Role of Ontology in Semantic Web

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Abstract- *The current generation of computers is ever-changing from single isolated devices to entry points into a worldwide network of knowledge exchange. Therefore, support within the exchange of information, data and data is changing into the key issue in engineering these days. The increasing volume of data accessible on the net makes information retrieval a tedious and tough task. The vision of semantic web introduces successive generation of the net by establishing a layer of machine-understandable knowledge. The success of semantic we tend to crucially depends on the simple creation, creation and use of semantic knowledge, which can rely on building associate degree ontology. This paper states the essential ideas of semantic web, defines the structure and applications of ontology. It additionally enlightens the role of ontology in supporting data exchange method, notably with semantic web.*

Keywords- Ontology, Semantic Web, OWL, RDF.

I. INTRODUCTION

Today we tend to live within the modern era and society is labelled as data society. Knowledge, a pre-dominant component, pervades and dominates the everyday activities in data society. There's a transmutation in data generation, distribution, and access. [1]

A million and billions of websites and documents are gift on current web. These documents are organized in unstructured manner on the net. Thus retrieving the proper data from the net becomes terribly tough. This is often as a result of the net documents are connected mistreatment hyperlinks with none relationship among them. Semantic web technology solves this downside. It links the documents on the web in a very pregnant manner bythe means that of relationship among web documents. Thus retrieving the relevant document is changing into doable. [2]

In the reference of semantic web, Ontologies specify domain theories for the specific illustration of the semantic web. In alternative words, ontology ought to be seen as a right answer to supply a proper conceptualization. Indeed, ontology should transcribe a precise agreement. Its basic features is to permit the functioning of the resources offered by the web in numerous applications or software system agents.

The ontology provides:

- For the vocabulary, the structuring and also the operation of metadatas;
- As illustration pivot for the combination of springs of heterogeneous data;
- To describe the net departments, and customarily, everyplace it's reaching to be necessary to press software system modules on semantic illustration requiring bound agreement. [3]

II. CONSTRAINTS OF THE PRESENT WEB

Current World Wide Web (WWW) may be a large library of interlinked documents that are transferred by computers and bestowed to folks. It's fully grown from machine-readable text systems; however the distinction is that anyone will contribute thereto. This additionally means that the standard of knowledge or maybe the persistence of documents cannot be uniformly warranted. HTML's simplicity has seriously hampered additional advance web applications in several domains and for several tasks. This was the explanation for outlining another language, protractible language (XML), that permits arbitrary domain and task specific extensions to be outlined. Semantic web is associate degree XML application, developed to create the current web semantically richer. [1]

III. SEMANTIC WEB

The idea of the semantic web was planned by Tim Berners-Lee, the founding father of the web. He envisions that in future, the huge quantity of knowledge on the net can bear computer readable information, leading to pc having the ability to govern the contents mechanically while not human intervention. Therefore, the semantic web is fanciful as associate degree extension of the net, within which data is given a well outlined which means. It's the appliance advanced data technologies to the net and distributed systems normally. It describes strategies and technologies to permit machines to grasp which means or "semantics" of knowledge on the web. To accomplish this, the provided data ought to be structured, in the middle of the sets of logical thinking rules that may be utilized by computers to conducted machine-driven reasoning.

3.1 Semantic Web Technologies:

The semantic web contain resources corresponding not simply to media objects (such as web content, images, audio clips, etc.) because the current web will, however additionally objects like folks, places, organisations and events. Further, the semantic web can contain not simply one reasonably relation (hyperlink) between resources, however many alternative styles of relation amongst the various styles of resources.

XML may be a straightforward language that allows users produce their own tags so as to annotate web documents. It provides associate degree alimentary syntax for contained structure among documents. XML schema may be a language for providing and proscribing the structure and content of components contained among XML documents. Whereas associate degree XML document may be a tree, associate degree resource description framework (RDF) document consists of sets of triples. Every triple contains a subject matter, predicate associate degree an object. These triple is written mistreatment XML tags. RDF may be a straightforward language for expressing knowledge models that talk over with objects and their relationship. Associate degree RDF-based model is drawn in XML syntax.

RDF schema stands RDF and may be a vocabulary for describing properties and categories of RDF -based resources, with semantic for generalised- hierarchies of such properties and categories.

XML associate degree RDF are two complementary technologies accustomed build an intelligent web. RDF model uses vocabulary outlined by the terms of ontology. [1]

IV. ONTOLOGY

An ontology may be a framing of a conceptualization. It infers that ontology formally describe the ideas and relationships which might exist in some community. Associate degree ontology describes an area of the planet.

A concept in associate degree ontology will represent the range of things. A plan is an object of any sort: person, car, building, will describe associate degree activity or state: swimming, being busy or accessible, abroad. It will represent abstract conception like time or price. There's no strict restriction what is expressed as a plan in our ontology. The sole restriction is that the globe that is ontology tries to replicate.

A relation in associate degree ontology represents some way within which two ideas is connected to every alternative. The affiliation might represent two allegiances: dog is supporter of man, train wants rails, characteristics of objects: kids are young, apple are juicy, activity: policemen chase criminals, etc.

The whole plan of ontology might sound the same as the conception of RDF. Infact, each ontology is associate degree RDF graph however the distinction is that the ontology sets rules, establishes facts regarding no single objects however categories of objects.

For example: Policemen chase criminals can be an area of ontology as a result of chasing criminals is policemen's job normally. Its associate degree establishes facts. [4]

V. ROLE OF ONTOLOGY FOR THE SEMANTIC WEB

The semantic web realise heavily on the formal ontologies that structure, underlying knowledge for the aim of comprehensive and conveyable machine understanding. So the success of the semantic web depends powerfully on the proliferation of the ontology which needs quick and simple engineering of ontology and rejection of the data acquisition bottleneck.

Conceptual structures that outline associate degree underlying ontology are related to the concept of machine method in position knowledge on the semantic web. Ontologies are information schemas, providing a controlled vocabulary of ideas, every with associate degree expressly outlined and machine method in a position semantic. By shaping shared and customary domain theories, ontology helps each folks and machine to speak exactly to support the exchange of semantic. Ontology language editors facilitate to builds semantic web. Hence, a budget and quick construction of domain specific ontology is crucial for the success of semantic web. [1]

VI. OWL- WEB ONTOLOGY LANGUAGE

Back then, in the semantic web analysis, there have been several formalisms used to explain ontologies. It created abilities and expectations from semantic web which nearly was not possible.

OWL, the net ontology language, may be a W3C recommendation of a language for specifying ontologies. It's been designed to facilitate bigger machine interpretability than previous answer. It provides additional intensive vocabulary than plain XML, RDF or RDF Schemas and higher facilitates

expressing semantic than these languages. OWL has its roots in DAML+OIL (DARPA Agent markup Language+ Oil Inference Layer or Ontology Interchange Language) web ontology language that ideas, revised and updated, were incorporated into OWL.

Currently the OWL is the alternatives for making ontologies.

The practise with making OWL ontologies showed that OWL is incredibly articulate. Some cases it's not convenient to use it. Typically we tend to don't use all of OWL's subtle ideas. However applications forever assume that we tend to may and check out to reason over these ideas. Designers of OWL foretold the matter and provided 3 OWL "species", set of OWL with decreasing quality. But there are initiatives to supply even easier languages than OWL Lite, the smallest amount communicative of the three. [4]

VII. CONCLUSION

Ontologies perform a significant role in achieving ability across various associations and on semantic web, as a result of their motive is to seize domain knowledge and their mantle is to make semantics unambiguous in an inclusive manner, facilitating the premise for consensus within a domain. This is used to convert from machine-readable to machine-understandable. Ontology is also a salient approach to elucidate semantics. It allots a typical, accessible substructure for amenities on semantic web.

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