

Towards Collaborative Ontology Development in the Upcoming Web 3.0 Era with UbisEditor

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1 Introduction

Collaborative ontology development combines the community approach of Web 2.0 with one of the key technologies of the Semantic Web; therefore, this idea perfectly fits to the definition of Web 3.0 by Wahlster and Dengel [4]. In this demo description we present UbisEditor, an easy-to-use web tool for the creation and manipulation of structured collective knowledge represented as ontologies, similar to the idea of WebProtégé [3]. This web ontology editor is realized as part of the UbisWorld project (<http://www.ubisworld.org>) and already supports ontology editing techniques like adding new concepts, renaming, deleting, multilingual label editing, but also the creation of personalized ontology views.

2 The Web Ontology Editor

The **UbisEditor** itself is part of the **UbisWorld** project, which focuses its research on ubiquitous user modeling [1] and Web 3.0. The latest tool set version UbisWorld 3.0 integrates Web 2.0-like services and Semantic Web technologies. The knowledge base of the system is built out of two ontologies: GUMO (General User Modeling Ontology) and UbisOntology. These ontologies are represented as foldable trees whose nodes consist of classes and instances. In addition, several external ontologies (e.g. SUMO, DOLCE, OpenCyc) and taxonomies (e.g. the Amazon.com category tree) have been parsed and integrated into the UbisWorld. All the trees can be browsed in a very efficient way by using Ajax technologies [2]. This means that the data needed to display the layer of a tree is sent to the client not before the user has opened the corresponding parent node. Using this visualization technique we are basically able to display arbitrary large trees.

In the **UbisEarth** ontology tree (our largest ontology with about 28 million nodes) we are already able to display roles and properties as tree nodes, too. This very useful feature shall also be implemented for the rest of the UbisWorld. Furthermore, this tree emphasizes the strength of our visualization by displaying limitation nodes, which subsume large numbers of nodes in ten thousand or hundred packets, respectively. These nodes add additional structure to the tree hierarchy and facilitate an easy-to-use tree browsing.

UbisEditor uses the same graphical user interface as the UbisWorld ontology browser, but with additional features enabled like check boxes, a context menu and editable tree node labels.

2.1 The Editing Process

The UbisEditor already supports the most important functionalities for editing an ontology: creating new classes or instances, renaming and deleting objects as well as changing a node's parent via drag&drop. By using a context menu, we provide an efficient and easy-to-use way of performing these editor actions. Right mouse button click opens the context menu and highlights the selected node in the tree (Fig. 1 left). This context menu is adaptive to the rights of the user, which depend on the user's role. The text editor for renaming a concept's label can either be opened by selecting the corresponding entry in the context menu or by double-clicking the tree node text.

In order to make a multilingual labeling of the concepts of the different ontologies possible, we provide an additional method to edit the label of an object. When selecting a node of an ontology tree, a grid appears on the right-hand side of the UbisWorld web page (Fig. 1 right). This grid has two columns (Language and Label) where the different labels that already exist for this concept are shown together with the corresponding language. Further translations of the concept's name can be added by first selecting a language out of a combo box containing the different iso 639 language codes and entering the appropriate name into a text editor field afterwards. This feature facilitates a collective generation of multilingual ontology concepts.

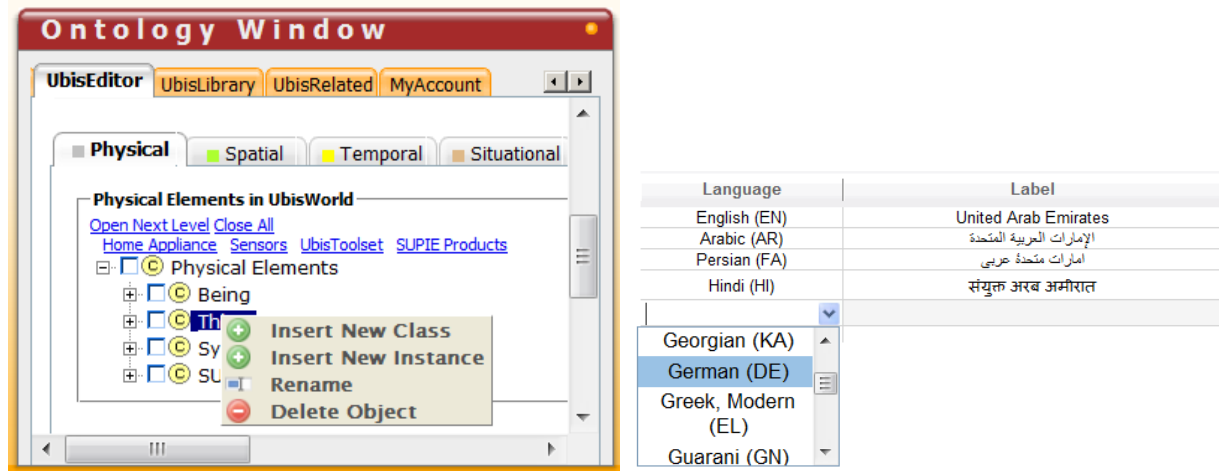


Fig. 1. Left: UbisEditor GUI ; Right: Grid for Multilingual Label Editing

2.2 Aspects of Collaborative Ontology Development

In order to facilitate a collaborative ontology editing with UbisEditor, different functionalities like a concurrency control mechanism (e.g. by locking subtrees and/or transaction management on the database level), conflicts resolution strategies (manual and/or automatic) or a change management system are needed. We plan to solve these problems within the next months. Other important features like a search functionality, a five-star rating system and role-based rights management are already implemented for UbisEditor and UbiWorld.

2.3 Personalized Ontology Views

Another important feature supported by UbisEditor is the possibility to create ontology views, i.e. to extract only those parts of the ontology that are relevant for the scenario on hand. In editor-mode, the ontology trees are displayed with a check box on the left-hand side of each node. So the user can easily select the needed concepts and create a personalized ontology view by pushing the appropriate button. Then an OWL-file is provided for download.

3 Conclusions and Future Work

We have presented UbisEditor, a Web tool which provides lightweight functionalities for efficient collaborative ontology editing using an Ajax-based visualization technique. The central idea of our approach is to facilitate the distributed extension of our basic ontologies, that were created by experts, performed by our ontology community. UbisEditor is part of the UbiWorld 3.0 tool set that can be tested online at www.ubisworld.org.

References

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