



PROJECT RESULTS

Communication, cooperation and coordination in virtual design

Platform for advanced engineering design teamwork



In the future cyber-enterprise, designing complex systems will be an 'e-group' process that requires smooth integration of all communication processes, with cooperation and coordination between the members of the design team. The VACCAT project produced an integrated 'CCC' platform with advanced design-decision support tools able to cope with complex engineering design tasks.

New collaborative tools for design teams

Complex software platforms are needed for teams of co-designers operating within a virtual enterprise. Such teams require collaboration-

sophisticated documentation facilities to support group decision-making and real-time content indexing.

As of today there are very few tools to support collaboration among designers, or between designers and technicians. Rather than using standard workstations for optimisation, maintenance and training, far better results are possible with specialised infra-structures that allow multimodal interaction, e.g. improved scale- and depth-perception, or interaction with touch-sensitive and acoustic interfaces.

Managing the information related to a complex engineering project poses extremely difficult problems like determining the potential impact of modifications on the product design. For instance, modifying the geometry of a mechanical part may influence manufacturing, assembly or maintenance of the whole system.

Innovative solutions are urgently needed to deal with such multi-disciplinary issues. More structured



supporting software that is integrated with full interactive prototype visualisations, combined with

information models are required to increase the efficiency of handling huge amounts of engineering data,

VACCAT (ITEA 01004)

Partners

- Bikit
- Fokker Control Systems
- Fraunhofer - IFF
- LMS
- LSIS
- Reachin AB
- University of Twente
- Vartec
- Virtual Reality Centre (University of Teesside)

Countries involved

- Belgium
- France
- Germany
- The Netherlands
- Sweden
- United Kingdom

Start of the project

January 2002

End of the project

December 2004



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as well as the related reports and documentation. Thesauri should include descriptive information related to the engineering data itself, and new indexing schemes need to be researched and developed.

Innovative platform

With respect to these challenging goals some impressive results were achieved within the scope of the ITEA project VACCAT:

- For platform and process assessment, the consortium carried out innovative research on the development and evaluation of a stereographics visualisation capability for computer-aided engineering (CAE) using the Virtual Lab environment. A very essential test of the VARTEC indexing and thesaurus tool and the LMS engineering data management environment was executed. Detailed use-case scenarios were delivered, with contributions from all partners.
- In the area of collaborative design methodology for a distributed platform, the VACCAT project has delivered a demonstrator for assessing collaborative workspace, taking into account common domain knowledge, haptics and workspace awareness.
- A proof-of-concept 'interactive multimodal platform in a distributed virtual and augmented reality (VAR) environment' was elaborated and demonstrated. For the evaluation report, this was used to evaluate the issues of scale- and depth-perception in engineering applications.
- As a negotiation platform for group decision-making, the team created a software environment permitting multiple users to

share and interact with both 2D and 3D information. The main achievement was to provide a platform enabling 2D and 3D information to be visualised at the same time on the same screen. This allows dispersed multiple users to discuss and manipulate 3D objects as if they were sitting together in the same room.

- A review report on indexing/ retrieval principles and algorithms for 3D environments was delivered, presented, and approved. A proof of concept indexing and retrieval platform for 3D VAR spaces was built, based on a thesaurus, content-based 3D indexing and a 3D search tool prototype (D5b).

Resource for European industry

The VACCAT platform is a direct answer to vital design needs in sectors such as transport, the oil industry, medicine and the pharmaceutical industry. Its negotiation support tools will increase the speed of decision-making, and advanced indexing solutions will help with searching and retrieving large amounts of visual data. Large high-performance wall displays and fully immersive environments will enhance visualisation of such data, which is often distributed across a network.

VACCAT will boost the competitiveness of the European design industry by providing developers with a virtual design software platform, including adaptations to engineering design tasks with advanced decision-support tools. The partners intend to use VACCAT as the basic platform and virtual network of excellence in Europe for co-design in a 3D environment.

Major project outcomes

Dissemination

- 15 papers (including conference presentations)
- 24 presentations/demos at events
- 1 article
- 13 other dissemination activities

Exploitation

- 4 new products (1 for internal use)
- 2 new services (1 for internal use)
- 2 new systems (1 for internal use)

Standardisation

3 new patents

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