

## ELISA

Methods and tools for supporting the semi-automatic evolution of semantic annotations based on the evolution of controlled terminologies



### Inspiration

The efficient management and exploitation of digital information is pushing companies to rely on Semantic Web technologies. Ontologies offer the means to make the semantics of data explicit by annotating available data with concept labels that make it possible for machines to understand the annotated data. This is the case, for instance, in the health sector where patient data stored in electronic health records (EHRs) are associated with concept codes or terms borrowed from standard controlled terminologies such as the International Classification of Diseases (ICD) or SNOMED CT, facilitating data exchange between health professionals. However, the dynamic nature of domain knowledge forces engineers to revise the content of ontologies, creating a mismatch between the definition of concepts and the annotations, thus preventing any intelligent exploitation of the data.

### Innovation

In this context, and in direct line with the results of the [DynaMO](#) project, ELISA will develop innovative concepts and tools to:

- Understand and characterize the evolution of ontologies over time with respect to the problem of semantic annotation evolution,
- Maintain the semantic annotations impacted by the evolution of ontologies they derived from. Two cases will be distinguished:
  - A direct modification if the annotations are modifiable,
  - An ad-hoc modification if the annotations are not accessible. This will be done through the design of a query enrichment mechanism reflecting the evolution of ontology in order to keep annotated data searchable over time.

### Impact

The proposed technology will help companies in managing the ever-increasing quantity of data they have to deal with. Moreover, it will be implemented in two real cases borrowed from the field of life sciences. First, we plan to apply our maintenance approach to annotations that serve to enrich patient data in the Luxembourgish national health platform. Second, we will investigate the semantic annotation maintenance problem that arises from the annotation of Case Report Forms used in clinical trial research.

### Partners

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