

Chapter 110

Survey Paper on Semantic Web

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ABSTRACT

The World Wide Web (WWW) allows the people to share the information (data) from the large database repositories globally. The tremendous growth in the volume of data and with the terrific growth of number of web pages, traditional search engines now days are not appropriate and not suitable anymore. Search engine is the most important tool to discover any information in World Wide Web. Semantic Search Engine is born of traditional search engine to overcome the above problem. However, to overcome this problem in search engines to retrieve meaningful information intelligently, semantic web technologies are playing a major role. In this paper the authors present survey on the role of search engines in intelligent web, Background, Challenges and some issues.

1. INTRODUCTION

The rapid growth of Internet has given user an easy way of accessing information and services. Web is a huge semi structured database that provides with vast amount of information. With ever-increasing information overload, we are facing new challenges for not only locating relevant information precisely but also accessing variety of information from different resources automatically. To solve this problem one solution is Semantic Web. The Semantic Web is an extension of the current Web that allows the meaning of information to be precisely described in terms of well-defined vocabularies that are understood by people and computers. On the Semantic Web information is described using a new W3C standard called the Resource Description Framework (RDF). Current Web sites can be used by both people and computers to precisely locate and gather information published on the Semantic Web. Ontology is one of the most important concepts used in the semantic web infrastructure, and RDF(S) (Resource Description Framework/Schema) and OWL (Web Ontology Languages) are two W3C recommended data representation models which are used to represent ontologies. The Semantic Web will support more efficient discovery, automation, integration and reuse of data and provide support for interoperability problem which cannot be resolved with current web technologies.

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Most of the traditional search engines get the answers syntactically correct but larger in amount. Semantic Web is gaining momentum. A semantic search engine gives selected results which the user is searching for. The main objective of Semantic Web is to make Web content understandable not only by humans, but also machine understandable. We need to ensure that semantics are not lost during the whole life cycle of information retrieval. Various semantic search engines developed so far differ from each other through the results obtained & technologies involved which can be discussed in detailed in later sections.

2. HISTORY

The concept of the Semantic Network Model was formed in the early 1960s by the cognitive scientist Allan M. Collins, linguist M. Ross Quillian and psychologist Elizabeth F. Loftus as a form to represent semantically structured knowledge. When applied in the context of the modern internet, it extends the network of hyperlinked human-readable web pages by inserting machine-readable metadata about pages and how they are related to each other. This enables automated agents to access the Web more intelligently and perform more tasks on behalf of users. The term “Semantic Web” was coined by Tim Berners-Lee, the inventor of the World Wide Web and director of the World Wide Web Consortium (“W3C”), which oversees the development of proposed Semantic Web standards. He defines the Semantic Web as “a web of data that can be processed directly and indirectly by machines”.

Many of the technologies proposed by the W3C already existed before they were positioned under the W3C umbrella. These are used in various contexts, particularly those dealing with information that encompasses a limited and defined domain, and where sharing data is a common necessity, such as scientific research or data exchange among businesses. In addition, other technologies with similar goals have emerged, such as microformats.

Tim Berners-Lee originally expressed the vision of the Semantic Web as follows:

I have a dream for the Web [in which computers] become capable of analyzing all the data on the Web the content, links, and transactions between people and computers. A “Semantic Web”, which makes this possible, has yet to emerge, but when it does, the day-to-day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines. The “intelligent agents” people have touted for ages will finally materialize.

The Semantic Web is regarded as an integrator across different content, information applications and systems. It has applications in publishing, blogging, and many other areas.

2.1. Semantic Web Solutions

The Semantic Web takes the solution further. It involves publishing in languages specifically designed for data: Resource Description Framework (RDF), Web Ontology Language (OWL), and Extensible Markup Language (XML). HTML describes documents and the links between them. RDF, OWL, and XML, by contrast, can describe arbitrary things such as people, meetings, or airplane parts.

These technologies are combined in order to provide descriptions that supplement or replace the content of Web documents. Thus, content may manifest itself as descriptive data stored in Web-accessible databases, or as markup within documents (particularly, in Extensible HTML (XHTML) interspersed with XML,

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