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Personalized Semantic Retrieval Using Domain Ontology

P.Tamilselvi [1]
Programmer, Department of CSE
Srinivasan engineering college,
Perambalur, India

K.Sangeetha [2]

Abstract: The current web is based on HTML which not able to be exploited by information retrieval techniques and hence processing of information on web in mostly restricted to manual keyword search which results in irrelevant information retrieval.This drawback may be overcome by a new web architecture known as semantic web which is an intelligent and meaningful web. In this, ontology plays a vital role to extract meaningful information from on web. An ontology is a model for knowledge description and formalization which is modeled for a domain will increase precision of relevant documents retrieved from web. Another problem in current searching is the current search engines are generic search engines, a major deficiency of this that they are not adaptable to individual users. Different users have different needs. It is not required for the users to view everything to identify their needs. This can be solved by using a personalized web search on the Semantic web which retrieves the exactly relevant information based on the need of the users. It focuses on the benefit of semantic web through ontology and Personalization based access of web content to attain the relevancy in the documents retrieved and to gain user readability and satisfaction by without spending or wasting their time in going through the documents.

Keywords:HTML,AnOntology,SearchEngine,SemanticWeb,Personalization

I. INTRODUCTION

The semantic web offers users the ability to work on shared meaningful knowledge representations on the web.Semantic web creates an Artificial Intelligence(AI)application which will make web content meaningful to computers,thereby unleashing a revolt of new abilities and it intends to support machine-processing capabilities that will automate web applications and services.Ontologies aim as capturing domain knowledge in a generic way and provide a commonly agreed understanding of a domain.They are shared conceptualizations of a domain,and they possibly include the representation of these conceptualizations.Ontologies are independent from the applications that use them.In the Proposed system,Personalization is applied on domain ontology to retrieve and display an accurate web content page to the user based on their needs.

II. RELATED WORK

SEMANTIC WEB:

The next generation intelligent web is called the semantic web offers users the ability to work on shared meaningful to computers,thereby unleashing a revolution of new abilities and it intends to support machine-processing capabilities that will automate web applications and services.

Agent (software programs) will perform various tasks by communicating with other agents and seeking information from web resources.

ONTOLOGY:

To compare conceptual information across two knowledge bases on web, a program must have a way to discover common meanings and the solution to this is to collect information at a place called ontologies.Ontology formally describes a list of terms which represent important concepts, such as classes of objects and the relationships between them in order to represent an area of knowledges.Ontologies provide a formal semantics that can be employed to process and integrate information on the web.

Ontologies plays a pivotal role in providing a vocabulary comprising unambiguous definitions for terms that can essentially serve as a formal support for communication between software agents.They provide a communication mechanism for users.

Web Ontology Language (OWL), recommendation from W3C, is widely used to expand ontologies.

ONTOLOGY EXPANSION IN EDUCATION DOMAIN:

Sir Jorge Cardoso a survey on most widely used ontology editors and most widely used domain for ontology development and found that protégé tool had a market share of 68.2% followed by swoop,Onto edit,Text editor altova semantic works, and hence forth and ontologies were mostly developed in the field of education(31%).

During the past decade, the amount of web-based information available has increased dramatically.How to gather from the web has become a challenging issue for users.Current web information their information needs.

USER PROFILES:

User Profiles were used to web information gathering to interpret the semantic meanings of queries and capture user information needs.User Profiles were defined by Li and Zhong as the interesting topics of a user's information need.They also categorize user profiles into two diagrams:the data diagram user profiles acquired by analzing a database or a set of transactions the information diagram user profiles acquired by using manual techniques,such as information retrieval and machine learning.

van der sluijis and huben proposed a method called the generic user model component to improve the quality and utilization of user modeling.wikipedia was also used by to help discover user interests.

User profiles categorized into 3 groups: Interviewing, Semi interviewing, and Non-interviewing.

1. Interviewing: user profiles can be deemed perfect user profiles.

2. Semi interviewing: user profiles are acquired by semi automated techniques with limited user involment.

3. Non interviewing: this techniques do not users at all, but ascertion user interests instead.

III. PROBLEM DEFINITION AND ARCHITECTURE

As we have experienced in using well-known search engines each day, the result set return by search engines is really too big and is mostly useless, to continually click to the "next page" to obtain the web pages users really want. The reason is that, when the user needs to search some information in the web, the search engine abstracts the information to the keyword combinations and then submits it. The relationship between keywords is apparent to users, while it is not for search engines. If the web page only include the keywords and there is no relationship between keywords and there is no relationship between keywords in the context of the webpage, the web page does not provide what the user wants. There are many keywords isolated pages in the result set returned by traditional search engines. In fact, because of the constraint of the current web architecture, search engines cannot prohibit these keywords isolated pages from the result set.

In proposed system, keyword search is the process used by search to collect relevant documents from the web. Most keyword base approach for retrieving the information from web. But they retrieve many irrelevant web pages as well.with in use of semantics more relevant pages can be downloaded.Semantics can be provided by ontologies. This paper proposes the ontology based search through personalization such that only relevant Web content pages can be retrieve.

IV. PERSONALIZATION BY USING UNIVERSITY ONTOLOGY

A. Website Registration

All related websites are annotated through their possible relationship using RDF and OWL. For Example, university domain system details about state, university name, college name, college URL are stored as ontology.

In this annotation activity state, university name, university URL, college name, college URL are created and submitted to the cluster. Each ontology has its associated domain and range values. This will hold the property values, and its constraints.

The specific values are given like state, university name, university URL, college name, college URL, and ontology domain like university are given as input and the details are inserted successfully.

After creating ontology and successful invocation of ontology learner we can view the created ontology and we can view RDF, and view ontology graph. Ontology has its associated domain and range values. This will hold the property values, and its constraints.

B. Keyword Search

Keyword search is the process used by search to collect relevant documents from the Database. Most keyword base approach for retrieving the information from Database. But they retrieve many irrelevant documents.

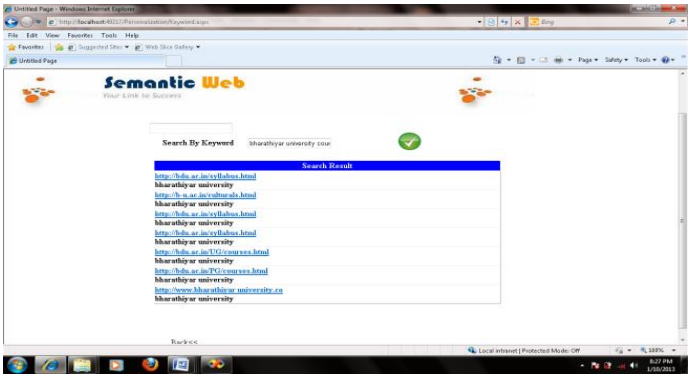


Figure.1

C. ontology search

Ontology search is better than Keyword search. Ontology search is the process used by search to collect relevant documents.fig 2 represents the ontology search to get the relevant information only.finally fig 3 the graph representations of two searches (keyword search, ontology search)

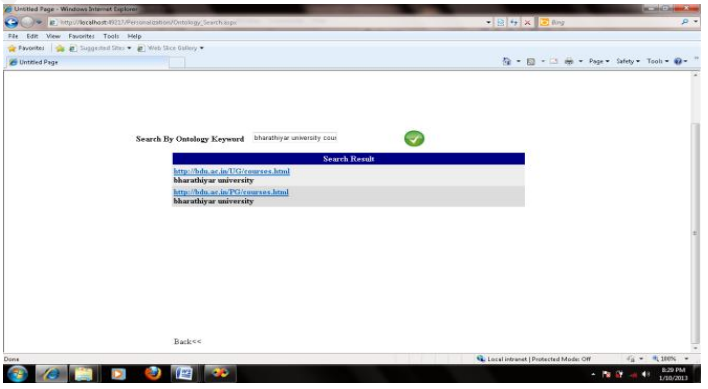


Figure 2

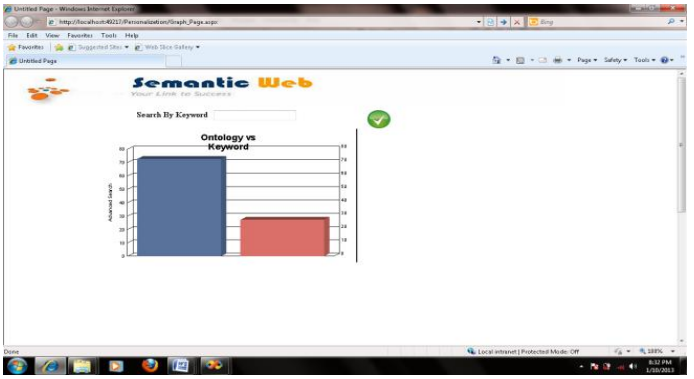


Figure 3

d. Personalization

Personalized is applied through the ontology in this section. So that the related content information only retrived.fig 4 searches by personal for example to search Bharthiyar University in UG courses only.fig 5 to produce only bharathiyar university UG courses.

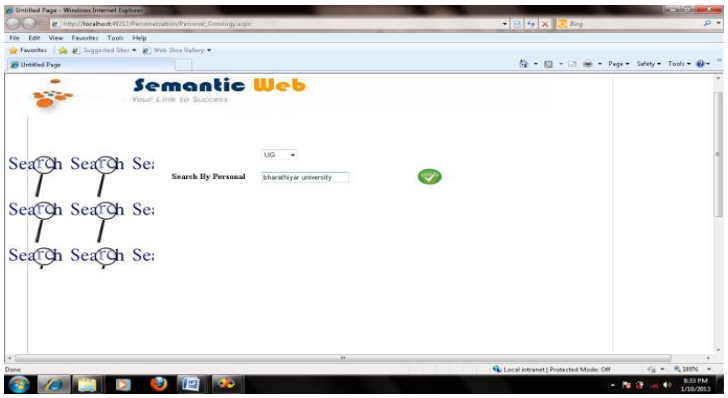


Figure 4

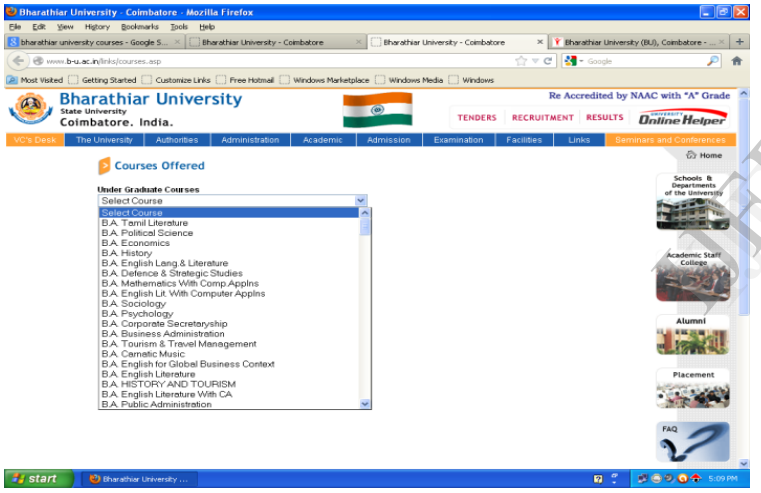


Figure 5

V. METHODOLOGY

A. OWL TREE CONSTRUCTION

Constucations of OWL Tree is shown below fig 6.

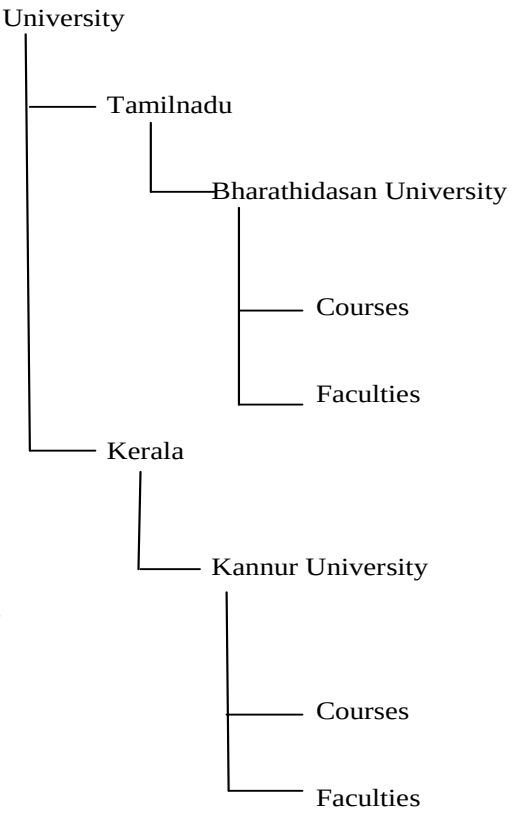


Figure 6

An Ontology building methodology may have the following layers:

- Top layer: building process compliance with software development process.
- Middle layer: Generic constraints and guidelines to specify major steps.
- Bottom layer: Most fine grain guidelines such as those for class identification process etc.

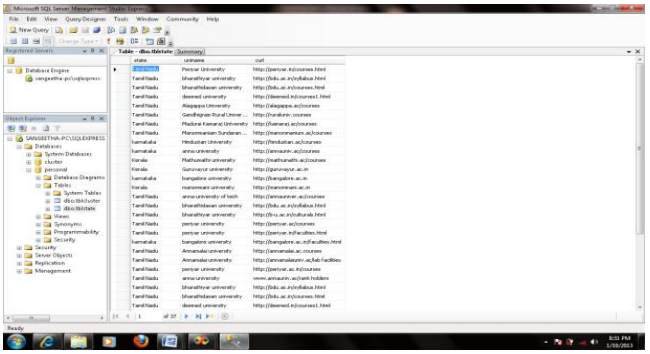
OWL and RDF is used to create the University Ontology. Super class and Subclass hierarchy has been illustrated where "**Bharadhidasan University"** is the super class and "**Courses"** and "**Faculties"** are some of it's sub classes which have further subclasses like, **"Kannur University", "Courses", "Faculties",** etc**.** Therefore, we create the classes and subclasses to describe the major concepts and then adding the properties (slots) and features (facets) to the classes to describe the internal structure of these concepts.

Fig 6 snapshot illustrates instances of University Ontology which gives some details of the corresponding classes that may be useful in finding some information about

the sub class like, "Tamil Nadu Bharadhidasan University" with some slot value as "Courses URL".

B. QUERY RETRIEVAL PROCESS

1 "Queries" tab is used to show how can run the query and find the particular information about any particular instances or classes. When the query is run giving the value of ID say "1", an instance of "Tamil Nadu" subclass is created with its slot values like, University, Courses, etc…



VI. CONCLUSION

This paper has been domain ontology is created for university domain and is accessed to retrieve only relevant information.Personalization is applied through the ontology in this proposed system so that the relevant content can be retrieved.This increases precision, flexibility, relevancy and user convenience. This approach can be extended to any domain and other personalization approached can also be added to improve the results much more better.

VI . ACKNOWLEDGMENT

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