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SEMANTIC WEB TECHNOLOGIES: AN OVERVIEW

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ABSTRACT

The term "Semantic Web" is often used more specifically to refer to the formats and technologies that enable it . These technologies include the Resource Description Framework (RDF), a variety of data substitution formats, and notations such as RDF Schema and the Web Ontology Language, all of which are intended to provide a formal description of concepts, terms, and relationships within a given knowledge domain. In the last decade the increasing popularity of the World Wide Web has lead to an exponential growth in the number of pages available on the Web. This huge number of Web pages makes it increasingly difficult for users to send required information. To enable machines to support the user in solving information problems, the Semantic Web proposes an extension to the existing Web that makes the semantics of the Web pages machine process able. The Semantic Web is well recognized as an effective infrastructure to enhance visibility of knowledge on the Web. The foundation of the Semantic Web is ontology , which is used to unambiguously represent our conceptualizations. Ontology engineering in the Semantic Web is primarily supported by languages such as RDF, RDFS and OWL. This article discusses the requirements of ontology's in the context of the Web, compares the above three languages with existing knowledge representation formalisms, and surveys tools for managing and applying ontology's.

KEYWORDS: Semantic Analysis, Ontology, Resource Description Framework, Web Ontology Language.

INTRODUCTION

The Semantic Web is well acknowledged as an effective infrastructure to augment visibility of knowledge on the Web. The Semantic Web takes the elucidation additional. The Semantic Web is not a separate entity from the WWW. The Semantic Web is a visualization to augment the current web with dignified knowledge and data that can be processed by computers thereby shifting the focus away from a human-centered interaction. Efforts are in progress to define the format and meaning of the language of such a Semantic Web. The structured data on the Semantic Web could provide both humans and computers, while a part of it will be formalized knowledge and will be used only by machines. The Semantic Web aims to put together a common framework that consent to data to be shared and recycle across applications, enterprises, and community limitations. It recommends to use RDF as a flexible data model and use ontology to represent data semantics.

Semantic Analysis

The increasing popularity of the World Wide Web (WWW) has changed the way we think about our computers. Originally computers were used for computing numerical calculations The Semantic Web is a interconnect of information associated up in such a way as to be effortlessly process able by machines, on a global scale. One can think of it as being an efficient way of representing data on the WWW, or as a worldwide linked database. The Semantic Web was thought up by Tim Berners- Lee, inventor of the WWW, Unified Resource Identifiers (URI), HTTP, and HTML . The Semantic Web is the extension of the World Wide Web that facilitates people to share content ahead of the restrictions of applications and websites. It has been described in rather different ways: as a topic vision, as a web of data, or merely as a natural paradigm shift in our daily use of the Web. Most of all the Semantic Web has inspired and engaged many people to create innovative semantic technologies and applications. Semantic web.org is the widespread platform for these inhabitants. The Semantic Web is a Web

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with a meaning if HTML and the Web made all the online credentials look like one gigantic manuscript, RDF, schema, and inference languages will make all the data in the world look like one huge database .Subheading should be 10pt Times new Roman, justified.

Figure:

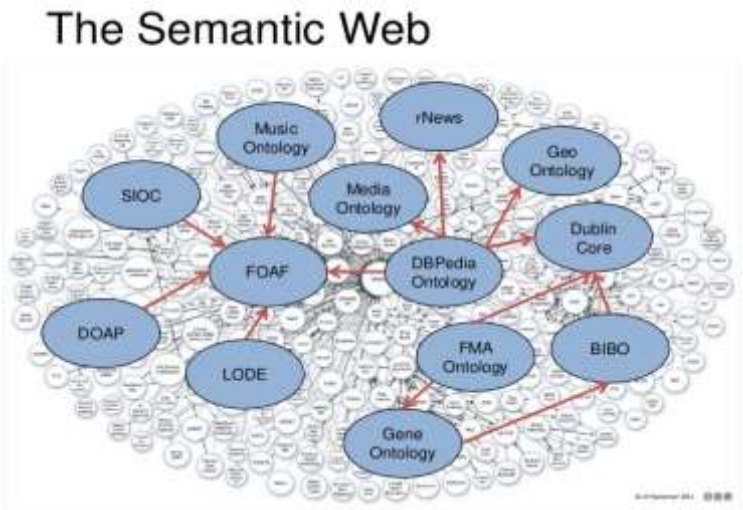

Fig.1 The Semantic Web

Ontology

Ontologies play an significant role in rewarding semantic interoperability as described in the seminal article on the Semantic Web . W3C has standardized a covered stack of ontology languages that acquires the advantages of both knowledge representation (KR) formalisms and conceptual modeling methods for databases. Standardization encouraged creating new ontologies and porting existing ontologies into the Semantic Web.RDF provides a way to express simple statements about resources, using subject . predicate . object triples. However, to use RDF we also need the possibility to the define the vocabulary that is used in the RDF statements. This controlled vocabulary is also called Ontology. For a given domain the ontology defines the concepts found in the domain, the relationships between these concepts, and the properties used to describe the concepts. Ontologies play an important role in fulfilling semantic interoperability as described in the seminal article on the Semantic Web Standardization encouraged creating new ontologies and porting existing ontologies into the Semantic Web.

Figure:

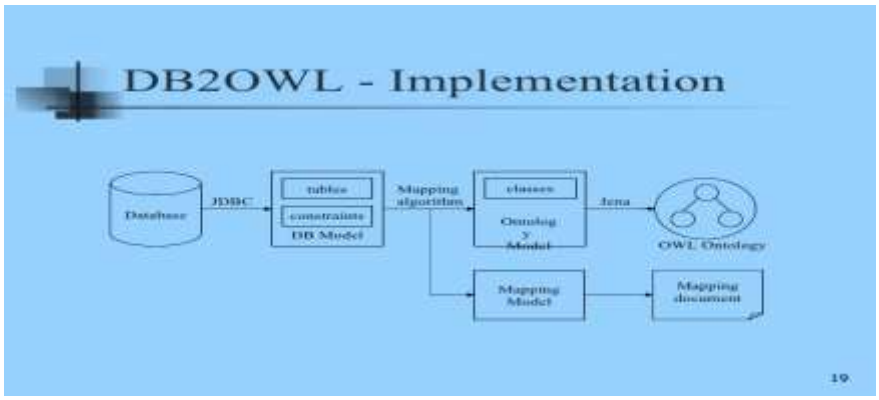

Fig 2. OWL Ontology Implementation

OWL ontologies can effectively capture data semantics and enable semantic query and matching, as well as efficient data integration The results and discussion may be combined into a ordinary section or accessible

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independently. They may also be broken down into subsets with short, informative captions.

Resource Description framework

RDF Schema (RDFS) is a simple ontology definition language that allows users to define the vocabulary needed to describe the resources in the domain with meta-data. To define the ontology RDFS uses the RDF triples format. Therefore, an ontology in RDFS is modeled as RDF graph. In RDFS users can define classes, properties, and relationships to model the concepts in the domain. RDF offers a simple graph model which consists of nodes and binary relations. It is a type of Semantic Network and is very similar to the Relational Model . RDFS has been used to supplement RDF to endow with better support for description and categorization. These models organize knowledge in a concept-centric way with descriptive ontology constructs (such as frame, slot, and facet) and built-in heritage axioms. Frame Systems facilitate users to characterize the world at different levels of generalization with the emphasis on entities, and this aspect makes it relatively different from the planar graph model offered by most semantic networks. RDF is a markup language for describing information and resources on the web. A language which utilizes three URIs in such a way is called RDF: the W3C have developed an XML series of RDF, the "Syntax" in the RDF Model and Syntax commendation. RDF XML is measured to be the standard substitution arrangement for RDF on the Semantic Web, although it is not the only format. Once information is in RDF form, it becomes easy to process it, since RDF is a common format, which previously has many parsers. When people are confronted with XML RDF is relatively straightforward, and is twofold. Firstly, the benefit that one gets from drafting a language in RDF is that the information maps directly and unequivocally to a model, a model which is decentralized, and for which there are countless generic parsers already existing.

Web Ontology Language (OWL)

It is a family of knowledge demonstration languages for authoring ontologies, and is sanctioned by the W3C. This family of languages is based on two (largely, but not entirely, compatible) semantics: OWL DL and OWL Lite semantics are based on Description Logics, which have eye-catching and well-understood computational properties, while OWL Full uses a novel semantic model intended to provide compatibility with RDF Schema. OWL ontologies are most commonly consecutive using RDF/XML syntax. OWL is measured one of the elemental technologies underneath the Semantic Web, and has fascinated both educational and commercial interest.

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