Semantic Web Search Engine for Accurate Outcomes Using Ontology- A Survey

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ABSTRACT-Web is commonly known as World Wide Web. Web has a important feature is *Semantic Web*, it is W3C standards. It gives machine to machine communication in their understandable format. Everyday Semantic web is using everywhere in internet environments. Semantic is possible by using Ontology's and Resource Description Framework (RDF), which are used to provide knowledge domain's to the machines in readable format (XML). This paper describe about working of semantic web application. It describe about communicating with friends via message who are having emails. It is about sending message to friends who are having emails or sending message to restricted friends who are having Gmail accounts, checking myself having different names and also adding friends and sending message to them by using knowledge specified in form of RDF and Ontologies.
KEYWORDS: Semantic Web, Ontology. RDF, Web(World Wide Web).

Introduction

SEMANTIC WEB

The word Semantic is defined as the specified structure and web is defined as World Wide Web. Now a days people are using for several services such as storing publishing etc provided by the web. Now a day's everybody know about the web, it had become quite common and handheld to the people. So as the day's passing away using only web had been becoming legacy to the people and also certain burden to them in searching, accessing, getting services and browsing. So semantic web is introduced, semantic web means an expansion of the existing web, which provisions a simple method in the direction of discover, share, reprocess and merge information. In semantic web human intervention is quite negligible; it has communication between machines to machine, that means information entered by the user is read by machine, then it understood and gives exact result to user.

Web search engines provides users to retrieve required information document. Information Retrieval (IR)[1] research technology is developing gradually and there are several techniques to search required information from large repositories. Usually search engines are not likely to understand the objective of the users to provide the best results for the given interrogation. Interpreting the formal languages in the Web content is more effortless using ontologies. Resource Description Framework (RDF) is used to add semantic information to Web pages.

II. RESOURCE DESCRIPTION FRAMEWORK

RDF is a framework used for interchanging data on the Web. RDF has features that facilitate data merging even if the underlying schemas differ, and it specifically supports the gradual development of schemas over time without requiring all the data consumers to be changed.

RDF provides the flexibility in defining the properties of classes. In RDF language, there is no need to define properties for each and every occurrence of a class [2].

RDF files are written in XML format. All RDF constitutes three format. They are subject, predicate and object. RDF is used for linked data (ontology). Linked Data is defined as the connection of the structured data on the web and also it is interrelation between the data that has some relation. For example mother and daughter.
Other relation in the family can also be described in the ontology. Ontology provides the relationship between the given domain, in turn will get the accurate result of the search

Ontology

Ontology is a formal way of representing the entities in a domain that can be reused easily. It is also referred as a vocabulary of terms and relationships between terms in a given domain. Ontology basically derived from the concept of philosophy. In the information domain, Gruber gave exact definition to show the nature property of ontology, that is "ontology is an explicit specification of a conceptualization [2]. Ontologies can be created automatically and manually. Manual creation of ontologies takes more time and error prone. Ontology is a knowledge representation method in the semantic Web and it includes three parts, i.e., concepts, relationships and instances [3].
Based on the content of ontology, ontology can be classified as follows:

- Domain ontology
- Generic ontology
- Task ontology

The domain ontology can be developed as follows:

- Check the reusability of the existing domain ontology, and define the c lasses of ontology.

- Set the reasonable hierarchy structure of class and subclass
- Define the properties of class and describe the restrictions on property values.
- The specific property values are set for the property of instance.

The reasons for developing the ontology are as follows:

- Ontology allows the reuse of domain knowledge.
- Ontology is used study the domain knowledge.
- Ontology is used to share the understanding of the structure of information between the people or among the software agent.

Creation of Ontologies

The proposed search engine retrieves the accurate results for the queries based on the ontologies and their model. This paper explains an outcome of an instance program designed for The Rao family and relations to explain the retrieval of the expected results of the users posted to the proposed searchengine. The internal query searching in the database isperformed by SPARQL. This model created the ontologies based on OWL data model by generating the huge repositoriesof these ontology models. Therefore, it becomes very easy tofind out the relations between the roles by declaring theirrelations and the properties.Thus, the creation of the ontology is one side and derivingthe properties according to the classes is another side. The program outcome makes clear concerning the packages to be imported, model, creation OWL classes, declarations to acquire Rao ontology. The two standards which construct the ontology are RDF and OWL. In accordance with RDF and OWL the ontology is made up of two main components, i.e., classes and relationships. With ontology concepts are only defined interms of relationships to other concepts. To retrieve the details and the relationship of the special roles in The Ramayana, the proposed search engine will search for the query given by theuser using SPARQL into the database. Thus, by applying thequery language SPARQL on the below ontology, one can get the anticipated results of the search engine from the Web.

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-
syntaxns#"
xmlns:owl="http://www.w3.org/2002/07/owl#"
xmlns:j.0="http://www.rao.org/"
xmlns:daml="http://www.daml.org/2001/03/daml+o
il#"
```

```
xmlns:rdfs="http://www.w3.org/2000/01/rdf-
schema#">
<owl:Class
rdf:about="http://www.rao.org/Sham"/>
<owl:Class
rdf:about="http://www.rao.org/Adithya"/>
<owl:Classrdf:about="http://www.rao.org/Sita"/>
<owl:Class
rdf:about="http://www.rao.org/Rayan"/>
<owl:Class
rdf:about="http://www.rao.org/Lakshaman">
<j.0:hasSon>
<owl:Class
rdf:about="http://www.rao.org/Rama"/>
</j.0:hasSon>
</owl:Class>
<owl:Classrdf:about="http://www.rao.org/Rama">
<j.0:hasSon>
<owl:Class
rdf:about="http://www.rao.org/RishiKrishna"/>
</j.0:hasSon>
<j.0:hasBrother
rdf:resource="http://www.rao.org/Sham"/>
<j.0:hasBrother
rdf:resource="http://www.rao.org/Adithya "/>
<j.0:hasBrother
rdf:resource="http://www.rao.org/Rayan "/>
<j.0:hasWife
rdf:resource="http://www.rao.org/Sita"/>
</owl:Class>
<owl:ObjectProperty
rdf:about="http://www.rao.org/brotherOf"/>
<owl:ObjectProperty
rdf:about="http://www.rao.org/hasWife">
<owl:sameAs>
<owl:ObjectProperty
rdf:about="http://www.rao.org/wifeOf"/>
</owl:sameAs>
</owl:ObjectProperty>
<owl:ObjectPropert
rdf:about="http://www.rao.org/hasBrother">
<owl:equivalentProperty
rdf:resource="http://www.rao.org/brotherOf"/>
</owl:ObjectProperty>
<owl:ObjectProperty
rdf:about="http://www.rao.org/hasSon"/>
        </rdf:RDF>
```

LITERATURE SURVEY:

Now a days semantic web is gradually increasing its power in the other research areas such as bioinformatics, eCommerce, eGovernment and the social web. Semantic web is classified into three categories.

- Semantic Architecture and security
- Semantic Mining
- Context aware

Semantic web is redefined in different ways, According to P.Hitzler "Semantic web is shared inference. Machine learning methods along with the deductive ones are needed to be explored in terms of precision and recall value."

According to H.Chen "Semantic web technology is explored to represent, integrate and analyse the knowledge in various biomedical networks. Semantic graph mining framework is introduced for network data analysis.

Now a days semantic web has became popular, and search engine like Google search engine, facebook graph search, bestbuy.com, etc. are using semantic web. In semantic web all information is used as linked data. In RDF file each and every term consist of subject, object and predicate format. All the three format of the RDF is used as resource. These resources are used in the form URI. Uniform Resource Identifier, which recognizes the resource over the network, and it also enables interaction between the resource. This means we are making the content of information available to search engine in semantic method.. In our daily life we are processing huge data. For example bank statements, photographs, events in calendar. To constitute the information in a calendar, like a particular event takes place at mentioned date and time in calendar, all this is possible using semantic web.

III. Layered Architecture of Semantic web Application
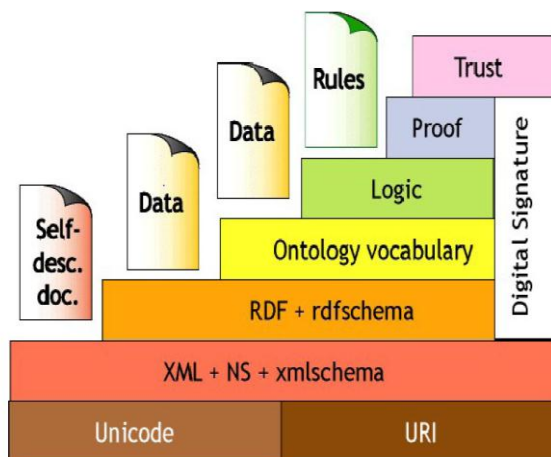
In semantic web layered architecture, the first layer consists of Unicode and URI. Unicode is described as international standard. Unicode is used by different languages and the scripts, language such as ASCII. Uniform Resource Identifier, which recognizes the resource over the network, and it also enables interaction between the resource.

The architecture's second layer describes about XML. It consists of XML namespace and XML schema. In web services, XML(extensible markup language) is used to maintain, store and transfer the

data. Because XML is portable and it is not replacement of HTML. XML namespace provides similar name for each node. Every node constitutes set of tags with particular name of starting of every tag. The structure of XML is given by XML schema. The XML with the structure is called valid and well formed XML document. By using XML schema it can provide restriction in the XML document.

The architecture's third layer explain about the "RDF" and "RDF schema file". To describe about a person and his relationship, in RDF we use "Friend Of A Friend" (FOAF). FOAF is machine understandable ontology a person, persona's activity, relationship to other people and the objectives. RDF can define as per the namespace attributes example is shown below.

```
<foaf:Personrdf:ID="me">
<foaf:name>Rama Sita</foaf:name>
<foaf:title>Drrr</foaf:title>
<foaf:givenname>Rama Sita</foaf:givenname>
<foaf:family_name>xyz</foaf:family_name>
<foaf:nick>vinni</foaf:nick>
</foaf:person>
```

FOAF namespace can be downloaded from internet it is freely available. RDF schema is used to provide some object properties to provide restriction as has friend, so that relation is made symmetric.

The architecture's fourth layer describes about OWL files and the RDF schema. XML syntax are used in OWL file in order to present the knowledge. There are some restrictions in RDF which are not possible, those can be resolved in the OWL file.

JENA

Jena is a open source framework, which helps in building the semantic web application. Jena framework has several java libraries which helps the developer to develop the application. Jena uses a Java RDF API and the java tool kit to build the semantic web application. In RDF files java programs are written in order modify the data or update the data or retrieve the data. In order to use Jena framework in the application, import the .jar file in the java program as a library. The "SPARQL" queries are written in the program in order to retrieve the information as per query requested by the developer. SPARQL is a query language similar to SQL. SPARQL gives the query result using Jena framework in the RDF/OWL file.

CONCLUSION

Now a day's semantic web becoming more popular, in upcoming days it will be a futures web. Today the search results are very accurate. All search engines uses the semantic web provide the accurate result. The semantic web to the uses RDF, micro formats and ontology to provide the accurate result to

the user. RDF increases information retrieval on the web in order to get semantic elation between two terms specified in the query sentence. Although many challenges will arises in the research world. Today, in the Internet world all layers of the architecture are implemented. All requests are processed using semantic web, to get accurate and dynamic result.

Reference

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