Chapter VII

Population of a Method for Developing the Semantic Web Using Ontologies

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ABSTRACT

At present, the Web offers available information to people in diverse ways. With the initiative of Semantic Web, the aim is to make the content of Web pages available in a way that allows people and computers to “understand” this information following frameworks commonly agreed upon by means of ontologies. However, users currently looking for ontologies in order to incorporate them into their systems, just use their experience and intuition. To improve the selection of ontologies, this chapter describes the ONTOMETRIC method which allows the users to measure the suitability of existing ontologies, regarding the requirements of their necessities.

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THE PROBLEM OF ONTOLOGIES SELECTION

The ARPA Knowledge Sharing Effort (Neches, 1991) revolutionized the way in which intelligent systems were built in Artificial Intelligence when proposing the construction of knowledge-based systems by means of the “assembling” of reusable components. Reusable components become the base (or skeleton) of the new system, to which are added specialized knowledge and specific reasoning methods, characteristic of the task that the system attempts to solve. This vision allows building bigger and more potent systems. The ontologies, used to represent the “static” knowledge of a domain, and the problem solving methods, used to carry out reasoning, become the key pieces that allow the reuse of knowledge and problem-solving methods (Gómez-Pérez, 1999a). The saving in costs and time that it is obtained in the software reuse (Bollinger, 1990; Poulin, 1997) is achieved in more scope in the reuse of these knowledge (ontologies and problem-solving methods), due to the enormous effort in the processes of knowledge acquisition of a domain, conceptual model’s construction, formalization and implementation of such knowledge.

At the moment, the ontologies are implemented in a great variety of languages. At the beginning of the decade of the nineties, a group of languages was designed and used for the implementation of ontologies. The most representative languages are: Ontolingua (Gruber, 1993), LOOM (McGregor, 1991), OCML (Motta, 1999), FLogic (Kifer, 1995), etc. These languages receive the name of “classic languages” (Corcho, 2000), they follow a syntax based on LISP (to exception of FLogic), and they are in a phase of stable development. Recently, XML has been adopted as a standard language to exchange information in the web. In the field of the ontologies, several languages have been created based on XML to implement ontologies. For example RDF (Lassila, 1999), RDF Schema (Brickley, 1999), XOL (Karp, 1999), SHOE (Luke, 2000), OIL (Horrocks, 2000), DAML+OIL (Horrocks, 2001) and OWL (Dean, 2003). These languages, called “web-based languages”, are still in development phase and in continuous evolution.

Equally, methodologies for building ontologies have been numerous. Already in 1990, Lenat and Guha (1990) published some methodological considerations related with the development of the CYC ontology. Some years later, in 1995, Uschold and King (1995) published the main steps in the development of the Enterprise ontology. In the same year, Grüninger and Fox (1995) showed the methodology used in the development of the TOVE ontology (Virtual Toronto Enterprise). One year later, Uschold (1996) carries out a proposal of unification of both methodologies. In the 12th European Conference for Artificial Intelligence the methodology used to build the project Esprit KACTUS project’s