An Analysis of Issues and their Countermeasures Prevailing in Semantic Web

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ABSTRACT

The generation of information on the web is increasing exponentially. The main need of web users is to access subject relevant and well-defined meaningful information. Semantic Web will bring structure to the meaningful content of Web pages, creating an environment where software agents roaming from page to page can readily carry out sophisticated tasks for users [2]. 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 is evident that, understanding level of a machine and human beings are different. The traditional web matches word by word and provides the result. But semantic web (SW) understands the meaning of each word, analyzes domain and defines the relationship among different words.

Keyboard Se**m**antic web, RDF, Ontolog**y,**

1. Introduction of Semantic web

Currently, computers are changing from single, isolated devices into entry points to a worldwide network of information exchange and business transactions called the World Wide Web (WWW) [4]. Semantic Web will provide intelligent access to heterogeneous, distributed information, enabling software products (agents) to mediate between user needs and the information sources available [4]. It is a major research initiative of the World Wide Web Consortium (W3C) to create a metadata-rich Web of resources that can describe themselves not only by how they should be displayed (HTML) or syntactically (XML), but also by the meaning of the metadata. In the Semantic Web community, the DAML Services effort attempts to rectify this by providing a more expressive way of describing Web Services using ontologies. However, this approach does not separate the

domain-neutral communicative intent of a message (considered in terms of speech acts) from its domain-specific content, unlike similar developments from the multi-agent systems community [9].

2. Architecture of semantic web

As depicted in semantic web comprises of a primary layers namely.(see fig-1)

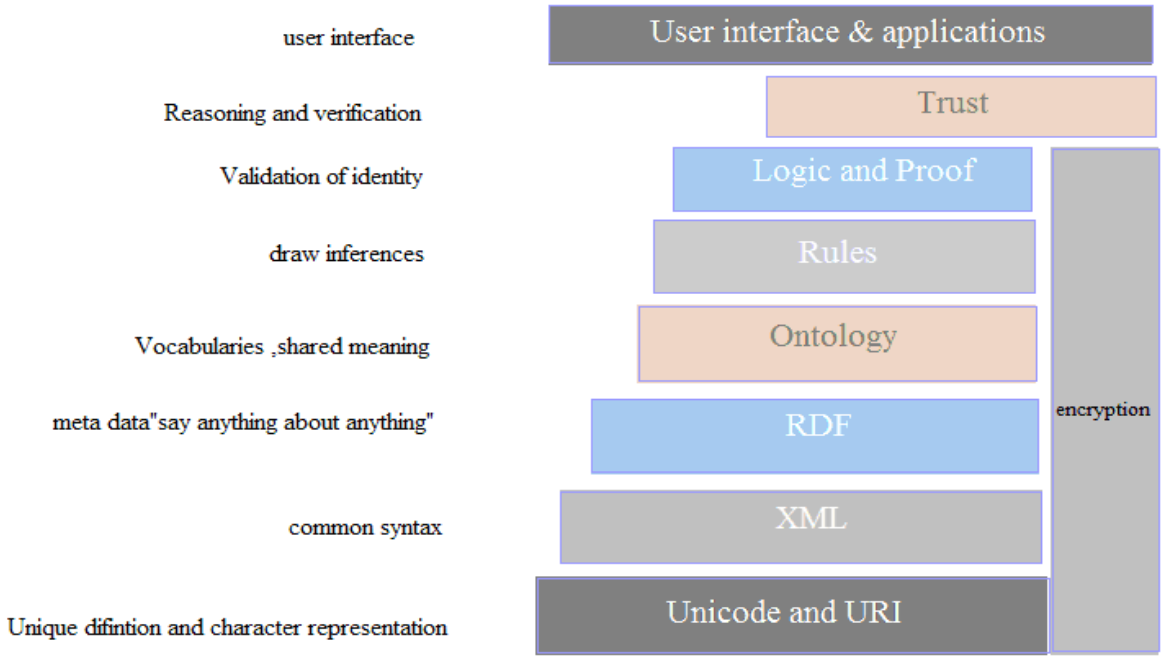


Fig. 1 Architecture of Semantic web

2.1 Unicode and URI

Layer 1 knows as Unicode & URI represents the standard for computer character representation and it provides an international standard which has the goal of providing a way to encode the text. URI, provide a unique identifier for any web resource (e.g. web page, book, country). The syntax for URI given as

"http", "ftp", mailto" etc., followed by a colon character, and then a scheme-specific p

2.2 XML

XML means Extensible Markup Language. XML is a metalanguage - for describing other languages. It describes a set of rules that used to encoding documents in machine-readable form.

2.3 RDF

RDF is a metadata representation framework, using URI to identify Web-based resources. Resource Description Framework (RDF) is an infrastructure that enables the encoding, exchange and reuse of structured metadata. It provides inter-operability between applications that exchange machine-understandable information on the web. This metadata is descriptive information about the structure and content of information in a document.(see fig-2)

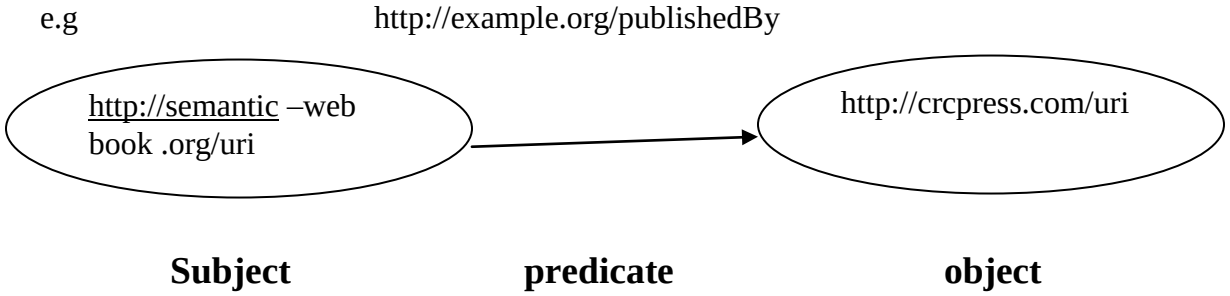


Fig.2 RDF

2.4 Ontology

Ontology can be used to common understanding of the structure of information among people and software agent. Ontology also called a vocabulary and shared meaning process, domain knowledge and relationship between different domains. Ontology is a representation of knowledge as a set of concept within a domain.

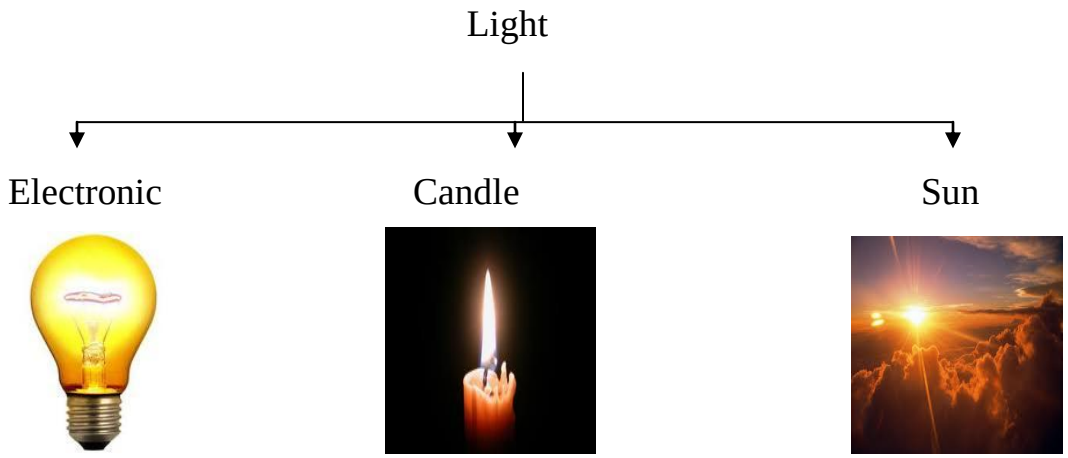


Fig.3 ontology

Ontology is one of the best techniques to problem solving and knowledge representation. For example search related to the light. Means light is one domain, and under many sub domain means light can be electronic light, sun light and candle light. Ontology first of analysis the domain knowledge and after this process they provide a result. (see fig-3)

2.5 Rules

Rules define a set of rules in logical based system. Due to this reason this system is also called an expert system and they convert the one format to another format within an inference rules. Example is

IF <logical condition are met>

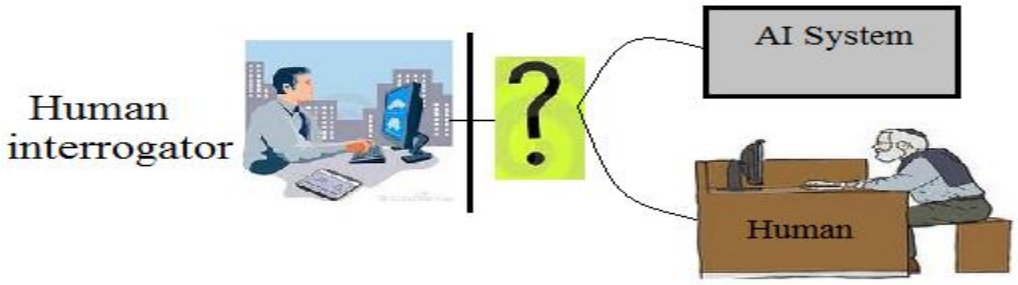
THEN<perform specified action>

2.6 Logic and Proof

The semantic web is logic and proof based process. Logical layer provides a logical reasoning to all kind of statement. Proof layer crate a one trust file means these information are correct or not with analysis all information.

4.6.1 Turing Test

The Turing Test was designed to test whether an AI system act humanly. A human interrogator (judge) interacts with two subjects: a human and an AI system. The AI system passes the test if the judge cannot tell which one is the human.



2.7 Trust

This layer provides authentication of identity and evidence of trustworthiness of data, services, and agents. They validate the information.

3. Feature

There are many features of semantic web, following are main feature of semantic web.

3.1 Meaningful result

Semantic Web is a search technology that uses at sentence logic (how words in a sentence relate to one another) and conducts semantic analysis (it attempts to understand the context of keywords) to produce appropriate meaningful results. Semantic technologies are meaningful process. It includes tools for auto-recognition of topics and concepts, information and meaning extraction, and categorization.

3.2 User satisfaction

The Semantic Web is an extension of the World Wide Web in which the semantics of information and services on the web is defined, making it possible for the web to understand and satisfy the requests of people.

3.3 Improve scalability

Benefit of the Semantic Web is that the user has to do a lot less work in getting the information or service that they want.

3.4 Security

The semantic web provides a better security services. Security here focuses on the concepts of trust and trusted sources, digital signatures to verify the metadata, non-repudiation etc. Trust relies on strong security mechanisms such as digital signatures and trusted certification authorities.

3.5 Combine the information from multiple resources.

Semantic web provides a set of standard formats and tools for describing controlled vocabularies and classifications called the Simple Knowledge Organisation System

(SKOS). It also provides some tools which use these formats, and some demonstration software to allow people and programs to browse and select terms from a multiple resource across the Web, and provide well-structured meaningful information.

4. Challenges

There are many challenges come in the semantic web processing. In this paper, we identify some of the major challenges the community faces in the coming years, and we outline solution directions. The major challenges are

(i) Vastness

Web is a very vast area, which contained 24 billion pages. It is very difficult to search a specific result. Now the problem arises that how to find an optimum result by using ants system, this is a big challenge to us.

(ii) **Ontology availability, development and evolution**

Ontology can be used to common understanding of the structure of information among people and software agent. There are thousands of ontology vocabularies and it is difficult task to define all the vocabulary domains by using ants system. Now the question arise, how to face this challenge by using ants system.

(iii) **Knowledge Representation**

Traditional knowledge representation systems typically have been centralized, requiring everyone to share exactly the same definition of common concepts such as "parent" or "vehicle.". how to presentation of knowledge with ants system.

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