Semantic interoperability in XBRL reports via collaborative ontology mappings and Linked Data principles

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- **Introduction**

- **Challenge**

- **Proposal**

- **Methodology**

- **Conclusion**

- To ensure that public services address societal needs, **society** should be involved on the **co-creation** process of such data driven public services.


- How to uniquely/uniformly identify a particular resource?
- How to represent the knowledge on such ecosystem?
- How to align such knowledge from different open data silos?

- ## Open Data Deployment Scheme
  1. Available on the web, whatever format, open licence
  2. Machine readable (text instead of scanned pdf)
  3. Non-proprietary format (CSV instead of Excel)
  4. Use W3C standards (RDF, SPARQL)
  5. Link to external datasets
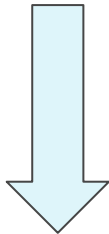
  - ## Linked Data Principles
    1. Use URI's as names for things
    2. Use HTTP URI's so that people can look up those names
    3. Provide REST-ful information using standards (RDF, SPARQL)
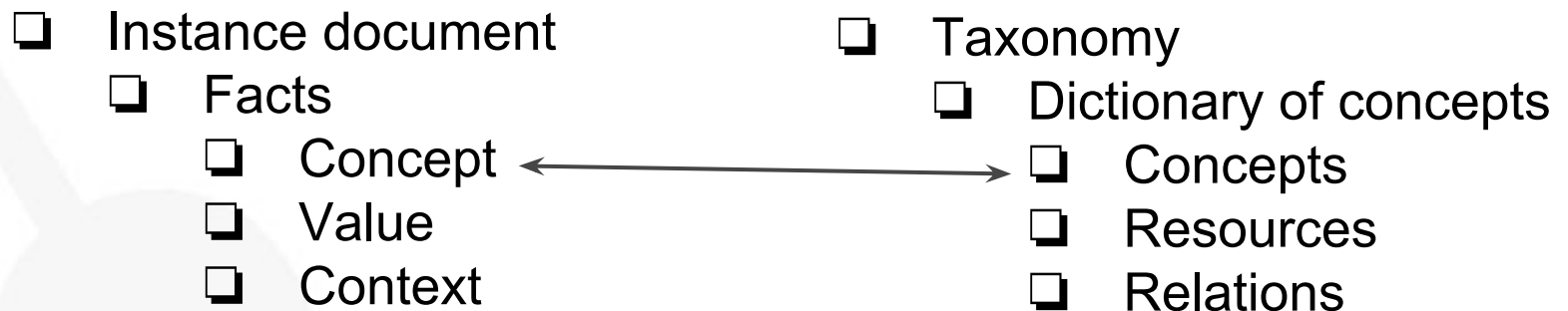   4. Include links to other URIs

http://mappingpedia.linkeddata.es/
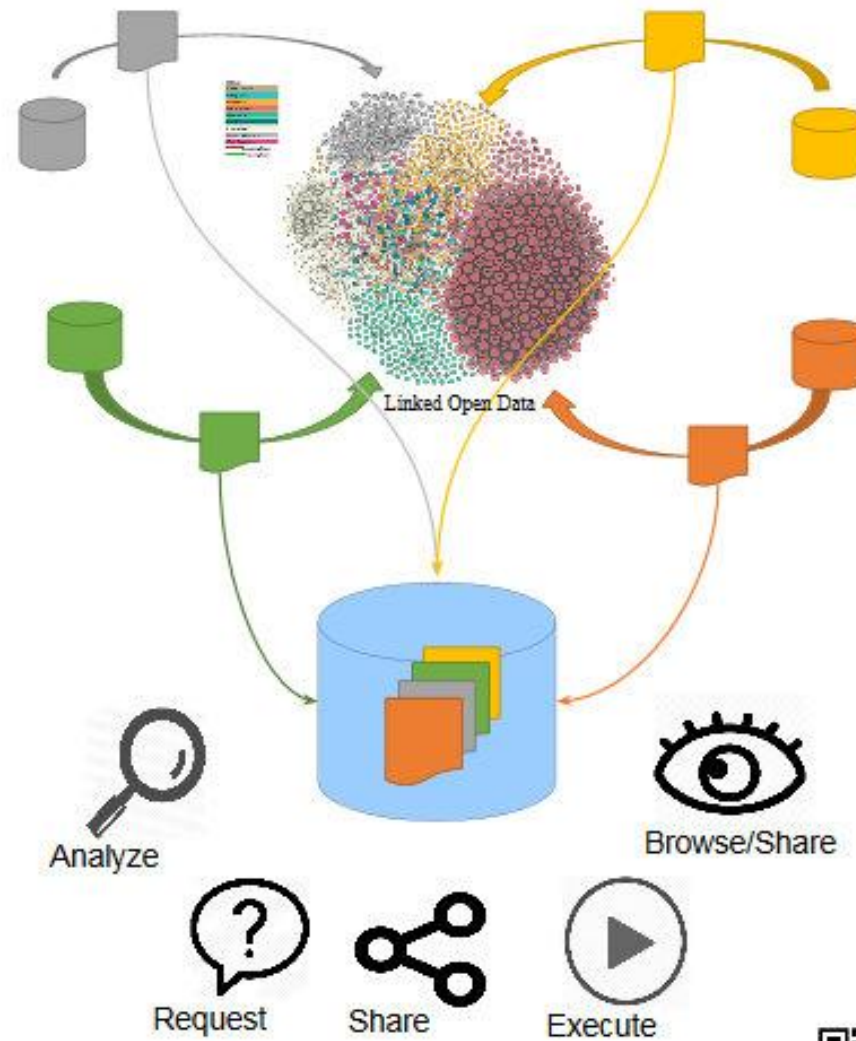
e**X**tensible **B**usiness **R**eport **L**anguage

- Standard way to communicate business and financial information

- Defined by meta-data set out in taxonomies which capture the definition of individual reporting concepts and the relationships between them

❏ Instance document
  ❏ Facts
    ❏ Concept
    ❏ Value
    ❏ Context

❏ Taxonomy
  ❏ Dictionary of concepts
    ❏ Concepts
    ❏ Resources
    ❏ Relations

The Semantic Interoperability

a. Lack of alignment between different taxonomies t in XBRL documents:

D(t_1, i)   **D'(t_2, j)**
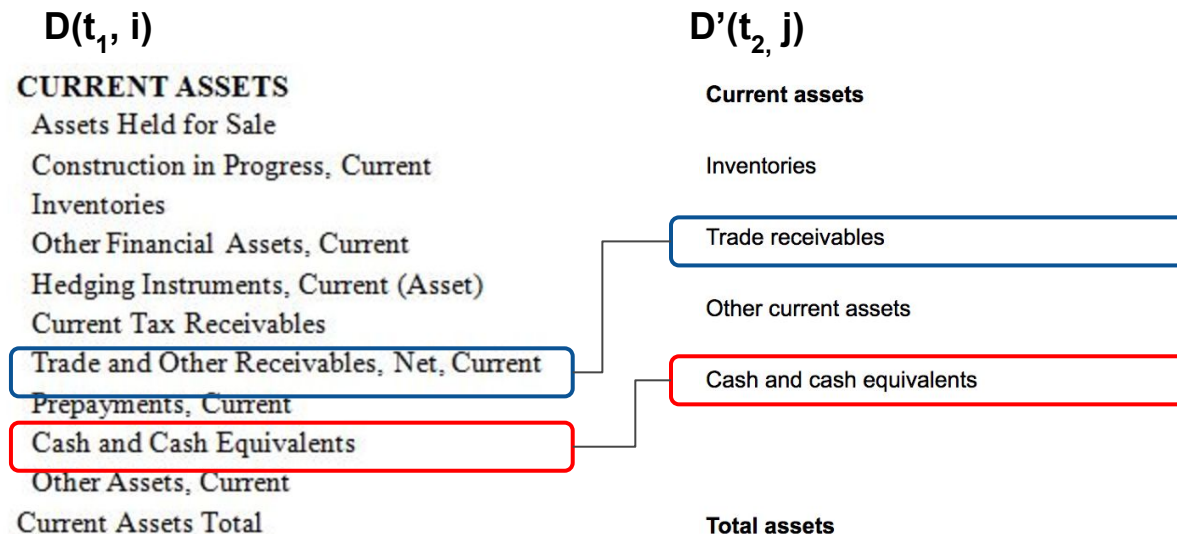
b. Lack of Unique identifiers for Documents and elements in Documents:

- Datasets
  - Input: XBRL Documents (Taxonomies + Instances)
  - Output: 5* RDF Datasets (Ontologies + Instances)
- Ontology
  - FIBO-based reference ontology
    - https://www.edmcouncil.org/financialbusiness
  - Financial Regulation Ontology (FRO)
    - http://finregont.com/
- Mappings
  - MappingPedia: Collaborative mapping approach

FIBO

1
XSD2OWL
Topbraid
XSD import

o

3
Mapping
Pedia

m

t

2
XSLT

i_o

4
Ontology
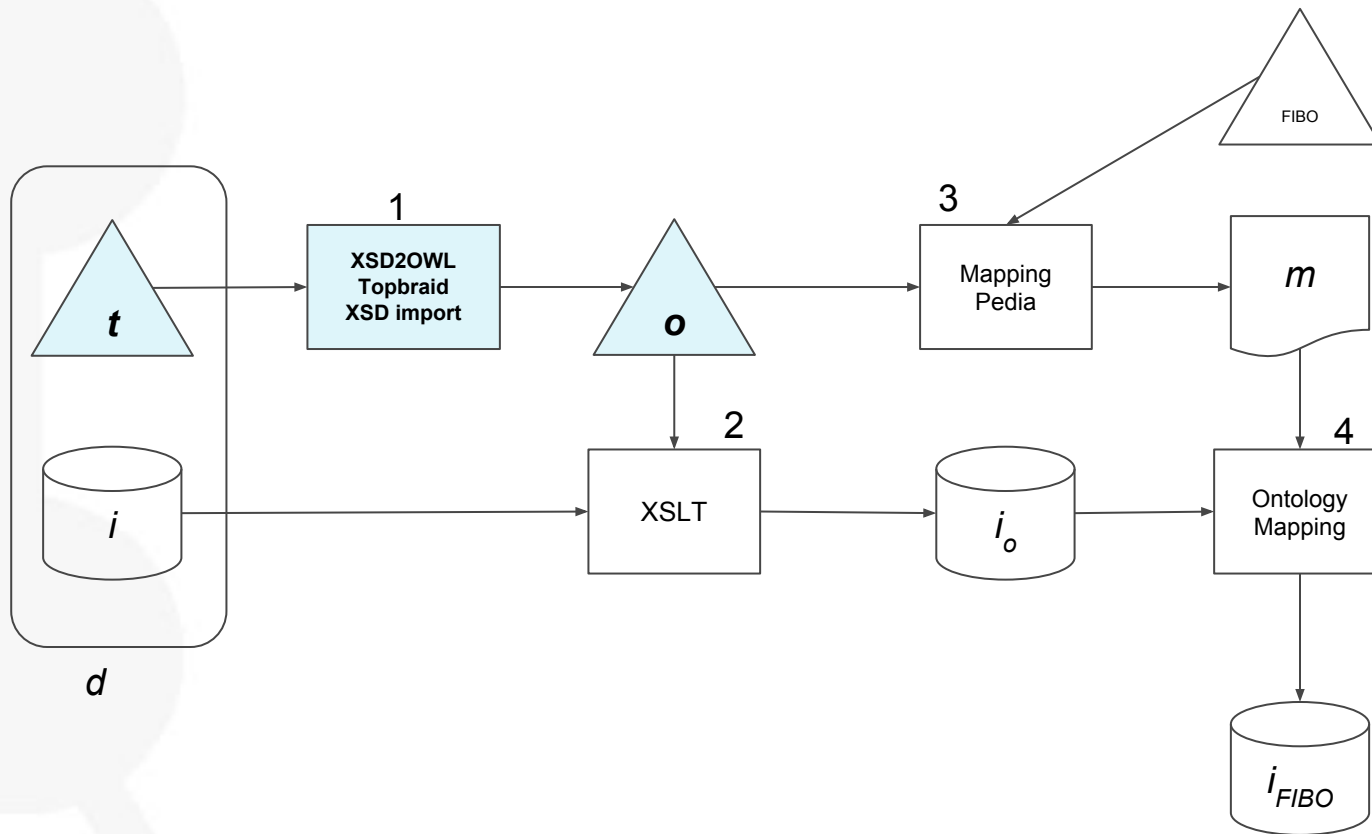Mapping

i

d

i_{FIBO}
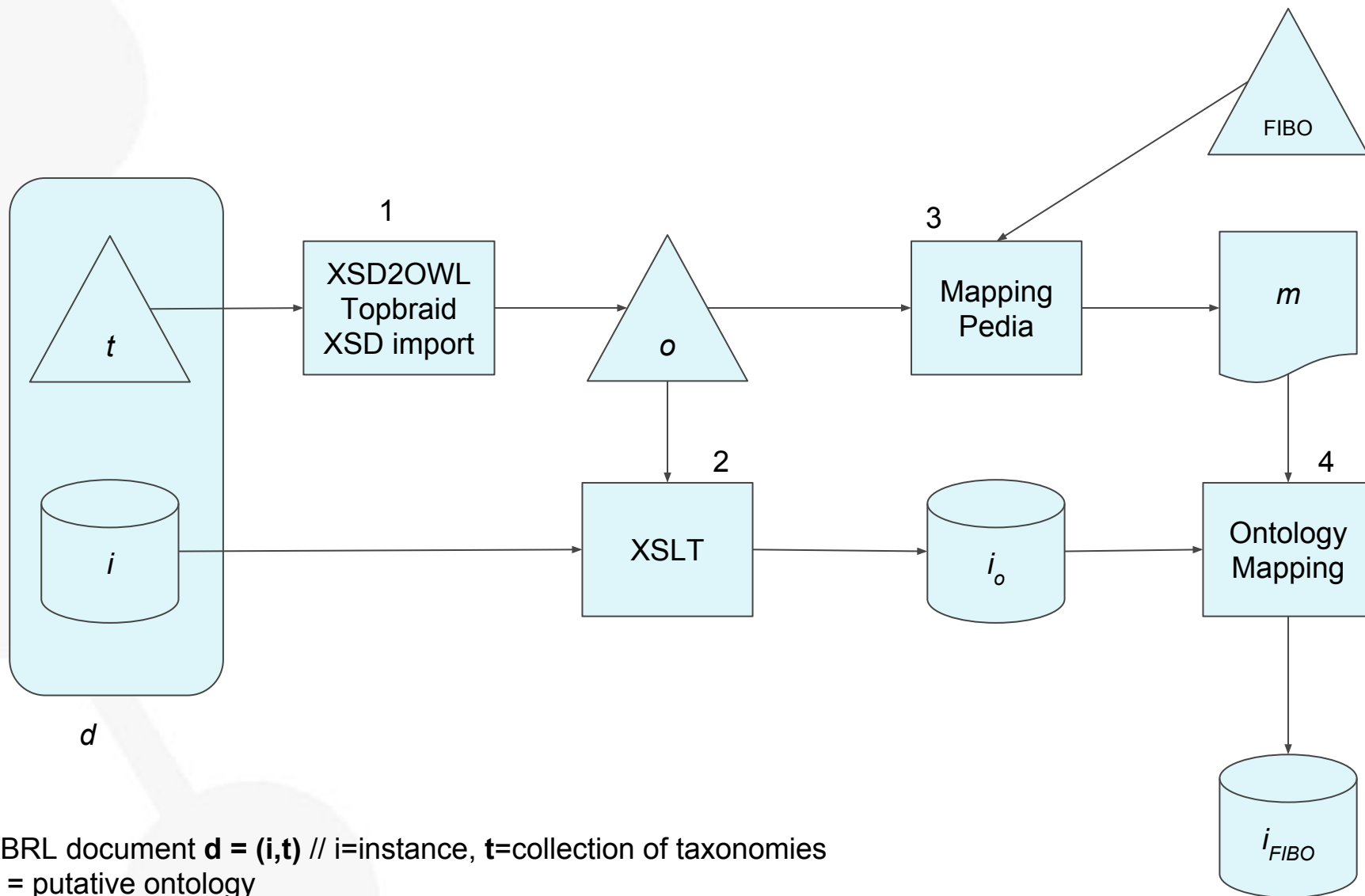
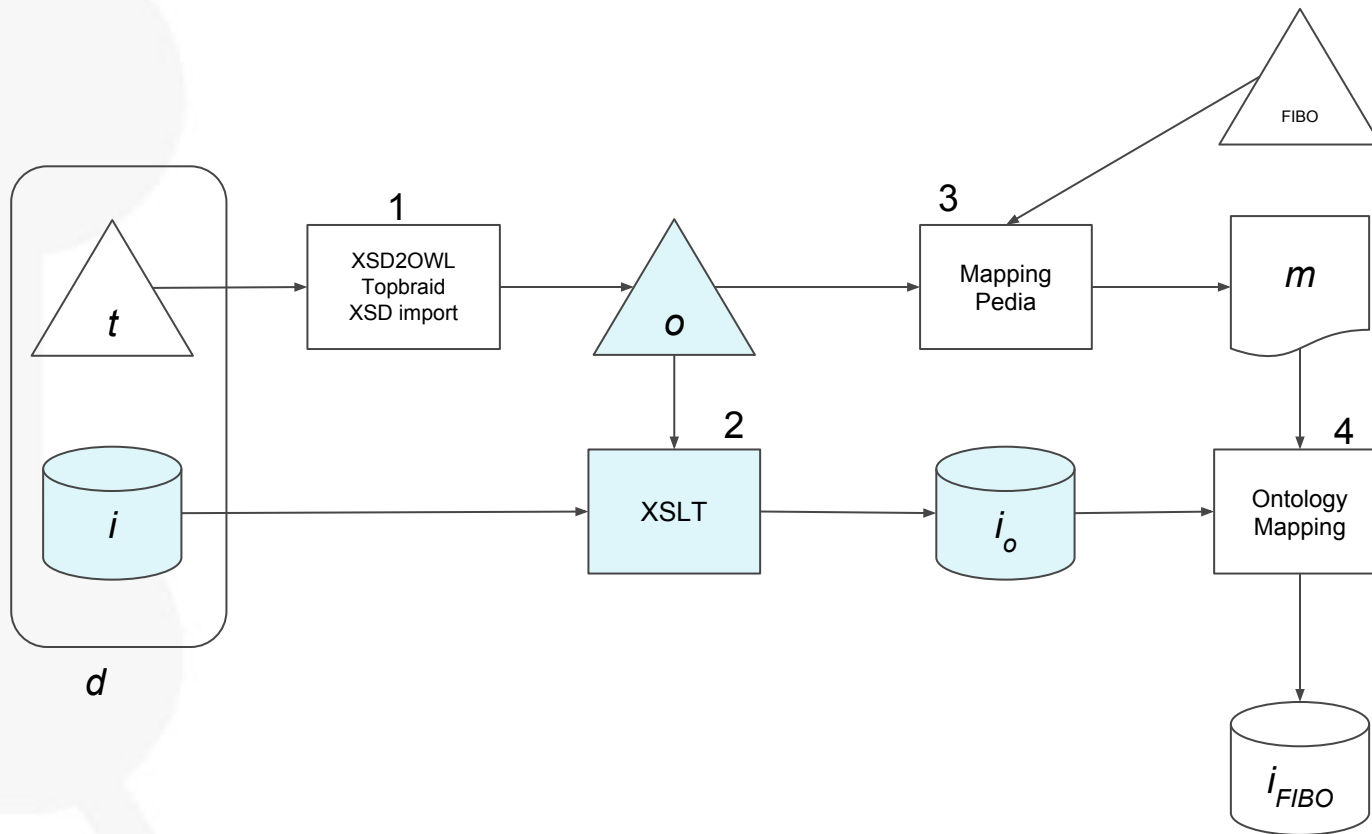XBRL document **d = (i,t)** // i=instance, **t**=collection of taxonomies
o = putative ontology
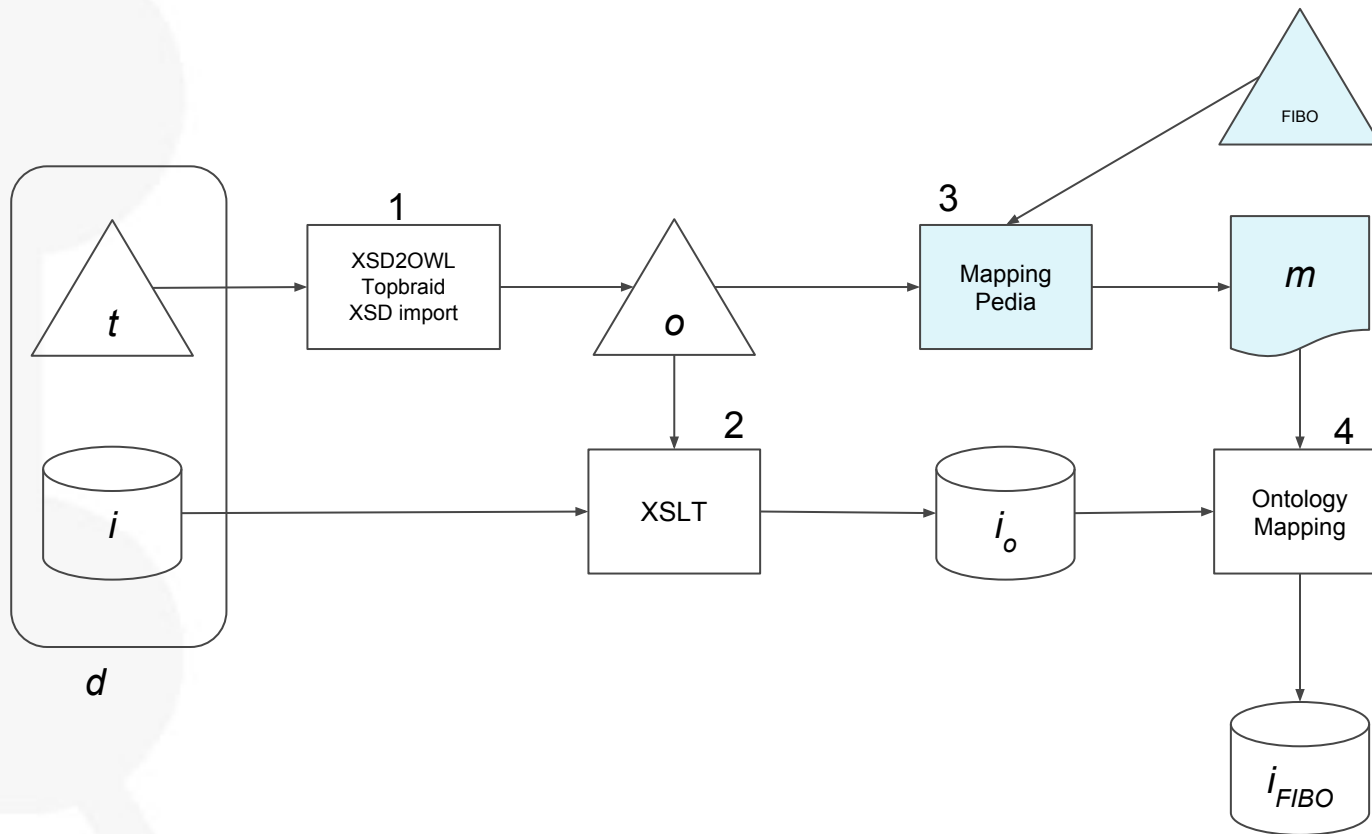**m** = mapping for the ontology **O** in Mappingpedia
i_o = result of transform **i** conforming on **O**

1. **Generate the putative ontology *o* reflecting the taxonomy *t***
2. Transform *i* into i_o conforming *o*
3. Find the corresponding EDOAL mapping *m* for the ontology *o* in MappingPedia.
   a. If such mapping exists, go to step 4
   b. Otherwise, create/request the mapping on MappingPedia
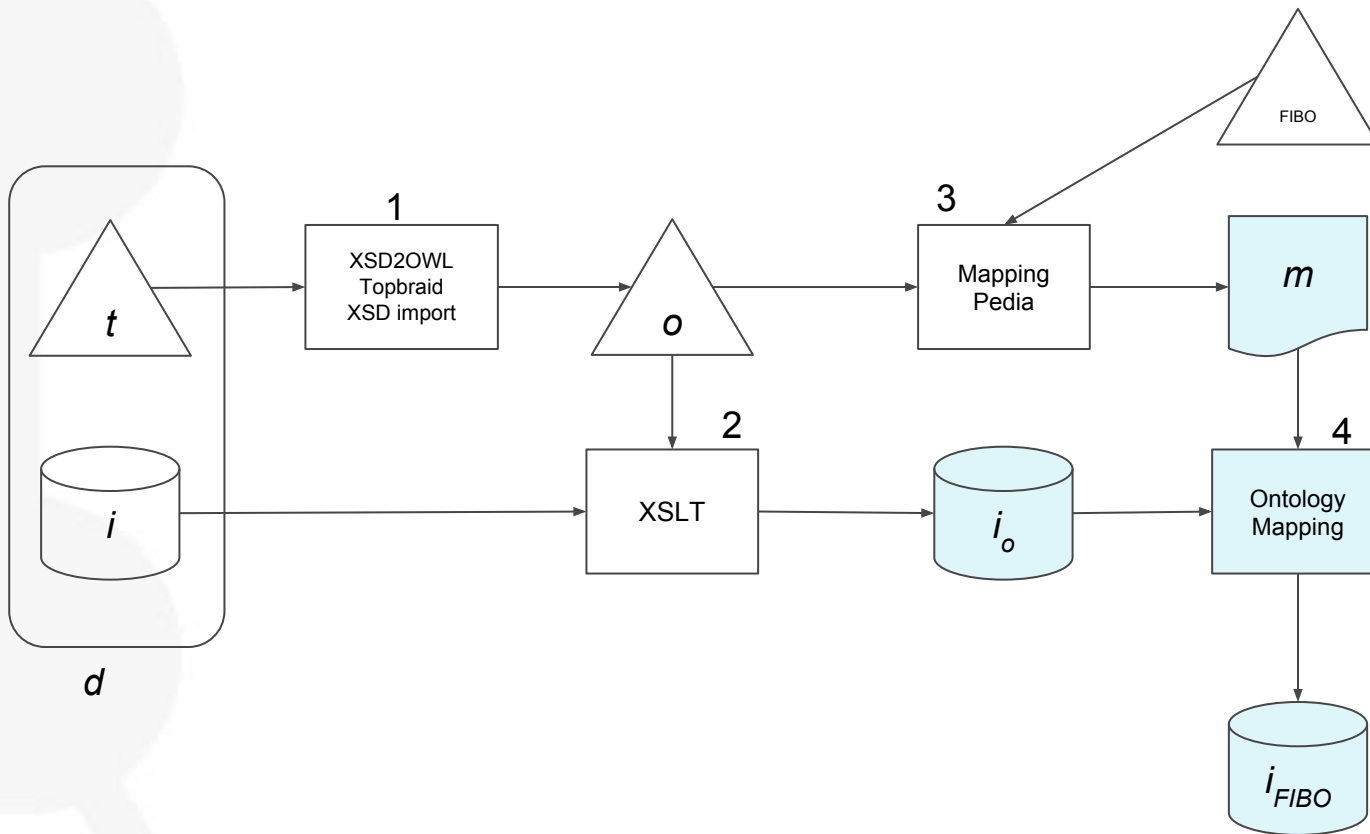4. Transform i_o into i_{FIBO} using *m*

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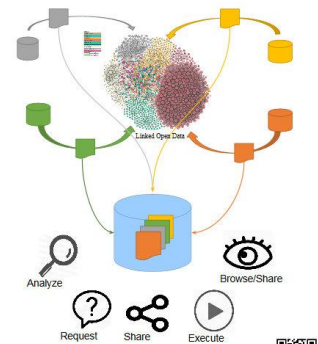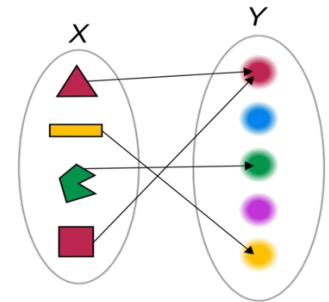4. **Transform i_o into i_{FIBO} using m**

- Initial approach for alleviating the **heterogeneity** problem between XBRL taxonomies.

- Methodology for generating **mappings** among the different XBRL taxonomies

- Technological infrastructure of a collaborative mapping environment: **MappingPedia**

- Increase number of mappings in MappingPedia:
  - wider Linked Data adoption
  - collaborative effort from different agents contributing

- Reduce efforts for publishers and consumers of XBRL documents

- **New opportunities to gain insights in Fintech Applications by seamlessly crossing data with other information domains.**

Connectivity with existing dataset (financial & non financial domains) in the LOD space

Adopting Semantic Technology for Effective Corporate Transparency. Maria Mora-Rodriguez, Ghislain Auguste-Atemezing, Chris Preist. Extended Semantic Web Conference 2017, Portoroz, Slovenia.

Thank You

Gracias

Merci

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Istuti

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