SEMANTIC WEB INITIATIVES: A STUDY

Dr. Pranali B. Gedam
Librarian, Veer Wajekar ASC College,
Phunde, Uran, Dist- Raigad
E-mail-pranu_gedam@yahoo.com

Abstract

The Study focuses on the Semantic Web, and its initiatives. Day by day, the web is rapidly changing. Now, we are moving to Web 3.0. The Concept 'Semantic Web' is a web describes things in a way that computers can understand. The Semantic Web describes the relationships between things. It allows a person, or a machine, to start off in one database, and then move through an unending set of databases which are connected not by wires but by being about the same thing. It takes the solution further. These initiatives will play an active role in national and international research *projects and* enabled E-work and E-commerce.

KEYWORDS: Semantic Web, Web 3.0, RTF, World Wide Web,

1. INTRODUCTION

The concept 'Semantic Web' is a web of data. It is an extension of the current Web. It is a representation of data on World Wide Web. This concept was brought by Sir Timothy John Berners-Lee who invented World Wide Web in 1980, his project based on the concept of hypertext, to facilitate sharing and updating information among researchers. Tim Berners-Lee, started to Weaving the Web, 1999. There is lots of data is used every day, and it is not part of the web.[1]

Day to day, a huge amount of resources are increasing on web which raises a serious problem of accurate search. This is because data in HTML files is useful in some contexts but meaningless under other conditions. In addition, HTML cannot provide description of data encapsulated in it. The Semantic Web is a mesh of information linked up in such a way as to be easily process able by machines, on a global scale. This is an efficient way of representing data on the World Wide Web, or as a globally linked database. The Semantic Web is not about links between web pages. The Semantic Web describes the relationships between things (like A is a part of B and Y is a member of Z) and the properties of things (like size, weight, age, and price). The Semantic Web is focused on machines. The Web requires a human operator, using computer systems to perform the tasks required to find, search and aggregate its information. It's impossible for a computer to do these tasks without human guidance because Web pages are specifically designed for human readers. The Semantic Web is a project that aims to change that by presenting Web page data in such a way that it is

understood by computers, enabling machines to do the searching, aggregating and combining of the Web's information — without a human operator.

1.1 Definitions of Semantic Web on the Web

According to Tim Berners-Lee *"*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.*"* [2]

1.2 Semantic Web Defined (Tim Berners-Lee's Described)

Tim Berners-Lee has described the semantic web as a component of Web 3.0. [3] Semantic Web technologies can be used in a variety of application areas; for example: in *data integration*, whereby data in various locations and various formats can be integrated in one, seamless application; in resource discovery and classification to provide better, domain specific search engine capabilities; in *cataloging* for describing the content and content relationships available at a particular Web site, page, or digital library; by *intelligent* software agents to facilitate knowledge sharing and exchange; in content rating*;* in describing collections of pages that represent a single logical "document"; for describing intellectual property rights of Web pages *(*see, eg, the Creative Commons*),* and in many others.

2. Objectives of the Study

- To identify the concept of Semantic Web
- To identify the initiatives of Semantic Web and to know their performance

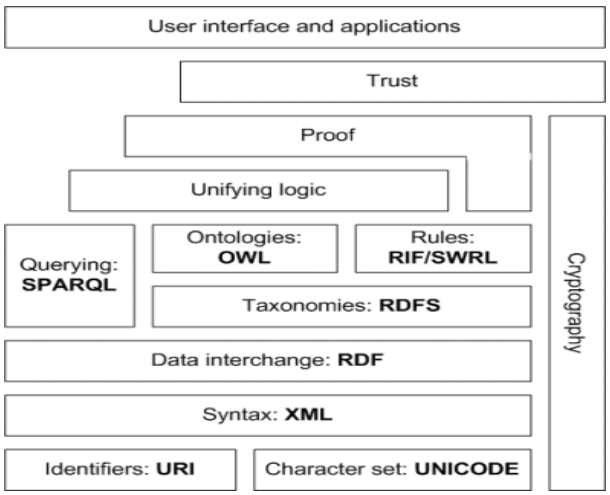
3. THE SEMANTIC WEB BUILDING BLOCKS

RDF (Resource Description Framework), which is one of the fundamental building blocks of the Semantic Web, gives a formal definition for that interchange. On that basis, additional building blocks are built around this central notion. The Semantic Web uses RDF to describe web resources.

The RDF (Resource Description Framework) is a language for describing information and resources on the web. Putting information into RDF files, makes it possible for computer programs ("web spiders") to search, discover, pick up, collect, analyze and process information from the web. If information about music, Dates of events, medicines, cars, tickets, etc. were stored in RDF files, intelligent web applications could collect information from many different sources, combine information, and present it to users in a meaningful way.

The Semantic Web is not a very fast growing technology. RDF was developed by people with academic background in logic and artificial intelligence. For traditional developers it is not very easy to understand.

Components of Semantic Web



Fg. 1

(Source: http://en.wikipedia.org/wiki/Semantic_Web Accessed on 22/5/09)

4. The Semantic Web Stack.

The semantic web comprises the standards and tools of XML, XML Schema, RDF, RDF Schema and OWL that are organized in the Semantic Web Stack. The OWL Web Ontology Language Overview describes the function and relationship of each of these components of the semantic web:

- **XML** provides an elemental syntax for content structure within documents, yet associates no semantics with the meaning of the content contained within.
- **XML Schema** is a language for providing and restricting the structure and content of elements contained within XML documents.
- **RDF (**Resource Description Framework) is a simple language for expressing data models, which refer to objects ("resources") and their relationships. An RDF-based model can be represented in XML syntax.
- **RDF Schema** is a vocabulary for describing properties and classes of RDF-based resources, with semantics for generalized-hierarchies of such properties and classes.
- **OWL adds** more vocabulary for describing properties and classes: among others, relations between classes (e.g. disjointness), cardinality (e.g. "exactly one"), equality, richer typing of properties, characteristics of properties (e.g. symmetry), and enumerated classes.
- **SPARQL** is a protocol and query language for semantic web data sources.

5. Groups

The following groups are part of the Semantic Web Activity.

Table – 1

Two Groups

Sr. No.	**Active Groups**	**Past Groups**
1.	*Semantic Web Coordination Group*	*RDF Core Working Group*
2.	*Rules Interchange Format Working Group*	*Web Ontology Working Group*
3.	*OWL Working Group*	*Semantic Web Best Practices and Deployment Working Group*
4.	*SPARQL Working Group*	*Semantic Web Education and Outreach Interest Group*
5.	*Semantic Web Deployment Working Group*	*Gleaning Resource Descriptions from Dialects of Languages Working Group*
6.	*Semantic Web Interest Group*	
7.	*Semantic Web Health Care and Life Sciences Interest Group*	

Table – 2

Semantic Web Software

Sr. No.	**Semantic Web Software & Demonstrations**	**Proposed by**	**Project Completed/ Country**	**Description**
1	**Human Computation Video**	Luis Von Ahn Presents	-	innovative techniques to incorporate RDF info into a database of images, video or other group of data.
2	**Open Source Semantic Search**	provided by WebGaps	-	-
3	**SWED portal (Semantic Web Environmental Directory)**	provided by WordPressHelp	Oct 2004	The Semantic Web Environmental Directory (SWED) is a prototype of a new kind of directory of environmental organisations and projects. http://www.swed.co.uk/swed/index.html
4	**Semantic Systems**	provided by Semantic	-	Semantic Systems Biology (SSB) is a systems biology approach that uses

	Biology	System Biology		semantic description of knowledge about biological systems to facilitate integrated data analysis. http://www.semantic-systems-biology.org/
5	**Semantic Search engine**	provided by Inbenta	-	Focused on your website and corporate Intranet, **INBENTA** is a pioneer in a new class of Enterprise Semantic Search Technology that's aimed to dramatically improving the experience of online customer, based on latest developments on Natural Language Processing technologies http://www.inbenta.com/index.php/en.html
6	**Semandeks**	an approach for generating semantic content through social input	-	Semandeks is an attempt to simplify the concept of semantic web. It is an attempt to make the concept more user-friendly so that it can be easily understood and manipulated by the layman http://semandeks.com/#home:
7	**Maven Semantic Healthcare Database**	Provided by Research and Markets Releases New Semantic Healthcare Database	DUBLIN, Ireland	The current database holds over 5 million healthcare executives, and 500,000 healthcare organisations. http://www.researchandmarkets.com)

Table – 3

The Projects of Semantic Web

Sr. No.	***Projects of Semantic Web***	**Sponsored/ Developed by**	**Year of Starting/ Finished**	**Aims & Objectives**
1	**DBpedia**	University of Leipzig, Freie Universität Berlin, OpenLink Software	Initial Rease January 23, 2007	1. To publish structured data extracted from Wikipedia 2. The data is published in RDF and made available on the Web for use under the GNU Free Documentation License http://en.wikipedia.org/wiki/DBpedia
2	**FOAF** (Friend of a Friend)		-	A popular application of the semantic web is FoaF, which describes relationships among people and other agents in terms of RDF.
3	**SIOC**	John G.	2004	The SIOC Project - provides a vocabulary of

	(Semantically -Interlinked Online Communities)	Breslin and Uldis Bojars	Started	terms and relationships that model web data spaces. Examples of such data spaces include, among others: discussion forums, weblogs, blogrolls / feed subscriptions, mailing lists, shared bookmarks, image galleries.
4	**Open GUID**	a global Identifier repository	-	Aimed at providing context for the Semantic Web, Open GUID maintains for use in the linked web.
5	**SIMILE**	by the MIT Libraries and MIT CSAIL	-	SIMILE (Semantic Interoperability of Metadata and Information in unLike Environments)is a joint project, conducted, which seeks to enhance interoperability among,digital,assets,schemata/vocabularies/ontologies, meta data, and services.
6	**NextBio**	NextBio Software Company California USA	2004	A database consolidating high-throughput life sciences experimental data tagged and connected via biomedical ontologies. Nextbio is accessible via a search engine interface.
7	**Linking Open Data**	The project is sponsored by the W3C's Semantic Web Education & Outreach Interest Group (SWEO).	Sept 2008	Linking Open Data project, as of - a community-led effort to create openly accessible, and interlinked, RDF (Resource Description Framework) Data on the Web. The data in question takes the form of RDF Data Sets drawn from a broad collection of data sources.
8	**Insemtives**	European Seventh Framework Program (FP7)	-	Insemtives is a -funded project with the objective to bridge the gap between human and computational intelligence for the semantic content authoring.
9	**Semantic MediaWiki**	-	-	The WikiProject "Semantic MediaWiki" provides a common platform for discussing extensions of the MediaWiki software that allow for simple, machine-based processing of Wiki-content.
10	**SWAN (Semantic Web Applications in**	-	-	**SWAN** is a Web-based collaborative program that aims to organize and annotate scientific knowledge about Alzheimer disease (AD) and other neurodegenerative disorders. swan.mindinformatics.org

	Neuromedicine)			
11	**Community Projects**	W3C Semantic Web Education and Outreach (SWEO)	-	Interest Group wishes to encourage a community of developers to come together to work on some Semantic Web projects.
12	**SWAD-Europe project**	EU	Started May 2002 to October 2004	aimed to support W3C's Semantic Web initiative in Europe, providing targeted research, demonstrations and outreach to ensure Semantic Web technologies move into the mainstream of networked computing http://www.w3.org/2001/sw/Europe/
13	**Open Data on Semantic Web (SWOD)**	w3c HCLS group's scientific publishing task force	Started in 2006	To further develop an easy-to-use semantic data publishing tool for everyone and organizations to publish data in semantic format on the web.. http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects
14	***SemWeb2o***			Develop a service oriented website that allows users to edit, publish, host and announce new RDF documents, in popular vocabularies, easily. basically, FOAF-O-Matic-ish apps + PURL + The friendliest user interfaces imaginable. http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects
15	**"A History Book For Tomorrow"**			This project includes an environment where historians would be able to compose and discuss their knowledge and the data would be obtainable through SPARQL. http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects
16	**Knowee / contact organizer**	Semantic Web Education and Outreach (SWEO) Interest Group	,	The knowee project aims to create a webby address book based on Semantic Web technologies. We will keep things simple and lightweight. A rather small subset of the huge (Sem)Web technology menu should get us most of the way. http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjectsknowee.org
17	**Weather View for Tabulator**			He proposes a weather view for Tabulator, but it should be ontology-based. http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects

18	**Powder Browser Extension**			POWDER (Protocol for Web Description Resources) uses RDF-CL to make statements about web content.http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects
19	**Content Label Wiki**			The purpose of this project is to develop a wiki on [www.contentlabel.org] so that content labels have a central repository of information. http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects
20	**Media Widgets**			Managing relationships of objects, attriubtes and processes Basically, your standard desktop widgets, but based on the SPARQL JSON format for maximum portability and scalability. http://esw.w3.org/topic/SweoIG/TaskForces/CommunityProjects
21	**Data, Information, and Process Integration with Semantic Web Services - Project**			DIP's objective has been to develop and extend Semantic Web and Web Service technologies in order to produce a new technology infrastructure for Semantic Web Services (SWS) - an environment in which different web services can discover and cooperate with each other automatically. http://dip.semanticweb.org/
22	**Your partner in Research and Commercial Projects**			The Semantic Web has altered to a very dynamic and comprehensive issue within the information-society. Whereas the years from 2001 to 2005 where characterized as far-reaching direction settings by means of standard-definitions and developing of basic technologies www.**semanticweb**.at/4.**projects**.htm
23	**Semantic Web Portal Project**			It is our mission to create a Semantic Web Portal, demonstrating the maturity of Semantic Web technology in a real application. sw-portal.deri.org
24	**Corporate Semantic Web**			Corporate Semantic Web invites businesses to state their interest in Semantic Web technologies and to describe individual business-cases which will be examined and evaluated with regard to innovative methods and tools designed by the research group. www.corporate-**semantic-web**.de
25	**DBin.org**		May, 2006	DBin is instead a general purpose and user

				oriented W3C Semantic Web empowered application .verion 0.4 "Barbera" has been released on 10 May, 2006 www.dbin.org
26	**KIWI: Knowledge in a Wiki**		Project start is March 2008	The objective of the project KIWI is to develop an advanced knowledge management system (the "KIWI system") based on a semantic wiki that will address this problem. This system will support collaborative knowledge creation and sharing, and use semantic descriptions and reasoning as a means to intelligently author, change and deliver content.
27	**ECOI**			ecoi.net provides up-to-date and publicly available country of origin information with a special focus on the needs of asylum lawyers, refugee counsels and persons deciding on claims for asylum and other forms of international protection.
28	**Sem'base**		started in February 2006 finished its activities in November 2006.	sem'base is an awareness measure in the programme FIT-IT Semantic System The project goals: • Survey and interviews with key players • Awareness building for semantic technologies at the European Forum in Alpbach 2006 and at the topic related conferences I-KNOW 06 and Semantics 06 • Gap analysis indicating the opportunities and weaknesses of the semantic systems sector in Austria • Development of a domain specific glossary • An online catalogue of semantic systems players in Austria
29	**SemNetMan: Semantic-based Network-Management**	. FFG-sponsored project	running 18 months from 2005 to 2006	The project "SemNetMan" (semantic-based Network-Management) is combining two methods that both are relevant for the cross-linked knowledge society: The Social Network Analysis (SNA) and the techniques of Semantic Web. www.semanticweb.at/19.6213.**projects**-do wn loads.htm
30	**Semantic Web Spaces**		September 1, 2006	**Semantic Web Spaces** is a Coordination Middleware for the Semantic Web. Semantic Web Spaces is based on Linda and it extends classical Linda model with new types of tuples,

				containing RDF statements and new coordination primitives. • release1.0 • semwebspaces1.0
31	**INFRAWEBS**		1st August 2004, Project Duration 30 months	**(**Intelligent Framework for Generating Open (Adaptable) Development Platforms for Web-Service**)European IST Project focus** and objective is the development of an application-oriented software toolset for creating, maintaining and executing WSMO-based Semantic Web Services (SWS) within their whole **life cycle**.
32	**Semantic web project** "Interface Development for Hypermedia Applications in Semantic Web"		Tue, 1 Jan 2008	He couldn't find much relevant information for his project.. :thinking: He needs some help from experts lists.w3.org/Archives/Public/**semanticweb**/2008Jan/0001.html
33	**Project Halo**	project partners at the Institute AIFB of the University of Karlsruhe, and the Saarbrücken-based German Research Center for Artificial Intelligence.		Seattle-based Vulcan Inc (http://www.vulcan.com) has created the long-term research program Project Halo (http://www.projecthalo.com) to develop a "Digital Aristotle" that can serve as a comprehensive computer knowledge base and problem-solving system for the natural sciences. www.**semanticweb**.org/wiki/**Project**_Halo
34	**Cathnet.org Projects**			This is a Catholic Semantic Web implementation project to provide rich access to theological documents. This is a Catholic Semantic Web project for users to share, process and collect Semantic Web information, such as Parish Mass times, youth group events and theologically rich interaction. catholic**semanticweb**.org/**projects**
35	**Muddy Boots project**	BBC	process in 2007	The system's main aim is to 'unambiguously identify the main actors in a BBC news story' Once the main actors/entities have been

				identified in a story, they need a unique reference to describe them (to ensure that the entities are unambiguous).
36	**Mindswap** *(Maryland Information and Network Dynamics Lab Semantic Web Agents Project)*	The Semantic Web Research Group		Semantic Web technology inside the MIND LAB at University of Maryland Institute for Advanced Computer Studis. www.mindswap.org
37	**METEOR-S**			The METEOR-S project at the LSDIS Lab, University of Georgia aims to extend these standards with Semantic Web technologies to achieve greater dynamism andscalability. lsdis.cs.uga.edu/**projects**/meteor-s
38	**Semantic Web project in the Dell Social Innovation Competition**	3 Mar 2009		The objective is to put all this technology into a real and practical social action. Part of this competition is based on votes, so I would widely appreciate any votes on this project lists.w3.org/Archives/Public/**semantic-we web**/2009Mar/0026.html
39	***Ensemble Project at Open Repositories 2009***	May 27th, 2009		Conference paper "The Ensemble Project: Using Fedora to Support the Development of the Semantic Web for Education", described how the project was using the Fedora Digital Repository and Mulgara Triplestore to allow teachers and learners to gain direct access to data and incorporate it into teaching and learning applications. www.**ensemble.ac.uk**/archives/category/**semant ic-web**
40	***MITRE Projects***			The Web Mashup Scripting Language (WMSL) enables an end-user (you) working from his browser, e.g. not needing any other infrastructure, to quickly write mashups that integrate any two, or more, web services on the Web. **semanticweb.mitre.org**
41	***CNI*** *(Connection Network Intelligence)*	by IBM China Research Lab		Connection Network Intelligence(CNI) is an innovation relationship analysis technology developed, The technology has been applied to several Asia stock market to help lenders, investors and regulators explore the non-obvious

				relationship between entities on financial market, thus empower them make better decision.
42	***CRAFT*** *(Collaborative Reasoning and Analysis Framework and Toolkit)*			The Collaborative Reasoning and Analysis Framework and Toolkit (CRAFT) is a research prototype aimed at helping analysts as they collect and share information to support decisions.
43	***MARIO*** *(Mashup Automation with Run-time Invocation and Orchestration)*			One of the long-standing grand challenges in component-based systems is the automated composition of applications from a set of basic components in response to high-level requirements. The aim of the MARIO project is to support varying degrees of manual to automated composition in different kinds of systems.
44	***Metadata Interoperability Framework leveraging Semantic Web***	Researchers at China Research Lab and Watson Research Center	The project, begun in 2008,	Addressing the management and interweaving of diverse kinds of IT Metadata in the Metadata Interoperability Framework. http://www.alphaworks.ibm.com/tech/wssem
45	***SHER*** *(Scalable Highly Expressive Reasoner)*			SHER is an OWL reasoner that is designed to provide semantic querying of large relational datasets using OWL ontologies. SHER (Scalable Highly Expressive Reasoner) is a breakthrough technology that provides ontology analytics (OWL-DL without nominals) over highly expressive ontologies. domino.research.ibm.com/.../semanticweb.Semantic Web Projects.html
46	***The Semantic Naturalist***	29 May, 2008		The use of macroinvertebrates as biological indicators of water quality has a long history , and variants of the biotic index developed by William Beck in the '50s are currently in wide use in stream and river monitoring efforts.**cain.ice.ucdavis.edu/semantic**naturalist
47	**Sir Tim Berners-Lee: Semantic Web is open**			Richard Cyganiak maintains an evolving picture of the participants in this project, a snapshot of which is reproduced here.Impressive as these activities are, if we are to see a similar growth in

	for business			the availability of data from less philanthropic sources, there is a clear need for greater clarity with respect to the 'proper' use and reuse of data. blogs.zdnet.com/semantic-web/?p=105
48	**The Semantic Web, Syllogism, and Worldview**	published November 7, 2003		The W3C's Semantic Web project has been described in many ways over the last few years: an extension of the current web in which information is given well-defined meaning, a place where machines can analyze all the data on the Web, even a Web in which machine reasoning will be ubiquitous and devastatingly powerful. www.**shirky.com**/writings/**semantic**_syllogism.html
49	**Palo Alto PAWS**	March 19, 2007	Palo Alto Semantic Web (PAWS) Group	Our discussion will include all Semantic Web technologies with a focus on current projects and potential project and startup opportunities.**semweb.meetup.com**/26
50	**AKT Related Projects**			CROSI - Capturing, Representing, and Operationalising Semantic Integration. It aims to overcome these problems by working on a systematic approach to *semantic integration* which will enable us to: capture and expose semantics, codify them in knowledge representation formats, and operationalise them for the benefit of integration.http://www.aktors.org/crosi
51	**SemanticWeb.org**			Semanticweb.org is the Semantic Web community portal. Its objective is to collect and explain tools and techniques, which will help to create the Semantic Web, and to be a forum for people interested in the Semantic Web.http://semanticweb.org/
52	***POPS***			The POPS project focuses on one subset of the data problem, namely, expertise location.
53	***Knowledge Web***	European Commission	1st Jan, 2004	The mission of Knowledge Web is to strengthen the European industry and service providers in one of the most important areas of current computer technology: Semantic Web enabled E-work and E-commerce. knowledge**web**.**semanticweb**.org

6. Conclusions:

The study provides a large amount of initiatives on 'Semantic Web'. It plays an active role in national and international research projects for creating and disseminating of information. Semantic Web enabled E-work and E-commerce.

7. References:

1. SW available at http://en.wikipedia.org/wiki/Semantic_Web (Accessed on 16/03/2015)
2. SW available at http://www.w3.org/RDF/Metalog/docs/sw-easy (Accessed on 16/03/2015)
3. *Op. cit*, 1