Chapter IX

How the World is Signified: Real World Semantics, or What Meaning Relation is

Introduction

How reality or the world with its parts and levels might be truly symbolized and represented by emerging semantic technology and knowledge systems appears the most challenging topic in the field of top ontology and ontology engineering. Along with causality, knowing the relationship of meaning makes all the difference in true representation of the real world features, in understanding (sensing, reading, or resolving) the real meaning values of world knowledge representation and reasoning. A formal account of meaning (or significance) is becoming a decisive issue in the whole matter of the Semantic Web promising machine-based processing by means of advanced information technologies. For without understanding the nature of meaning, its critical dimensions, mechanisms, and algorithms of representation in computable forms, the whole enterprise of semantic technology is an otiose undertaking and expensive academic mystification. As far as computing ontology is viewed as a semantic model where the relationships among resources are to be identified, differentiated, or processed by automated tools [SICoP, 2005], the above meaningful topics presuppose creating the standard ontology framework. As far as the emerging Semantic Web is the universal medium for the exchange of information across users, systems, applications, and networks, the unified frame ontology is the universal semantic platform for a uniform organization of all human knowledge.

As for now, a great many of Web researchers and developers are trying to create the application programs capable to meaningfully process the Web data, services, and processes just by using syntactic markup languages, such as XML or RDF or OWL or RuleML tagging structures (Berners-Lee et al., 2001; Uschold, 2003; XML, 2004; RDF, 2004; OWL, 2004; RuleML, 2007). Though, it is plain that "meaningless data cannot acquire meaning

by being tagged with meaningless data, and the ultimate source of meaning is the physical world" (Sowa, 2000b). Such illusive hopes come from a lack of understanding of meaning (or signification), its nature, types, modes, aspects, components, and hence the nature of semantics-based machine understanding and reasoning. It is an unjustified deprecation of the extensive field of semantics, when reducing it to a formal semantics resorting to the notion abstract possible worlds (RFD Semantics, 2004; OWL Semantics, 2004).

As a matter of fact, the meaning (or significance) relationship involves as its foundation three substantial constituents:

- Real entities (things in the world)
- Constructs (representations and rules)
- Signs (symbol systems as static Web data and dynamic Web agents)

So to place the Semantic Web on a solid semantic base, instead of formal semantic languages, it is necessary to develop a real world, ontological semantics dealing with existent referents and relations as mapped to signs, their patterns and syntactic structures.

And it is most critical that ontology and semantics are inherently complementary. The former provides a set of basic constraints (truths) the world imposes on the languages, while the latter symbolically identifies the entities in the world, setting a set of semantic rules specifying how to assign a substantial significance, veridical meaning, or material signification to signs and their collections. It is significant that to understand meaning as such we need to realize that any sign is a "monster beast" of three different parts, like Chimera. Being a crossbreed of three sorts (icons or images, indices or indications, symbols or marks), "it is an (1) *entity* that represents (2) another *entity* to (3) an *agent* (human, animal, or robot)" (Sowa, 2000b).

Characteristically, from the semantic outlook, the universe of things can be marked by threefold division:

a. There are things that are merely things, all acting as the real world referents of meanings.
b. There are things that also are signs of other things (natural signs of the physical world and mental signs of the human mind).
c. There are things that are always signs, as conventional signs (words) and other cultural nonverbal symbols and social constructs.

In other words, there are things that MAY have meanings (the things of the external world, as all sorts of indications, evidences, symptoms, and physical signals); there are signs that ALWAYS have senses and meanings (the entities of the mind as ideas and images, thoughts and feelings); and there are signs that HAVE to get their meanings (as linguistic entities and cultural symbols). So, while natural signs serve as the source of signification, the cognitive agent is the agency through which signs signify naturally occurring things, such as objects, states, qualities, quantities, events, processes, or relationships. The types and modes of