OULx: Event-Driven Ontology Updates

Introduction
The Ontology Update Language (OUL) 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.

Language
In our extended language, OULx, we additionally allow for the use of various operators in the update rule syntax:
- **Negation**: expresses the non-existence of specific information in an ontology.
- **Prefixes**: creates shorthands for commonly used namespaces in rules.

Also, we extend OUL in such a way, that the following execution models are available:
- **Immediate** updating: executes updates immediately when triggered by event occurrences (instead of deferred updating, which stores actions first).
- Executing all matching handlers: considers every specified set of update actions (instead of merely the first match).
- **Update chaining**: allows actions performed by handlers to trigger new events that are subsequently handled by other handlers.
- **Update looping**: re-firing events until no matching handlers are found.

These execution models can also be combined into more complex configurations. We implemented the language and its execution models in the Hermes News Portal (HNP), an ontology-based news personalization service. A stand-alone version is available at [http://people.eur.nl/fhogenboom/oulx.html](http://people.eur.nl/fhogenboom/oulx.html).

Conclusions
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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