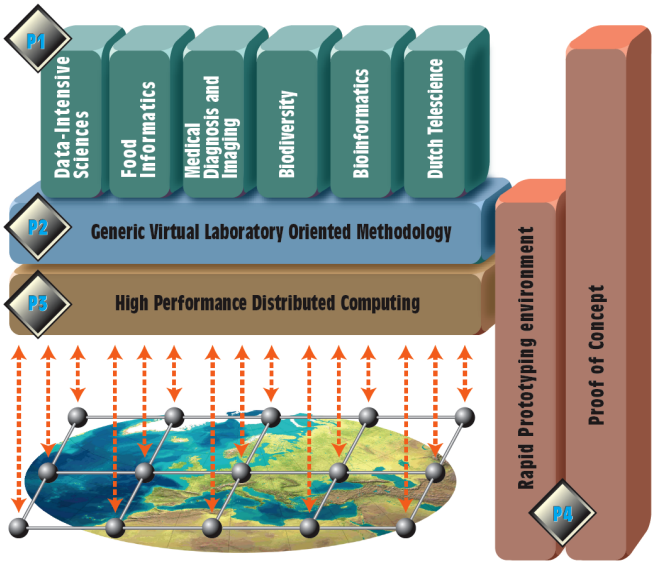
vl·e virtual laboratory for e·science

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.

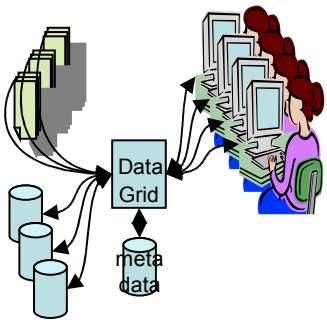


More specifically, VL-e is developing a Proof-of-Concept (PoC) infrastructure (both hard- and software) to enhance location-independent access to scientific information and stimulate global and multidisciplinary collaboration, thereby enabling new approaches to traditional sciences. The VL-e software (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.

Food Informatics:
Building Problem-Solving Environments for Food Scientists

The 'Food Informatics' project aims at the development of e-Science based Problem Solving Environments for Dutch Food Research Institutes and industry. These environments will support and enhance the competitive position of the parties involved by enabling their knowledge workers state of the art access to and use of the vast amount of information and computing resources, inside and outside their organisations.

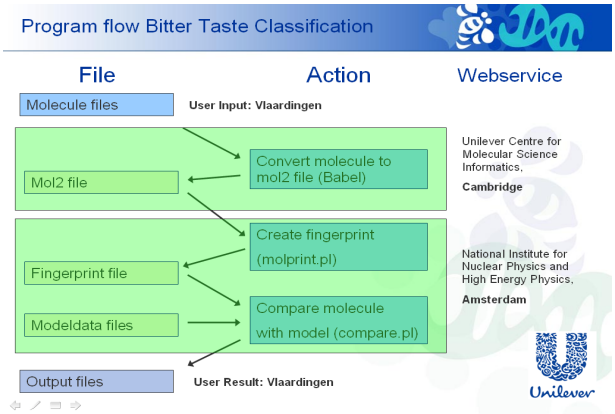


Retrieval of information from multiple sources and formats, supported by ontology/ taxonomy based query enrichment and annotation tools. Development of ontology/taxonomy generation and maintenance tools.

Processing of complex search results like dataset combination and integration, e.g. for early recognition of food related risks.

Application of workflow tools to link services and data in SOA based customised problem solving production environments.

Application of Grid based infrastructure and services to deploy specific mass data and computation intensive support modules.



Unleash data and information for world class food innovations.

Example 1: Prediction of Bitter taste

What:
Estimate bitterness of molecules.

Why:
Understand physico-chemical product properties; introduction or masking of bitter taste.

Key Technologies:
Machine learning (format recognition, data conversion), Naive Bayesian Classifier, application of locally maintained tools via Web services, linked by Taverna (workflow)

Applications:
Automated taste consultant. Principle can be equally applied for prediction of other (sensory) properties in complex ingredient-receptor systems.

Example 2: Ontology supported document search.

To improve search results on bitterness a domain specific ontology was developed and applied. This doubled approximately the amount of relevant documents without compromising precision.

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: e-Science in applications

Subprogram:	SP1.2 Food Informatics
Leader:	Dr. D.J.P. Out Dirk.Out@unilever.com
Organization:	UFHRI Unilever R&D Vlaardingen

http://www.atoapps.nl/foodinformatics/index.asp