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Question Answering Based on Sparql Using Protégé 5.2: A Review

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ABSTRACT

The world of knowledge is vast and every one requires the answer of his question. Question answering system outputs the answer of the user queried to existing resource. It can be any language or in any format. After the invention of searh engine the question answering system becomes easy and user can query with real world. The domain of the semantic web is not limited after the invention of web 3.0. After the invention of artificial intelligence system the question answering system become more popular. Ontology are the key technologies of question answering system[1].

Keywords: **Ontology, Semantic Web, Question Answering, WWW, Plug-In**

1. INTRODUCTION

The ontology is the collection of data, documents, portion of document, providing relationship among things and containing information intended for automated processing of query by our machine. Ontology technologies bring the new benefits to QA system [1]. It is observe that in present scenario everyone uses internet for the retrieval of information, the classical technique that is being used for this purpose is keyword-based search, and the main drawback of this technology is irrelevant information retrieval and huge volume of information related to the searched keyword. The selection of relevant information is difficult because the output of the query is multiple and there can be different answer for single question. There are various search engines available in modern internet system and they are not domain restricted as the early system. QA system converts a user query using NL parser based on different aspect like ranking of the content, frequency of usage etc. QA system is the main pillar of semantic web and ontology. It is a fast growing field of research which gives a new direction to new technologies. The QA system focuses on the open domain system that can answers the question asked by the user. There are various tools like Protégé(available in different version), Top Braid Composer(TBC™), Neon Tool kit which provide the inbuilt question answering interface restricted to the boundary of ontology knowledge.

Fig: 1. Realization of current web to the future web

2. RELATED WORK

For the user of ontology it is important to have knowledge of software tools. Comparative analysis of different ontology tools is not a new work, lots of work has been done in this field using different criteria of comparison still there are chances more work to be done in this field like individual features of tools. As in [3] Seongwook youn, Dennis McLoed performed a survey on ontology construction tools in which they briefly explained the different tools and finally compared the features of different tools. Sunitha Abburu and G. Suresh Babu [5] explained about different ontology development tool and give

the methodological support according to the features of the tool. Emhimed Alatrish [6] performed a survey on web ontology editing tools and gives the comparative case study of ontology tools according to their feasible needs of development. Sabin Corneliu et. al. [7] give the detail features of ontology schema and layered architecture with their features. Escorcio, L.Cardoso [8] performed comparison of ontology tools based on ontology language formalism and their features. Thabet Slimani [9] give the description of ontology tools, their needs & comparative study on re-engineering of ontology tools. Arti Singh and Poonam Anand [10] performed the comparison of tools based on experience of different group of person and their experience of using the tools.

3. Proposed Work

In this paper we represent a QA interface in which the domain knowledge is represented by means of ontology. The objective of this paper is to making the web more meaningfull. There are various question answering system available on the inertenet to query with the ontologies and semantic web but all of them are domain knowlwdge based. The people who have not knowledge about the ontology language and about the semantic web can not query with the system based on natural language. Main objective is to introduce a system which provide the simple interface to all the users of ontology and semantic web. Protege 5.2 support plug-in like Sparql, Sqwrl etc which are the inbuilt plug-in to provide a interfacing window based query language.

4. Tool Description

Protégé 5.2

Protégé Ontology Editor Protégé (Stanford University School of Medicine.) is a free, open-source platform that provides a growing user community with a suite of tools to construct domain models and knowledge-based applications with ontology's.

The strength of protégé is that it supports at the same time tool builders, knowledge engineers and domain specialist. This is the main difference with existing tools, which are typically targeted at the knowledge engineer and lack flexibility for data modeling. Protégé with the OWL plug-in. Protégé OWL provides a reasoning API that access an external DIG-compliant reasoner, enabling the inference about classes and individuals in an ontology [1]. Protégé (Kapoor & Sharma, 2010) includes an interface for SWRL (Semantic Web Rule Language), which sits on top of OWL to do math, temporal reasoning, and adds Prolog-type reasoning rules. The significant advantage of Protégé is its scalability and extensibility. Protégé (Escórcio& Cardoso, 2007) allows to build and to process large ontology's in an efficient manner. Through its extensibility Protégé might be adopted and customized to suit users' requirements and needs.

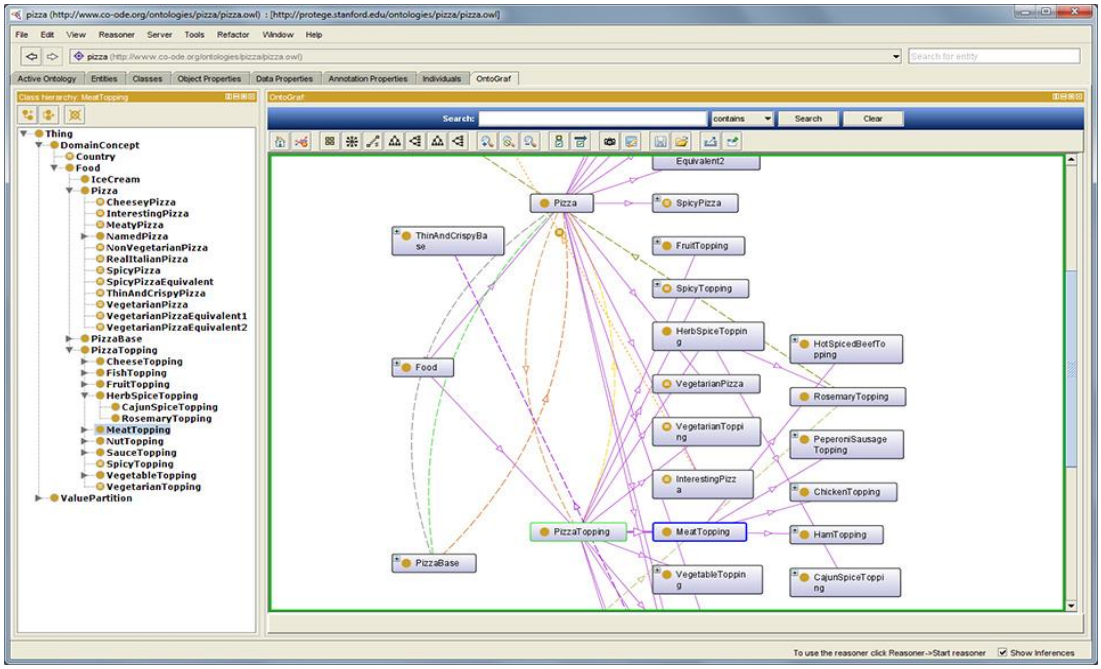

Fig. 2 Snapshot of Protege 5.2

5. SPARQL QUERY

Sparql query is a couple of syntax based on query to fetch the knowledge in the form of question answer queried by the user from ontology. It is a query language for semantic web. SPARQL queries are executed against RDF datasets, consisting of RDF graphs. A SPARQL endpoint accepts queries and returns results via HTTP.

A SPARQL query comprises, in order:

i) *Prefix declarations*, for abbreviating URIs
ii) *Dataset definition*, stating what RDF graph(s) are being queried.
iii) A *result clause*, identifying what information to return from the query.
iv) The *query pattern*, specifying what to query for in the underlying dataset.
v) *Query modifiers*, slicing, ordering, and otherwise rearranging query results.
    a) Generic endpoints will query any Web-accessible RDF data.
    b) Specific endpoints are hardwired to query against particular datasets.
vi) The results of SPARQL queries can be returned and/or rendered in a variety of formats:
    a) *XML*. SPARQL specifies an XML vocabulary for returning tables of results.
    b) JSON. A JSON "port" of the XML vocabulary, particularly useful for Web applications.
    c) RDF. Certain SPARQL result clauses trigger RDF responses, which in turn can be serialized in a number of ways (RDF/XML, N-Triples, Turtle, etc.)
    d) HTML. When using an interactive form to work with SPARQL queries. Often implemented by applying an XSL transform to XML results.

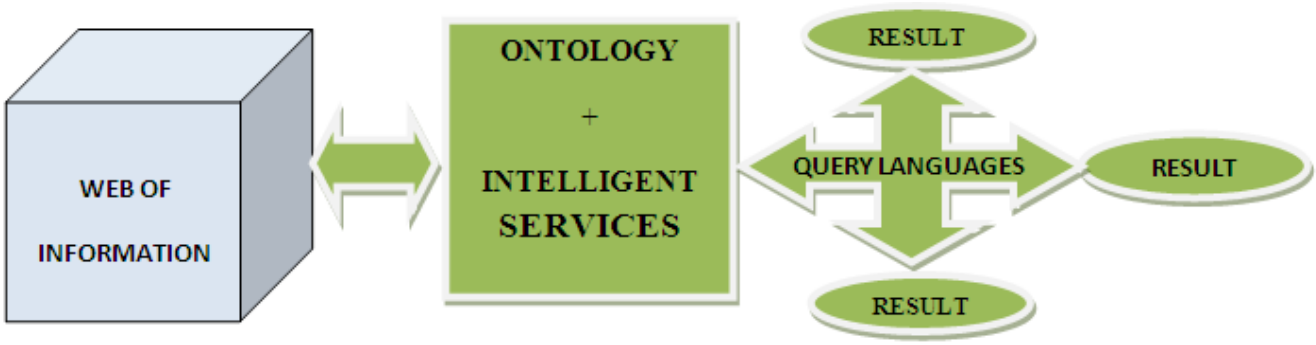

Fig. 3 Question Answering Process Overview

Examples of SPARQL Query
Select query

i) Select: name

```
Where
{
?name wheel : object : subject
}
```

ii) SELECT ?country_name ?population

```
WHERE {
   ?bycycle a type:Two wheelers ;
         rdfs:label ?bycycle name ;
         milage:milageEstimate ?20 .
   FILTER (?price > 15000000) .
}
```

iii) SELECT *

```
{ ?launch space:launched ?date
  FILTER (
    ?date > "1968-10-1"^^xsd:date &&
    ?date < "1968-10-30"^^xsd:date
  )
}
```

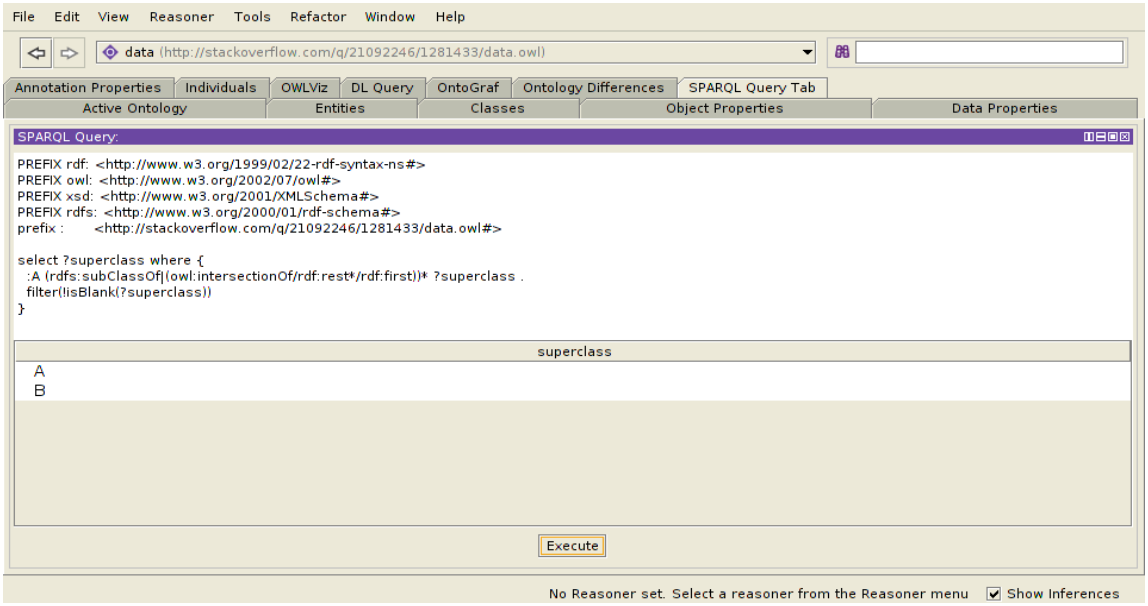

Fig. 4 Snapshot of Question in the form of SPARQL

CONCLUSION

Ontology is useful for several purposes, for example, for applications where a certain error rate is tolerable, such as information retrieval, browsing, question answering and navigation etc . The semantic Web community has produced a great number of ontology learning methods and techniques, nevertheless, these methods have not been implemented for various domain ontology constructions except a few. QA can enable users to access the knowledge in a natural way by asking natural language questions and get back relevant correct answers. The major challenges in QASs are: understanding natural language questions regardless of their types or representation; understanding knowledge derived from the documents (structured, semi structured, un-structured to semantic web) and searching for the relevant, correct and concise answers that can satisfy the information needs of users.

REFERENCES

[1]. Al-Arfaj Abeer et. Al. " Ontology Construction from Text: Challenges and Trends", International Journal of Artificial Intelligence and Expert Systems (IJAE), Volume 6 : Issue 2, 2015 PP 15-26
[2]. Sunitha Abburu and G. Suresh Babu, "Survey on Ontology Construction Tools" International journal of Scientific and Engineering Research , Vol 4, Issue 6, June 13, pp 1748-1752
[3]. Emhimed Alatrish, " Comparison some of ontology Editors", Management Information System, Vol 8, 2013, PP- 18-24.
[4]. Arti Singh, Poonam Anand, "International Jouranl of Advances in Computer Science and technology" Vol. 2,No. 7, July 2013,pp 96-101.
[5]. Thabet Slimani, "Ontology Development: A Comparing Study on Tools, Language and Formalism" Indian Journal of Science and Technology,vol8(24),sep 15 , pp 1-12.
[6]. Tuffis D, (2011) "Natural Language Question Answering in Open Domains, " Computer Science Journal of Moldova
[7]. M.Rahamatullah Khondoker, Paul Mueller, "Comparing Ontology development Tools Based on an Online Survey" Proceeedings of world Congress On Engineering 2010 Vol I WCE 2010.
[8]. Quinglin Guo, Ming Zhang, Question answering system based on semantic web and ontology Springer- Verlag Berlin Heidelberg 2008, et al.(eds):RSTK 2008 LNAI 5009, pp 652-659, 2008.
[9]. Escorcio, L. and Cardoso, j. "Editing Tools for Ontology Construction", in "Semantic Web Services: Theory, Tools and Application", Idea Group. (scheduled for march 2007).
[10]. Sabin Corneliu Buraga, Liliana Cojocaru, Ovidiu Catalin Nichifor, "Survey on web ontology Editing Tools" Periodica Politechnica, Transaction on Automatic control and Computer Science,Vol.NN(ZZ),2006,ISSN 1224-600X,pp 1-6.
[11]. Surdeanu M, Moldovan D, (2003) "On the role of Information Retrieval and Information Extraction in Question Answering Systems, " Information Extraction in Web Era -Springer.
[12]. Tim Berners-Lee, James Hendler and Ora Lassila, "The Semantic Web", Scientific American, May 2001, p. 29-37.
[13]. B. Diaz-Agudo, P. Gonzalez-Calero, An architecture for knowledge intensive CBR systems, Adv. Case-Based Reasoning 1898 (2000) 37–48.
[14]. R. Djedidi, M. Aufaure, ONTO-EVOAL an Ontology Evolution Approach Guided by Pattern Modeling and Quality Evaluation, in: Foundations of Information and Knowledge Systems, Springer, Berlin Heidelberg, 2010, pp. 286–305.

[15]. Shaker El-Sappagh, S. El-Masri, M. Elmogy, R. Riad, B. Saddik, An ontological case base engineering methodology for diabetes management, J. Med. Syst. 38 (8) (2014) 1–14.
[16]. Shaker El-Sappagh, M. Elmogy, S. El-Masri, A. Riad, A diabetes diagnostic domain ontology for CBR system from the conceptual model of SNOMED CT, in: Proceedings of the Second International Conference on Engineering and Technology (ICET 2014), Cairo, Egypt, 2014, pp. 1–7.
[17]. Shaker El-Sappagh, M. Elmogy, A. Riad, H. Zaghlol, F. Badria, EHR data preparation for case based reasoning construction, in: Proceedings of the 2nd International Conference on Advanced Machine Learning Technologies and Applications (AMLTA14), 488, 2014, pp. 483–497.
[18]. Shaker El-Sappagh, M. Elmogy, A. Riad, A CBR system for diabetes mellitus diagnosis: case-base standard data model, Int. J. Med. Eng. Inf. 7 (3) (2015) 191–208.
[19]. Shaker El-Sappagh, M. Elmogy, A. Riad, A fuzzy-ontology-oriented case-based reasoning framework for semantic diabetes diagnosis, Artif. Intell. Med. 65 (3) (2015) 179–208.
[20]. Shaker El-Sappagh, M. Elmogy, An encoding methodology for medical knowledge using SNOMED CT ontology, J. King Saud Univ. Comput. Inf. Sci. 28 (3) (2016) 311–329.
[21]. Shaker El-Sappagh, Farman Ali, DDO: a diabetes mellitus diagnosis ontology, Appl. Inf., Springer, Berlin Heidelberg 3 (1) (2016) 5–33.
[22]. M. Fernández, C. Overbeeke, M. Sabou, E. Motta, What makes a good ontology? A case study in fine-grained knowledge reuse, Semantic Web 5926 (2009) 61– 75.
[23]. M. Gan, X. Dou, R. Jiang, From ontology to semantic similarity: calculation of ontology-based semantic similarity, Sci. World J. 2013 (2013) 1–11.
[24]. C. García-Diéguez, M. Herva, E. Roca, A decision support system based on fuzzy reasoning and AHP–FPP for the ecodesign of products: application to footwear as a case study, Appl. Soft Comput. 26 (2015) 224–234.
[25]. G. Gottlob, S. Kikot, R. Kontchakov, et al., The price of query rewriting in ontology-based data access, Artif. Intell. 213 (2014) 42–59.
[26]. B. Grau, et al., Towards query formulation and query-driven ontology extensions in OBDA systems, in: OWL Experiences and Directions Workshop (OWLED 2013), vol. 1080 of CEUR Workshop Proceedings, 2013.
[27]. T. Gruber, Toward principles for the design of ontologies used for knowledge sharing, Int. J. Hum Comput Stud. 43 (1995) 907–928.
[28]. Y. Guo, J. Hu, Y. Peng, A CBR system for injection mould design based on ontology: a case study, Comput. Aided Des. 44 (6) (2012) 496–508.
[29]. S. Harispe, D. Sánchez, et al., A framework for unifying ontology-based semantic similarity measures: a study in the biomedical domain, J. Biomed. Inform. 48 (2014) 38–53.
[30]. S. Heras, V. Botti, V. Julian, An ontological-based knowledge-representation formalism for case-based argumentation, Agreement Technol. 8068 (2013) 105–119.
[31]. S. Heras, V. Botti, V. Julian, ArgCBROnto: A knowledge representation formalism for case-based argumentation, Agreement Technol. 8068 (2013) 105–119.
[32]. A. Jaya, G. Uma, Role of ontology in case-based reasoning (CBR) for diagnosing diabetes, J. Inf. Technol. 5 (3) (2009) 17–23. M. Jha, D. Pakhira, B. Chakraborty, Diabetes detection and care applying CBR