ISSN: 2321-7782 (Online)
Volume 1, Issue 7, December 2013
International Journal of Advance Research in Computer Science and Management Studies
Research Paper
Available online at: www.ijarcsms.com

Diversified Approaches in Ontology: A Survey

Saranya C[1]
PG Scholar
Department of computer science & Engineering
Dr. N.G.P Institute of Technology
Coimbatore - India

Ramya R. S[2]
Assistant Professor
Department of computer science & Engineering
Dr. N.G.P Institute of Technology
Coimbatore - India

Abstract: ***Ontology is the currently emerging for representing the context domain. Ontology is one of the techniques for describing the knowledge and for finding the relationship between the concepts. In semantic web Technology, for specifying relationship between the concepts the ontology is one of the tools used. For achieving the interoperability between the existing different ontologies in both the heterogeneous and heterogeneous environment uses onto-matching, this is the fundamental method. The ontology uses the language known as Owl (web Ontology language). OWL is used to explicitly represent the meaning of the terms and the relations between the terms. The goal of this paper is to provide the brief survey about ontology and ontology mapping approaches.***

Keyword: : ontology; onto-matching; Owl;.

I. INTRODUCTION

In this world, the internet plays a major role where it contains huge amount of information and also which is updated with new content periodically every day. Here the semantic web is one of the newly emerging search engines, in this can able to search for content in the web which is based on the metadata based search. Here it enables people to share and reuse of content beyond the boundaries of the application. RDF, crawler, annotated/knowledge database, ontology and ranking and prioritization are the structures of semantic web. The primary goal of semantic web is enable the user to find, share and combining the information more easily. The unstructured and semi-structured documents are converted into "web of the data" through semantic web.

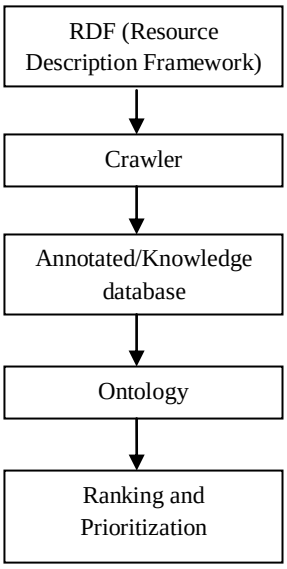

Fig. 1 Semantic web structure

The web crawler is also called as web spider, ant or webs scutter. The web crawler is used to identify the hyperlinks in the web pages which are all in the URL s list to visit. The crawler starts with seeds, this visits all the URLs to identify the

hyperlinks and add those hyperlinks into the visit URL lists. Those lists are recursively visited based on the set of policies. There are several policies in crawler they are selection policy, re-visit policy, politeness policy and parallelization policy. These policies are to select the pages for downloading, to check for changes in the pages, for avoiding the overload the web sites and also states how to coordinates distributed web crawlers. The knowledge/annotated databases are the special database for knowledge management. These stores the entire topic based on the search from ordinary web database. The database contains three parts syntactic homogenization, terminology creation and annotation creation.

Web search engine uses web crawler to update the content with other content. Web crawler copies the entire content that is all retrieved by the user and indexes for quick search by the user. The web crawler start searching from the starting of the seed points, here the crawler visits the seeds and identifies all the hyperlinks in that page and adds that links to the seeds, this is done recursively based on some crawler policies. The main policy of the crawler are selection policy is to download the pages, re-visiting policy is to check for changes in the pages, politeness policy is to avoid overloading websites and parallelization policy is to coordinate the distributed web crawler.

A. Ontology

Ontology are defined as set of primitives for knowledge, it is for describing the relationship between the search topics. Commonly, ontology used in representing knowledge, retrieval of information, understanding of natural language and web services [2]. Ontology is for determining the relation among the various concepts and used to find the distance between the pair of concepts [1].

Ontologies are related to each other through ontology mapping, which is challenging factor. Ontology mapping refers to finding relation between the different ontologies. The major goal of ontology is to share the understanding of information, to analyse domain knowledge, domain assumption, domain knowledge reuse and separation of domain knowledge from operational knowledge [2]. Owl is the ontology specification language. OWL is used to explicitly represent the meaning of the terms and their relationship between those terms. Owl contains three sublanguages [2].

- OWL Lite: it is to support classification for the users and also for simple constraints. It has less formal complexities than the Owl DL.
- OWL DL: while retaining the computational completeness and decidability, OWL DL support the users for maximum expressiveness. This includes OWL language constructs and it is used under only certain constraints.
- OWL Full: it support users with no computational expressiveness completeness for achieving maximum expressiveness and syntactic freedom with RDF. It uses the OWL primitives and also RDF and its Schema with it.
- Ontology specifies the entities of interest in domain in terms of attributes for classes which defines the concepts in ontologies , individuals is the object instances, properties which finds the possible associations between the individuals and data types are the values can have with it.

B. Onto-matching

Ontology specifies the entities of interest in domain in terms of attributes for classes which defines the concepts in ontologies, individuals is the object instances, properties which finds the possible associations between the individuals and data types are the values can have with it. Onto-matching is to derive the adjustment between the ontologies. Ontology-matching is also known as onto-match or onto-matching or ontology-map. Onto-matching defines the semantic relationship between the concepts in different ontologies by using many formal languages like OIL, DAML+OIL and RDF [15]. Ontology deals the problem of mapping pattern, when matching the element with same meaning between different ontologies it reflect the internal structure of the mapping pattern. Consider two different ontologies l and m with entities l' and m'. By using the entities find the coherence between the elements based on the same meaning and also find the equivalence between the elements [2].

Ryutaro Ichise [14] States that the different similarity measures such as concept similarities including the string based similarity, graph based similarity, instance classification similarity and knowledge resource similarity are proposed for the mapping process. The string based similarity utilizes the similarity measures of the ontology; the graph based utilizes the structure similarity between ontology.

II. Related Work

This section deals with the discussion about the ontology and onto-matching. In this method, Soner Kara,O¨zgur Alan, OrkuntSabuncu, SametAkpınar, NihanK.Cicekli, FerdaN.Alpaslan [4], in this paper deals with issues of the semantic search such as usability, retrieval performance and scalability. The retrieval of information is developed by using domain-specific information extraction, inference and rules. Here proposes keyword-based semantic retrieval approach. Scalability is accomplished by accommodating the semantic indexing approach and representing the world as small-scale models. The system is implemented by using state of the art technology and query expansion method is implemented for improving the performance of the system.

In this method, Hai Wang, Shouhong Wang [5], in knowledge system community it considers about the data summarization uses query system for designing it. For developing the generic organization for data summarization query system it uses the first analysis of requirement representation in data summarization. Based on the proposed ontology structure in this paper, this proposes the ontology-based query language of data summarization. The ontology plays two roles for data summarization, integrating the resources and interactive user-computer interface of data summarization query system.

In this method, Paolo Bouquet, Fausto Giunchiglia , Frank Van Harmelen , Luciano Serafini , Heiner Stuckenschmidt [6], this paper deals with the ontology contextualization and the mapping of ontology with other ontology. The representation of contextual ontology is to allow the C-OWL which is the language where the syntax and the semantics are obtained by enhancing the OWL syntax and semantics. In this paper, for mapping the ontology with other ontology it uses the bridge rules this follows the five forms:

$$i: x \xrightarrow{\sqsubseteq} j: y, \qquad i: x \xrightarrow{\sqsupseteq} j: y, \qquad i: x \xrightarrow{\equiv} j: y, \qquad i: x \xrightarrow{\perp} j; y, \qquad i: x \xrightarrow{*} j: y$$

For mapping, given the OWL space $\{(i, Oj)\}i\in I$ for mapping from Oi to Oj uses the set of bridge rules from Oi to Oj, for all i ,j $\in$ I. Then the context space is a combination of OWL space $\{(i, Oj)\}i\in I$ and a family of mapping from i to j, for each combinations takes i, j $\in$ I. the interpretation are model for the context space which must satisfy the bridge rules. The interpretation is the combinations of context space $(\{(i, Oj)\}i\in I, \{Mij\}i,j\in I)$ and the pair (I, { rij} i,j$\in$I), I is the interpretation with holes, the local relation $\{(i, Oj)\}i\in I$ and domain relations rij. This paper shows only the small work of mapping and the issues is how to deal with globalize via ontology and share and also how to localize with the limited and totally controlled form of globalization.

In this method, Silvana Castano et. al [7], the availability of the multiple data sources in complex organization and in global information system, the heterogeneous data sources is to support querying and cooperation activities is more essential one. By resolving possible semantic heterogeneity and analysing the conceptual schemas combining with them in different sources this provide a unified representation. They used ARTEMIS tools for construction of the global views. This paper proposes the affinity-based unified representation method, this involves following steps

- First step is to assess the level of semantic relationship between the elements in different schema s uses the concept of the affinity. The two schema elements are used for assess of affinity, they are name affinity coefficient which is based on the element names and structure affinity coefficient, which is based on their properties it introduces semantic correspondence for elements.

- Next step, here different representation are analysed for unification, it uses the elements are classified using clustering procedures by affinity method. The clustering start from global affinity coefficient computation is by analysing the pair of possible elements. After analysing the elements cluster it based on the cluster group. Then select the two cluster group and find the maximum global affinity coefficient. The clustering technique is terminated when the merging reaching to one.

- Next step is the construction of the global views from the selected elements. It uses the unification rule for the selected candidate clustering. Uses both the name unification rule (UR1), the domain unification (UR2) and the cardinality unification (UR3) for constructing the global views

In this method, Hong-Hai Do, Erhard Rahm [8], the several mapping techniques are needed only to reduce the user efforts, risks. Here, for finding the semantic correspondences between elements of two schemas uses one technique called schema matching, this is required for many database applications like integration, data loading and XML message mapping. The matching technique also faced many difficulties while matching the best combinations. For this purpose they proposed COMA schema matching system to combine multiple matching, this is to evaluate the effectiveness of the different matching schemas. In this, from the XML files or database tables the schemas are imported. Those imported schemas are internally represented by rooted directed acyclic graphs. In graph, the schema elements are represented as nodes and the links between the elements are represented by edges. After constructing the graph, the matching is done with the schemas in the graph then is represented as either 0 or 1 where represents no similarity and 1 represent strong similarity between the schemas.

In this method, Giunchiglia et al., [12], this paper deals with ontology mapping method based on the semantic integration for schemas. In this the schemas are converted into trees, in the tree node is associated with number and the labels. The result of this method is the matching with the different levels of schemas with strengths with all possible concepts.

In this method, Noy and Musen, 2001 [12] presents the anchor-PROMPT, this is the traditional ontology mapping method, which is automatically find the semantic similarity between the different ontologies. This method takes input as pair of related terms from ontology, and then traverses the paths between the anchors. The path follows he link between the classes defined by the hierarchical relation and their domain and ranges. This approach finds the 75% perfect matches which are not found in different approaches.

In this method, Ehrig and Staab, 2004 [13] presents the QOM (Quick Ontology Mapping) is one of the ontology mapping technique, which prioritizes speed over accuracy. This method extends native ontology mapping (NOM). The basic high-level steps are feature engineering in this all ontologies format to be RDFS format, search step selection here the number of candidate mappings are done to reduce the complexities and also to improve the performance, next step is the similarity computation, this avoids pair-wise computation for optimizing QOM, next step is similarity aggregation is same as NOM, next step is interpretation, this is done either by setting threshold values or by maintaining bijectivity relation and last step is the iteration is based on the lexical knowledge and knowledge structure QOM iterates to find the mappings.

In this method, Paul Buitelaar, Philipp Cimiano, Anette Frank, Matthias Hartung, Stefania Racioppa [9], they proposed the SOBA, which is the system for ontology-based information extraction from heterogeneous data resources to extract information it is the capable of processing structured information, texts and images and integrate those extracted information into coherent knowledge base. To integrate the information the knowledge base provides the query for that information. This is to increase the robustness and accuracy this allows advanced retrieval functionalities.

In this method, David Sánchez ⇑, Montserrat Batet, David Isern, Aida Valls[10], this deals with the estimation of the semantic likeness between words. This finds the semantic similarity measures to exploit the measures. This paper deals with different approaches for semantic similarity measure for estimating it by using the limitations of the different approaches and compared with their theoretical and experimental performances by using metrics.

III. CONCLUSION

As this brief survey shows, many issues in ontology mapping and integration in the semantic web. This work is useful for researcher for finding the similarity between the content and also finding the matching between the schemas in the web pages. The ontology mapping the research area there is still problem in mapping the different schemas. This paper is more helpful for future research work for finding the similarities between the ontologies by using any one of the mapping pattern.

References

1. Punam Bedi , Anjali Thukral, Hema Banati Focused crawling of tagged web resources using ontology, Computers and Electrical Engineering 39 (2013) pp 613–628.
2. Ramya.R.S, Raja Ranganathan.S, Dr. S.Karthik A Brief Survey on Improving the Efficiency of Revisiting Concepts in Semantic web ISSN: 2278 – 7798 International Journal of Science, Engineering and Technology Research (IJSETR) Volume 2, Issue 1, January 2013.
3. Chakrabarti S, van den Berg M, Dom B. Focused crawling: a new approach to topic-specific web resource discovery. Comput Netw 1999;31(11–16):1623–40
4. Soner Kara, O¨zgur Alan, Orkunt Sabuncu, Samet Akpınar, Nihan K.Cicekli, Ferda N.Alpaslan, "An ontology based retrieval system using semantic indexing", Elsevier information Systems 37 (2012) 294–305.
5. Hai Wang, Shouhong Wang, "Data summarization ontology-based query processing", Expert Systems with Applications 40 (2013) 2109–2116
6. Paolo Bouquet , Fausto Giunchiglia , Frank Van Harmelen , Luciano Serafini , Heiner Stuckenschmidt, C-OWL: Contextualizing ontologies Second International Semantic Web Conference, Sanibel Island, FL, USA, October 20-23, 2003.
7. Silvana Castano, Valeria De Antonellis, Sabrina De Capitani di Vimercati, "Global Viewing of Heterogeneous Data Sources" IEEE Transactions On Knowledge And Data Engineering, Vol. 13, No. 2, March/April 2001.
8. Hong-Hai Do, Erhard Rahm, "COMA - A system for flexible combination of schema matching approaches", Proceedings of the 28th international conference on Very Large Data Bases, page 610--621. Hong Kong, China, VLDB Endowment, (2002)
9. Paul Buitelaar, Philipp Cimiano,_, Anette Frank, Matthias Hartung, Stefania Racioppa, Ontology-based information extraction and integration fromheterogeneous data sources, science direct, Int. J. Human-Computer Studies 66 (2008) 759–788.
10. David Sánchez ⇑, Montserrat Batet, David Isern, Aida Valls, Ontology-based semantic similarity: A new feature-based approach, science direct, Expert Systems with Applications 39 (2012) 7718–7728.
11. F. Giunchiglia, P. Shvaiko, and M. Yatskevich. Semantic schema matching. Technical Report DIT-05-014, University of Trento, 2005.
12. Noy, N.F. and Musen, M.A. (2000). PROMPT: Algorithm and Tool for Automated Ontology Merging and Alignment. In: Proceedings of the Seventeenth National Conference on Artificial Intelligence (AAAI-2000), Austin, TX
13. Ehrig and Staab, 2004 QOM: Quick ontology mapping. In Proceedings of the International Semantic Web Conference (ISWC), pp. 683-697, 2004
14. Ryutaro Ichise, "Machine Learning Approach for Ontology Mapping Using Multiple Concept Similarity Measures", Proceedings of the 7th IEEE International Conference on Computer and Information Science, 2008.
15. Yves R,. Jean-Marya E, Patrick Shironoshitaa, Mansur R. Kabuk, "Ontology Matching with Semantic Verification", Web Semantics: Science, Services and Agents on the WWW, vol.21, 2009.

AUTHOR(S) PROFILE

C. SARANYA, received B. Tech degree in Information Technology from KTVR Knowledge Park for Engineering and Technology, Coimbatore, Tamil Nadu. And pursuing M.E degree in Dr.N.G.P Institute of Technology, Coimbatore, Tamil Nadu.

R. S. RAMYA. received B. Tech degree in Information Technology from Dr.N.G.P Institute of Technology, Coimbatore, Tamil Nadu and M.E degree in Computer Science and Engineering from SNS College of Technology, Coimbatore, Tamil Nadu.

Presently working as Assistant Professor in Dr.N.G.P Institute of Technology, Coimbatore, Tamil Nadu.

