INNOVATIVE APPLICATION AREAS OF SEMANTIC WEB

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ABSTRACT
The exponential development of semantic web enables the machine to interpret the result with human being and enhance the information interpretability where user can retrieve information through the integration of various technologies. The emerging of semantic web has the potential abilities to develop internet economy in more precise way. However achieving this interpretability among different information system is laborious task due to machines don’t have the kind of vocabulary that people have but human behavior is voracious which oblige us towards possibilities of exploring potential for betterment and semantic web resolve this by using intelligent agent components, which are able to done his jobs in the behalf of humans. The central objective to write this paper is outlining the application areas of semantic web.

1. INTRODUCTION

The information technology is shifting from distant contrivance to knowledge-based system and with this development, user obligation enhancing rapidly. They desire to make appropriate infrastructure which will be able to locate his necessitate. The semantic web is an apparition which attains information from the user and crafts it achievable to assist machines to understand complex human requests. This knowledge oriented understanding obliges essential mediums of information to be made semantically so that the meaningful information can be accessed and provided satisfactory result to the users. However, the prophecy of the semantic web has formulated it enlarged difficult to retrieve, exchange, present and preserve the information necessitated by an extensive variety of users. To resolve this trouble, semantic web has made various appropriate topologies with machine understandable semantics and used some intelligent entity like intelligent agent which does works as middleware among user’s needs and the information retrieve system.

Today semantic web is a suitable medium for achieving goal of information society. However human behavior is voracious, which move us towards feasibilities of investigating potential for betterment and semantic web reassigned that vision into actuality. The application area of semantic web is extremely spacious and that take pay attention of every domain in human life such as e-commerce, social media, education, scientific work, medical, travelling and other field related to human life.

This paper has been broadly divided into five sections. Section 2 to 7 gives a brief overview of semantic web applications areas. Eight sections provide literature review and section nine concludes by presenting open research challenges. The next section justifies the incorporation of ontology approach in the existing model of semantic web.

2. E-COMMERCE

The term semantic web formulates an intelligent web where information not fabricates only for users but also for computers, so that computers can infer and exchange information on the web, therefore, escalating the possibility of relevant information accessed. However this apparition cannot easily accomplish, because only human are capable to appreciate complex product information published online [1]. Therefore, semantic web have potential ability to achieve this task precisely manners.

![Figure 1: Role of Intelligent Agent in E-Commerce](image)

The term e-commerce describes an electronic business. It is one type of online service, which runs over the internet and computer network, such servers are online marketing, online transaction processing, mobile corners and inventory management system. Where user are trying to buy and selling product online. The population of e-commerce is increasing rapidly and it offers wide ranges of technologies and applications, which are more helpful for saving human effort and time. Everyday millions of searches are perform by people attempting to find their requirements [1]. The majority of searchers are related to consumer product, where they are looking product for buying. In that instance, semantic web and intelligent agent enabled semantic search will have a dramatic impact on the precision of these searches. It will decrease and probably abolish information irregularity where a superior informed buyer obtains the best value. By impacting this explanation determinant of market prices semantic web will foster the progression of different business and economic models [1].

3. KNOWLEDGE REPRESENTATION AND MANAGEMENT

Knowledge representation and management is an important application area of semantic web. The word semantic represents the study of meaning and how to represents the knowledge. The essential vision of semantic web gave
knowledge-based result to users and make essential inferences. Knowledge representation is related with obtaining and maintaining knowledge within a concern domain. It has emerged as a key role of huge database because they help to maintain its internal knowledge as knowledge-based grid asset from which they can infer best results, create new prototype and increase their competitiveness. Knowledge management is primarily imperative for online system where user can retrieve intelligent information. The idea of the semantic web is to allow much more advanced knowledge management systems. Where:

(i) Knowledge will be maintained in logical forms according to its significance.
(ii) Automated tools will assist preservation by examination for irregularities and accessing new knowledge.
(iii) Keyword-based retrieval system will be changed by knowledge-based system and presented it in a user friendly way.
(iv) It is medium for intelligent reasoning.

It aims to represent the knowledge with symbolic and automatic reasoning programs. However this aim cannot easily obtained. It required more intelligent features which can work same as human brain, such features are ontology, semantic network and multi-agent system.

4. SEMANTIC NETWORK

The term semantic network is used to represent the knowledge in graphical notation. This graphical notation can be organized into a taxonomic hierarchy of nodes and arcs. The nodes represent the concepts and arcs represent the relationship among concepts. Inheritance plays a key role in semantic network, which allow an object to inherit the properties of multiple concepts. In computerized algorithmic completions of semantic networks were first developed for artificial intelligence and machine translation but prior editions have long been applied in philosophy, psychology, and linguistics. As shown in figure 2, common to all semantic networks is a declarative graphical representation that can be used either to represent knowledge or to support automated systems for reasoning about knowledge [5].

![Semantic Network](image)

The semantic network symbolizes information as an intended graph. The nodes of the graph are dissimilar things, and the edges of the graph communicate relationships among those things. This is most effortlessly illustrated with a figure. Here, the things are "Plant", "Tree", "Oak", and so on. The relationships are "is a", "has" and "used for".

5. ONTOLOGY

Ontology refers to the vocabulary of a domain. To make computers understand meaning of various terms these must be supported by some files containing description of terms along with their relationship with each other. It is a file that properly defines terms and their relations [6]. It is predicted that ontologies will play a vital role in the processing, sharing and reuse of knowledge between web applications. On the semantic web, ontologies should be applied in applications required to explore across or merge information from assorted areas. It should have the ability to support inference. It is an
appropriate technique to study design of conceptualization, where conceptualization is a vision of different words, which demonstrate the objects and their relationship with other entities [2].

6. DOMAIN UNDERSTANDABILITY

It is fundamental application area of semantic web. It provides formal semantics, thereby making information understandable not only to humans but also machines understandable. In addition domain understanding could further the understandings between domains so as to enable the dialogue across multiple domains. Ontology matching does work as bridge them. This feature could significantly help machines process a large amount of business partner information that humans cannot handle, and thus save time and money.

7. SEMANTIC SEARCH ENGINE

Search engine is the essential technique to retrieve desired information from the web. It is consists more intelligent tools which are able to resolve complicated queries and allows user to use knowledge-based grid. Semantic search engines are playing important role in every field related to user search such as e-commerce, research work and social communications. It may be able to significantly contribute to the development of electronic business applications since it is based on strong theory and widely accepted standards. Therefore in classify to give competent search outcomes, search engines are also forward employing semantics parameters and have emerged as semantic search engines. Currently many of semantic search engines are developed and implemented in different working environments. Some existing semantic web search engines are: Hakia, SenseBot and Swoogle etc.

8. RELATED WORK

Extensive research has been done in the area of semantic web. This section highlights the work of eminent researchers and explores the challenges.

Heidari et.al in [1] elaborated the necessity for integrating the semantic web and e-commerce and evaluates the beneficial advantage of this amalgamation. Their work defines the emerging of semantic web technologies have the potential to extremely persuade the prospect development of the internet economy. They proposed novel semantically model that will support to conventional web enlargement and business to join the semantic web resultings.

Fensal el.al in [2] have provided intact summarized appraisal of application areas of semantic web and illustrate those issues comes into front semantic web development. Their work also outlined various appropriate techniques such as knowledge-management or electronic commerce and on the basis that study, they presents current issues those comes into development of semantic-e-commerce communities which are semantic services. Semantic services deals with orthogonal limitation of the current web

Bakshi et.al in [3] have proposed information management system which used to avoids the stringency of domain specific applications and gave a new power structure to user for making a elastic task oriented model and attain advantages of information on semantic web instantly without any additional tools or services. Their work also highlights the obstacle that come into the path of semantic web developments and proposed suitable solution to achieve that goal.

Davis et.al in [4] have define necessity of knowledge representation and represent that it is best medium for illustrate the expression and communication matters. Their work outlines the five individual characteristics of knowledge representation. First one was substitute, which enables the entity to determine consequences by thinking. Second one was ontological obligations, which consists common domain understandability. Third one was intelligent reasoning, which was medium of pragmatically efficient computations and fifth one medium of hum expressions.

John et.al in [5] have presented the absolute working of semantic web network and outlines different techniques of semantic network applications. Their work highlights six major category of semantic network. These are definitional network, assertion networks, implementation network, executable network, learning network and hybrid network.

9. CONCLUSION

This paper outlines the application areas of semantic web and presents complete summarized review of intelligent communities. Today web is not just information access system therefore it is medium for communication, where user all able to buy and sales products online. Semantic play an important role in knowledge-management, e-commerce, search engine and semantic network.
References


