



# information

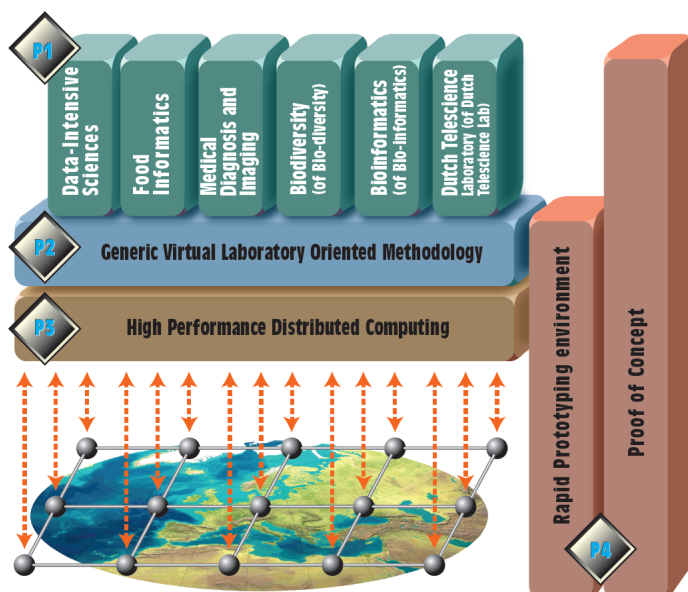
## Multidisciplinary collaboration in VL-e

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

The exceptional increase in computing power, storage capacity and network bandwidth of the past decades forms the basis of a digital revolution, which has only just started. Increases in detector resolution also invokes a changing scale and scope of experimental science. Both ongoing developments lead to an immense data explosion and the experimental sciences require a new research paradigm: *(digitally) enhanced science or e-Science*.

Due to recent breakthroughs in optical wide-area bandworking, network bandwidth does not limit distribution of large amounts of data and information generated by modern networked R&D experiments. A new generation of applications for the Internet is now about to be introduced, unleashed by the availability of ample bandwidth. Parallel to this, another technology is emerging that has the potential to enable users share compute power, storage and other resources such as expensive experimental facilities (e.g. a mass spectrometer or a large telescope). In analogy with the electricity power grid, this technology has been called the Grid.

While focusing on the life sciences, the 'Virtual Laboratory for e-Science' project aims to bridge the gap between the technology push of the high performance networking and the Grid and the application pull of a wide range of scientific experimental applications. It will provide generic functionalities that support a wide class of specific e-Science application environments and set up an experimental infrastructure for the evaluation of the ideas.



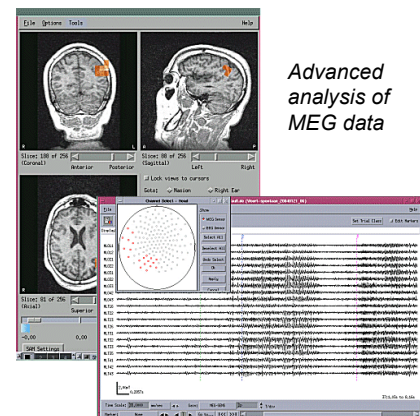


## Medical Imaging e-Science: *enhancing* Biomedical Research and Healthcare

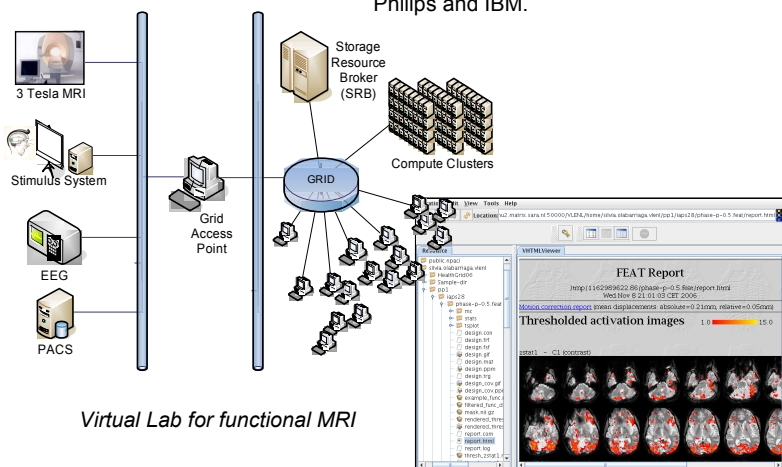
Medical imaging is facing the challenge of handling data of increasing size, complexity, and heterogeneity. The Medical subprogram of VL-e investigates the adoption of advanced IT infrastructures and methodologies to address these problems and enhance medical imaging in healthcare and biomedical research.

Our goal is to develop problem solving environments (PSEs) for a variety of neuroimaging applications, including functional MRI, CT-Angiography, Magneto-Encephalography (MEG) and Diffusion Tensor Imaging (DTI).

The clinical environment of two academic hospitals (AMC and VUmc) provide the scope of this subprogram. The research is based on close collaboration with several academic and industrial partners: Informatics UvA NIKHEF, SARA, Computer Science VU, Philips and IBM.



Advanced analysis of MEG data



Virtual Lab for functional MRI

The various PSEs are built with the common infrastructure provided by the VL-e Proof-of-Concept and Rapid Prototyping environments. Activities involve developing and/or adopting...

- new (parallel) algorithms to perform complex image analysis and visualization within feasible response time;
- high performance systems for large studies involving analysis of large amounts of images;
- (external) facilities to store and manage research data and metadata;
- data analysis workflow management;
- secure medical data sharing mechanisms.

In all cases, we strive to provide access to the e-Science infrastructure via user-friendly interfaces that can be directly operated by medical users from the hospital environment.

**VL-e Program line:** e-Science in Applications  
**Subprogram:** SP1.3 Medical Diagnosis and Imaging

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### 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