The emerging scenario of Web 3.0 (Semantic Web)
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Abstract: An attempt has been made in this paper to trace out the basics of emerging Semantic Web with special focus on its function, basic elements and construct. And at the end of the paper, steps in building up of the Semantic Web have been presented.

Keywords: Web 3.0, Semantic Web

Introduction
Presently, the Internet world is experiencing Web 2.0. The out come of this social networking (http://www.w3.org/2000/10/Primer [Getting into RDF & Semantic Web Using N3]) is RSS (Really Simple Syndication), Wikis and so on. However, there is a slow development of the extension of Web 3.0. This is otherwise known as Semantic web. This paper explains the simple ways of understanding of Semantic Web. The World Wide Web Consortium (W3C) is taking lot of efforts to improve the semantic web that is in infancies. It is evident that there is a quiet number of unmanageable e-information which is unable to access pin pointedly by every user of the Internet. At this crucial juncture, the concept of semantic web has been emerged. The first real manifestation of the W3C’s semantic work was the publication of the Resource Description Framework (RDF) (http://purl.org/swag/whatisSW [What is the Semantic Web?]). It is a specification for encoding and sharing metadata which consists of statements about a resource.

The semantic web has been described as a vision of the Web that goes beyond billions of linked Web documents waiting to be indexed by global search engines; it is a Web in which the semantics, or meaning behind the content, can be utilized in a meaningful way.

Why we need RDF
When there are XML tags what is the benefit we get out of the use of RDF? The answer is: a) the information maps directly and unambiguously to a model which is decentralized, and for which there are many generic parsers already available. It means that when you have an RDF application, it is known to everyone which bits of data are the semantics of the application, and which bits are just syntactic fluff, and b) we hope that RDF data will become a part of the Semantic Web, so the benefits of drafting the data in RDF now draws parallels with drafting the information in HTML in the early days of the Web.

Once information in RDF form, it becomes easy to process it, since RDF is a generic format, which already has many parsers (http://purl.org/swag/whatisSW [What is the Semantic Web?]). XML RDF is quite a verbose specification, and it can take some getting used to (e.g., to learn XML RDF Properly, one need to understand a little about XML and name spaces beforehand…).

Given below is an example about XMLRDF:

```
<rdf: RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
   xmlns:dc="http://purl.org/dc/elements/1.1/"
   xmlns:foaf="http://xmlns.com/0.1/foaf/"
   xmlns:loc="http://www.loc.gov/vocabulary/locn/"
>
   <dc:title>Library and information science descriptive for UGC - NET/SLET/JRF</dc:title>
   <dc:description>This piece of RDF tells that the title of the book 'Library and Information Science - UGC - NET/SLET/JRF' and creator of the book 'Dr. K. Kaliyaperumal'. And here are the triples</description>
</rdf: RDF>
```

This format is actually called Notation3". It is to note that some may using XML RDF to Notation3, but it is evident that using Notation3 is easier than that of the XML RDF and it can be converted in to XML RDF anyway. RDF specifies that every part of this assertion can be assigned a Uniform Resource Indicator (URI), much like a Uniform Resource Locator(URL) but different in the sense that it doesn’t have to map to a real Web address and can represent concepts ("Creator"), living entities("K.Kaliyaperualma"), and anything else in the known and imagined universe, from animals to laundry lists. The dc in the example is for “Dublin Core,” which is associated with a special URI called a namespace (purl.org/dc/elements/1.0) that, in turn, is associated with a set of metadata elements. On its own, this is somewhat useful, but one of the most compelling aspects of RDF is combining elements from different metadata sets.

**Notation3**

Notation3 is a simpler syntax for RDF, originally proposed by Tim Berners-Lee. The Notation3, which results in triples such as the following:

```
"DrKK :creator "Library and Information Science descriptive for UGC - NET/SLET/JRF"
```

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Others also have made attempts to mitigate RDF’s syntax, but this is far from the only stumbling block on the way to the Semantic Web. Another difficulty with the Semantic Web is that going beyond assertions to supporting any high level of inferences. When a computer automatically pulls together concepts, what really require is some understanding of RDF Schema and Ontology Language such as DAML+OIL.

RDF Schema (www.w3.org/Protocols/) allows concepts to be specified and related; for example, specifying that a “writer” is a type of “creator.” Ontologies are also formal representations of relationships, but languages such as DAML+OIL differ from RDF Schema by supplying more types. For example, using Notation 3, we could have this relationship:

dc: creator daml:dquivalent To red: Prepare Name

Screen Scarping and Forms

The Screen scraping is the act of literally getting the data form a source into a more manageable form i.e. RDF using whatever means come to hand. The Screen Scarping has two tools viz., RegExps (in Perl, Python, and so on) and XSLT (an XML transformations language). It has been proved that this Screen Scarping is a tedious solution. To solve this, first to build up proper RDF systems that take input from the user and then store it in RDF. So different types of data ranging from buying and selling can all be stored in RDF and then can be used on the Semantic Web.

CWM (Closed World Machine): An Inference Engine

The Closed World Machine (Rhyno, Art, Using Open Source Systems for Digital Libraries, Rain Tree Publishing Pvt. Ltd., Westport, 2004. pp: 12-14) is used to process RDF and Semantic Web Processing. A detailed report on CWM can be found on the site viz., SWAP and it is a Python program. It is useful to convert XML RDF into Notation3 and vice versa. An example is given to convert “a.rdf”. It is a powerful semantic web tool kit.

Python cwm.py a.n3 - rdf > a.rdf

Simple Data Modeling: Schemata

Schemata5 is a master checklist or definition grammar. It is a piece of code that controls set of terms in another document or piece of code. RDF Schema is simple data typing model. By using it we create properties and classes of different types of data or concepts.

The RDF Schema start with http://www.w3.org/ 2000/01/rdf-schema#. The most important concepts with the RDF Schema that give “Resources”, “Classes” and the “Property”. Given below is an example to illustrate:

```rdfs : Resource rdfs : class
rdfs : Class rdfs : type rdf : Property
rdfs : Type rdf : class
```

The above syntax says that Resource is a type of Class, Class is a type of Classes, Property is a type of Class, and type is a type of Property. It is quiet easy to make up our own classes. For instance we create class called “Cars”, which contains all the cars in the world:

```:Car rdf : type rdf : class
```

Now it can be said that “Ambassador is a type car:

```:Ambassador rdf : type rdf : Car
```

With this we can also create properties quiet easily as follows

```:name rdf : type rdf : Property

:Ambassador name "Ambassador"
```

What is the reason the name Ambassador is said as Ambassador , because the term “:Ambassador is a URI. Thus, we can select any URI for Ambassador.

RDF schema is also facilitating to represent the sub classes of property. For example we can say that the class Ambassador is a sub class “Cars” to represent this it can be said as follows

```:Ambassador rdf : subclassof : Car
```

DAML+OIL

DAML 5is a language created by DARPA is an ontology inference language based upon RDF. It will take further step of RDF Schema for describing in depth properties and classes. DAML provides lot of avenues to describe unambiguous properties, unique properties, lists, restrictions, cardinalities, pair wise disjoint lists, data types and so on.

The Principles or steps involved in the creating of Semantic Web

There are many ways to create Semantic Web, some of the steps are:

- Try to Publish useful data in RDF
- Write Inference engine with powerful language
- Develop RDF Schema or DAML
- Contribute in representing state in RDF
- Enhance Your Semantic Web
- Refine or remodify your property system used in the Semantic Web for future applications if needed

Conclusion

It is hoped that the ongoing research in the area of Semantic Web will certainly removes lot of handcuffs that are associated with it. Although the Semantic Web is still very much at a grassroots kind of level, people are starting to use it. The emerging semantic Web is the beginning of the Web 3.0.