



# D16.0v0.2 Languages for WSMO

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## 1. Introduction

The conceptual model for WSMO is described in [[Roman et al. 2004](#)]. In order to express the described concepts, a concrete syntax is required. This concrete language must be able to model all concepts (and their attributes) as described in WSMO. A human-readable syntax for WSMO (called WSML) is given in [[Roman et al., 2004](#)].

However, different applications need different logical expressivity. Therefore the WSML working group will provide several variants of WSML with different logical expressivity. In this document we introduce these different variants and indicate in

which deliverables they will be defined.

Secondly, different applications need different syntaxes. Therefore the WSML working group will also provide three syntactical variants of WSML, which can be used to express any of the (above mentioned) semantical variants. In this document we will also shortly introduce these different syntaxes and indicate in which deliverables they will be defined.

## 2. Semantical layering in WSML

In figure 1 the five semantical variants of WSML and the relation between them are shown. These variants differ in the logical expressivity they offer, and thus in the computational complexity they imply. By offering these five variants, we allow users to make the trade-off between the provided expressivity and the implied complexity on a per-application basis.

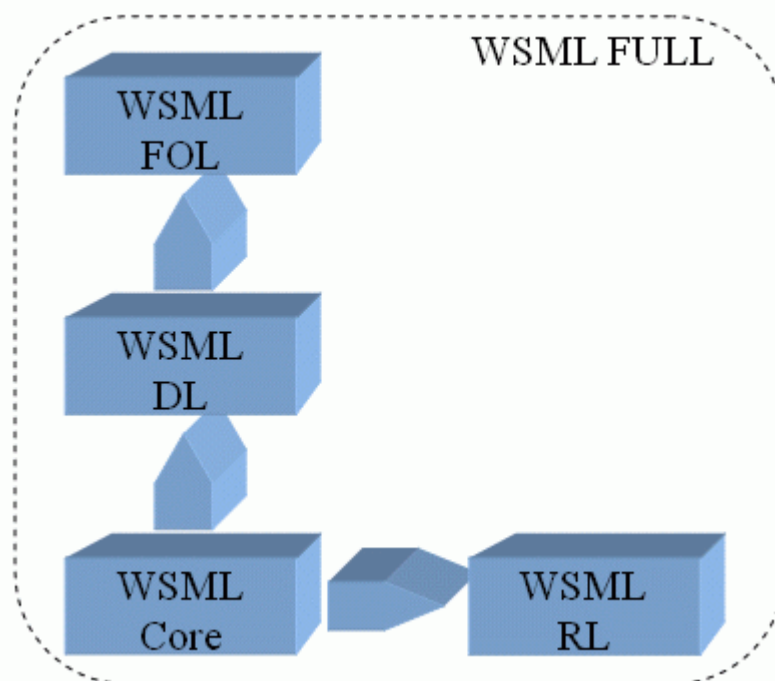


Figure 1. Languages in WSML

### WSML-Core

This language is defined by the intersection of Description Logic and Horn Logic. It has the least expressive power of all the languages of the WSML family and therefore the most preferable computational characteristics. WSML-Core is defined in [\[de Bruijn and Foxvog, 2004\]](#).

### WSML-DL

This language is an extension of WSML-Core that supports Description Logic. It is defined by OWL-Lite [\[Dean and Schreiber, 2004\]](#) which is a recommendation of the W3C and has reasonable computational characteristics. OWL-DL adds nominals to OWL-Lite that are not very useful in our context and do not justify the added computational complexity. WSML-DL will be defined in a future deliverable.

### WSML-RL

This language is an extension of WSML-Core that supports Horn Logic. WSML-RL will be defined in in a future deliverable.

### **WSML-FOL**

This language is an extension of WSML-DL that supports full first-order logic. It is defined in [Roman et al., 2004]. Syntactically this language is also a superset of WSML-RL, but it has a different semantics.

### **WSML-Full**

This language is an extension and superset of both WSML-FOL and WSML-RL. We will try to identify this superset in the future, but do not focus on it currently.

## 3. Syntaxes

The three semantical variants of WSML all share the modelling elements from WSMO. They differ only in the kind of logical expressions one is allowed to use. Therefore the syntaxes for these variants will only differ regarding the allowed logical expressions; for usability reasons, a semantical variant may also include language constructs for certain often-used logical expressions.

The three syntaxes for WSML are:

#### **Abstract syntax:**

A human readable syntax for WSML. This syntax is defined in [Roman et al., 2004; appendix B]. An example can be seen in [Stollberg et al., 2004]. This abstract syntax is machine-readable with a specialised parser (which we provide as open-source software).

#### **XML syntax:**

A syntax specifically tailored for machine processability, instead of human-readability; it is easily parsable by standard XML parsers, but is quite unreadable for humans. This syntax is defined in [de Bruijn and Kifer, 2004]

#### **OWL/RDF syntax**

An OWL syntax for WSMO will be provided in a future deliverable to enable interoperability with current web ontologies (for which OWL is the current standard).

## References

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