Chapter 10

DEVELOPING AN OWL ONTOLOGY FOR E-TOURISM

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1. INTRODUCTION

Currently, the World Wide Web is mainly composed of documents written in Hyper Text Markup Language (HTML). HTML is a language that is useful for visual presentation and for direct human processing (reading, searching, browsing, querying, filling in forms, etc). HTML documents are often handwritten or machine generated and often active HTML pages. Most of the information on the Web is designed only for human consumption. Humans can read HTML documents and understand them, but their inherent meaning is not shown to allow their interpretation by computers.

To surpass this limitation, the W3C (World Wide Web Consortium, www.w3.org) has been working on approaches to define the information on the Web in a way that it can be used by computers not only for display purposes, but also for automation, interoperability, and integration between systems and applications. One way to enable machine-to-machine understanding, exchange, and automated processing is to make Web resources more readily accessible by adding meta-data annotations that describe their content in such a way that computers can understand it. This is precisely the objective of the semantic Web – to make the information on the Web understandable and useful to computer applications in addition to humans. “The semantic Web is not a separate Web but an extension of the current one, in which information is given well-defined meaning, better enabling computers and people to work in cooperation.” (Berners-Lee, Hendler et al. 2001).
The W3C has proposed a language designed for publishing and sharing data, and automating data understanding by computers using ontologies on the Web. The language, called OWL (Web Ontology Language), will transform the current Web to the concept of Semantic Web. OWL is being planned and designed to provide a language that can be used for applications that need to understand the meaning of information instead of just parsing data for display purposes.

2. OWL AND THE SEMANTIC WEB STACK

The semantic Web identifies a set of technologies, tools, and standards which form the basic building blocks of an infrastructure to support the vision of the Web associated with meaning. The semantic Web architecture is composed of a series of standards organized into a structure that is an expression of their interrelationships. This architecture is often represented using a diagram first proposed by Tim Berners-Lee (Berners-Lee, Hendler et al. 2001). Figure 10-1 illustrates the different parts of the semantic Web architecture. It starts with the foundation of URIs and Unicode. On top of that we can find the syntactic interoperability layer in the form of XML, which in turn underlies RDF and RDF Schema (RDFS). Web ontology languages are built on top of RDF and RDFS. The last three layers are logic, proof, and trust, which have not been significantly explored. Some of the layers rely on the digital signature component to ensure security.

![Figure 10-1. Semantic Web layered architecture (Berners-Lee, Hendler et al. 2001)](image)

In the following sections we briefly describe these layers. While the notions presented have been simplified, they give a reasonable conceptualization of the various components of the semantic Web.