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REDIRECT: Mapping Drug Prescriptions and Evidence from Biomedical Literature

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Abstract. To enhance their practice, healthcare professionals need to cross-link various usage recommendations provided by heterogeneous vocabularies that must be retrieved and integrated conjointly. This is the aim of the Knowledge Warehouse / K-Ware platform. It enables establishing relevant bridges between different knowledge sources (structured vocabularies, thesaurus, ontologies) expressed in the semantic web standard languages (i.e. SKOS, OWL, RDF). This poster presents the strategy applied in K-Ware to hide the different aspects of linking literals with medical entities encoded in these knowledge sources to fetch some publications abstracts from Pubmed.

Keywords. Knowledge Resource, RDF, meta-model, ontology, terminology, semantic, Knowledge warehouse

1. Introduction

The poster focuses on drug prescribing, which is an old known problem in Public Health Informatics, using Pubmed as a supplementary resource providing more up to date therapeutic advances. We tackle the integration of heterogeneous Semantic Knowledge Resources **SKR** at several levels by their format but also by their representation within vocabularies available in the Linked Open Data [1] **LOD**. Its life-science part is full of SKRs about *symptoms*, *indications*, *drugs* and so on, persisted and defined by standardized vocabularies such as **RDF** [2], **OWL** [3] or **SKOS** [4]. These schemes are natural tools to bring meaning to concrete data that would not be linked at first sight.

2. Methods

We have to seek external knowledge in order to refine a **MeSH** (Medical Subject Heading [5]) query to be performed on Pubmed. The Romedi resource [6] provides us enough metadata by structuring the open Public Drug Database and marketed in France [7] in an RDF format. Romedi provides links between a marketed drug and its therapeutic indications from the **ATC** (Anatomical Therapeutic Chemical Classification [8]) and

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also their bibliographic tag to MeSH terms themselves represented as SKOS-based terminologies.

K-Ware is the framework used for handling each of the RDF-based SKR, provides ways to:

1. *Recognise* a drug name from a Literal as an identified entity within Romedi
2. *Browse* a marketed drugs' attributes from Romedi to retrieve its active substance as an ATC entity
3. *Handle mappings* between MeSH terms and ATC codes

Then establishing a cooccurrence query with all the MeSH terms retrieved from a starting prescription's expanded entities in order to retrieve PubMed's abstracts.

3. Results

An implemented GUI is available to specify a prescription order by using a drug/active substance name auto-complete.

When a prescription for at least 2 drugs is formed, the interface displays the different publication's abstract fetched from Pubmed.

The scenario is testable at <http://kware.erias.fr>.

4. Conclusions

K-Ware being more considered as an RDF framework rather than a simple termino-ontological resource repository, allows by using its internal metamodel, the heterogeneous management of the Romedi vocabulary which is an RDF database along with the ATC and MeSH vocabularies which are rather SKOS terminologies without having to modify them.

The K-Ware framework, by allowing us to move towards less data, but more metadata provides ways to not distort any represented Semantic Knowledge Resources for a well-defined project context.

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