to offer. The resulting language, OWL2, for the Web Ontology Language, is closely related to a fragment of a family of logics that are specially crafted for representing terminological knowledge. These Description Logics (DL) have a long history, and their features are well understood by the community. OWL2 is the second iteration of the OWL language.

Chapter Overview

In this chapter, we first describe the motivation for OWL2 in terms of its requirements (section 4.2) and its relation with RDF and RDFS (section 4.3). We then describe the various language elements of OWL2 in detail in section 4.4, followed by a discussion of three OWL2 *profiles* (section 4.5).

4.2 Requirements for Ontology Languages

We have seen in the previous chapters that RDF and RDFS allow us to describe classes, or 'concepts,' that exist in a domain, and share these descriptions across the web. An explicit formal specification of the concepts in a domain is called an *ontology*. Languages that allow us to express ontologies are therefore called *ontology languages*. The main requirements for these languages are: a well-defined syntax, a formal semantics, sufficient expressive power, convenience of expression, and efficient reasoning support.

4.2.1 Syntax

The importance of a *well-defined syntax* is clear and known from the area of programming languages; it is a necessary condition for machine processing of information. A syntax is well-defined if you can use it to write down everything a language allows you to express in an unambiguous manner. All the languages we have presented so far have a well-defined syntax. As we will see, OWL2 builds on RDF and RDFS and uses an