) -> C_{V1}(Resource1) ->
{Grant, G., Version12,
LSRII Analytical cytometry, doi.10/resource1}

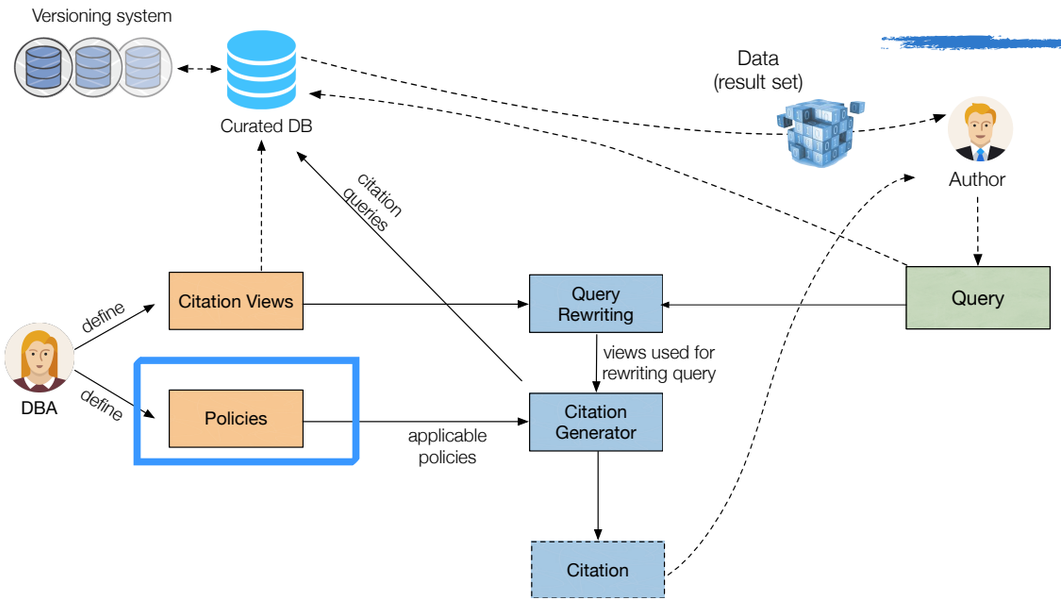
V2(Resource3) -> C_{V2}(Resource3) ->
{Grant, G., Version12,
LaserScan cytometry, doi.10/resource3}

Creating a citation



The citation policies are used to define how to create a single citation text

Creating a citation



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{Grant, G., Version12,
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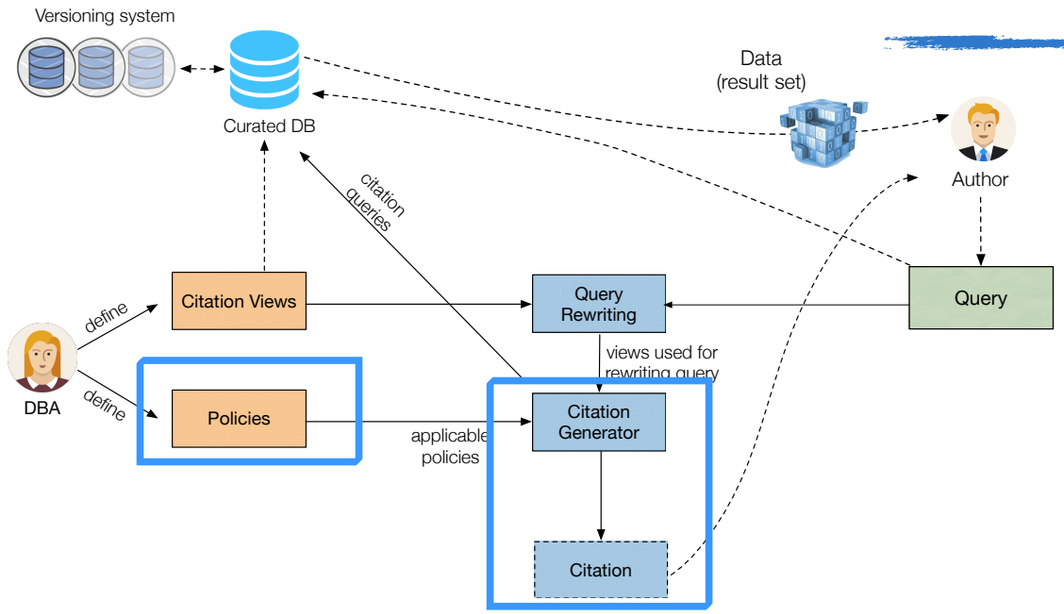
Creating a citation



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V1(Resource1) ->
{Grant, G., Version12,
LSRII Analytical cytometry, doi.10/resource1}

V2(Resource3) ->
{Grant, G., Version12,
LaserScan cytometry, doi.10/resource3}

A possible citation policy is to take the union of the citations

{Grant, G., Version12.
LSRII Analytical cytometry, doi.10/resource1;
LaserScan cytometry, doi.10/resource3}

What's required to the DBA

- Understand what information must be captured in the database to populate the citations

- Specify the citation views for the database

- Specify the citation policies

- Ensure that the system is versioned and enable dereferencing

http://wazirul.blogspot.it/2015/12/5-orang-yang-mendadak-jenius-setelah.html

XML: Learning to Cite Framework

Application: Digital Archives

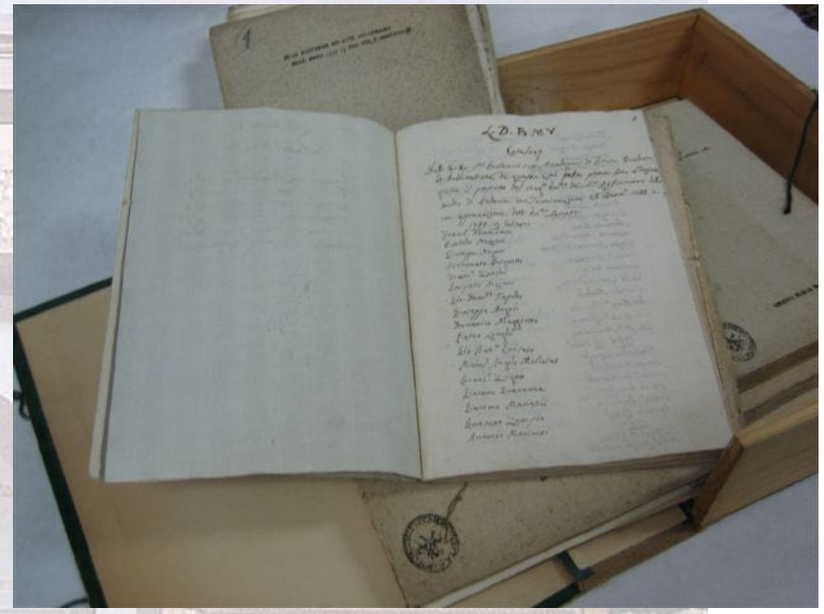
Check JASIST2017a

Use case: Digital archives

What is an Archive?

Shelves

Folders

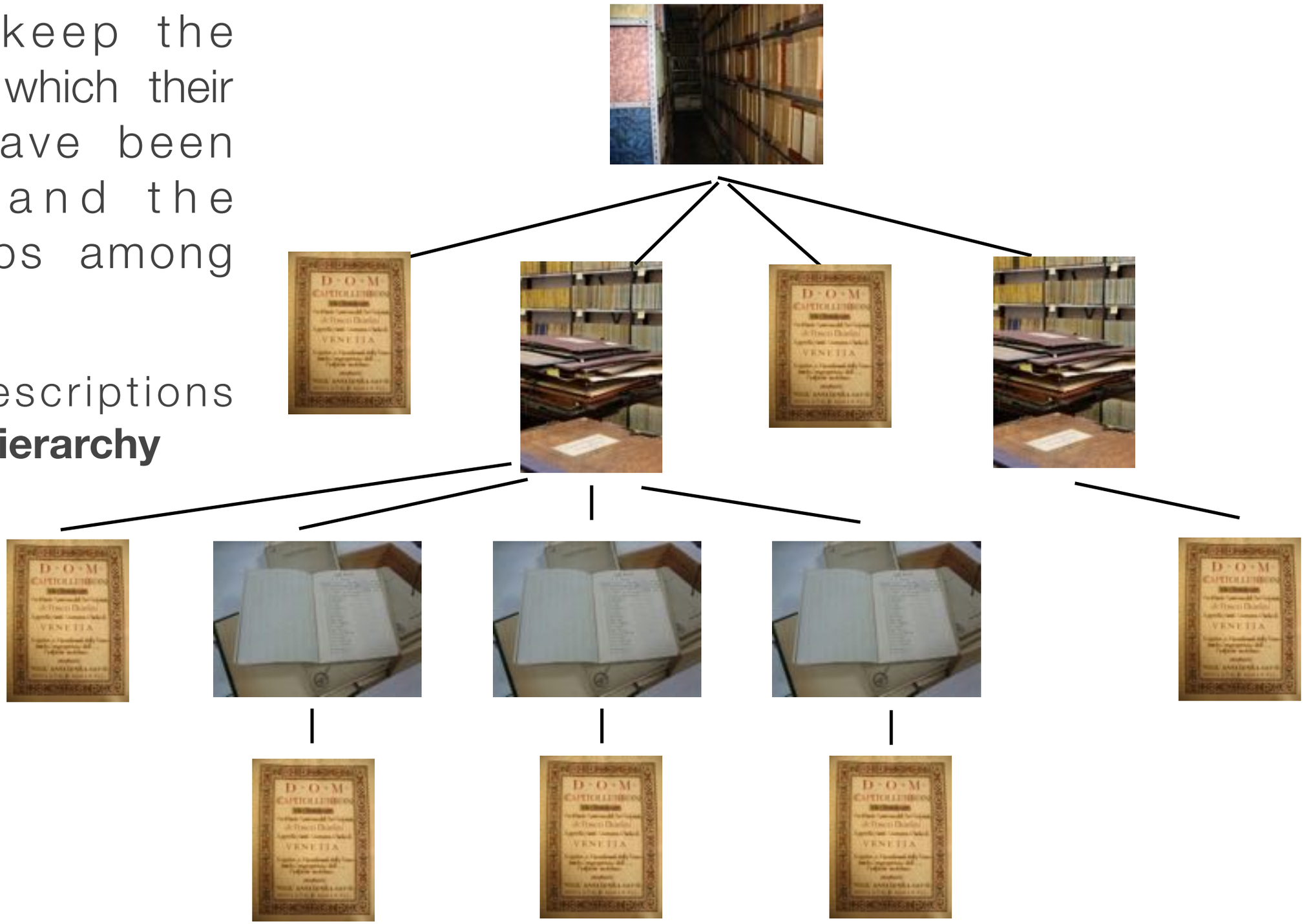


Envelops

Documents (e.g. letters, registers, testaments)

Archival Tree

- Archives keep the **context** in which their records have been created and the relationships among them
- Archival descriptions constitute a **hierarchy**



Archival Tree

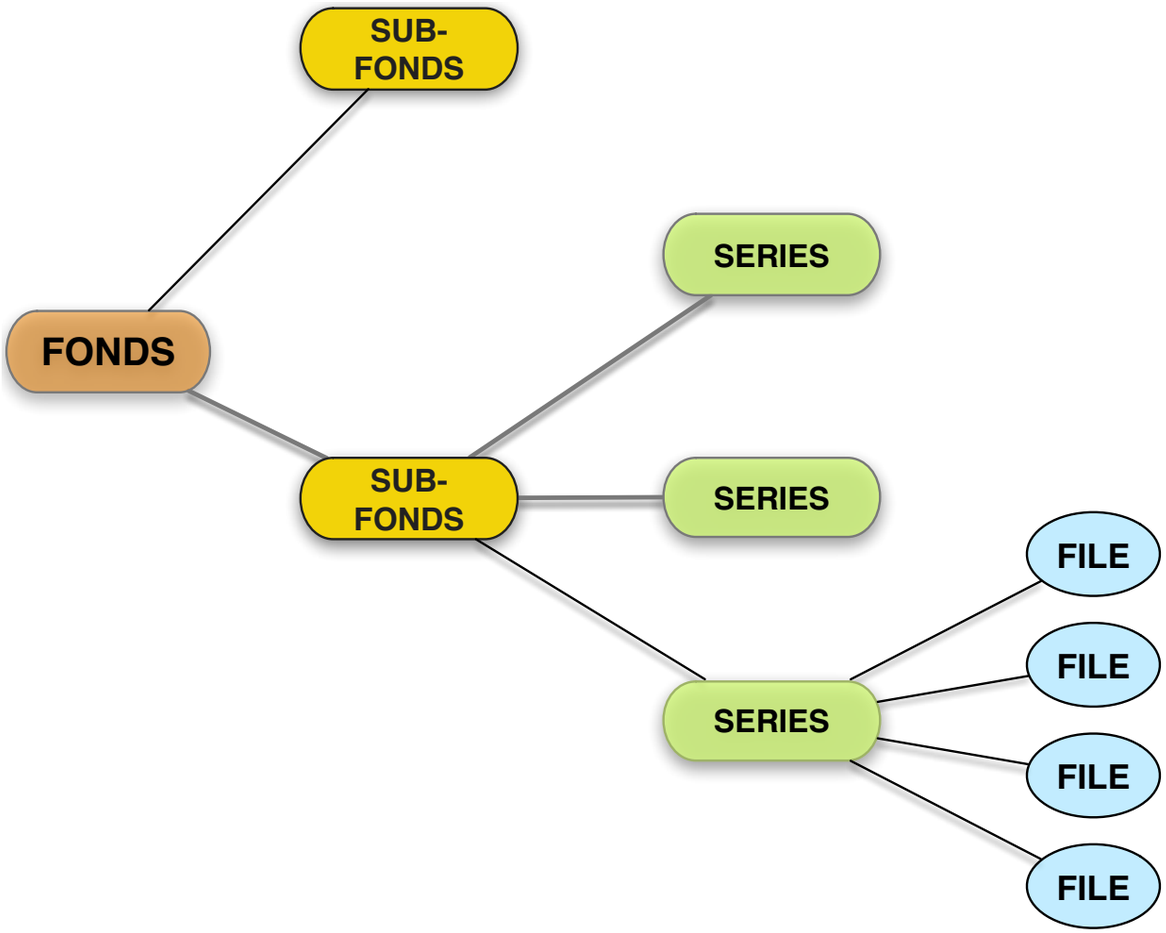
fonds

sub-fonds

series

document

Encoding of archival data: EAD



(a) Archival Tree

```
<ead>
    <eadheader>
        […]
    </eadheader>
    <archdesc level="fonds">
        […]
        <did>[…]</did>
            <dsc level="fonds">
                […]
                <c01 level="sub-fonds">
                    […]
                </c01>
                <c01 level="sub-fonds">
                    […]
                    <c02 level="series">
                        […]
                    </c02>
                    <c02 level="series">
                        […]
                    </c02>
                    <c02 level="series">
                        […]
                        <c03 level="file">
                            […]
                        </c03>
                        <c03 level="file">
                            […]
                        </c03>
                        <c03 level="file">
                            […]
                        </c03>
                        <c03 level="file">
                            […]
                        </c03>
                    </c02>
                </c01>
            </dsc>
    </archdesc>
</ead>
```

(b) EAD representation

Characteristics of EAD files

- A sigle EAD file encodes a whole archive
- “Big” XML files with deep hierarchy
- Heterogeneous use of tags across collections and within the same collection
- Often textual elements contain HTML tags
- Every element and attribute of an EAD file is a potential citable unit

EAD: Some statistics

Collection	Files	Nodes		Depth		Size (KB)		Max Fan Out	
		max	median	max	median	max	median	max	median
AH 2005	233	14,648	158	21	6	760	15	1,332	23
IISG 2005	798	52,213	513	17	9	2,290	34	2,601	21
NA 2008	1681	160,061	880.5	18	9	9,750	58	10,271	34
LoC 2014	2083	188,862	685	18	10	15,510	58	5,000	32
UniMa 2014	662	69,766	711	10	8	2,960	40	6,861	43

AH 2005: UK Archival Hub, 2005 snapshot
IISG 2005: International Institute of Social History, 2005 snapshot
NA 2008: Nationaal Archief, The Netherlands, 2008 snapshot
Loc 2014: Library of Congress, 2014 snapshot
UniMa 2014: University of Maryland, 2014snapshot

A Human-readable citation

Citable unit

```
Correspondence, 1951-1956,
```

Contextual Information (from ancestors of the citable unit)

```
"The Elements of Legal Theory" (unpublished). Books, box 135. Part II:

Writings (1905-1984), box 129-152. Huntington Cairns Papers.

Manuscript Division, Library of Congress.
```

```
http://hdl.loc.gov/loc.mss/eadmss.ms001024
```

(Persistent) Unique identifier of the EAD file

All the elements of the citations are obtained from the EAD file containing the citable unit

In general, EAD files always contain all the information required to build a citation and a citable unit alone cannot be used to create a complete citation

A machine-readable citation

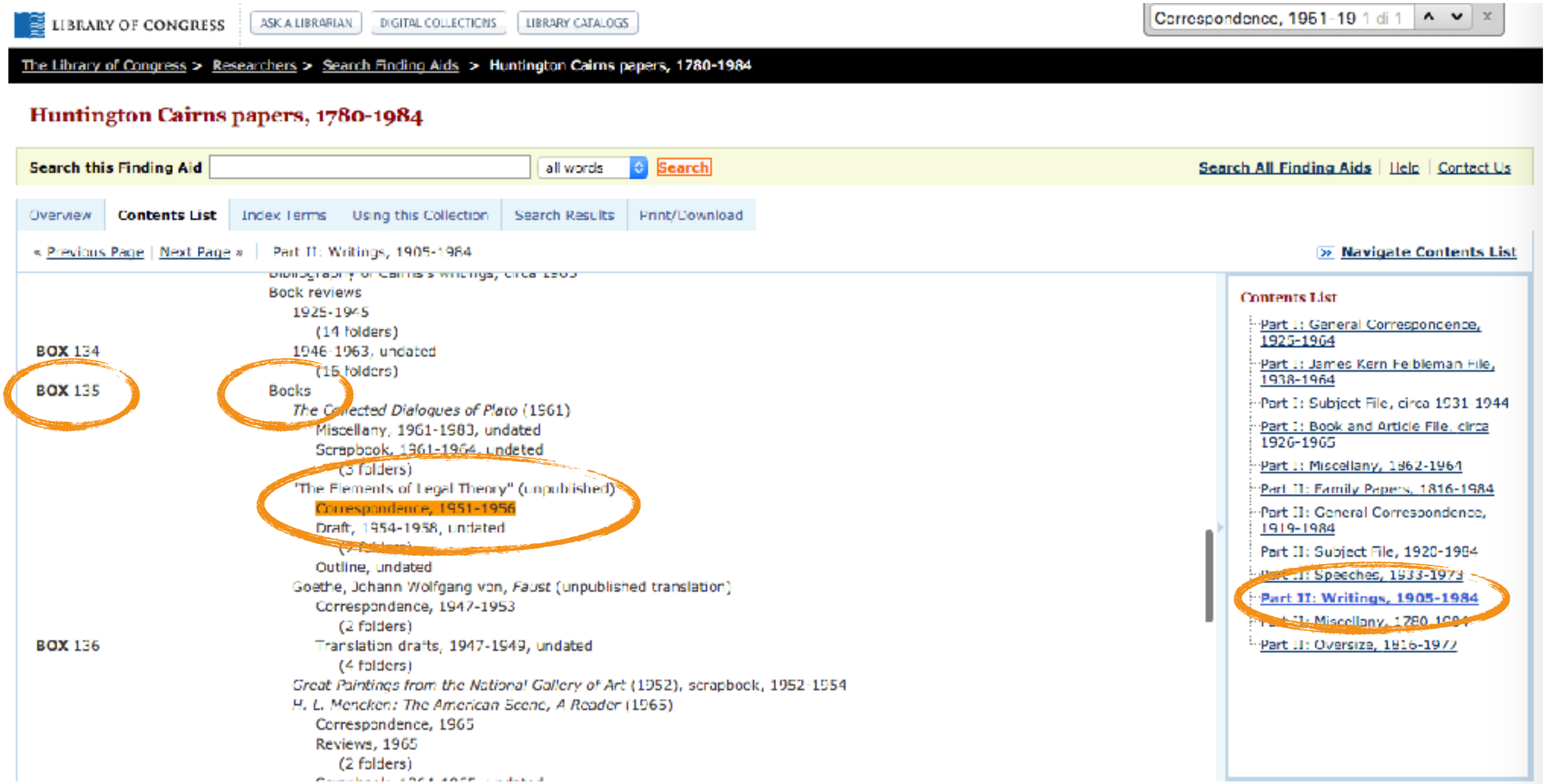
Conjunction of XPaths

```
/ead/eadheader/eadid && /ead/eadheader/filedesc/publicationstmt/publisher && /ead/
archdesc/did/unittitle && /ead/archdesc/dsc/c01[10]/did/unittitle && /ead/archdesc/
dsc/c01[10]/did/unittitle/unitdate && /ead/archdesc/dsc/c01[10]/did/container/@type
&& /ead/archdesc/dsc/c01[10]/did/container &&  /ead/archdesc/dsc/c01[10]/c02/did/
container/@type && /ead/archdesc/dsc/c01[10]/c02/did/container && /ead/archdesc/dsc/
c01[10]/c02/did/unittitle &&  /ead/archdesc/dsc/c01[10]/c02/c03[4]/did/unittitle
&& /ead/archdesc/dsc/c01[10]/c02/c03[4]/did/container/@type && /ead/archdesc/dsc/
c01[10]/c02/c03[4]/did/container &&  /ead/archdesc/dsc/c01[10]/c02/c03[4]/c04[2]/
did/unittitle && /ead/archdesc/dsc/c01[10]/c02/c03[4]/c04[2]/c05[1]/did/unittitle
```

A machine-readable citation

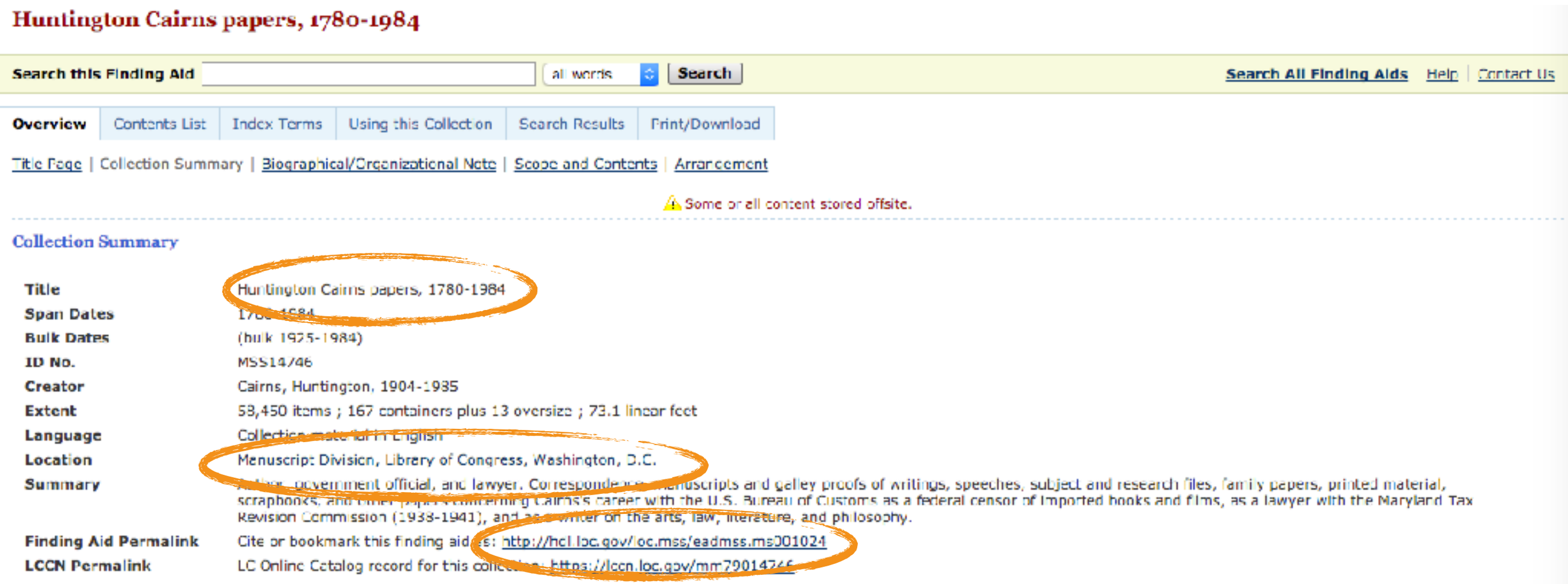
Human-Readable Citation	Machine-Readable Citation
http://hdl.loc.gov/loc.mss/eadmss.ms001024	/ead/eadheader/eadid
Manuscript Division, Library of Congress	/ead/eadheader/filedesc/publicationstmt/publisher
Huntington Cairns Papers	/ead/archdesc/did/unittitle
Part II: Writings	/ead/archdesc/dsc/c01[10]/did/unittitle
1905-1984	/ead/archdesc/dsc/c01[10]/did/unittitle/unitdate
box	/ead/archdesc/dsc/c01[10]/did/container/@type
129-152	/ead/archdesc/dsc/c01[10]/did/container
By Cairns	/ead/archdesc/dsc/c01[10]/c02[1]/did/unittitle
box	/ead/archdesc/dsc/c01[10]/c02[1]/did/container/@type
129	/ead/archdesc/dsc/c01[10]/c02[1]/did/container/
Books	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/did/unittitle
box	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/did/container/@type
135	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/did/container
"The Elements of Legal Theory" (unpublished)	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/c04[2]/did/unittitle
Correspondence, 1951-1956	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/c04[2]/c05[1]/did/unittitle

What does the user see?



Correspondence, 1951-1956,
"The Elements of Legal Theory" (unpublished). Books, box 135. Part II: Writings (1905-1984), box 129-152. Huntington Cairns Papers.
Manuscript Division, Library of Congress.
http://hdl.loc.gov/loc.mss/eadmss.ms001024

What does the user see?




```
Correspondence, 1951-1956,
"The Elements of Legal Theory" (unpublished). Books, box 135. Part II: Writings
(1905-1984), box 129-152. Huntington Cairns Papers.
Manuscript Division, Library of Congress.
http://hdl.loc.gov/loc.mss/eadmss.ms001024
```

Generation of citations: The problem

Given:

data

```
/ead/archdesc/dsc/c01[10]/
c02/c03[4]/c04[2]/c05[1]/
did/unittitle
```

Query: XPath

Dataset: EAD file

generate

citation

Human-Readable Citation	Machine-Readable Citation
http://hdl.loc.gov/loc.mss/eadmss.ms001024	/ead/eadheader/eadid
Manuscript Division, Library of Congress	/ead/eadheader/filedesc/publicationstmt/publisher
Huntington Cairns Papers	/ead/archdesc/did/unittitle
Part II: Writings	/ead/archdesc/dsc/c01[10]/did/unittitle
1905-1984	/ead/archdesc/dsc/c01[10]/did/unittitle/unitdate
box	/ead/archdesc/dsc/c01[10]/did/container/@type
129-152	/ead/archdesc/dsc/c01[10]/did/container
By Cairns	/ead/archdesc/dsc/c01[10]/c02[1]/did/unittitle
box	/ead/archdesc/dsc/c01[10]/c02[1]/did/container/@type
129	/ead/archdesc/dsc/c01[10]/c02[1]/did/container/
Books	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/did/unittitle
box	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/did/container/@type
135	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/did/container
"The Elements of Legal Theory" (unpublished)	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/c04[2]/did/unittitle
Correspondence, 1951-1956	/ead/archdesc/dsc/c01[10]/c02[1]/c03[4]/c04[2]/c05[1]/did/unittitle

Learning to cite framework

Check JASIST2017a

Learning to cite framework

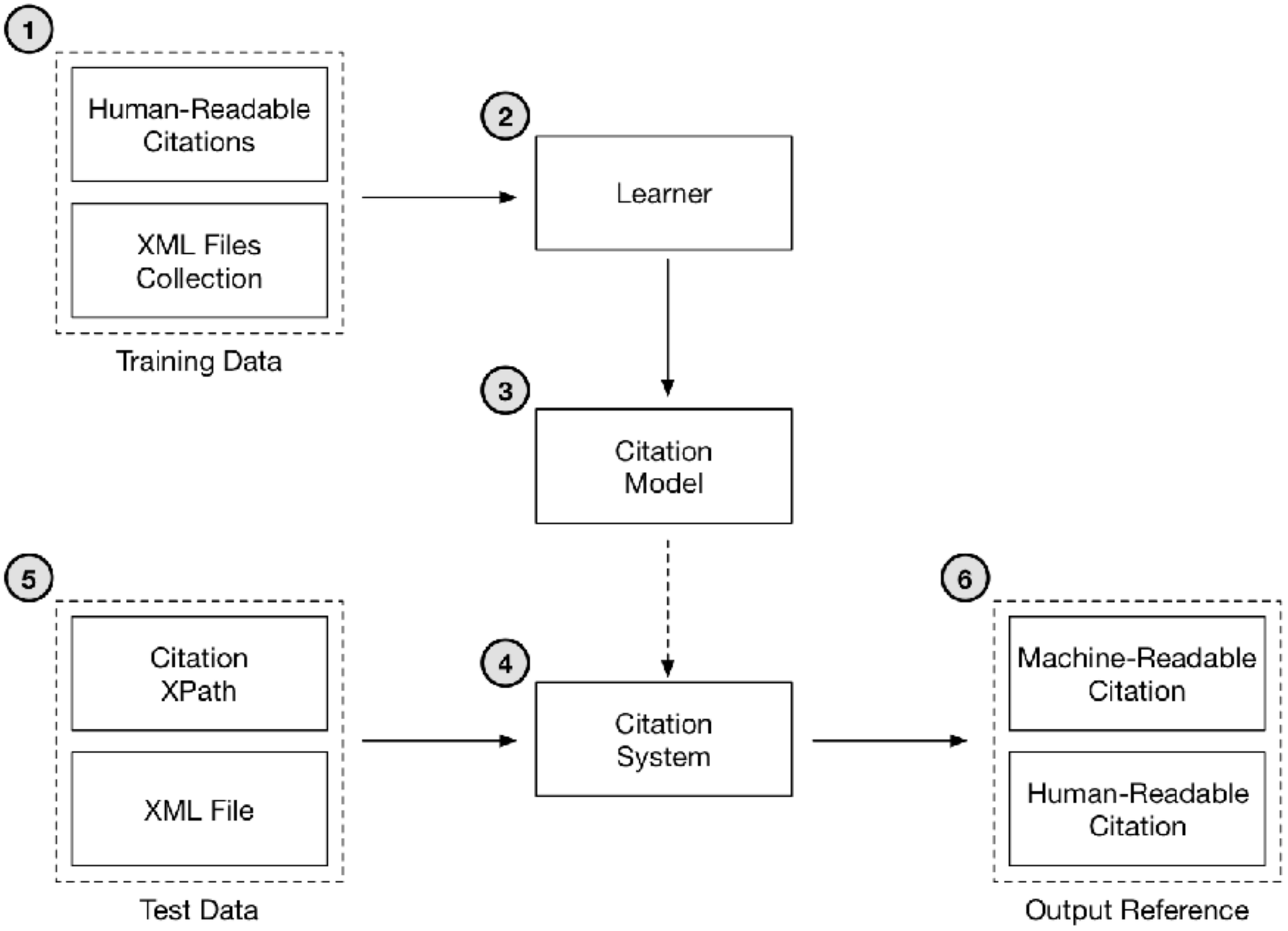
- The idea is to employ a machine learning approach for the generation of citations

- Learn from some sample data (human-readable citations), get a citation model out of it, and generate citations

- Require low effort (and resources) to data creators and curators

- Handle data heterogeneity

Learning to cite framework

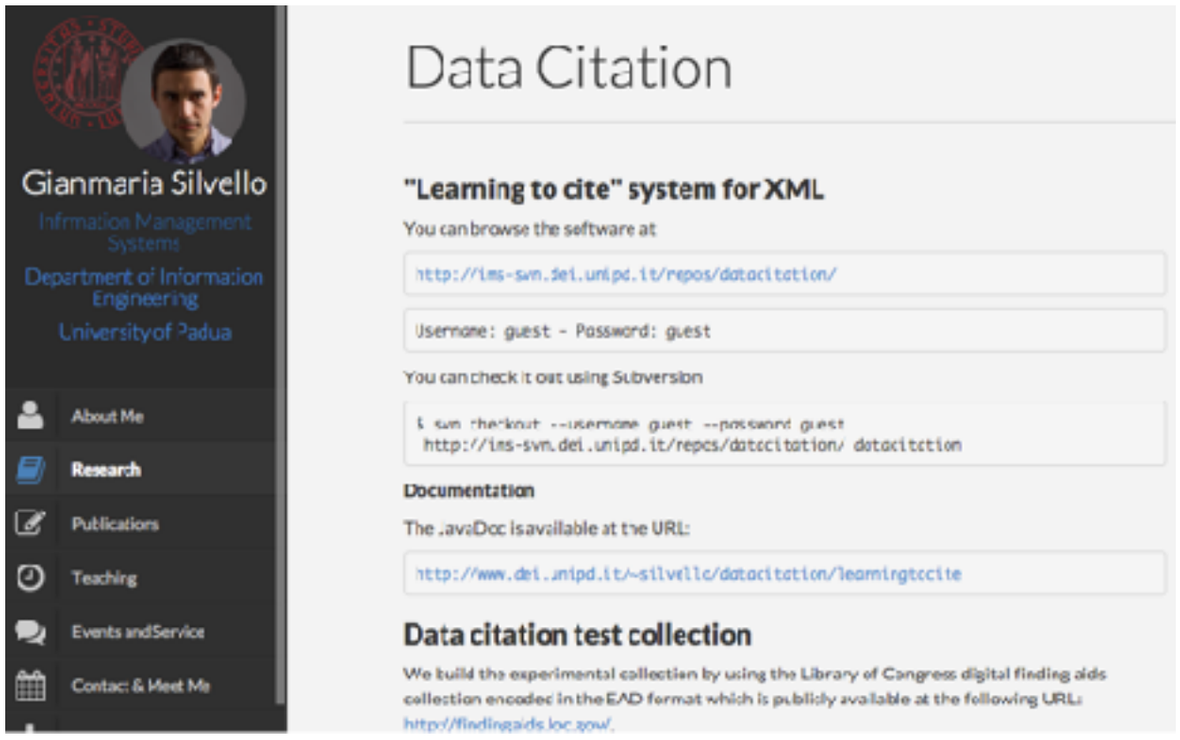


System implementation and data

- The citation system is open-source and implemented in Java (Maven project) as well as the code for the experiments

- The training data, test data and the ground truth are openly available

- http://www.dei.unipd.it/~silvello/datacitation/



Citing Relational DB Using Views

Application: IUPHAR/BPS

Check CIDR2017 + PODS2017

Joint work with Susan Davidson, Daniel Deutch and Tova Milo

Some slides are taken from Davidson's presentation @PODS2017 and Silvello's presentation @SEBD2017

G. Silvello - Automatically generating citation text from queries

The citation generation problem

- It is common for database owners to supply citations for some parts (**views**) of the database, $V_1 \ldots V_n$. .

- So the problem becomes: Given a query Q, can it be rewritten using the views? That is, is there a Q_i such that

- $$\forall D \in S.\ Q(D) = Q_i(V_{i1}(D), \ldots, V_{ik}(D))$$

- If so, the citations for $V_{i1} \ldots, V_{ik}$ could be used to create a citation for Q.

Answering queries using views

- The problem of answering queries using views has been well studied and is generally hard – but in our context may be tractable.

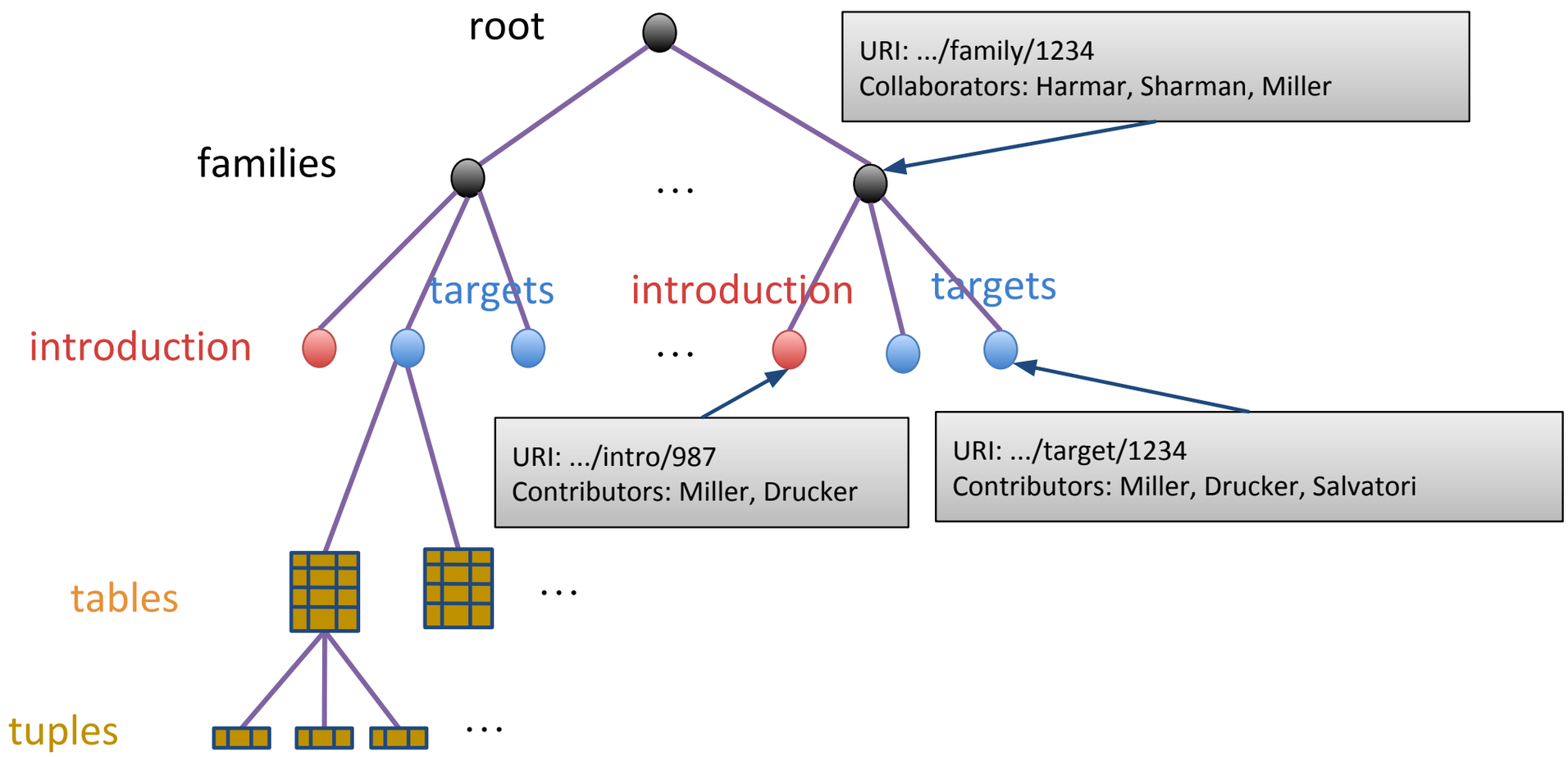
  - A. Halevy. Answering queries using views: A survey. *VLDB J.*, 10(4):270–294, 2001.

  - Lenzerini. Data Integration: A Theoretical Perspective: *PODS*, 2002.

  - A. Deutsch, L. Popa, and V. Tannen. Query reformulation with constraints. *SIGMOD Record*, 35(1):65–73, 2006.

  - F. Afrati, C. Li and J. Ullman. Using views to generate efficient evaluation plans for queries. *JCSS* 73(5): 703 - 724, 2007.

“Parameterized” Views



Taken from Davidson’s presentation @PODS2017

Effect of parameters

Family

FID	FName	Type
1	Glucagen receptor…	GPCR
2	CLR (calcitonin receptor-like receptor)	GPCR
3	Peptidases and proteinases…	Kinase
4	A multifunctional molecule,	Kinase
5	Chromatin modifying enzymes…	Kinase

λF. V1(F, N,Ty) :- Family(F, N, Ty)

"Instantiated views": V1(F, N, Ty)(1), V1(F, N, Ty)(2),…, V1(F, N, Ty)(5)

Taken from Davidson's presentation @PODS2017

Effect of parameters

Family

FID	FName	Type
1	Glucagen receptor…	GPCR
2	CLR (calcitonin receptor-like receptor)	GPCR
3	Peptidases and proteinases…	Kinase
4	A multifunctional molecule,	Kinase
5	Chromatin modifying enzymes…	Kinase

V4(F, N,Ty) :- Family(F, N, Ty)

Taken from Davidson's presentation @PODS2017

Citation views

- To specify a citation, there are three components:
  - **View definition**: specifies what is being cited
  - **Citation query**: specifies what snippets of information to include in the citation
  - **Citation function**: specifies how to construct the citation from the snippets of information
- We call this triple a **citation view**.
- For now, we will focus on the view definition, which is expressed in Datalog.

One simple example

IUPHAR: Citation views

Schema:

Family(<u>FID</u>, FName, Type)
FamilyIntro(<u>FID</u>, Text)
Person(<u>PID</u>, PName, Affiliation)
FC(<u>FID</u>, <u>PID</u>) FIC (<u>FID</u>, <u>PID</u>)

View definitions:

λF. V1(F, N,Ty) :- Family(F, N, Ty)
λF. V2(F, Tx) :- FamilyIntro(F, Tx)

Citation queries:

λF. C_{V1}(F, PN) :- Family(F, N, Ty), FC(F, P), Person(P, PN)
λF. C_{V2}(F, PN) :- FamilyIntro(F, Tx), FIC(F, P), Person(P, PN)

Taken from Davidson's presentation @PODS2017

Generating citations

- If the query matches a view definition, we can use the associated citation query and function.
  - “Match” must be extended to take parameters into account.

- But what if it doesn’t?
  - Nothing matches the query
  - A set of view definitions are used to rewrite the query
  - More than one set of view definitions can be used to rewrite the query

Taken from Davidson’s presentation @PODS2017

What is a “good” citation?

- Contains appropriate snippets of information

- Allows the data as it appeared at time of citation to be retrieved

- Concise

- Specific

- Our approach enables the DBA to specify the tradeoff between conciseness and specificity.

IUPHAR: Generating the citation (1)

- A query is another Datalog expression (unparameterized).

Schema:

Family(<u>FID</u>, FName, Type)
FamilyIntro(<u>FID</u>, Text)

View definitions:

λF. V1(F, N,Ty) :- Family(F, N, Ty)
λF. V2(F, Tx) :- FamilyIntro(F, Tx)

- This can be rewritten using V1

$Q_1(F, N, Ty) :- Family(F, N, Ty), F= 1$

- We can then construct a citation to Q in terms of the citation for V1(F, N, Ty)("1").

$Q_1'(F, N, Ty) :- V1(F, N, Ty)(1)$

Taken from Davidson's presentation @PODS2017

Citation views as annotation

- Citation views are a type of annotation on tuples.

- Provenance is a form of annotation on tuples, which is well understood while being carried through queries.
  - Green, Karvounarakis, Tannen: Provenance Semirings, PODS 2007: 31-40.
  - **Joint use**: joins of tuples
  - **Alternate use**: unions and projections of tuples

- Can we use these ideas to understand how citation “annotations” on tuples are combined in general queries?

Taken from Davidson’s presentation @PODS2017

Citation “semiring”?

- Given a (conjunctive) query, we rewrite it to a set of minimal equivalent queries that contain at least one citation view.
  - Let the set of queries obtained in this way be $\{Q_1, \ldots, Q_n\}$

- Each Q_i contains a set of citation views $\{V_{i1}, \ldots, V_{imi}\}$. The **joint** use (*) of their citations constructs a citation for Q_i, $C(Q_i)$.
  - $$C(Q_i) = C(V_{i1})*\ldots*C(V_{imi})$$

- The **alternate** use (+) of each $C(Q_i)$ constructs a citation for Q, C(Q).
  - $$C(Q) = C(Q_1)+ \ldots + C(Q_n)$$

“Model for Fine-Grained Data Citation”, CIDR 2017
S. Davidson, D. Deutch, T. Milo, and G. Silvelllo.

Interpreting * and +I

- **Joint** use of citations: $C(V_{i1})*...*C(V_{imi})$
  - * could be union or some sort of join
  - E.g. in example 4, VI and V2 were jointly used: V1(F,N, Ty) ("F123")*V2(F, Tx)("F123")

- **Alternate** use of citations: $C(Q_1)+ ... + C(Q_n)$
  - + could be union or min (wrt some ordering on views)
    - E.g. in example 3, both the parameterized and unparameterized views on Family matched (V1(F, N, Ty)(1), V1(F, N, Ty)(2), …, V1(F, N, Ty)(5)) + V4

- **Joint and alternate use are "policies" specified by the DBA**

Taken from Davidson's presentation @PODS2017

Example of output citation

View definition:

λF. V1(F, N,Ty) :- Family(F, N, Ty)

Citation query:

λF. C_{V1}(F, PN) :- Family(F, N, Ty), FC(F, P), Person(P, PN)

Q_1(F, N, Ty):- Family(F, N, Ty), F= 1

Q_1'(F, N, Ty):- V1(F, N, Ty)(1)

FID	FName	Type
1	Glucagen …	GPCR

Citation:

Miller, Drucker, Bataille, Chan, Delagrange, Göke, Mayo, Thorens, Hills.
Glucagon receptor family.
Accessed on 08/05/2017.
IUPHAR/BPS Guide to PHARMACOLOGY,
Family(F, N, Ty), F= 1

Taken from Davidson's presentation @PODS2017

Example, with * as "join"

View definitions:

λF. V1(F, N,Ty) :- Family(F, N, Ty)

λF. V2(F, Tx) :- FamilyIntro(F, Tx)

Citation queries:

λF. C_{V1}(F, PN) :- Family(F, N, Ty), FC(F, P), Person(P, PN)

λF. C_{V2}(F, PN) :- FamilyIntro(F, Tx),FIC(F, P), Person(P, PN)

Q_1(F, N, Ty, Tx):- Family(F, N, Ty), FamilyIntro(F, Tx), F= 1

Q_1'(F, N, Ty, Tx):- V1(F, N, Ty)(1), V2(F, Tx)(1)

FID	FName	Type	Text
1	Glucagen …	GPCR	Glucagon regulates …

Citation:

Miller, Drucker, Bataille, Chan, Delagrange, Göke, Mayo, Thorens, Hills. Glucagon receptor family, introduction.

Miller, Drucker, Bataille, Chan, Delagrange, Göke, Mayo, Thorens, Hills. Glucagon receptor family.

Accessed on 08/05/2017. IUPHAR/BPS Guide to PHARMACOLOGY, Family(F, N, Ty), FamilyIntro(F, Tx), F= 1

Taken from Davidson's presentation @PODS2017

The big picture

- **Database owners** need to be able to specify citation views for the database – schema level information.

- **Database users** (“authors”) need to have citations “served up” as they extract data through queries.

- **Dereferencing** the citation should bring back the data to “readers” as of the time it was cited.

Computational challenges

- Schema-level versus instance level?
  - Should we store the citations as annotations on tuples, or should we reason at the schema level and then calculate the citation?
- Given an expected query workload, what are the “best” citation views?
  - And are the necessary snippets of citation information in the schema?
- The number of alternative uses of citation views can be large.
  - Are there efficient algorithms to find the “best” according to some metric of quality (e.g. involving the number of views, the specificity of views, or related to a view hierarchy)?

Final remarks

- In general, the automatic generation of citation snippet is overlooked by many scientific databases

- Automatic generation of citation text is a key aspect of data citation

- Citation systems need to be customised for specific domains

- We are looking for interesting and challenging datasets to work with (new domains, requirements, users, …)

References

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ANY
QUESTIONS
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