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# The CoBiS Linked Open Data Project and Portal



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with Federico Morando (Synapta) and the CoBiS Communication Working Group

## 1 - Introduction

The CoBiS ("Coordinamento delle Biblioteche Speciali e Specialistiche di Torino" i.e. *Coordination of Special and Specialized Libraries of Turin*) is an informal network of 65 libraries, collaborating to provide continuing professional development and to offer a better service to their users.

CoBiS libraries are heterogeneous from many points of view: holdings, cataloguing softwares and OPACs.

The LOD project started in 2015 as a training program, in collaboration with Prof. Vivarelli from the University of Turin.

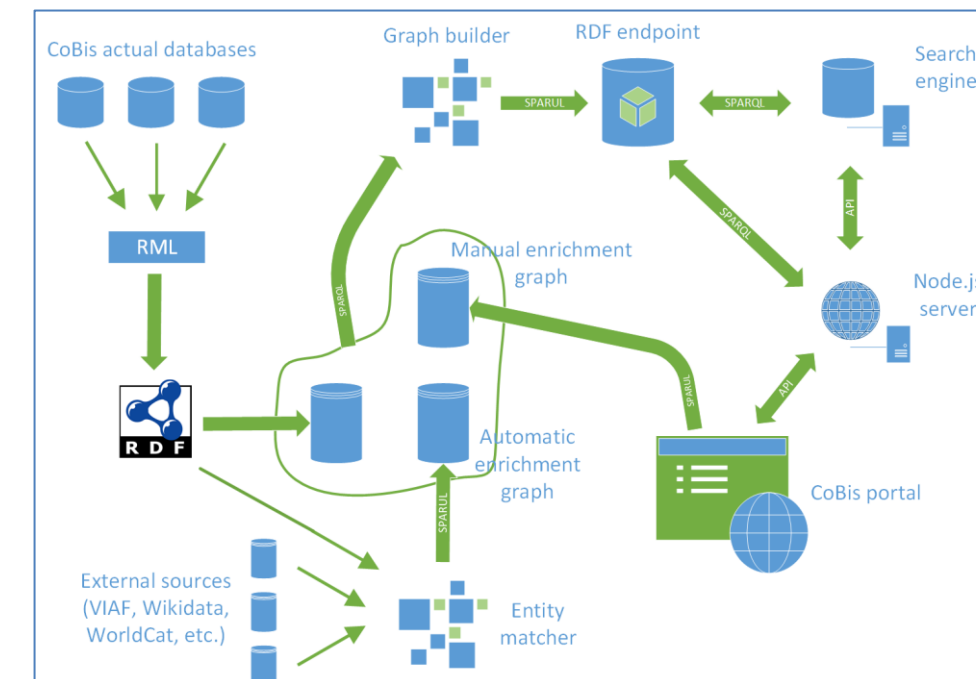
The program was divided in various topics: copyright, collaboration between libraries and Wikipedia, Open Data.



## 3 - The Project

Let's focus on the **Linked Data stack**.

We used two main **ontologies**: Bibframe and Schema.org. We also used selected properties from RDFS, OWL, DCTerms, FAOF, and Culturalis (<http://culturalis.org/> – used to describe CoBiS libraries as cultural heritage institutions).



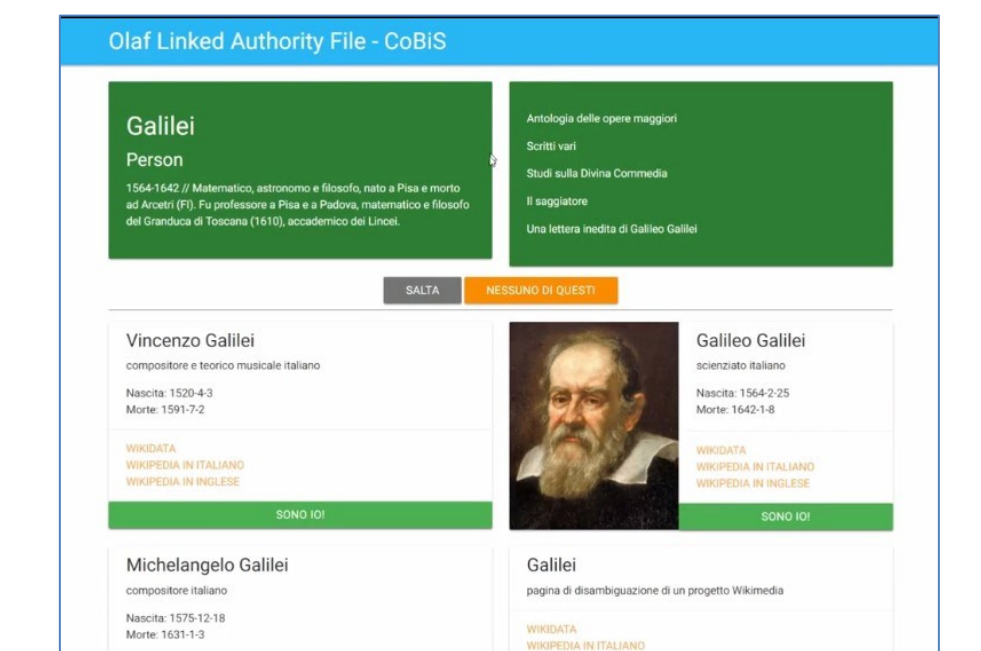
This is an overall picture of the **project architecture**.

We started from heterogeneous sources, with the aim of combining them into RDF data. To reach this purpose, we used both **RML** (in particular in a first phase of the project) and our newly developed **JARQL library**, which turns JSON into RDF using a mapping written as a SPARQL construct query.

Using a SPARQL query, we describe the transformation, obtaining an RDF file as result. (You may try JARQL live at <http://jarql.synapta.io/>.)

During the graph building, we also enriched data with external sources. We used both automatic algorithms and manual approaches. For the latter, we exploit **OLAF (Open Linked Authority File)**, our **crowd-sourcing interface for creating an authority file**. For instance, we want to match the correct Wikidata entity to a person named "Galilei", who wrote the books mentioned on the right side. Calling Wikidata SPARQL API, we obtain different entities that you can choose to identify the exact matching. In this case Galileo Galilei.

You may try OLAF live at <https://olaf.synapta.io/> selecting "CONNETTI" near "Autori dei libri del CoBiS" and registering, in order to annotate the suggested triples with your identity. All the interlinks, discovered via OLAF and the other enriching techniques, make the portal able to access to external resources: VIAF, Wikidata, the Italian National Catalogue SBN, Enciclopedia Treccani.

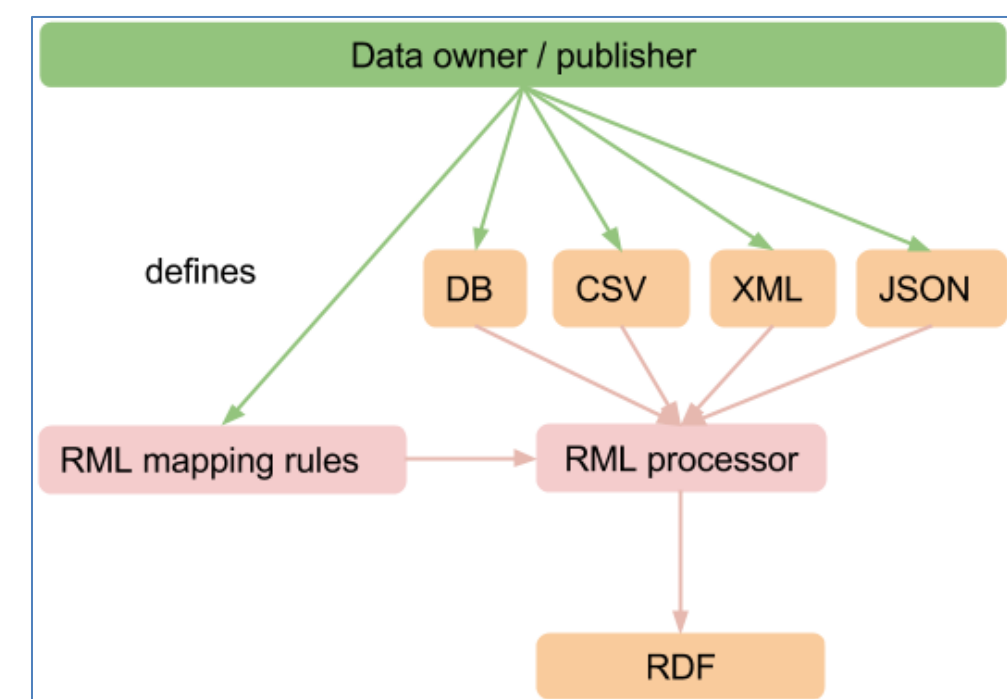


## 2 - Purpose

Turin Astrophysical Observatory Library and other five libraries from the CoBiS decided to participate to a **pilot project** with the purpose to **provide a unique access point to the collections of CoBiS libraries**.

CoBiS bibliographic data will be not only more interoperable among them.

Data will also be opened in order to facilitate the collaboration with online communities and to connect them to the Linked Open Data Cloud.



**Synapta** made some improvements to the RML Processor to speed-up (by about two orders of magnitude) the triplification process.

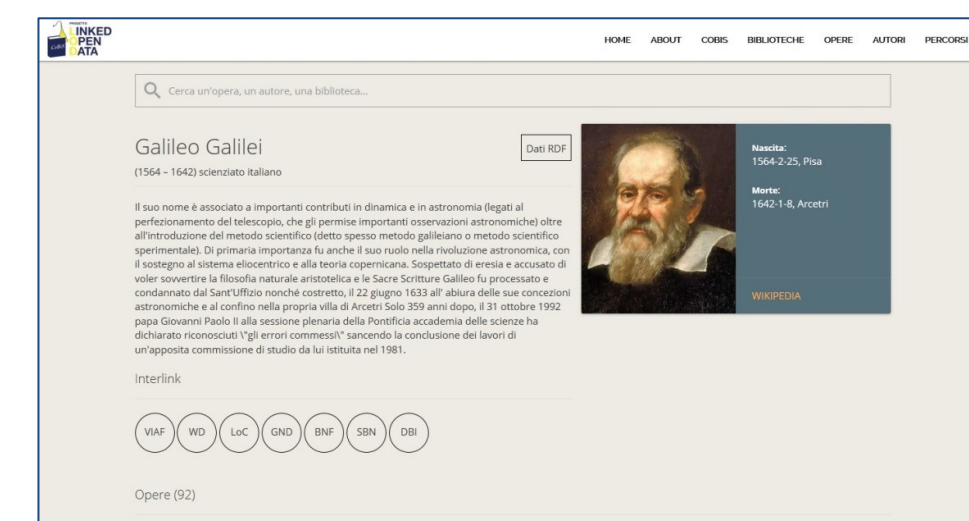
This is done using open source technologies, including the RDF Mapping Language (RML).

RML can be used to define, using RDF triples, the rules for transforming heterogeneous data (XML, JSON or tabular data) into linked data. It is freely available under the MIT license on GitHub.

## 4 - The Portal

Finally, as result, we have exposed data through a **SPARQL endpoint** that feeds the CoBiS portal <http://dati.cobis.to.it>.

The CoBiS LOD Project portal is online with its full Linked Data stack, including a public SPARQL end-point (configured to support federated queries), a full dump of the RDF data, LodView to dereference URIs, etc.

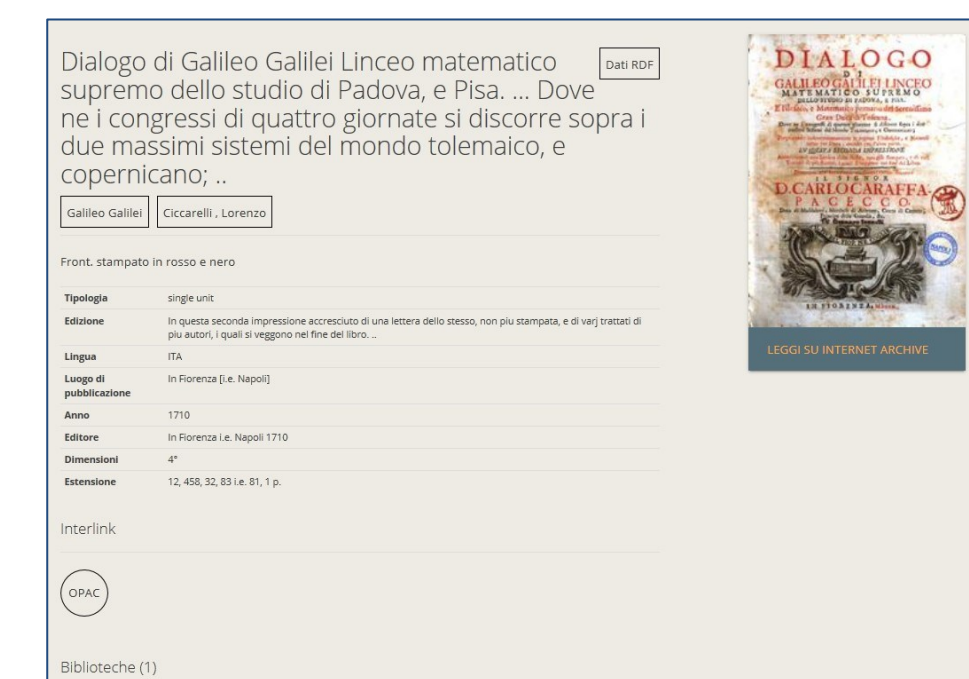


In the **author's page** - **dynamically generated through SPARQL queries** - you have biographical information and a list of interlinked resources coming from Wikidata and other bibliographic repositories (VIAF, Wikidata, LoC, Deutsche National Bibliothek GND, Bibliothèque Nationale de France BNF, Servizio Bibliotecario Nazionale SBN, Dizionario Biografico degli Italiani DBI).

On the right, an infobox with author's data and an image, both coming from Wikipedia, thanks to the leverage of Linked Data. Clicking on the **RDF button**, all the triples of the resource can be directly fetched.

At the bottom of the page, all the author's **books inside the CoBiS database** are shown.

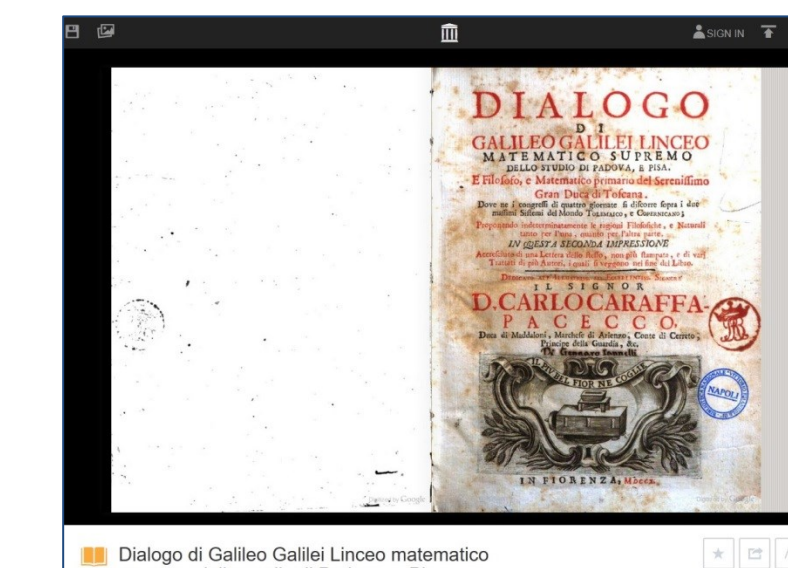
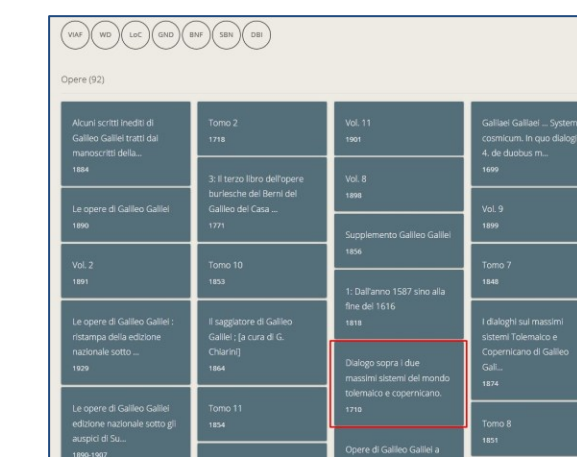
To explore information on such books, you can click one of the boxes or you can use the *search bar*, looking for a title which is not listed.



The image shows an **example search for the Dialogo**. On the left side of the page, you see bibliographic details with a collection of interlinked resources.

Exploiting the power of Linked Data, we are also able to read the **Internet Archive digital copy of the book**.

A **physical copy of the book** is available in some CoBiS libraries. All details can be shown by clicking the **OPAC** button.



## 5 - Contacts

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The portal will be online by Fall 2017