

Work Information System Based on Semantic Search Approach

Priyanka Thakur¹ Khomlal Sinha²

^{1,2}Department of Computer Science & Engineering

^{1,2}Chhatrapati Shivaji Institute of Technology Durg, Chhattisgarh

Abstract— With the enhancement in the areas of web technologies, large number of users are connected to internet. Internet becomes the primary source of information for many users as well as organizations. This web information are accessible by number of users from different sources. Since it is very difficult to find relevant and updated information from the web because huge amount of information are stored or scattered in different databases. This information are not present in single place where one can get all the required information of any user. The aim of this paper is to provide the central platform contains information of working as well as non working individuals and organizations. Semantic Web Framework is used for retrieval of relevant, accurate and updated information from database.

Key words: Semantic Web Search, RDF, Ontology

I. INTRODUCTION

The rise in the number of organizations and institutions increases the amount of information related to working professional as well as non working candidate. Due to the large nature of information, all organization have their own database i.e. there is not any system where accurate and updated information of all the user (working professional as well as non working candidate) is maintained.

Since all the information are stored in central database, accurate and relevant information is hard to retrieve. So it requires efficient searching technique to get best relevant and accurate results. Semantic Search is one of the best searching technique for relevant data retrieval.

Due to this progressively increase in the amount of information to find the accurate and updated search result of user from the large database repositories efficient searching mechanism is required.

II. TECHNOLOGY DESCRIPTION

Semantic Web is one of the searching technique which endure the information to be specifically described in well-defined manner. In Semantic Search technique a search query aims not only to search keywords, but also to find out the contextual meaning of the words which the user is searching for.

“The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and peoples to work in cooperation.”(Tim Berners-Lee et al.). The main idea of the Semantic Web proposed by Tim Berners-Lee, is to enhance existing data on the Web with machine interpretable metadata to enable better automation, integration, discovery and reuse across various application [6]. Semantic Search works on making the machine readable data and also makes the web content understandable by humans so that machines are able to find out information from the database repositories.

III. PROPOSED SYSTEM

To propose a Centralized Information System for working and non working candidates, for Organizations /Institutions, contains updated records of each individual either working and non-working candidates along with the organizations. This system contains relational database which stores the information of working and non-working candidates, and organizations. Semantic Search is used here for relevant and accurate data retrieval form that relational database.

IV. RESEARCH METHODOLOGY

This system uses the concept of Semantic Web which is simply based on the ideas of representing Web documents with Extensible Markup Language (XML) markup which is very much similar to widely used Hypertext Markup Language (HTML) syntax. It involves publishing in languages specifically designed for data: Resource Description Framework (RDF), Web Ontology Language (OWL), Sparql [11]. SPARQL is query language for RDF [5].

RDF is a simple metadata representation framework, using URIs to identify Web-based resources and a graph model for describing relationships between resources [7]. It is the first language developed for semantic web. RDF purposes to add machine readable metadata to web resources Semantic Web purposes current web unstructured documents to web of data with RDF. RDF is simple, general-purpose metadata language. It provides conceptual modelling knowledge. RDF comprises of subject-predicate-object triples about an object [5].

OWL a richer language for providing more complex constraints on the types of resources and their properties [7]. It is an ontology language which describes inherent classes and relations in web documents and applications. Things, groups of things and relations between things are represented rich and complex by OWL [5].

Ontology is a specification designed to categorize and help explain the relationships between various concepts of in the given area of knowledge and research. The most widely accepted definition of ontology in the context of knowledge sharing and information science was proposed by T. Gruber (1995), he says that ontology is a specification of a conceptualization [11].

FOAF (Friend Of a Friend) ontology describes people, the relationship between them and the things what they do. It is a machine-readable ontology describe persons, their activities and their relations to other people and objects. FOAF is a descriptive vocabulary expressed using the Resource Description which is used when defining these relationships.

The following is a list of elements used here :

- Category: Person (representing Foaf: Person)
- Property: Foaf: info
- Property: Foaf: picture

- Property: email
- Property: Foaf: phone

The system follows following steps:

- Store the information of Candidates, Organization and Employees in a Relational Database.
- Configuration of ARC2 and PHP.
- Creation of API to generate RDF Graph at run time from Relational Database. Generated RDF consist of FOAF based ontology for Candidates, Employees working profile and Organization related information domain.
- Load ontology and execute user query in to SPARQL using PHP. Display Semantic Relevant search result to user/browser.

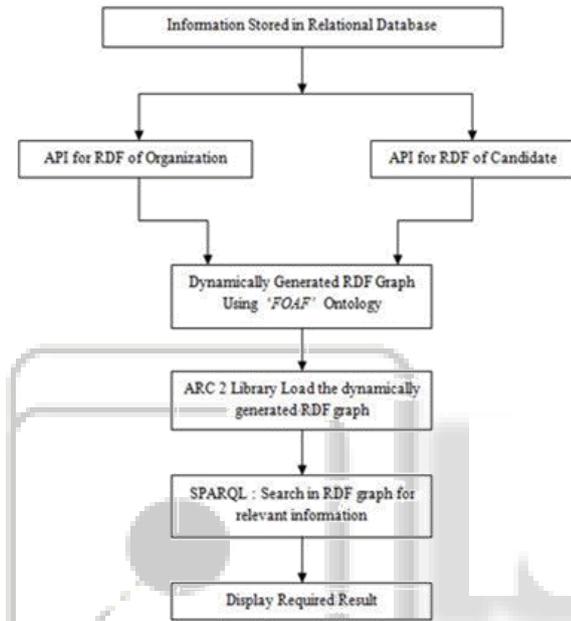


Fig. 1: Semantic Search Flow Diagram

V. RESULTS

This system provides a platform contains updated and accurate information of working and non-working candidates as well as details of organization. This system enriches the user search by using Semantic Web based search and provides the relevant result in accordance to the user’s query. Through this one can get the survey report of employed as well as unemployed people along with the report of persons working in different states. This system also takes less time for informational retrieval from huge database as compared to normal search since it has been build using semantic search technique.

The outcomes of Semantic Search are follows:

- 1) Accurate data
- 2) Relevant data
- 3) Less Execution time

Here Table 1 shows the data retrieval on the basis of search types using normal search as well as Semantic Search.

Search Type	Accurate Or Relevant Data	
	Normal Search	Semantic Search
Skills wise	NO	YES
Educational Details wise	NO	YES

Company Name Wise	YES	YES
Job Wise	NO	YES

Table 1: Relevant data retrieval difference between Semantic Search and Normal Search

Now from Figure. 2 which shows the bar graph of the search time required for searching from various sizes of datasets. Here the blue colour bar represents the time required for semantic search whereas orange colour bar represents the time required for normal search. Here it shows the time difference graph between semantic search and normal search. Normal Search time increases when the size of datasets increases. Similarly for Semantic Search time remains almost constant for different size of datasets.

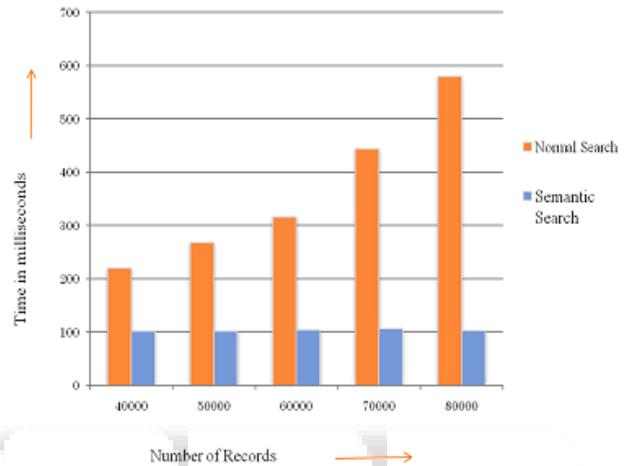


Fig. 2: Time Difference Graph between Semantic Search and Normal Search

VI. CONCLUSION

In the world of information, Semantic Web plays a very important role in data accuracy or data linking relation. This study describes and explores Semantic Web for optimizing the data oriented searches on today’s Web. In doing so, Semantic Web Framework is useful for large data oriented applications to perform a relevant data retrieval with Semantic Web Ontology. This paper approaches a system which provide updated, accurate information of working professionals along with organizations and also non-working candidates in one place. Therefore to retrieve relevant information of any individual Semantic Web is used as a searching technique. Semantic Web is suitable for large information oriented applications.

REFERENCES

- [1] Pratiba and G.Shobha, “Semantic Web Search Engine,”International Journal of Advanced Research in Computer Science and Software Engineering Research Paper, ISSN: 2277 128X, 2013, pp. 974-979.
- [2] I. Pavković, and I. Štajduhar, “Semantic Approach to Accommodation & Booking Related Web Services,”MIPRO , Opatija, Croatia, 25-29, pp. 419-424, May 2015.
- [3] Monika Shekhar and Saravanaguru RA. K , “Semantic Web Search based on Ontology Modelling using Protégé Reasoner”.
- [4] Anna Jordanous, “Enhancing Information Retrieval and Resource Discovery from Data using the Semantic

- Web,” 4th International Symposium on Emerging Trends and Technologies in Libraries and Information Services, 2015, pp. 105-110.
- [5] Oguzhan Menemencioglu, and Ihami M. Orak, “ A Review on Semantics Web and Recent Trends in its Application,” IEEE International Conference on Semantic Computing, 2014, pp. 297-303, DOI 10.1109/ICSC.2014.57.
- [6] Artem Chebotko, “Literature Survey on the Semantic Web and Search,” 2005, TR-DB-032005-C.
- [7] Maalouf and Maria Sokhn, “Enhancing Business Process Modelling for E-Government Processes using Semantic Web Technologies and Linked Data Principles, eChallenges e-2014 Conference Proceedings Paul Cunningham and Miriam Cunningham (Eds)IIMC International Information Management Corporation, 2014, ISBN: 978-1-905824-46-5.
- [8] Eleni Giannopoulou, Nikolas Mitrou and Chimos Konstantinos, Karvounidis Theodoros, “A Semantic Web Approach in the implementation of a Linked Data Portal using a CMS,” Tenth International Conference on Signal-Image Technology & Internet-Based System, IEEE, 2014, pp. 164-171, DOI 10.1109/SITIS.2014.103.
- [9] Rosa Navarrete and Sergio Luján-Mora, “Use of Linked Data to Enhance Open Educational Resources,” IEEE, 2015.
- [10] Eman Rezk, and Sebti Foufou, “A Survey of Semantic Web Concepts Applied in Web Services and Big Data,” IEEE. 2014, pp.767-772.
- [11] Ilona Pawełszek and Jędrzej Wiczorkowski, “The role of semantics in searching for information on the Web,” Online Journal of Applied Knowledge Management, 2015, pp. 102-113.