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Voice Based Ontology Framework on Semantic Web for Blind User Development

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Abstract— Internet has become one of the major sources for people to obtain information and perform tasks. Keyword based searching is mostly possible for all kinds of search engines. A number of search engines are available for different purpose. Conventional methods, using manual finding and matching it with the web feeds are time-consumable and produce inaccurate results. The proposed work introduces a semantic search engine to solve this problem. Semantic means meaning and the knowledge obtained by using this search engine provides us most appropriate results of human thinking and decision making. Even though a lot of search engines can be developed for different purpose by various activities, it cannot be helpful to blind people. The real world cannot support the blind people to search on the web. The proposed framework to describe the voice based ontology. It can be used in the search engine by the blind people to achieve their tasks/goals.

Keywords: Search engine, Ontology, Semantic Web, Stemming, NLP

I. INTRODUCTION

The keyword based input is mostly insufficient for the user and also provide irrelevant information provided by search engine. In the past days search engines are used to help to find the keyword based searching for relevant people but lot of dissimilarity information displayed by more than one pages. So the search people must get accurate information based on the search keyword. However to over come these problems semantic searching is essential in the current search processing. Hence semantic searching is used to help the user's quires in an understandable way for electronic agent based searching. In additionally Ontology plays a significant role to define the semantic and relationship between the user quires. The main objective of this study is to improve the usability and efficiency of semantic search using Ontology in order to enrich user quires and gain user satisfaction in resultant search with input and output as voice. The semantic web is a web of data illustrate and linked in ways to establish frame work that hold to define vocabulary constrained. In the current development of technology input is based on voice. In this way user most preferable to focus on voice. In general voice based input are mostly used by blind people and also used illiterate people.

II. RELATED WORK

2.1 Natural Language Processing

NLP system have been designed to process unstructured text which consist of Natural Language Sentence, the meaning unstructured text depends entirely on linguistic analysis and Natural Language understanding. For example of unstructured text include new stories, magazine article and books. In contrast to structured data where the semantic of the data is defined by is organization.

The use of natural language processing (NLP) and information retrieval (IR) techniques to improve machine learning algorithms, namely: IR techniques - stop words removal, documents as bag-of-words; NLP techniques - stemming or lemmatization; Machine learning algorithm -Support Vector Machines. The voice [1] is considered as a input to the search engine. Here we use conceptual based search engine which receives the user query through voice and converts it into text with the help of specialized software called stemmer.

III. PROPOSED METHODOLOGY

In this work, we use conceptual based search engine used to receive the voice based user query for further processing. After processing, the exact result can be converted into the voice.

The framework has been developed for semantic searching purpose for blind people using **NLP**. We have described the use of voice based ontology in the search engine for the blind people to achieve their tasks/goals. The benefit of such framework has three folds. In the framework, first consider the voice is considered as a input to the search engine by the blind people.

The query is pass to pre-processing techniques using porter stemmer. Secondly, it provides a way to construct the domain ontology, based on user's needed information through by query. Thirdly, it based on the constructed domain

ontology the data is loaded into the Jena inference engine match to the exact relevant web feed data item of a particular web site using semantic matching method.

IV. ONTOLOGY BASE

The collected root words are denoted a set of defined concepts representing classes and their relationship in an ontology. A Web-based ontology O∈K is a tuple O = <C; P; a; b; g ;Σ; Π>, where
C denotes a set of concepts representing classes in an ontology.
P denotes a set of relations representation properties in an ontology.
A denotes the hierarchical relation function for classes.
α: C→C, where aðc1Þ c2 means that c1 is a subclass
of c2:

It is composed of OWL - based Ontology that provide semantic reasoning.

This hierarchical relation can be used to determine if two classes have subclass/super class relationship

V. ARCHITECTURE OF VOICE BASED USER FRAME WORK

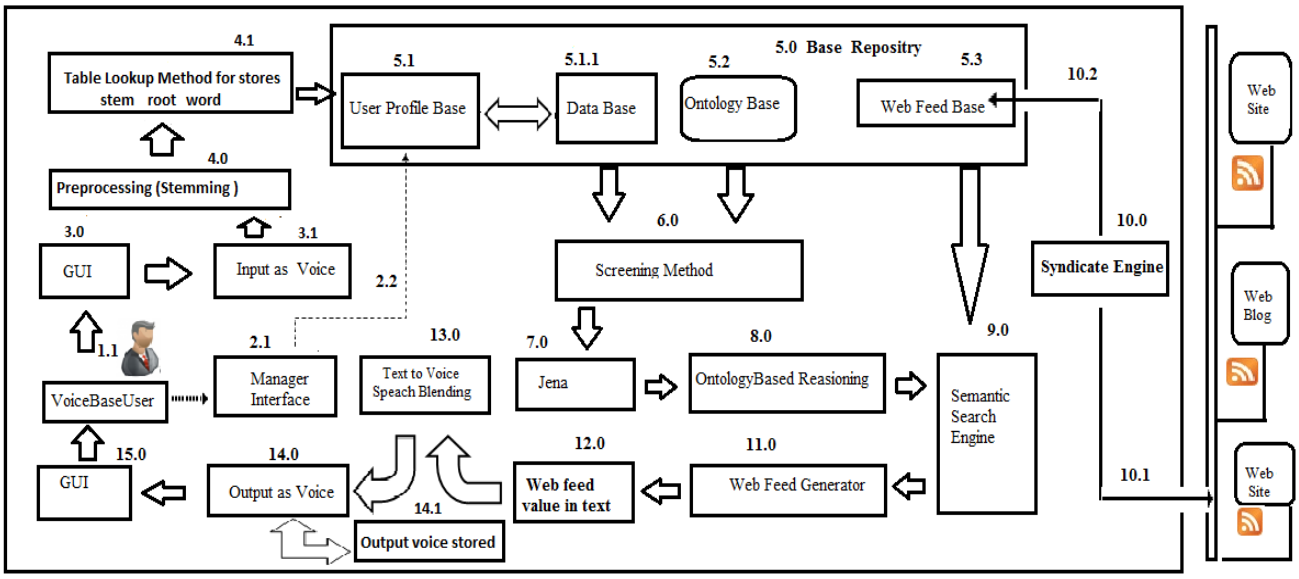


Fig. 1

The information flow of the Voice Based User Frame Work is as follows

Web Feed	Ontology-based Reasoning			Keyword Matching		
	Precision	Recall	F1 Measure	Precision	Recall	F1 Measure
XXL	0.810	0.790	0.7998	0.580	0.450	0.5067
XXM	0.830	0.827	0.8284	0.660	0.580	0.6174
XXN	0.825	0.822	0.8234	0.600	0.490	0.5933
XXK	0.840	0.830	0.8349	0.695	0.597	0.6422
XXT	0.811	0.820	0.8154	0.612	0.495	0.5473

β denotes the hierarchical relation function for properties. β: P→P, where β (p1)=p2β: means that p1 is a property of p2:
γ denotes the attribute relation function between classes.
γ: P→C x C, where gðp1Þ c1;c2 ð Þmeans that domain
of p1 is c1 and range of p1 is c2: Σ denotes a set of ontology axioms, expressed in an
appropriate description logic.
Π denotes a set of RDF-based ontology language, such as RDF schema, DAML+OIL, or OWL. p1Þ p2 means that p1 is a sub_property of p2:
γ denotes the attribute relation function between classes.
γ: P→C x C, where gðp1Þ c1;c2 ð Þmeans that domain of p1 is c1 and range of p1 is c2: Σ denotes a set of ontology axioms, expressed in an appropriate description logic.
Π denotes a set of RDF-based ontology language, such as RDF schema, DAML+OIL, or OWL.

VI. EXPERIMENTAL RESULT

After describing the framework for enhancing the reasoning capabilities of Web feeds through framework, a preliminary This study uses three indexes, Precision, Recall andF1 Measure, to evaluate the performance of the proposed

frame work Precision measures the capability of our approach of finding Web feed items considered relevant by the user, whereas Recall measures the capability of our approach of not missing Web feed items relevant to the user. They are formally defined as follows

NRDQ = number of relevant Web feed items retrieved By search engine.

TNRSD = total number of exiting relevant Web feed items in the dataset.

TNDQ = total number of web feeds items retrieved by a search engine

Precision = NRDQ / TNDQ

Recall = NRDQ / TNRD

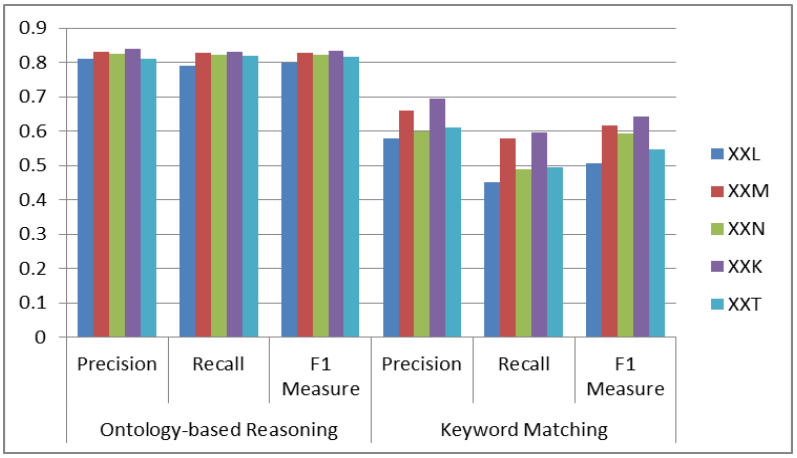
F1 measure = (2 * Precision * Recall) / (Precision +Recall)

Table No. 1

User ID	Classification: ontology# Class	Query areas: Ontology# Class
XXL	Train,name, express, Tiruchendur,Chennai	http://62.128.212.88/
XXM	Train,fare, Tiruchendur, Chennai, express	http://62.128.212.88/
XXN	Total, time, hour, vaigai, express	http://62.128.212.88/
XXK	Stage, Mambalam, Kanyakumari, express	http://62.128.212.88/
XXT	Train, departure, thanjavur	http://62.128.212.88/

The test dataset contained 3200 Web feed items. Each Web feed item contains at least one category element associated with a domain attribute to refer to a specific class of Train Ontology. The content of category element is regarded as a keyword of the Web feed item. An illustration of a Web feed item in the data set. These Web feed item contains more then one keywords "Train, Name, Express, Tiruchendur, Chennai". Also, it is annotated with the ontology class "Train" and "Station".

The test result of web feed compare with different users as shown in Fig.



VII. CONCLUSION

In this paper we have proposed a framework which can be useful for blind /illiterate people. The voice is used as a input for searching keyword on the semantic web search. Moreover it additionally supported the area of human computer interaction for accessing the system by the voice. Finally this proposed framework will support to all the applications area used by the blind people.

VIII. FUTURE ENHANCEMENT

In the future the framework will support to develop for the web service base daily activities. A lot of web services are available in ready that are used to different daily activities.The voice based web services can enable an user to achieve their task of composing more than one web services using web resource for day-to-day activities of real life.

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