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# SVM: Semantic Versioning Manager

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**Abstract.** Knowledge domains and their semantic representations via ontologies are typically subject to change in practical applications. Therefore, especially in distributed environments, change management for ontologies becomes a crucial aspect. In order to handle these issues, we propose *SemVersion*, an RDF-centric versioning approach and its integration as the *Semantic Versioning Manager* plug-in in the *Protégé* Ontology Editor.

## 1 Introduction

Knowledge domains and their formal representations via ontologies are typically subject to change in practical applications [2]. Additionally, engineering of ontologies often takes place in distributed settings where multiple independent users interact. Support for change management is crucial to support decentralised engineering of ontologies.

Ontology versioning is needed in all phases of the ontology life cycle (i. e. creation, evaluation/refinement, adaption/mapping, usage). As soon as the first – potentially incomplete – version of an ontology is saved, it should be stored and comparable to later versions. When the development phase reaches a level of maturity, so that the ontology can be used, versioning becomes even more important. During the usage phase, the ontology has to be refined in order to match changes in the application domain or its conceptualisation.

This poster proposes a combination between the existing *SemVersion* [3], an RDF centric ontology versioning system and *Protégé* Ontology editor. This integration has the goal to give birth to a combined system which should be able to handle most of the phases present in the ontology lifecycle.

## 2 The Semantic Versioning Manager

*SemVersion* uses an RDF-based approach that provides versioning for RDF models and RDF-based ontology languages like RDFS, OWL flavours or TRIPLE [1]. The core element is the separation of language-specific features (i.e. the

semantic diff, taking the ontology language semantics into account) from general features (such as generic, structural RDF diff, branch and merge, management of projects and metadata).

We thus distinguish between **data management**, which deals with storage and retrieval of chunks of data and **versioning functionality**, dealing with ontology language specific functionality such as the structural diff (ignoring semantics) and the semantic diff (depends on ontology language; uses structural diff). Only the semantic diff is different between ontology languages. Our general idea is the direct re-use of data management functionality across ontology languages. A more detailed description about the design and implementation of SemVersion, including the classical problems associated with version control (branching, merging, etc ...) can be found in [3].

By implementing the integration of *SemVersion* in the *Protégé* Ontology Editor, as the *Semantic Versioning Manager* we intended to offer the users the opportunity to create, edit and manage their ontologies under one single environment. And through this, cover three of the four phases of the ontology lifecycle. While *Protégé* takes care of the user's needs in terms of ontology creation and editing, the *Semantic Versioning Manager*, provides the proper functionalities for versioning RDF-based ontologies and integrating in the environment like: loading a version for editing, saving the current edited ontology under a new version, visualise structural and semantic diffs or exporting and importing versions to and from local files.

### 3 Summary

In summary, we presented shortly a methodology for RDF-based ontology versioning integrated as a plug-in in *Protégé*. We intend in the future to correct the current limitations and to continue developing the versioning system, the next step being the implementation of collaborative versioning functionalities.

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