**Collaborative Discussion 2: KRR: Ontologies for WWW**

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## Initial Post

Kalibatiene and Vasilecas (2011) describe ontology using four key words based on Gruber (1993): formal, explicit, shared, and conceptualisation. This means a machine-understandable logically defined abstract model that captures accepted group knowledge.

Following the ontology language evolution timeline, this compares Knowledge Interchange Format (KIF), Resource Description Framework (RDF), Web Ontology Language (OWL) Lite, and OWL 2, to determine the most appropriate ontology language for software agents on the World Wide Web (WWW).

### KIF

Created in 1992, KIF is formal and explicit—it uses first-order logic, and it can be machine readable. DARPA explicitly designed it to share knowledge. However, DARPA did not design an ontology for the web until DARPA Agent Markup Language (DAML) in 2000. Furthermore, because it is so expressive, it is complex to use and inefficient due to its size (Kalibatiene & Vasilecas, 2011; Slimani, 2015).

### RDF

The World Wide Web Consortium (W3C) published RDF in 1997 and designed it for machine readability and web. However, it lacks a mechanism for affection inference and formal semantics (W3C, 1997; Kalibatiene & Vasilecas, 2011).

### OWL Lite

OWL extends RDF, as a formal language designed for the semantic web. OWL 1, launched by W3C in 2004, includes OWL Full, OWL DL and OWL Lite. While OWL Lite has an inference engine and is simpler, it is weakly expressive, has high computational complexity and is the only OWL class not carried forward into OWL 2 (Cuenca Grau et al., 2008; Kalibatiene & Vasilecas, 2011; Slimani, 2015).

### OWL 2

The W3C announced OWL 2 in 2009 to address drawbacks of OWL 1. Building on OWL 1 and RDF, and designed for web, it maintains OWL DL and OWL Full and adds three new profiles (EL, QL and RL). Furthermore, it adds expressivity, qualified cardinality restrictions, relational expressivity, datatype expressivity and keys (Cuenca Grau et al., 2008; W3C, 2012). However, its expressiveness adds complexity, and there may be use cases where a simpler ontology is more suitable.

For software agents on the semantic web, OWL 2 is most relevant.

## References:

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