



PROJECT RESULTS

Computer power for innovation

Harnessing CAD/CAE and CAM systems for innovation

The CAD/CAE/CAM software market is dominated by a few software vendors, whose products and data aren't interoperable. Manufacturing companies often need many CAD/CAE/CAM systems. First, because their customers want 'native' data and, second, because their specific needs cannot be fulfilled by one product.

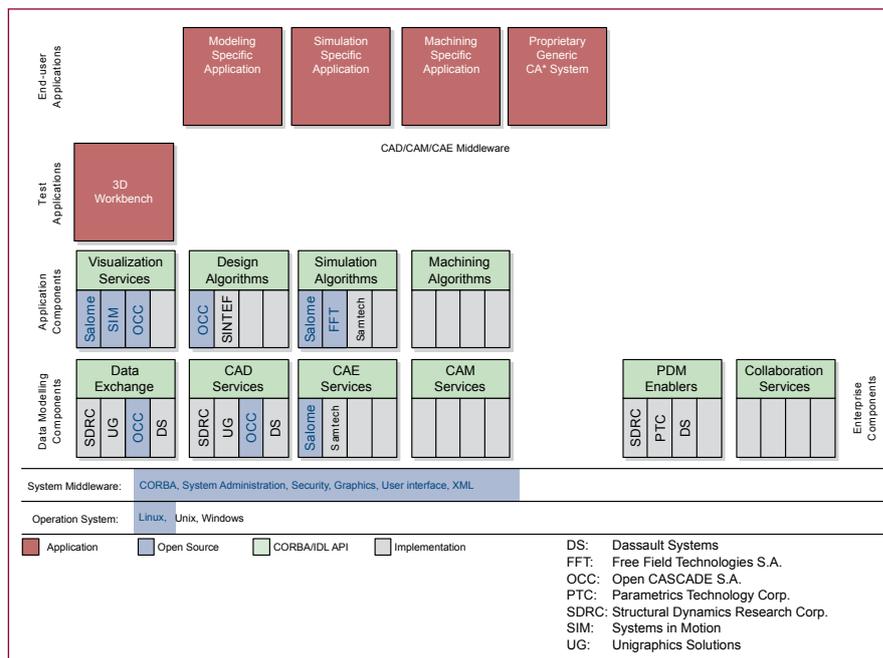
ITEA project 3D-Workbench aims to change this situation. By building CAD/CAE/CAM middleware on recognised and open standards, smaller software manufacturers can develop higher quality software that is fully compatible with other system. This creates promising prospects for a new and productive wave of innovation.

3D-Workbench provides more flexibility through integration of CAx systems/components.

Engineered efficiency

While conventional CAD systems are used widely across the entire industrial design process (for cars, planes, for example), there are still opportunities to shorten development times and increase productivity. Levels of concurrent and simultaneous engineering need to be increased in this industry and seamless integration of systems is required to achieve this objective.

Use of distributed object-oriented CAD systems, comprising components from various suppliers accessed via a common standardised API, is now considered the best way to improve engineering processes.



3D-Workbench component framework for CAx application development

3D-WORKBENCH (ITEA 01012)

Partners

ACATEC
DaimlerChrysler
Free Field Technologies
Generic.de
RPK, University of Karlsruhe
SAMTECH

Countries involved

Belgium
Germany

Start of the project

September 2002

End of the project

March 2005



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By using 'best of class tools' for every task – without proprietary barriers – seamless integration becomes possible, forming the basis for increased productivity and more dynamic innovation. This is what the 3D-Workbench project is all about.

Independent design power

While globalisation increases, international companies are exposed to heavier competition. Accelerated research leads to shorter development cycles.

Interoperability of CAD/CAM/CAE applications is a critical factor for international competition. This has impact on the development and usage of such systems. The current situation is that most applications are specialised solutions built on and designed to work with the CAD systems that dominate the market. Software development is either done by customising existing systems or by using special APIs for these systems. These applications are not portable and constitute a huge investment based solely on those proprietary CAD-Systems.

The availability of standards-based middleware, which implements the base functionality of CAD/CAM/CAE software enables more flexible enhancement of software systems. It also enables smaller software development companies to implement their own solutions based on this middleware, as independency from dominant proprietary systems is ensured.

The project results

A development framework for industrial applications, a standards-based CAx middleware, was built in the project. The core component is the CAD Services library, which was standardised by the OMG. The CAD Service adapters built on top of the CAD Services enable the development of third party CAx software components independently of the CAD system.

Such components were developed in the project. VR.Viewer is a component for visualizing CAD

geometry and metadata (CAD feature information) in VR, independent from the CAD system. NET.Viewer is a component for viewing CAD models over the internet using a standard browser (Java support required) independently of the CAD system.

Software components already written by project partners were extended to use the CAD Services standardised interface. The Product Configurator is one of the end-user applications in the project. It uses all middleware components developed in the project and is, therefore, the reference application. It is a multi-functional, computer aided system, which works as an interface between sales and value chain functions. The project also includes the integrated simulation system FEMTown and the stress analysis tool SAMCEF/Field.

3D-Workbench provides a basis for:

- Industrial companies to develop dedicated industrial applications for their internal use.
- Software companies in the areas of consulting, support and specific development of industrial applications in the CAD/CAM/CAE area.
- Universities needing a platform in order to demonstrate and disseminate their results in the CAD/CAM/CAE research area.

Major project outcomes

Dissemination

- Five publications
- Four presentations at conferences and fairs

Exploitation

- One spin-off company: Incentrix GmbH
- Three new products based on the 3D-Workbench framework: CADService Adapters, VR.Viewer and NET.Viewer
- Three existing CAx products were enhanced: ACATEC Product Configurator, FFT FEMTown and SAMCEF Field

Standardisation

- CADServices standardised by the OMG

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ITEA - Information Technology for European Advancement - is an eight-year strategic pan-European programme for pre-competitive research and development in embedded and distributed software. Our work has major impact on government, academia and business.

ITEA was established in 1999 as a EUREKA strategic cluster programme. We support coordinated national funding submissions, providing the link between those who provide finance, technology and software engineering. We issue annual Calls for Projects, evaluate projects, and help bring research partners together. We are a prominent player in European software development with some 9,000 person-years of R&D invested in the programme so far.

ITEA-labelled projects build crucial middleware and prepare standards, laying the foundations for the next generation of products, systems, appliances and services. Our projects are industry-driven initiatives, involving complementary R&D from at least two companies in two countries. Our programme is open to partners from large industrial companies, small and medium-sized enterprises (SMEs) as well as public research institutes and universities.

