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Multilevel Ontology Driven Tools in Semantic Web: A Survey

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ABSTRACT

This paper emphasizes on a detailed survey on multilevel ontology driven tools in semantic web. Knowledge Engineering can be represented in many ways ontology is the one of method to do this. Ontology is the huge source of domain knowledge for E-learning, data storage, semantic matching, dynamic evaluation etc. Ontology is the one of the back-bone of semantic web. The main goal of this survey is to understand and evaluate multilevel structure and hierarchical representation of semantic in ontology's.

Keywords: **Multilevel structure, Semantic Web, Dynamic Evaluation, E-learning.**

1. INTRODUCTION

There are various software tools available to develop ontology. Many ontology tool could be found on internet like protégé, top braid composer (all three editions available for trail), SWOOP, Neon toolkit etc. are used by many people to develop ontology. The term ontology has been adopted from two Greek words: on which means "being," and logia, where it is defined as the "theory of existence". Ontology is a backbone technology for semantic web. Semantic differences are the biggest objection in the semantic web. In semantic web ontology matching in multilevel structure is hard to achieve. How a level is semantic related to the other level entities of ontology's.

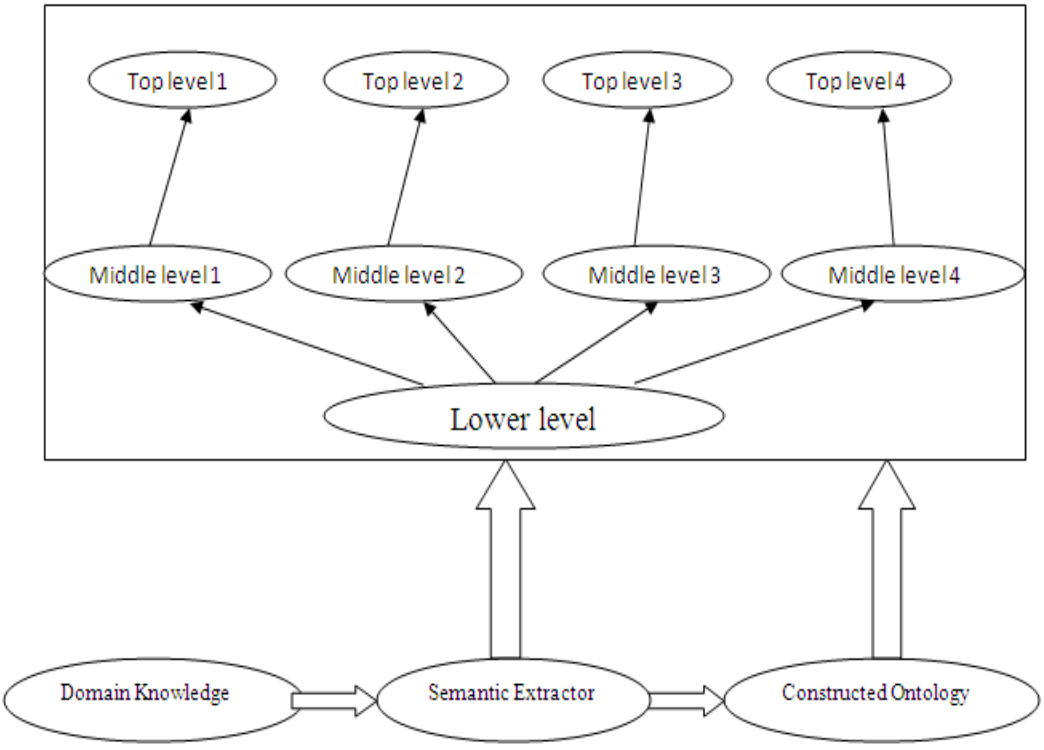

Fig. 1: Hierarchical Structure of Ontology

2. RELATED WORK

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. As in [2] author performed a survey on ontology construction tools in which they briefly explained the different tools and finally compared the features of different tools. Author of [5] explained gave detail about different ontology development tool and give the methodological support according to the features of the tool. Author of [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. Author of [7] give the detail features of ontology schema and layered architecture with their features. Author of [8] performed comparison of ontology tools based on ontology language, formalism, & their features. Author of [9] give the description of ontology tools, their needs & comparative study on re-engineering of ontology tools. Authors of [10] performed the comparison of tools based on experience of different group of person and their experience of using the tools.

Table 1: Features of Different tool available to develop multilevel ontology

Features	Apollo	Top braid composer	Protégé	Swoop	Neon Toolkit	Text2Onto
Availability	Free	License for SE & Me	Free	Free	Free	Free
Implemented in	Java	Java	Java	Java	Java Eclipse	Java
Import format	OCML, CLOS	RDBMS, OWL, RDF(S)	XML, RDF(S), XML schema	OWL, RDF, XML, TEXT, OIL, DAML	RDFS, OWL	RDF(S), OWL
Export Format	OCML, CLOS, META, RDF, XML	OWL, RDF(S), XML	XML, RDF(S), XML schema, F-Logic, CLISP, Java, HTML	RDF(S), OIL, DAML	RDFS, OWL	OWL, RDF(S), F-logic
Inference Engine	No	WOL, OWLIM, JENA, PELLET, Oracle rules & SPARQL Rules	Fact	No	Yes Pellet2, Hermit, Onto broker	Yes
Exception Handling	No	Yes	No	Yes	Yes	Yes Only Writing Mistake
Software Architecture	Standalone	Standalone Eclipse plug-in	Standalone Client/Server	Web-based & Client/Server	Standalone	Standalone & Via Plug-in
Backup Management	No	Yes	No	No	Yes	Yes
Querying	Yes	Yes	Yes	No	Yes	Y/N
Indian Language Support	No	No	No	No	No	No
Versioning	Y/N	Y/N	Y/N	YES	YES	Y/N
Merging	No	Y/N	Via ANCHOR-plug-in	No	Yes	Y/N
Ontology Storage	Files	DBMS	Files & DBMS (JDBC)	As HTML Models	Files	Files
Multi User	No	Yes Except Free Edition	Limited (multiuser capability added to it in	Yes	Yes Limited	Yes

			2.0 version)			
Web support	No	Yes Except free Edition	Via protégé OWL plug-in	Yes	Yes	Yes Via KAOON portal
Internal Web Browser	No	Yes	No	Yes (Standard web browser Only for Ontology)	Yes	No

CONCLUSION

Focusing on the multilevel ontology, this paper gives the summary about multilevel structure of ontology and analysed the semantic matching of hetrogenoius datasets. Based on these, we suggest a new way to learn structure of ontology tools and mapping between the layers.There are various advantage of construting ontologies in semantic web but still some limitation and weaknesses exist.

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.
[33]. M. Jha, D. Pakhira, B. Chakraborty, Diabetes detection and care applying CBR