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Simple Visualization of Structures of Interrelated Concepts in the FRBRoo Ontology

Krzysztof Sielski, Marcin Werla

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Foreword: the Knowledge Base

Part of the SYNAT project financed by the National Center for Research and Development in Poland*

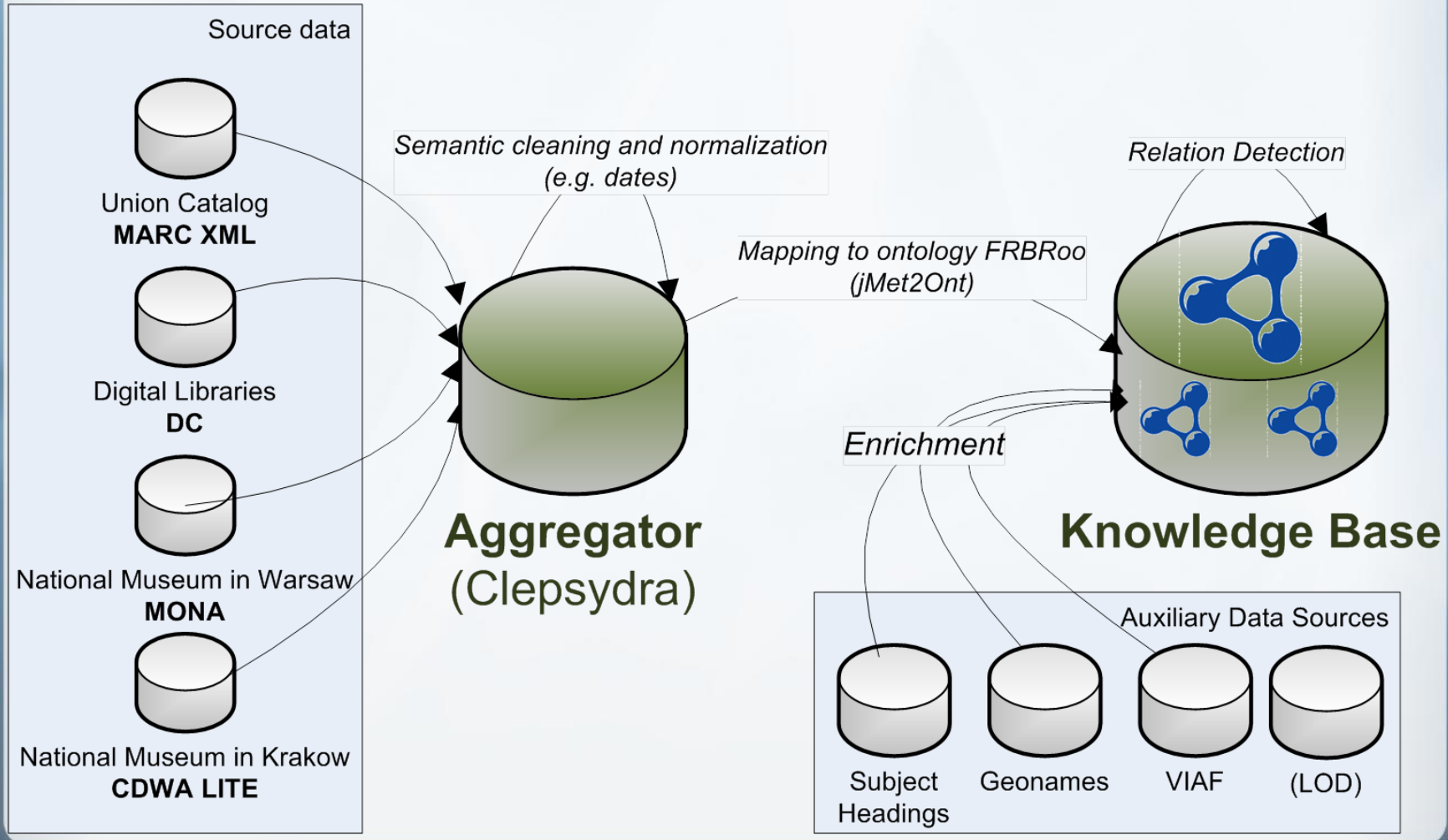
Aim:

Integrate data from heterogeneous sources such as:

- digital libraries and museums,
- bibliographic union catalogues,
- inventory databases,
- archives

* *(grant no SP/I/1/77065/10, funding period: 2010 –2013)*

Foreword: the Knowledge Base



Knowledge Base statistics

- Over 3,100,000 cultural heritage objects
- 535,602,864 RDF triples (including 234,530,568 explicit)
- 60,644,249 instances of FRBRoo concepts (URIs + bnodes):
  - 3,133,629 works,
  - 1,717,455 persons,
  - 507,907 legal bodies,
  - 890,252 subject headings
- RDF database engine: Owlim SE

Entailment rules

Very reduced rule set, e.g. no full type materialisation because of complex type hierarchy in FRBRoo

- e.g. `efrbroo:F24_Publication_Expression` is a subclass of 12 other FRBRoo classes + `owl:Thing` + `rdfs:Resource` + 13 instances of `owl:Restriction` (in implementation by Erlangen) = 27 classes

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- We can query for abstract classes in SPARQL simply by using `a/rdfs:subClassOf`

```
PREFIX rdfs:<http://www.w3.org/2000/01/rdf-schema#>
PREFIX ecrm:<http://erlangen-crm.org/current/>

SELECT * {
    ?actors a/rdfs:subClassOf ecrm:E39_Actor
}
```

`P14.1_in_the_role_of` problem

- property of a property instance in RDF/OWL ?
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P14.1_in_the_role_of problem

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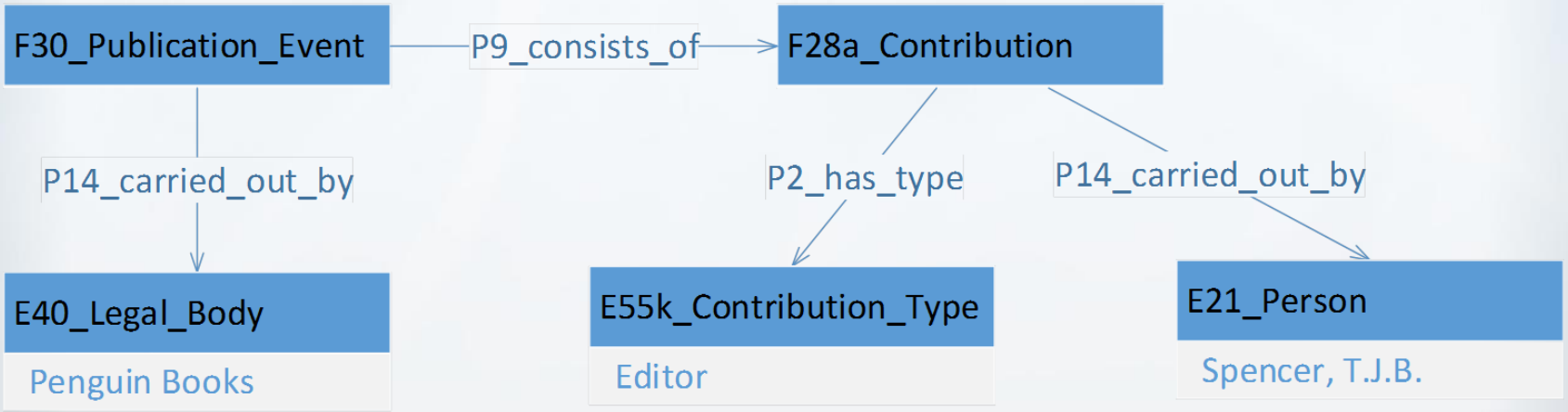
- No implementation of such property in ECRM
- Our workaround by introducing a new class: `F28a_Contribution` – a subclass of `F28_Expression_Creation`

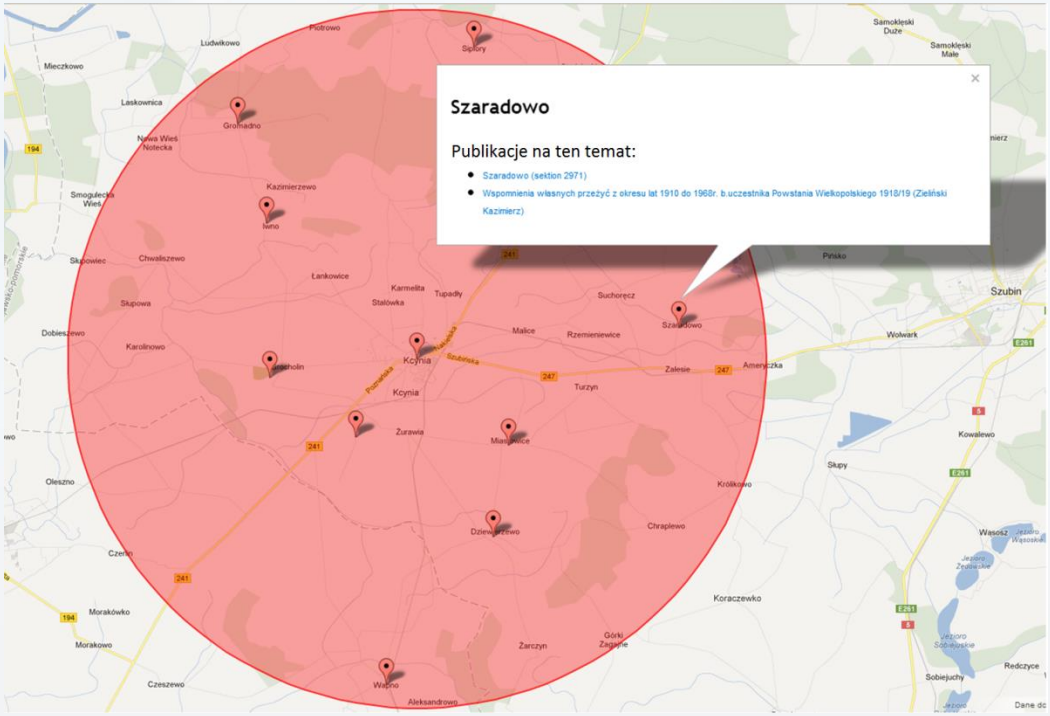


Explore the Knowledge Base contents (1)

- a raw SPARQL endpoint, which is aimed at expert users who know the ontology very well and have precisely defined goals

Explore the Knowledge Base contents (2)

- a geographical search application, which allows user to select an area on a map to find all objects connected with places contained in that area (e.g. all publications whose subject is a particular city)



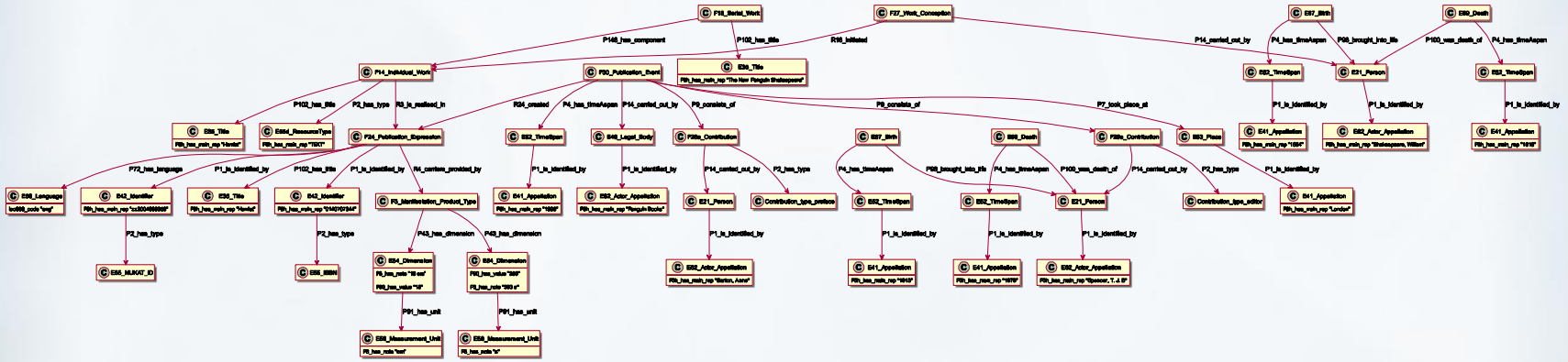
Explore the Knowledge Base contents (3)

- a full text search application, which searches for keywords provided by user in RDF literals from the triplestore and uses the Query Processing Module (QPM) which maps on-the-fly information represented in the FRBRoo ontology to a simplified model, consisting of a small number of concepts: works, items, persons, places, legal bodies, and subjects

Explore the Knowledge Base contents (4)

- an application to explore semantic database with dynamically fetched portions of data describing particular object (RDF Units), which are presented as FRBRoo concepts in a legible way understandable by non-experts.
- RDF Units are graphs which consist of several ontology objects of different classes that are needed to provide all the essential information about a certain resource. For example, an RDF Unit for a particular instance of Publication Expression from the Knowledge Base would include objects representing its Title, Publication Event and Place of Publishing, but not geographical coordinates of that place

Explore the Knowledge Base contents



RDF Unit simplification rules

[E21_Person] *P100_i_died_in* [E69_Death]
P4_has_time_span [E52_Time-Span]
P1_is_identified_by [?]
→ *date of death*

[F18_Serial_Work] *P148_has_component* [F14_Individual_Work]
→ *series element*

[?] *P9_consists_of* [F28a_Contribution]
P14_carried_out_by [?]
→ *contributor*

[?] *P9_consists_of* [F28a_Contribution]
P2_has_type [?]
→ *in the role of*

[?] – stands for any class

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APPLICATION DEMO

Poznań Supercomputing and Networking Center
affiliated to the Institute of Bioorganic Chemistry of the Polish Academy of Sciences,
ul. Noskowskiego 12/14, 61-704 Poznań, POLAND,
Office: phone center: (+48 61) 858-20-00,
fax: (+48 61) 852-59-54,
e-mail: office@man.poznan.pl, http://www.man.poznan.pl