Short Communication

Towards the Development of Web-based Ontology Development and Editing (WODE) Tool

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Abstract

The World Wide Web is the biggest data manipulation center where semantic web is step towards easy content access over millions of machine. Where as, ontology is important part of semantic web and play a vital role in future web. Ontology development tool matured enough in last decades but no such on-line Web-based ontology tool has been developed under the technology of PHP (Hypertext Preprocessor). Defining things semantically by the help of ontology will be beneficial for LAMP technology. Therefore, a LAMP based tool is planned to fill in the gap in the area of ontology development. For which, Web-based Ontology Development and Editing (WODE) tool is developed which help in creating ontology on web environment.

Keywords: WODE, ontology editor, semantic web, LAMP, biological viruses community ontology.

Introduction

The concept to fill the gap of technology is the creativity of distinguished Web-based Ontology Development and Editing (WODE) tool, from already built ontology tools like Web Protégé[1], TODE[2], OBO-Edit[3-4]. These are open source ontology editors that are not built in LAMP[5] environment so no such work is found in LAMP environment. WODE tool not only opens the door in the research sector as well as give the platform to a LAMP developers to contribute to this research work and construct different visuals and compatibility towards ontology. So, WODE tool is built under-conciliation and facts that it is convenient for importing, creating and editing ontologies online to gather the functionalities under this tool. WODE tool performs the criteria for constructing ontologies, the relation between entities, concepts and attributes in that particular domain, view the graphical form. Since WODE tool is a web based online platform that gives the ease to the user to merge all the ontologies on a single server to make it centralized and global. Where researchers contribute and enhanced the development criteria for ontologies and create more ideas having the interface of the WODE tool. WODE tool is divided into four panels to give out the ontology definition, graphical view, tree view and search the entity of ontology. WODE tool is procedure enough to visualize for user interface to get the information and manipulate ontologies dynamically and conceptually. WODE tool supports RDF[6] and OWL[7] for ontology creation and manipulation.

Material and Methods

LAMP Environment: The open source development with LAMP gathered up to construct an environment consisting of four packages that describes LAMP. Where as L is denoted as for Linux operating system that is open source on which the development is executed. A represents as Apache server where server side scripts are compiled and manipulated for desired output. M is used a MYSQL Database Server to store the data in to the database in multiple way. PHP is represented by P, used for working server side and communicating the database it gives contemporary developers a cost-effective and robust alternatives to create dynamic data driven tools like WODE Tool.

Ontology: The concepts, relationships, attribute and other major difference that are related to present domain, define the term ontology referring to Tom Gruber[8] that "ontology is a specification of a conceptualization". Ontology is a classification technique[9] for classifying the any type of data. Research on ontology is underway and further advancements day by day achieved. Currently, researchers emphasize not only on ontology development, but also ontology analysis. As more ontology are generated and reused, more tools will be available to analyze the need and enhancement for WODE tool as an example.

Ontology Editors: Web Protégé: Web Protégé[1] is a very handy tool, it uses Protégé as a backbone for ontology development. It uses JavaScript framework GWT (Google Web Toolkit) for the user interface.

OBO-Edit: OBO-Edit[3-4] is a desktop based application, which is built on java. The Gene Ontology[10-12] is the major achievement of OBO-Edit group, which is the most mature ontology of biomedical, developed in OBO-Edit. OBO-Edit also provides the set of rules to create the ontologies especially in the field of biomedical.

TODE: TODE[2] is a multilingual ontology editor tool developed in Dot net environment. It gives multiple implementations criteria for ontology in a visualized way. TODE require metadata, scope, concepts and properties for ontology development. They used JENA API after conversion of it in Dot net.

Table-1 shows the comparative analysis of the above mentioned ontology editors with WODE tool.

Results and Discussion

WODE Tool: Web-based ontology Development and Editing (WODE) tool gives multi functionality for ontology management for contribution of web based environment being online around the globe. Ontologies created via WODE tool are managed through a well defined manner. Definitions, classes, comments are commonly define while creating ontology. The search entity in the WODE tool allows user to search a particular attribute referring to the ontology. Graphical view of class and instances makes the WODE tool more users friendly and compatible. It supports RDF and OWL ontology even exporting or importing from RDF to OWL and OWL to RDF so that the ontology is backed up.

Developing Ontology with WODE Tool: Biological Viruses Community Ontology (BVCO) as an Example

Tree View: The classes, instances and attributes define in WODE tool of BVCO[13] can be seen in figure-1. The main class is biological viruses community, where as multicellular organism and unicellular organism are two main sub classes. All the tree nodes are editable. Every class denoted with icon. Graphical point of view is focused to make the user interface understandable.

Graphical View: Figure-2 shows the example of graphical view of same ontology i.e. BVCO created in WODE tool. It is simplest form where user can see all its classes, sub classes and relations in a visualized way.

The Human Biological Viruses Ontology (HBVO)[14], and other ontologies which originally developed in OBO-Edit can import and edit in WODE tool.

Conclusion

The initial step has been taken in the form WODE tool in LAMP environment. WODE tool provides an on-line platform to create and manipulate ontologies in a simplified way. It produced a centralized database for the ontologies to make it possible for all the researchers to contribute and share the ideas with regards to ontologies. WODE tool also opens the door for the LAMP environment and LAMP Developers to make their way towards the futuristic approach to the ontologies editors and ontologies.

Table-1
Comparison between ontology Editors

Ontology Editor	Development Language	Free	Installation	Import/Export	Open Source
Web Protégé	Java	Yes	No	RDF, OWL, Flogic, CLIPS	Yes
TODE	Dot Net	No	Yes	RDF, OWL, Lite, RDBMS	No
OBO-EDIT	Java	Yes	Yes	OBO, RDF, OWL	Yes
WODE Tool	PHP	Yes	No	RDF, OWL	Yes

Figure-1
Tree view of BVCO
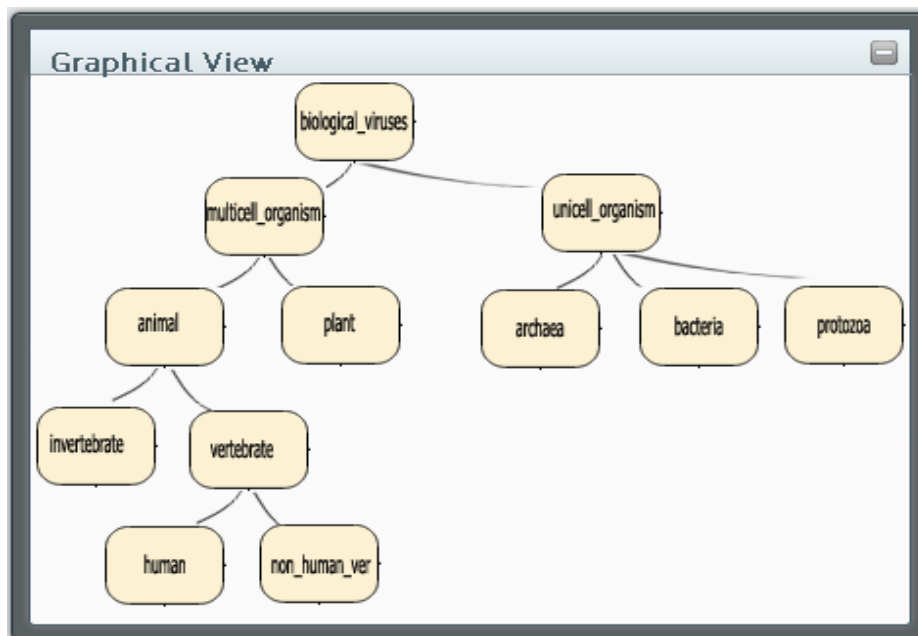
Figure-2
Graphical view of BVCO

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