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Semantic Web

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Abstract

Semantic Web helps in easy aggregation of information online without the help of human hand, thus, making it easier for us to find information readily. Normally, it is impossible for the computer to aggregate information without human guidance as web pages are designed for humans to read. Semantic Web is a project which is making inroads into presenting web page data in such a way that the computers understand it and consequently, enabling machines to do the searching, aggregating and combining the Web's information without any form of human guidance. This paper presents the upcoming ideas and projects for easy implementation of Semantic Web.

The Semantic Web has provided new possibilities and a new way for accessing web resources. The increase in web services and lack of semantic base in search mechanism of Universal Description, Discovery and Integration (UDDI) make it difficult for users to find a required web service .Thus, Semantic Search Agent (SSA) is used to discover required web services and OWLs allows semantic description of web services. There are two concerns related to users of Semantic Web. First, it is impractical for us to expect all new services to have Semantic tagged description. Second, the description of the vast majority of existing web services does not have associated semantics. The domain ontology oriented resource (DOORs) and problem oriented registry of tags and labels (PORTAL) are proposed as infrastructure systems for resource metadata within a paradigm that can serve as a bridge between original web and the semantic web.

The semantic web is an extension of the World Wide Web main technologies and standards that enable interpretation and processing of data and useful information for extraction by a computer. There are two groups related to the ranking, techniques and algorithms of semantic web. First group is based on Semantic web link structure and second group is based on internal structure of ontology.

Introduction

The semantic Web is an extension of the current Web in which information is given well-defined meaning, better enabling computers and people to work in cooperation . It provides new possibilities for automatic Web information processing.Web service mechanisms provide a good solution for application interoperability between heterogeneous environments.Though they have mainly been used for business processes until now, we have seen that WSRP has been approved as a standard of OASIS to integrate remote portlets, and we can predict that Web services will soon be used by Web portals for information gathering, display and delivery. Web services will provide a new way for accessing. Web information and play a vital role in Web information retrieval activities.

Currently, web services interact by passing XML data, with data types specified using XML Schema. Simple Object Access Protocol [SOAP] can be used as the communication protocol [11, and the I/ 0 signatures for web services are given by Web Services Description Language [WSDL]. UDDI stands for Universal Description, Discovery and Integration and provides the means to publish and discover web services through a UDDI registry. There are some difficulties in discovering required web services by a user due to increase of web services and lack of semantic parts in current web service technologies such as UDDI and WSDL. Due to this fact, the web requires an intelligent system, which may be implemented using Semantic Web. The lack of semantic parts in web services technologies and also increasing number of web services are making it too difficult for finding suitable web services according to the user's request. A large number of web services are being developed as an emerging standard to construct distributed applications in the web. Current service discovery approaches often adopt keyword-matching technologies to locate the published web services. Semantic Web technology is a potential solution for automated service discovery . Consequently, semantic web services, an amalgamation of the semantic web and web services technology, are emerging as a promising methodology for the effective automation of service discovery, composition, and monitoring. The Semantic Web aims at systematizing and merging web service descriptions by using machine-understandable concepts explicitly defined through ontologies that are used to provide metadata for the effective manipulation of available information including discovering information sources and reasoning about their capabilities. There are two concerns: 1) it is impractical for us to expect all new services to have semantic tagged descriptions; and 2) descriptions of the vast majority of already existing web services do not have associated semantics.

Proposals From Various Authors

Our main aim is to develop an application can be supported by various mobile operating system. This can be possible by

Proposal 1 : A conceptual architecture for a personal Semantic Web Information Retrieval System which should incorporate semantic web, web services and multi-agent technologies. Semantic web is defined as an extension of the web where information is well defined and which enables computers and people to work in tandem and providing possibilities for automatic Web Information Processing. Web

Services is explained as a good solution for application interoperability in heterogeneous environments. They have been predicted to be used by web portals for info gathering, display and delivery. They have been predicted to play an important role in web information retrieval activities. The Semantic Web Information Retrieval System should be able to locate the correct location of web resources but also the automatic or semi-automatic integration of hybrid semantic information from web content and web service resources. They have chosen a P2P architecture for the system as it accommodates to open and dynamic web environments and will be used to connect consumers and providers. Each of the provider will describe their capabilities in a WSCD (Web site capability description) and will be assigned a PSA (provider search agent). Each of the consumer describes the user's requirement which will include the preferences. It is assigned consumer search agent (CSA) and user interface agent (UIA). CSA and PSA will be functioning as mediators between the consumer and the provider by communicating with both and in the process fulfilling the searching and accessing task. The consumer is constructed as a "Myportal" which will act as a gateway to all the relevant information.

Proposal 2: A searching mechanism to discover web services which satisfies user requirements. The paper explains the current process of how web services interact using XML data and Universal Description, Discovery and Integration (UDDI) registry and the difficulties which a user can face in discovering the required web service due to the increase of web services and shortage of semantic parts in current web service technologies. To improve upon this, they have proposed to develop a Semantic Search Agent (SSA) which will help in discovering web services from the web. The SSA work is classified into two main parts: Semantic Enhancement of Input Terms and Matchmaking Algorithm. The proposed system uses OWLS for facilitating the finding of semantic web services for a user. It uses it for describing semantics of web services and consequently finds suitable semantic web services through these descriptions. Firstly, SSA takes user's request word(s) and enhances them with their synonym and is a related terms. The terms are sent to UDDI registry server to retrieve all the related web services.

Proposal 3: A critical step in the process of reusing existing WSDL-specified services for building web-based applications is the discovery of potentially relevant services. UDDI servers are essentially catalogs of published WSDL specifications of available services. Semantic Web Services (SWS) augmenting Web service descriptions using Semantic Web technology were introduced to address the above problem and to facilitate the autonomous publication, discovery, and execution of services at the semantic level. Moreover, semantic Web service description languages, such as OWL-S and Web Service Modeling Ontology (WSMO), were proposed as abstractions of syntactic Web service description languages such as WSDL. a fuzzy-set based semantic similarity matching algorithm for Web Service to support a more automated and veracity service-discovery process, by distinguishing among the potentially useful and the likely irrelevant services and by ordering the potentially useful ones according to their relevance to the requester's query.

Proposal 4: the Semantic Web provides a common framework and format for sharing, integration, combination and reuse of Web data across multiple applications with different requirements . Ontologies work as the main component in representing the knowledge. Therefore, finding relevant and appropriate ontologies for some requirements is very important but, this is now a difficult task since numbers of ontologies develop rapidly. A ranking method that considers both internal structure and Semantic Web link structure of Ontologies to find the best ranking of ontologies. The currently available ranking techniques and algorithms in the Semantic Web: Swoogle Ranking, Ontokhoj, OntoQA, AKTiveRank, OntoSearch, Content-based Ontology Ranking, SemSearch and ReConRank are some ranking techniques. Conclusion and future work come in the final Section. we propose a ranking method that considers both internal structure and Semantic Web link structure of Ontologies to find the best ranking of ontologies. The currently available ranking techniques and algorithms in the Semantic Web: Swoogle Ranking, Ontokhoj, OntoQA, AKTiveRank, OntoSearch, Content-based Ontology Ranking, SemSearch and ReConRank.

Proposal 5: Witnessing the localized devastation of hurricane Katrina coupled with the global effects of climate change and diminishing food supplies, people become aware how the oceans can touch and affect our lives so directly. It also determines that existing technologies alone will not solve the problem. Several major inventions and Web related technologies are coming of age. Challenges Ahead Given the IOOS vision, the ocean observing community and its stakeholders face several data-integration challenges ahead. Semantic Web holds promises. As the DIF is being implemented and the IOOS system is gradually taking shape, innovative technologies and new concepts should be explored to ensure the final IOOS vision can be met and the needs of the ocean observation community of users addressed. A solution to this problem is provided by the third basic component of the Semantic Web, collections of information called ontologies. In philosophy, an ontology is a theory about the nature of existence, of what types of things exist; ontology as a discipline studies such theories. Artificial-intelligence and Web researchers have co-opted the term for their own jargon, and for them an ontology is a document or file that formally defines the relations among terms. The most typical kind of ontology for the Web has a taxonomy and a set of inference rules. The real power of the Semantic Web will be realized when people create many programs that collect Web content from diverse sources, process the information and exchange the results with other programs. The effectiveness of such software agents will increase exponentially as more machine-readable Web content and automated services (including other agents) become available.

Proposal 6: the rapid development and wide application of the Internet, Web has become an exchange, sharing of information and effective tool for collaborative work. People's attention and frequent use of the Web promote the development of this technology, but also make the Web information resources on the rapid growth. Machine-processable semantics information can be with the intelligent software

products such as Agent to effectively interact. Web mining based on semantic is a combination of semantic Web and Web mining, which can better improve the intelligence level of access to information. In general, Web mining can be divided into three categories: Web content mining, Web structure mining and Web usage mining. Semantic Web The basic idea of Semantic Web =-098[-s that embed machine-readable, on behalf of certain types of knowledge mark in the Web message. So that the data on the Web is not only used to display, but also be understood by the machine so as to enhance the quality of the information services and explore a variety of new, intelligent information services.

Proposal 7: this aspect is improving recently as major search engines started to index some structured data such as RDFa and microformats. Another factor, especially in the enterprise space, is that the Semantic Web is perceived as a disruptive technology, making it a show-stopper for organizations needing to evolve their systems and build upon existing infrastructure investments, The major problem of RESTful services is that no agreed machine-readable description format exists to document them. All the required information of how to invoke them and how to interpret the various resource representations is communicated out-of-band by human-readable documentations. In consequence, machine-to-machine communication is often based on static knowledge and tight coupling to resolve those issues. The challenge is thus to bring some of the human Web's adaptivity to the Web of machines to allow the building of loosely coupled, reliable, and scalable systems. After all, a Web service This aspect is improving recently as major search engines started to index some structured data such as RDFa and microformats. Another factor, especially in the enterprise space, is that the Semantic Web is perceived as a disruptive technology, making it a show-stopper for organizations needing to evolve their systems and build upon existing infrastructure investments, The major problem of restful services is that no agreed machine-readable description format exists to document them. All the required information of how to invoke them and how to interpret the various resource representations is communicated out-of-band by human-readable documentations. In consequence, machine-to-machine communication is often based on static knowledge and tight coupling to resolve those issues. The challenge is thus to bring some of the human Web's adaptivity to the Web of machines to allow the building of loosely coupled, reliable, and scalable systems. After all, a Web service proposed The primary contribution of this work is a new model for read-write capable Linked Data applications by integrating JSON services into the Web of Data. This aims to generalize the application respectively mashup development by homogenizing the proprietary schemas used in today's Web services to a common data format, namely RDF. The approach is based on SEREDAS, a semantic description language for JSON services we introduced in. As previously outlined, one of the limitations of the current Semantic Web is that it usually just provides a read-only interface to the underlying data. SPARQL, the standardized query language for RDF just defines how to retrieve data, not how to manipulate it.SA-REST and HREST are two approaches that enrich the, mostly already existing human-readable HTML documentation with RDFa or microformats to make it machine-processable. The biggest difference

between them is that SA-REST has some built in support for semantic annotations where as hRESTS provides nothing more than a label for the inputs and outputs. SA-REST uses the concept of lifting and lowering schema mappings to translate the data structures in the input and outputs to the data structure of an ontology, the grounding schema, to facilitate data integration.

Proposal 8: Semantic Web Service aims to bring Semantic Web technology-for representing, sharing, and reasoning about knowledge-to bear in Web service contexts. The central theme of semantic web service, then, is the richer, more declarative description of the elements of dynamic distributed computation. Because a rich representation framework permits a more comprehensive specification of many aspects of services, semantic web service can provide a solid foundation for a broad range of activities throughout the Web service life cycle. Since the concept of semantic Web service brought forward, the research work about semantic Web service discovering has been the concern of researchers, made a lot of useful exploration. One of the main research themes includes the semantic index and matching strategy of Web services resources, etc. After deeply understanding of these studies, it can be considered that the search for semantic Web services in a number of research themes, one of which is an indispensable link in the results of semantic Web service matching mechanism of the sort. First, it concerns about the concept defined in ontology and its semantic similarity between each other, and then ranks the match results according this semantic similarity .The work presented in defines the functional similarity of services and discusses a semantic similarity measure for determining the similarity of OWL concepts. Then it shows how neural networks can be used for combining these two measures for a better compound measure. The third aspect is to inference the concept involved in services by description logics and other formal tools. Such research works are included in paper . In paper identifying peculiarities in the use of DL inferences for matchmaking that derive from OWL's open world semantics, analyzes local closed-world reasoning for its applicability to matchmaking, and investigates the suitability of two non-monotonic extensions to DL, auto epistemic DLs and DLs with circumscription, for local closed-world reasoning in the matchmaking context. Semantic space vector model (SSVM) is such a three dimensional space conceptual model for presenting the semantic relationship of objects defined in ontology. There are three types of semantic relationship of concepts, instances and attributes in a specified ontology.

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