

Role of the “Semantics” WG

Andrea Preite Martinez

1. Introduction

Even before the InterOp in Madrid, it was clearly emerging the need to redefine the name of the UCDs WG into a new name that could better describe the activities centered on the description of words used in astronomy, and in particular within the IVOA. The name that can precisely describe our (present and future) activities is “semantics”.

Indeed, semantics is traditionally defined as the study of meaning of words, phrases, sentences, and texts. Semantics can be approached from a theoretical as well as an empirical point of view, and we were actually using both approaches to define UCDs. Semantics is distinguished from ontology (study of existence) in being about the use of a word more than the nature of the entity referenced by the word (see for instance, <http://en.wikipedia.org/wiki/Semantics>).

This is the reason why I proposed to the IVOA Exec to change the name of the working group, from “UCDs” to “Semantics”.

What follows is the result of the presentation and discussion at the UCD session in last InterOp meeting in Madrid (<http://www.ivoa.net/twiki/bin/view/IVOA/InterOpOct2005UCD>).

The present document is the answer to:

ACTION FM17-8.2 APM Bring forward a revised charter for the Semantics WG to define its expanded role (including responsibility for opening a discussion list to look at wider Semantics issues).

The reorganization of mailing/discussion lists and twiki pages has still to be discussed in the WG. I will report to the IVOA Exec on the opinion of the WG on these matters before the next InterOp meeting.

2. A rationale for Semantics

We are clearly at a turning point in the activities of the former UCDs WG. During last year 2005 two documents of the WG reached the status of IVOA Recommendation: the main UCD document “[An IVOA Standard for Unified Content Descriptors. Version 1.10](#)” (19 Aug 2005), and the first list of standard UCD words “[The UCD1+ controlled vocabulary. Version 1.11](#)” (31 Dec 2005).

In the same period of time, other WGs realized the need to interact with our WG in order to standardise the vocabulary used to describe the data they were working on (e.g.: DM/SSAP, VOEvents/VOConcepts). The request (implicit at the beginning) was to expand and generalize the work done on UCDs, and so update our task into the definition of a standard vocabulary in the fields covered by IVOA activities. In other words, a more explicit migration/evolution towards semantics came from the interaction with other IVOA WGs.

At the same time, we need to move our UCDs activities from the foundation phase to the phase of maintenance, in order to keep UCDs at a level of useful “semantic meaning” requested by the community.

Looking further in the future, and preparing for it, we also need to explore the applicability of Ontologies in describing our data, their structure, their inter-relations.

3. A charter for the Semantics WG

The IVOA Semantics Working Group will explore technology in the area of semantics with the aim of producing new standards that aid the interoperability of VO systems. The Semantics Working Group is concerned with the meaning or the interpretation of words, sentences, or other language forms in the context of astronomy. This includes standard descriptions of astrophysical objects, data types, concepts, events, or of any other phenomena in astronomy. The WG covers the study of relationships between words, symbols and concepts, as well as the meaning of such representations (ontology). The WG covers use of natural language in astronomy, including queries, translations, and internationalization of interfaces.

The activities of the IVOA Semantics WG can be classified as follows:

- **Maintenance of UCDs**
- **IVOA Standard Vocabulary**
- **Exploration of Ontologies**

Details on activities, roadmaps and milestones follow.

3.1. Maintenance of UCDs

In the WG we are presently working to define a procedure for the maintenance of the list of UCD words (<http://www.ivoa.net/Documents/latest/UCDlistMaintenance.html>). A specific board in charge of the maintenance was already set-up in June 2005. The WD document describing the procedure was discussed in the WG, and we will shortly open an RFC to the interop community. We expect to present the procedure to the Exec before next InterOp spring-2006 meeting.

The **roadmap** for UCDs is then the following:

- Feb 2006: open RFC on the maintenance document
- March 2006: revise document and submit to Exec/TCC
- April 2006: request to vote on recommendation.

3.2. Standard Vocabulary

In collaboration with the DM and VOEvent WGs, the Semantics WG will try to revise the terms used in DM/SSAP and in VOConcepts in order to uniformize the meaning of the words used in those contexts.

The main activity of the Semantics WG will be to define the basic elements of a Standard Vocabulary (SV) in all the fields covered by IVOA activities. Starting from already available lists of astronomical words, objects, or concepts (the old thesaurus, keywords used in Journals, and the actual text of scientific papers), we will try to define the basic **concepts** (processes, instruments, methods, object types, etc.), the **instances** of these concepts, and possibly the **relationships** among them. The concepts will be described using a syntax similar to that already used for UCDs. This work will be done in collaboration with those IVOA WGs more closely interested in the outcome (and possible rapid application) of this semantic effort.

The **roadmap** for the definition of an IVOA SV is then the following:

- March 2006: first draft document on SV-VOConcepts (TN)
- March 2006: jointly revise DM/SSA for spring InterOp
- April 2006: joint session at InterOp on SV (WGs Semantics and VOEvents)
- April 2006: explore other WG interactions on SV
- Oct. 2006: WD document on SV

3.3. Ontologies

We need to Start discussion on Ontology(ies) to gather information on: (i) what we want in an Ontology, (ii) how many and of what type we need, and (iii) what possible use they might have within IVOA. The work will procede in parallel with that on Semantics. We can consider that the definition of concepts, inferences and relationships is of propedeutic value to build an ontology.

The **roadmap** for the exploration of the use of Ontologies within IVOA is the following:

- June 2006: open discussion list to start exploring what, how, why
- Sept 2006: first test-case ontology on a selected field (TN document)