

Implementation of Semantic Web in Social Computing: Review

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Abstract: *Semantic Web is an emerging concept in the associated with World Wide Web. There are several challenges in the path of implementation of Semantic Web also known as Web 3.0. As Social Computing is still evolving technology, thus giving meaning to it and managing the huge content of web in systematic form is major issue. In this paper we analysis pros and cons associated with the implementation of Semantic Web in Social computing and give a brief idea about some of the developments in this context.*

Keywords: Semantic Web, Social Computing, Ontologies

1. INTRODUCTION

The Semantic Web is the name for the next WWW generation as very recently coined by the World Wide Web Consortium (W3C) and its chair Tim Berners-Lee [1]. The Semantic Web has attracted a diverse, but significant, community of researchers, institutes and companies, all sharing the belief that one day the it would have a big impact on social as well as economic computing world. The Semantic Web and Web 2.0 ideas are increasingly interweaving, Social Semantic Web applications are being developed. Such applications are, e. g., semantic wikis (Semantic MediaWiki, Kaukolu), semantic blogs (SemBlog), social semantic networks (PeopleAggregator) and social semantic information spaces (NEPOMUK). The Semantic Web is an effort to create new facilities on top of the current Web to make knowledge better for representation, accessible, and usable for its user communities [1]. A few Semantic based search

engine also exists[9,10] It is technically envisioned as a network of so-called ontologies (shared, formal models of a domain that connects to a relatively coherent community of practice [2]) that add machine-process able semantics to information resource content, electronic web services and software agents populating the current Web.

Social Computing as a set of open, web-based and user-friendly applications that enable users to network, share data, collaborate and co-produce content [3]. Social computing is interactive and collaborative behavior between computer users. Personal computing is an individual user activity in that one user generally commands computing. In social computing, the Internet allows users to interact through many mediums, including: *Social media sites* ,*Blogs* , *Microblogs*, *Multiplayer*

games, Wikis, Instant messaging, Open-source development.

The difficulty is that Social Computing is still a moving target, with rapidly evolving technologies, markets and user behaviors, all of which have emerged and developed over just a few years. As a result, there is little comparable, systematic and longer-term data available. The measurement issue is a crucial one, particularly as regards assessing policy implications.

2. DEVELOPMENT ISSUES

While analysis of *pros and cons* associated with the implementation of Semantic Web in Social computing main area to work on are Usability, Performance and Scalability issues for Semantic Web technologies. Some more challenges identified so far in this direction are classified as: availability of content, ontology availability, scalability, multilingualism, visualization to reduce information overload, and stability of Semantic Web languages [4]. Major development issues associated with implementation of Semantic Web in Social Computing are categories as:

Knowledge Acquisition bottleneck as it includes creating expressive machine- readable descriptions of web reality contents, which in turn is also expensive. Also relation between the real world phenomena and their formal descriptions is very difficult to be reliably captured with current approaches. The data acquisition problem is closely related to *imprecision* without a well-founded, non-

arbitrary link between the reality and its symbolic descriptions, it is difficult to achieve and/or validate the precision and actuality of the Semantic Web knowledge bases, which hampers their reliability and applicability [7].

Defining Ontologies is basic task in development of Semantic Web and it is to represent knowledge in a machine understandable form. Ontologies are regarded as an abstraction of a conceptualization containing explicitly defined concepts and associated relations (Gruber, 1992). Ontologies are also supposed to be used for the defining the content on web and also for inter-relation between them. Data integration are available for a lot of domains, however, one often has to perform a non-trivial ontology alignment before proceeding with the data integration itself [6]. Using several Ontology development tools lets defining of ontology is carried out, then next challenge would be mapping of web services specification to Process Ontologies, which in turn also contain some limitations [8].

Semantic Web Repository is one of the main challenges in adding semantics to social web system. Present web system comprises of huge distributed environment which in turn to change or modify according to Ontologies vocabulary requires lots of efforts and expense. Also diversity in these distributed data repository adds some more milestones to cross for making Semantic web dream to come true.

Development of Software Agents will bring structure to the meaningful content of Web pages, creating an environment where these software agents roaming from page to page can readily carry out sophisticated tasks for users. These software agents must be intelligent enough to function in the 'social' environment. These agents must have a

3. SOLUTIONS TO ABOVE ISSUES

There is some of the implementation of Semantic Web in Social Computing which in near future will change the scenario of computing in social network. Here are some solutions in this regards to solve above mentioned issues.

-Rein provides ontologies for describing policy and delegation networks, and provides mechanisms for reasoning over them, both of which can be used to develop domain and policy language specific access control frameworks for Web resources. Rein is an open web-based policy and delegation framework, which supports heterogeneous domains that use different policy languages and domain knowledge. Rein provides ontologies for describing policy networks, delegations, keys, and signatures and provides mechanisms for reasoning over them, both of which can be used to develop domain and policy language specific frameworks for providing access control to Web resources [9].

- Cross Language Information Retrieval CLIR seek to support the process of finding documents written in one natural language with automated systems that can accept queries expressed in other

tendency to learn, collaborate, compete or negotiate with other agents also. Development of software agents for semantic web where they had numerous numbers of tasks to perform and at the same time constrains on how to perform or deliver the service on a social network.

languages [10]. CLIR is the key factor in adding semantic to web coz it solves the problem of diversity in the communication languages as it is huge problem to solve for social computing and universal usability. For example a searchers wants to search some content and fire the query in its own language, and in web system there are limited content in that language but the exact content desired is in some other language, so in order to solve this multilingual issues CLIR might preferred.

- DBpedia is a community effort to extract structured information from Wikipedia and to make this information available on the Web. As discussed above development of knowledge bases is of huge importance in enhancing the intelligence of Web, optimizing searching and in supporting information integration.

The DBpedia knowledge base currently describes more than 3.64 million things, out of which 1.83 million are classified in a consistent Ontology, including 416,000 persons, 526,000 places, 106,000 music albums, 60,000 films, 17,500 video games, 169,000 organizations, 183,000 species and 5,400 diseases. The dataset consists of 1 billion pieces of information (RDF triples) out of which 385 million were extracted from the English edition of Wikipedia and roughly 665 million were

extracted from other language editions and links to external datasets [12]. Having these interlinked and analytical supporting systems DBpedia also allows its users to ask sophisticated queries against Wikipedia, and to link other data sets on the Web to Wikipedia data.

The DBpedia knowledge base is served as Linked Data on the Web. As DBpedia defines Linked Data URIs for millions of concepts, various data providers have started to set RDF links from their data sets to DBpedia, making DBpedia one of the central interlinking-hubs of the emerging Web of Data. We hope that these types of approaches in building huge databases and interconnecting them would make it easier for the amazing amount of information in Web to be used in new and interesting ways, and that it might inspire new mechanisms for navigating, linking thus advancing and improving the Social Computing.

- **Semantic Search Engines** till date have some limited powers in the search world. These are defined to search and retrieve information from web by analyzing the meaning of query fired by end user. Some of these meant for Social Web searches are *Swoogle*, *SenseBot*, *Wolframe Alpha* . In order to implement these search engines for whole web system is long way to go. These engines not only search for keywords in the data repository but also analyze data and come out with relevant information about the query fired.

4. CONCLUSION

The semantic web describes a structure that allows machines to not only process data but also extract meaning (semantics) from it. The idea of course being that if software has access to this knowledge and meaning it could serve its user better. It sounds like a lot of power is unleashed if it becomes possible for machines to “understand” what data means. Still there are miles to go for implementation of intelligence to web for computing data from one casual user to other and adding wisdom to present social computing scenario. All the above development shows a new perspective to present web system which is vision of the future Web, where information is given well-defined meaning (semantics) in a way that allows our computers to combine and reason with information from multiple sources just as we do ourselves when we search and browse the Web. Might be possible in near future there will be cases and situations where this might come in handy for a user.

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