Technical University of Berlin and Fraunhofer IPK

Implementing a comprehensive training program with Version 6

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Dr. Rainer Stark
*Professor of IIT
TUB*

*Director of the Virtual
Product Creation dpt.
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Challenge

The Technical University of Berlin (TUB) and the Fraunhofer Institute for Production Systems and Design Technology (IPK) want to train engineers using a comprehensive teaching concept. The goal is to help industry gain expertise in developing more versatile, efficient, and environmentally friendly products.

Solution

The Version 6 solution portfolio allows researchers and students to create products and manage projects using a multidisciplinary, real-life approach.

Benefits

Version 6 technology with its 3D-based product development environment and intuitive collaboration tools helps TUB and Fraunhofer IPK give future engineers the skills required by industrial manufacturers of tomorrow.

DS DASSAULT SYSTEMES

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KONSTRUKTIONSTECHNIK

Expanded requirements for engineers

The Technical University of Berlin (TUB) emphasizes an industry approach to product development in its engineering program. The university believes that tomorrow's engineers will have to be able to develop mechatronic systems in an integrated and function-driven manner, and work much more closely with shop floor planning and production, as well as purchasing, sales, and marketing. The Version 6 development tools from Dassault Systèmes, which support multidisciplinary system design and collaboration, play a central role in the university's curriculum.

At the nearby Fraunhofer Institute for Production Systems and Design Technology (Fraunhofer IPK), the department of Virtual Product Creation also relies on Version 6 technology for research and the training of product developers, designers, and production planners. "This is because advanced production companies have recognized that the future of virtual product creation lies in multidisciplinary development and integration, from product requirements to service," said Dr. Rainer Stark, who heads the industrial information technology department at the Institute for Machine Tools and Factory Operations at the TU Berlin. "We encourage the concept of comprehensive development in our educational program, in cooperation with the industry. With this new way of thinking, we are poised to make great headway with the help of Dassault Systèmes' Version 6."

From digital mock-up to functional mock-up

Students at TUB trained in integrated systems engineering will be able to support industrial companies after graduation, and help them modernize their development methods so that they can remain competitive. Stark believes that engineering software must be increasingly used in an interconnected way and that the next stage of evolution beyond the classic digital mock-up will be the simulation of the properties of multidisciplinary model systems allowing users to experience them as part of a concept, system, and functional mock-up. "This demand is growing stronger and stronger within companies, and many decision-makers are now faced with the challenge of accessing the new potential of this integrated approach," said Stark. "Therefore, we need to recharge with a new, well-trained generation of students. That is precisely the aim of the partnership with Dassault Systèmes."

Version 6 - from product requirements to production process

After just a few practical tests with the Version 6 solutions in 2009, Professor Stark and his team at the TU of Berlin soon recognized how the multidisciplinary collaboration capabilities of Version 6 matched the teaching philosophy of TUB. "This was something new, and it fits very well with the next level of virtual product creation," said Stark.

The team was particularly impressed with the integrated Requirements, Functional, Logical, Physical (RFLP) concept in Version 6 that spans the entire product development process. "What we see for the first time is that this integrated approach is implemented across several tools," said Eckart Schulze, Science Associate at TUB. "The individual Version 6 workbenches can be used interchangeably in applications such as CATIA and DELMIA. Due to integrated data management in CATIA, users have a much wider reach now. For example, it was always a challenge to master large numbers of weld points and fasteners using CAD tools. With the integrated ENOVIA functionality in CATIA Version 6, these elementary yet critical manufacturing elements are much easier to manage."

Developing a seat for a fuel-cell car

For the first time, TUB is using Version 6 to design the seat of a fuel-cell car. The project is part of the open-source development project called *40 Fires*. Its goal is to use the method of community-driven design to develop and build a cutting-edge electric car. "It is a project that fits extremely well with the expanded develop capabilities offered by the Version 6 architecture," said Schulze.

TUB students work as a team on the Version 6 platform across a wide-ranging set of tasks: requirements engineering, mechanical design, ergonomic verification, process and manufacturing planning, and product data management in ENOVIA. The vehicle seat development results will ultimately be made available to the *40 Fires* community. The young engineers use 3DLive, the 3D collaboration tool in Version 6, as a decision-making medium during design review. "The ability to rapidly switch between intelligent parametric CATIA models, visualization with 3DLive, and the digital factory with DELMIA, provides excellent opportunities for more productive cooperation across different disciplines," Schulze stated. "The students, who knew other systems from their main course of studies, greatly appreciated this integration."
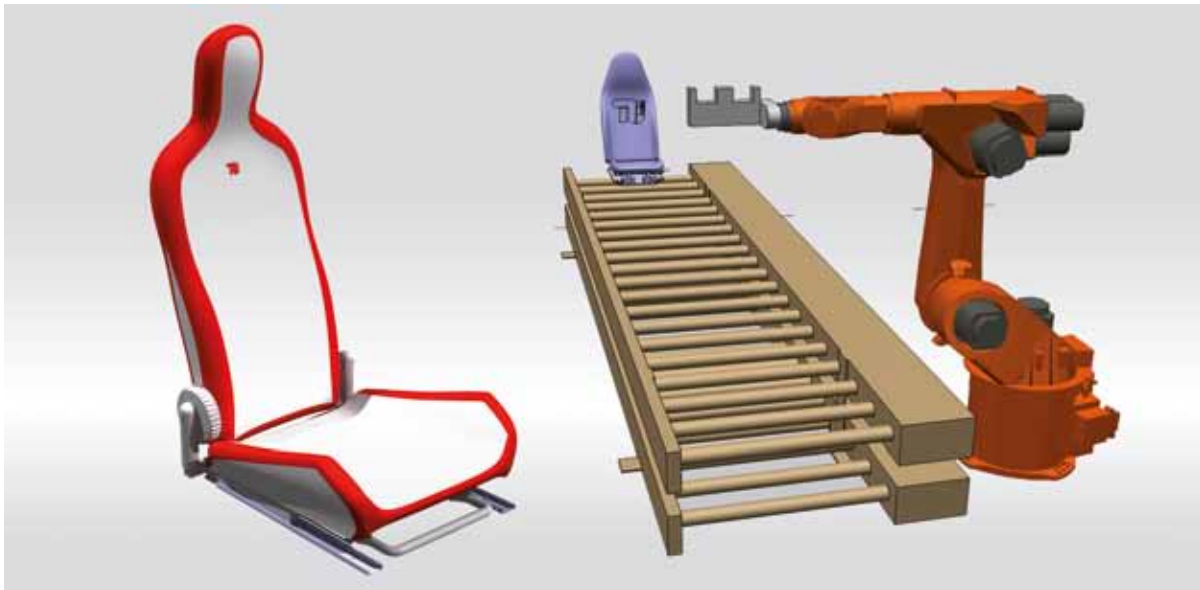
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>
> **Eckart Schulze**
> *Science Associate*
> *Technical University of Berlin*

In particular, the students were excited that the use of the same workbenches in CATIA and DELMIA dissolved the old boundaries between design and manufacturing planning. "The fact that the 3DLive navigation is very intuitive, that components can be found quickly, that even the planning of the manufacturing process is visualized very clearly in 3D, were all very well received by the students," said Professor Stark. Because of its positive experience in the *40 Fires* project, TUB wishes to use the complete RFLP concept in the future. "The time savings and reduction in design iterations with Version 6, specifically for the comprehensive, function-driven development of mechatronic systems, are strong arguments," explained Stark

The next stages in achieving virtual product creation

The Fraunhofer Institute for Production Systems and Design Engineering (IPK), which is also organizationally closely linked to TUB offers students multifaceted project and research opportunities. The virtual product creation field at IPK is headed by Professor Stark. It provides industrial organizations with services such as optimizing their development processes and integrating product development with production planning. As a Dassault Systèmes partner, IPK holds seminars on Version 6 for engineers and uses the Dassault Systèmes' Version 6 solutions to demonstrate how the next stage of integrated, mechatronic,

function-driven product development will be supported by technical processes and application software.

In addition, Fraunhofer IPK is also working, assisted by Dassault Systèmes, on the next step: how to directly experience the functional virtual product. "This and other questions on the future of product development will be addressed in our new Center for Innovative Product Creation (ZIP), which opened in September 2010, in close cooperation with the TUB Virtual Engineering Learning Center (VELC)", announced Stark. "Our goal is to work together with Industry and with PLM solution providers to address those questions."