

The collision of Semantic interoperability though mapping query to the ontology in Semantic Web mining

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ABSTRACT

The web mining is a vision to interact with user queries. It accesses the information using search techniques and satisfies users. Since people make use of language to communicate. They use many words, concepts and gestures in their communication. But this is not possible for computer system. Web mining achieves this goal through semantic web. The semantic web mining is comprised from two words such as semantic web and web mining. The semantic web is the meaningful web where as web mining is the extraction of information from the web. In particular, we analyze data stored in web search engines logs to discover usage patterns and the aim is to enhance performance of search tools as well as to help users to find information on the web.

I. INTRODUCTION

The Semantic Web is the vision of transformation of information from web to knowledge web. The semantic web is a search mechanism which fulfils user needs. The initiative of semantic web was originated by Tim-Berner Lee in 'The Scientific Americans' [33] in 2001. The article described the growth of knowledge of a web that comprised a number of documents containing data and information for computer systems to manipulate.

The semantic web is energetic and distributed scheme which contains partial and dissimilar knowledge; hence there was need of an autonomous and distributed software system to develop the information accessible on the web [3]. Tim Berner-Lee explained the design of software agents to interpret relations and algorithms for managing complex systems [27]. The software agents signified as intelligent agents which behave like actors to describe semantic web. The semantic web has the vision to make economical transactions, communications and access to large heterogeneous information. It is very hard to integrate information, web content and web services [7].

The web needs software programs to integrate web pages that can share information independently. This need gives birth to semantic web. The expansion of semantic web requires techniques to express semantic content and ontologies on the web. The software agents help to make interaction in between web systems. The logical connections in between web pages using semantic web technologies establish interoperability in between systems [5]. The architecture of semantic web [23] includes various layers. Each layer represents technology or mixing of technology. It includes layers from bottom to top as their effort listed as below:

- The first layer **URI and Unicode** explains unique identification mechanism.
- The second layer **XML** gives syntax description.
- The third layer describes Meta data using **RDF** Schema.
- The fourth layer contains **ontology** of domain.
- The fifth layer contains **rules** for transforming documentation in schemas.
- The sixth layer includes **logic** for writing documents.
- The seventh layer includes **proof** for valid identity.
- The last vertical layer **Trust** includes signature verification of the system.

Tim Berner Lee also presented architecture of four versions of semantic web. It explains the inclusion and exclusion from one version to another for the expansion of semantic web.

A. WEB MINING

Web mining leads to enlargement of information. Web mining is the technique to extract information from the web on the demand of user. But the sources which generate information are not good reliable sources, there is redundancy of information. There is requirement of such umbrella activities for the expansion of web mining standard [22]. Web mining is used as tool to originate information from the web.

Web mining is most suitable tool to handle problem of overloading. Web mining exploits the data mining techniques to find the information from the web and produce desirable results. User input the data in the form of query, the web process it, then produce information in the form of output.

B. THE CORRELATION BETWEEN SEMANTIC WEB AND WEB MINING

Semantic web and Web mining techniques play an important role to mining valuable information from web.

Semantic web is an extension of current web and web mining technique is an extension of data mining technique.

II. RESEARCH METHODOLOGIES

The research work is to use of this framework base on ontology usage mining and word sense disambiguation for quality improvement for user preference and expectations with usage patterns and improve the scalability and accuracy of recommendations for user.

This research will first evaluate and simulate current personalization technique then propose new algorithms using ontology and web usage mining technique and develop framework. These are the following points whose focus is on various modules for enhancement and improvement of personalization system:

- Data Preprocessing
- SAE Approach
- Web Usage Ontology
- User Profile Evaluation Module
- Relevant Information Retrieval Module

- Web Personalization & Most Probable Results

The proposed System for Relevant Information Retrieval, predicting user behaviors and web personalization recommendations is shown in Figure 4.

III. FRAMEWORK FOR DEFINING SEMANTIC INTEROPERABILITY

The semantic interoperability is defined as the characteristics of artifact or a meaning in a language of a system, whose interfaces are entirely, understood its current, past and future conditions in either implementation or access without any restriction. To conquer interoperability, the query is fragmented as in taxonomies and structure. The taxonomy segmentation gives the identification of classes, attributes and their relations. The structure segmentation gives the grammatical structure of query such as subject, object and verb. Then there is mapping of ontologies with the query and display of results. The algorithm outlet for conquering semantic interoperability displaying the ontologies is as below:

Step1: Find Taxonomies

- (a) Identify classes c_i ;
- (b) Identify attributes of classes c_{ij} ;
- (c) Identify relationship r_i ;

Step 2: Find structures

- (a) Identify subject s ;
- (b) Identify object o ;
- (c) Identify predicate p ;

Step 3: Mapping of ontologies

- (a) $S=c_1$
- (b) $O=c_n$
- (c) $P=r$
- (d) If ($c_i=o_i$ and $c_{ij}=o_i$)

Then display

Step 4: Display the content

We recognize the query as elements could be classes, properties, instances and relations in between ontologies.

The distinct relationships are defined operators equivalence ($=$), subset (\subseteq), the union (\cup) etc.

IV. TOOLS FOR DEVELOPING SEMANTIC WEB

There are many tools which support the ontologies. These tools help in ontology creation, visualization, manipulation, search etc.

- a. Protege is an ontology editor. It is open source platform which implement queries to access knowledge through ontologies. It can also be extended tools and applications Java API for building [horrocks].
- b. JADE is a java framework for developing web applications. It gives programming environment for RDF, OWL and MYSQL. JADE is Java Agent Development Framework to develop multiagent systems. It is a middleware that gives the development of multiagent systems. It includes runtime environment, library and graphical tools. The messages are exchanged by JADE agents. The FIPA international standard use Acl for agent interoperability. It includes

- Sender who put the query
- List of receiver
- Their Communication

Query is the combination of content in a language and ontology that is vocabulary of symbols. This query is matched and responds to user.

c. PHP MYADMIN

The query for semantic data to access knowledge is given in MySQL. There are different methods and languages to put queries in order to access information [karvounarakis, Broekstra].

The first command is used to identify prefixes. Mysql is a query processor that search ontology while matching with condition as given.

V. CONCLUSION

The computer system understands on the basis of its limited database and logic. There is also a need of some documents and logic to make necessary connection. The proposed system define ontology mapping as to semantic alignment in between similar elements in different ontologies. The semantic alignment is the semantic correspondence in distinct relationships. The ontology alignment is referred as 1-1 mapping in this dissertation. It means to find similar relation in between classes and their properties.

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