OIL-E

In order to realise the convergence of vocabulary at a technical level, it is necessary to identify the shared concepts in various standards and specifications that currently govern the handling of data and tools in the environmental sciences. **Open Information Linking for Environmental RIs (OIL-E)** is a semantic linking framework being developed to help perform this challenging task based on the core concepts of the ENVRI reference model.

Objectives

OIL-E is a developing framework for addressing the semantic linking requirements of environmental science e-RIs. Specifically, it is intended to provide a machine-readable bridge between the ENVRI Reference Model and other concept models related to research infrastructure, architecture and scientific (meta)data.

The ENVRI Reference Model (E-RM) is constructed using the Open Distributed Process (ODP) for modelling complex distributed systems; ODP requires the modelling of a system from five different viewpoints (enterprise, information, computation, engineering and technology) with the correspondences between the five resulting views ensuring their mutual validity. This viewpoint-based approach provides clarity to each 'facet' of the end model by reducing the number of competing elements to only those that match a particular set of concerns (such as the flow of information through the system), while still retaining the aggregate complexity needed to model any substantive distributed system.

At present, E-RM models three of the five views prescribed by ODP: enterprise (renamed science in respect to the subject area), information and computation. These three viewpoints best capture the generic aspects across all e-RIs, with the engineering and technology viewpoints being more e-RI-specific (though there is a plan now within ENVRIplus to generate these views). The E-RM ontology within OIL-E defines all the objects defined in the three existing views and their relations. It is intended that OIL-E will link concepts used in a variety of different standards and specifications to E-RM as a means to harmonise technical developments in RIs; a number of small pilots were carried out in the original ENVRI project to gauge the feasibility of this process.

The purpose of OIL-E is to provide a framework by which the semantics of different controlled vocabularies can be studied in order to allow translation and reasoning over heterogeneous datasets. This entails:

- Comparing different concept models for modelling research assets and data, and identifying commonalities and gaps.
- Building generic tools using existing technologies to handle the search and mapping of models related to e-RI architecture and specification.

The core component of OIL-E glues concepts both inside E-RM and between E-RM and external vocabularies. In the latter case, external models can be classified in terms of E-RM in order to help map the landscape of e-RI-related standards and models. The E-RM ontology only contains a limited set of vocabularies derived from common e-RI functionality and design patterns, so linking the E-RM ontology with external models will also enable domain-specific extensions to E-RM itself. The internal correspondences between the different E-RM views can also be used to indirectly draw associations between models with quite different foci (e.g. data versus services or architecture).

The OIL-E ontologies can be found online at http://oil-e.net/ontology/.
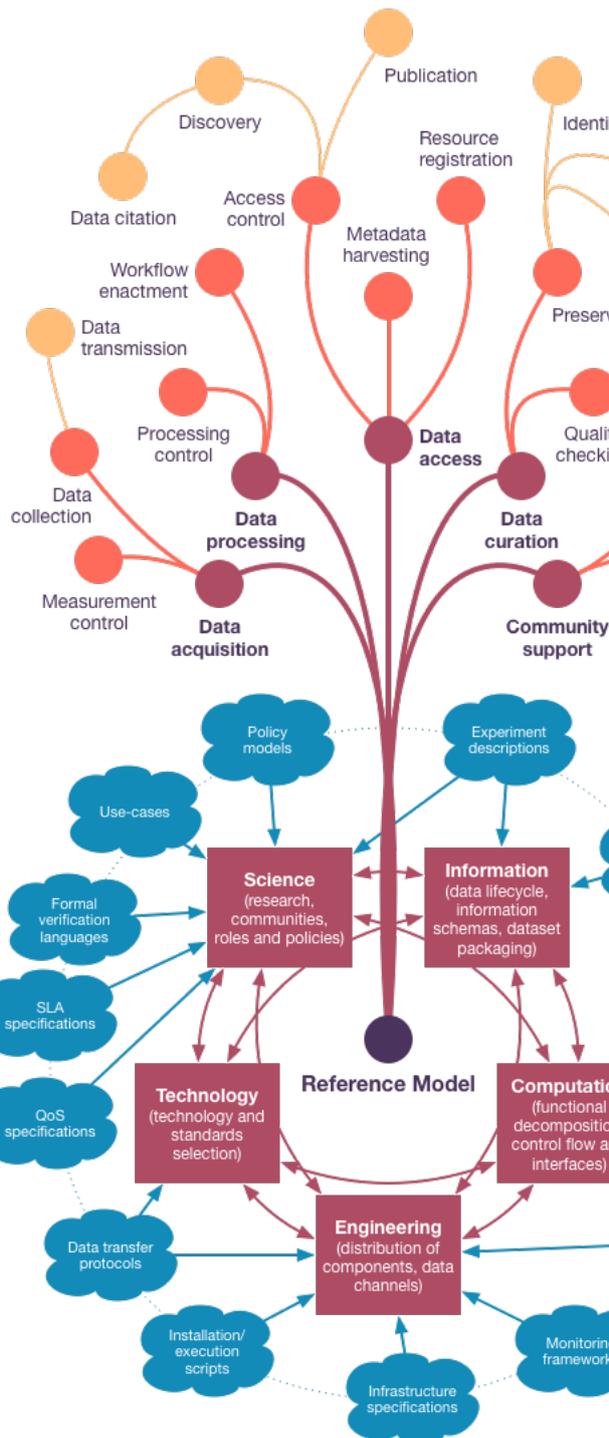
The reference model uses five viewpoints to address the requirements of RIs. OIL-E will link concepts used in a variety of different standards and specifications to the reference model as a means to harmonise technical developments in RIs.

Relation to ENVRIplus

Within the ENVRIplus project, Task 5.3 is concerned with the development and expansion of OIL-E, both in order to mirror

developments in the ENVRI reference model, and to establish links with selected standards for RI specification, geospatial metadata and research data annotation.

Resources

Aside from the ontologies at http://oil-e.net/ontology/, there exist some introductory resources to the OIL-E concept and work:

- A flyer has been produced for dissemination at events and other meetings.
- A slide-set has also been produced, describing some key ideas.