

# OULx: Event-Driven Ontology Updates

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Ontology updates, execution models, events, event handlers

## Abstract

Nowadays, most modern Web applications represent domain-specific knowledge by means of Web ontologies, describing domain concepts and relations using the triple paradigm. Such data structuring facilitates data understandability and interoperability, yet due to society's non-static nature, knowledge bases require regular updates. Traditional data sources like relational databases have mechanisms for automatic updates, but there is no principled way for automated Web ontology updating, forcing domain experts to update ontologies manually.

The Ontology Update Language (OUL) [1] alleviates the process of manual updating by defining sets of SPARQL/Update rules. It is based on an automatic update mechanism and operates using the Event-Condition-Action model, where event occurrences trigger actions through *handlers* and preconditions are assessed. However, OUL only supports deferred execution of the first matching handler, and hence there is no support for a fully automated update mechanism.

In this poster, we propose OULx, an extension to OUL supporting various additional execution mechanisms inspired from active databases, i.e., immediate

execution, multi-handler execution, update chaining, and update looping. Figure 1 displays a typical OULx handler, which can be executed using various models. We implemented the language and its execution models in the Hermes News Portal (HNP), an ontology-based news personalization service. A preliminary analysis of the characteristics of the various execution models shows that although termination is not always guaranteed, the proposed extensions are viable, provided that technical experts who are accustomed to the update language work together with experts of the knowledge domain.

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## References

- [1] U. Lösch, S. Rudolph, D. Vrandečić, and R. Studer. Tempus Fugit. In *6th European Semantic Web Conference on The Semantic Web: Research and Applications (ESWC 2009)*, pages 278–292. Springer-Verlag, 2009.

```
CREATE CHANGEHANDLER addProductHandler
PREFIX kb: <http://www.hermes.com/knowledgebase.owl#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
FOR add(?company kb:hasProduct ?product)
AS IF (contains(?company rdf:type kb:Company)
and !(contains(?product rdf:type kb:Product)))
THEN insert data{?product rdf:type kb:Product};
applyRequest;
```

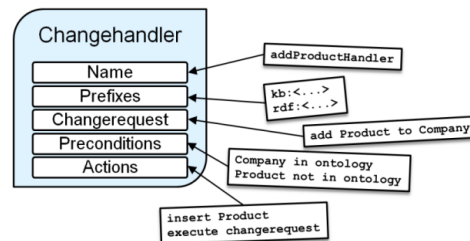


Figure 1: A typical OULx handler for adding an item to an ontology.