



information

VL-e enables new approaches to traditional sciences

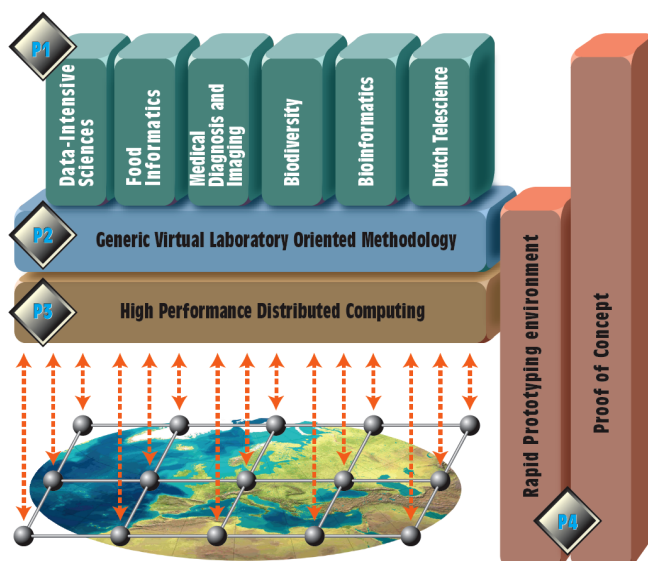
Information has become the fuel of our knowledge society, and our ability to digest, understand and share it will determine our scientific, economic and social progress.

The exceptional increase in computing power, storage capacity and network bandwidth over the past decades forms the basis of a digital revolution which has only just started. Also the changing scale and scope of experimental sciences require a new research paradigm: (digitally) enhanced science or e-Science. The aim of the 'Virtual Laboratory for e-Science' (VL-e) project is to bridge the gap between the technology push of the high performance networking plus the Grid and the application pull of a wide range of scientific experimental application domains. A typical example of this is the life sciences, where VL-e offers solutions for combining laboratory

research with computational experiments and simulations, making use of the knowledge and experience gained from dealing with large data sets in high energy physics. At the same time, however, it is recognised that data sets in the life sciences are far more complex than in high energy physics.

More specifically, VL-e is developing a Proof-of-Concept (PoC) infrastructure (both hard- and software) to enhance location-independent access to scientific information and stimulate global and multidisciplinary collaboration, thereby enabling new approaches to traditional sciences. The VL-e software (both for rapid prototyping and in the PoC) provides generic functionalities that support a wide range of e-Science applications. This PoC infrastructure will boost the knowledge economy of the Netherlands.

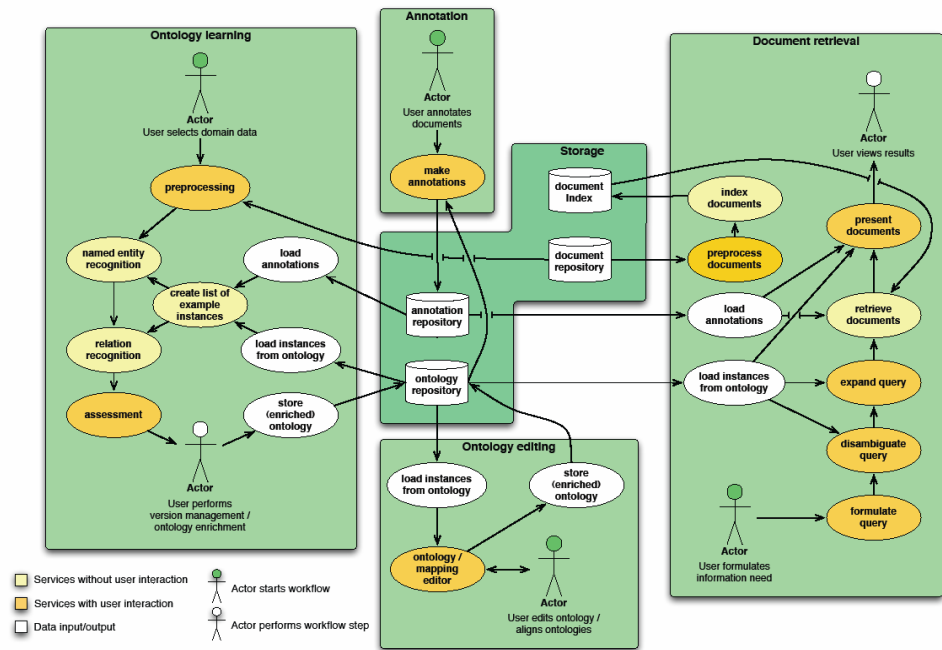
Currently, six application domains are involved: Data-Intensive Sciences, Food Informatics, Medical Diagnosis & Imaging, Biodiversity, Bioinformatics and Telescience. Several Dutch universities, academic hospitals and industries in the life sciences and ICT domain participate in this project. There is also strong collaboration with NBIC (Netherlands Bioinformatics Centre). The recently started Dutch BIG GRID project will build a nationwide production grid, making use of methodology still being developed within VL-e.





Knowledge in a test tube with the AIDA toolbox

Many scientific domains, and certainly life science, store an enormous amount of knowledge in the form of literature and text documents. For biological systems this is not remarkable given their inherent complexity. E-science offers new possibilities for experimentation and analysis in such domains.



Use case diagram of the AIDA toolbox

MEDLINE statistics
(biomedical literature)
>120 million searches
>10 million citations
>400,000 each year

AIDA is a service-oriented toolbox for ontology-supported information extraction: a general purpose toolbox that can be specifically applied in domains such as biology.

AIDA is a modular platform for adaptive extraction of information in a 'Virtual

Laboratory for e-Science'. The use of web services simplifies the creation and sharing of specific applications (workflows), possibly in combination with external (web) services.

In an example application, we discover possibly overlooked connections between enzymes and diseases. To achieve this we extend our own 'proto-ontology' with terms discovered automatically from a body of literature (typically MEDLINE). The AIDA toolbox also contains services that create trained models for recognizing specific concepts of interest. We use Taverna to prototype and compose our services into workflow applications.

vl-e facts

budget 40 M, period 2004-2008
more than 20 consortium partners from industry and academia
director: prof. dr. L.O. Hertzberger
website: <http://www.vl-e.nl>

consortiumpartners

A&F Wageningen, AMC, CWI, DSM, Friesland Foods, FEI, FOM AMOLF, NBIC, Nikhef, IBM, LogicaCMG, Philips Research, Philips Medical, SARA, Top Institute Food and Nutrition, TNO Kwaliteit van Leven, TU Delft, Unilever, UvA-IBED, UvA-IvI, UvA-SILS, VU, VUmc, WTCW

VL-e Program line: Generic Virtual Laboratory Methodology

Subprogram: SP2.2 Adaptive Information Disclosure

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<http://adaptivedisclosure.org>