Chapter IV
Editing Tools for Ontology Creation

Ana Lisete Nunes Escórcio
Escola Básica e Secundária do Carmo, Portugal

Jorge Cardoso
University of Madeira, Portugal

ABSTRACT

This chapter gives an overview of some editing tools for ontology construction. At the present time, the development of a project like the one of building an ontology demands the use of a software tool. Therefore, it is given a synopsis of the tools that the authors consider more relevant. This way, if you are starting out on an ontology project, the first reaction is to find a suitable ontology editor. Furthermore, the authors hope that by reading this chapter, it will be possible to choose an editing tool for ontology construction according to the project goals. The tools have been described following a list of features. The authors believe that the following features are pertinent: collaborative ontology edition, versioning, graphical tree view, OWL editor and many others (see Appendix 2).

INTRODUCTION

The World Wide Web is mainly composed of documents written in HTML (Hypertext Markup Language). This language is useful for visual presentation since it is a set of “markup” symbols contained in a Web page intended for display on a Web browser. Humans can read Web pages and understand them, but their inherent meaning is not shown in a way that allows their interpretation by computers. The information on the Web can be defined in a way that can be used by computers not only for display purposes, but also for interoperability and integration between systems and applications (Cardoso, 2005).

“The Semantic Web is not a separate Web but an extension of the current one, in which information is given a well-defined meaning, better enabling computers and people to work in cooperation” (Berners-Lee, Hendler, & Lassila, 2001). The Semantic Web was made through incremental changes by bringing machine read-
able descriptions to the data and documents already on the Web. In recent times, instead of a Web site comprising a collection of manually constructed HTML pages, server-side applications and database access techniques are used to dynamically create Web pages directly in response to requests from user’s browsers. The technologies available to dynamically create Web pages based on databases information were insufficient for requirements of organizations looking for application integration solutions. Business required their heterogeneous systems and applications to communicate in a transactional manner.

Ontologies can be used to increase communication either between humans and computers. An ontology is a shared conceptualization of the world. Ontologies consist of definitional aspects such as high-level schemas and assertional aspects, entities, attributes, interrelationships between entities, domain vocabulary and factual knowledge, all connected in a Semantic manner (Sheth, 2003). They have generally been associated with logical inferencing and recently have begun to be applied to the Semantic Web. Ontologies provide specific tools to organize and provide a useful description of heterogeneous content. The three major uses of ontologies are:

• To assist in communication between humans
• To achieve interoperability and communication among software systems
• To improve the design and the quality of software systems

The most prominent markup language for publishing and sharing data using ontologies on the Internet is the Web Ontology Language (OWL, 2004). There are several ontology development tools for domain modeling, for building knowledge base systems, for ontology visualization, for project management or other modeling tasks. Many of the tools are research prototypes that have been built for a particular project or for an Institute/University. There has been a significant growth in the number of ontology technologies products.

After studying Michael Deny’s Survey on Ontology Tools and reading the paper The Hitchhiker’s Guide to Ontology Editors of Loredana Laera and Valentina Tamma we decided to do an updated study of the tools that are available. Some of the tools described in the Michael Deny’s Survey either were no longer available (the project has finished) or have been improved. There are also new tools and new languages since there are new projects that demand so. In composing the list shown on Table 1, we have selected the tools that comprise some of the following features: are robust and ready to be used; free and open source; provide support to most of the activities involved in the ontology development process and ontology practice; support resource description framework (RDF), resource description framework schema (RDFS) and Web Ontology Language (OWL); offer collaborative environment; provide multiple ontology environment; offer server-based environment with support for consistency checking; offer easy-to-use functionality for visual creation and editing; offer a query builder; support a methodology; support editing formal axioms and rules; support the growth of large scale ontologies; support versioning; promote interoperability; has a reasoner; has a graphical view; promotes easy and fast navigation between concepts; has tutorial support; and offers Plug-ins.

We have chosen the following tools: Protégé; OntoEdit; differential ontology editor (DOE); IsaViz; Ontolingua; Altova SemanticWorks 2006; OilEd; WebODE; pOWL and SWOOP.

Protégé is one of the most widely used ontology development tool. It is free and open source. It is an intuitive editor for ontologies and there are plug-ins available to carry out some of the tasks for building an ontology. OntoEdit is an ontology editor that integrates numerous aspects of ontology engineering. OntoEdit environment supports collaborative development of ontologies.
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