An Ontology-based solution for XML query response enrichment

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Abstract— The use of ontologies for the enrichment (expansion) of the user query can be a solution to solve the problem of semantic variations, also for our case in the case where the object sought (drugà is not found, Of similar products by taking into account the contours related to the sick profile and the orientations of the physician and the semantics given by the pharmaceutical ontology. The ontologies offer resources in the form of semantic relations, they allow to extend the field To search for a query, which results in improved search results

Keywords—XML query , response, enrichment, ontology

I. INTRODUCTION

In recent years the database research domain has concentrated on XML (eXtensible Markup Language) as a flexible hierarchical model suitable to represent huge amounts of data with no absolute and fixed schema, and a possibly irregular and incomplete structure[1].

Ultimately, it is expected that applications deployed on the Internet may lead reasoning using the knowledge stored on the web . So, we aim to exploit the richness of relationships semantics provided by ontologies to adapt the user query and improve its response

II. THE ONTOLOGY CONCEPT

Gruber [2] introduced the ontology notion as "an explicit specification of a onceptualization“, Borst. A. has slightly modify the definition as follows: "an explicit and formal specification of a shared conceptualization“. Ontologies are used in many fields. Areas identified in 1998 by Guarino are engineering knowledge, qualitative modeling, language engineering, databases design, information retrieval, information extraction, management and the organization of knowledge. One of the biggest projects based on the use of ontologies is add to a real web layer enabling knowledge research information at the semantic level and at the simplest lexical and / or syntactical level.

III. STATE OF ART

There are many works including the ontology for treating the problem of including the semantic to the query [3],

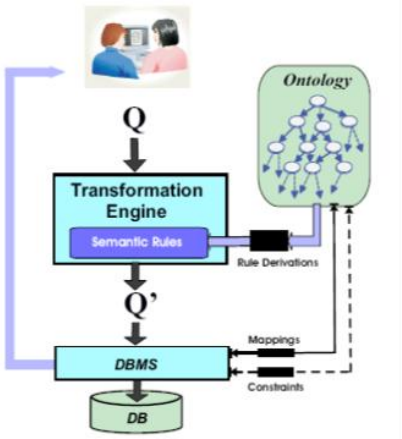

Figure 1. Semenatic Query Transformation Using ontologies

or for using semantic query over heterogeneous databases [4], or for answering queries using views[5]

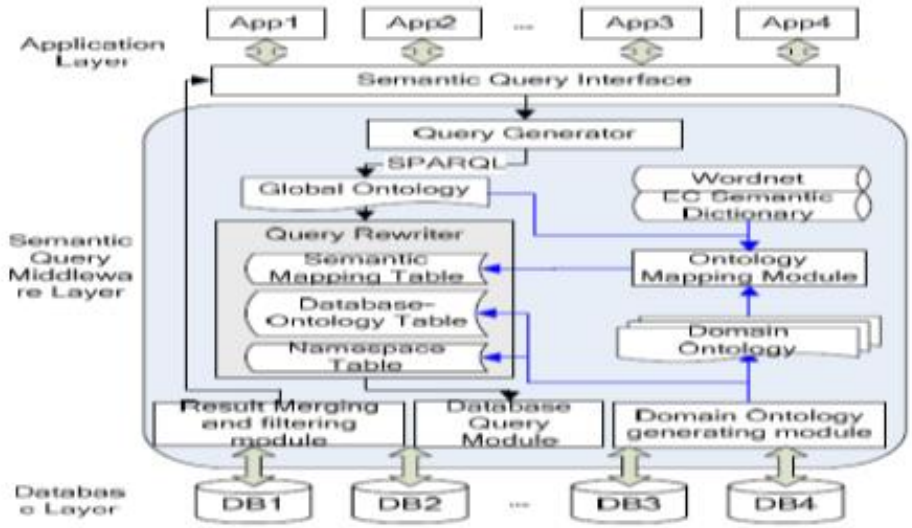

Figure 2. An ontology-based system for semantic query Over heterogeneous databases

IV. DESIGN OF THE PROPOSED SOLUTION

The entry of the proposed solution is a written query in SQL. A first processing consists in segmenting the query and searching for the predicate value indicating the name of the drug. The following figure (see figure 1) shows the steps of the solution:

1. The system receives the patient's profile
2. Calculating the similarity of the concepts close to the drug derived from the ontology
3. Rewriting the patient's request
4. Searching for the rewritten query response by viewing the XML database
5. Display the response of the request.

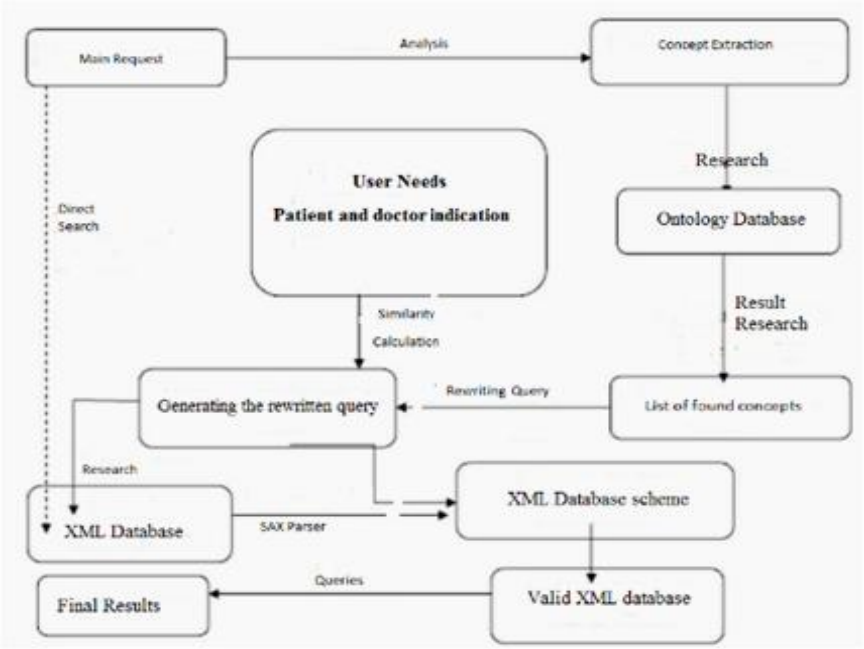

Figure 3. Proposed solution

```
        <owl:Class rdf:ID="Winery"/>
        <owl:Class rdf:ID="Region"/>
    <owl:Class rdf:ID="ConsumableThing"/>
```

```
<owl:Class rdf:ID="TexasThings">
  <owl:equivalentClass>
    <owl:Restriction>
      <owl:onProperty
rdf:resource="#locatedIn" />
      <owl:allValuesFrom
rdf:resource="#TexasRegion" />
    </owl:Restriction>
  </owl:equivalentClass>
</owl:Class>
```

Figure 4. Ontology Structure

V. ILLUSTARTIVE EXAMPLE

With the help of the editor Protege2000 we can create our ontology following the information given by the expert.

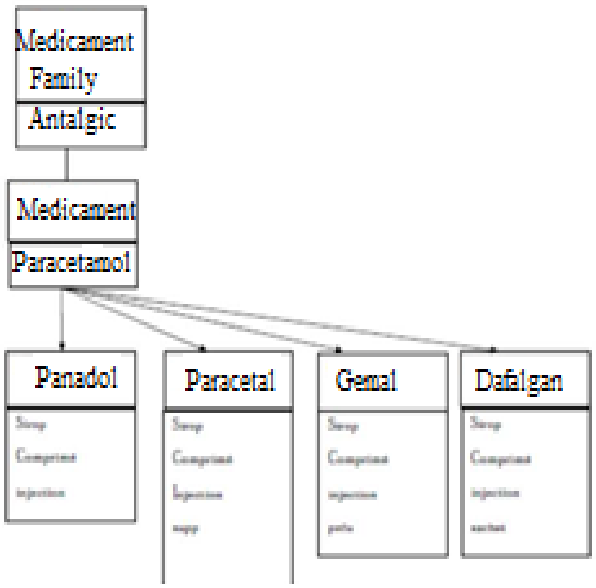

Figure 5. Proposed solution

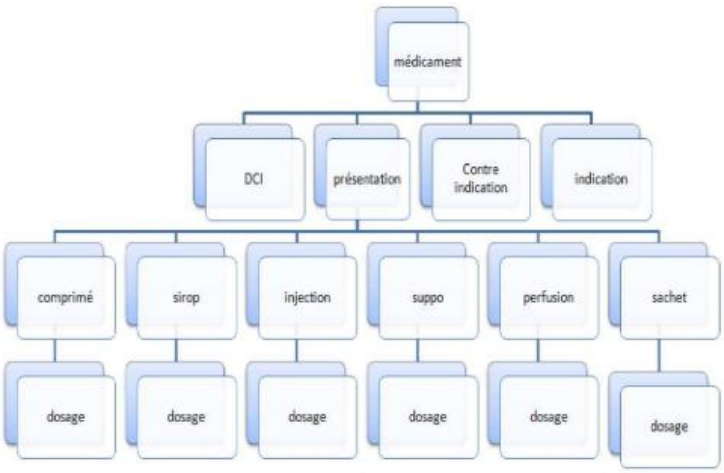

Figure 6. Proposed solution

The application supports multiple paths to get results in this example there are two voices:
1. Direct Request. In this case the application directly accesses the database.
2. Semantics Query: Accesses the ontology query, regenerate other queries against the XML database. In this case the resulting query will closer to the original query domain and in the user selection.

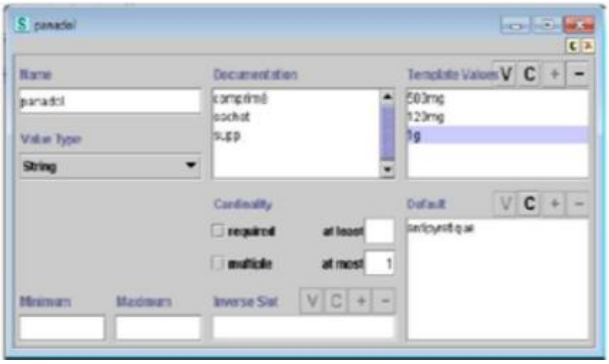

Figure 7. Proposed solution

It can be seen from the example that there is a correct result ie represents the execution of the main query directly on the basis of XML data, and other results represent the query execution generated by the use of ontology.

VI. CONCLUSION

Our query expansion mechanism exploits the richness of relationships semantics provided by ontologies. Its adaptation to the user by the through prototypicality (represented by the terminology, by weights on the terms) allows you to customize both the extension query input the amount of results provided. Our solution allows us to customize the user query by patient requirements and directed by the doctor on one hand and according to the concepts provided by the terminological ontology in the other (validated by pharmaceutical expert) in order to have a comprehensive response. The first results are encouraging and it is estimated the continuity of this project in the future.

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