

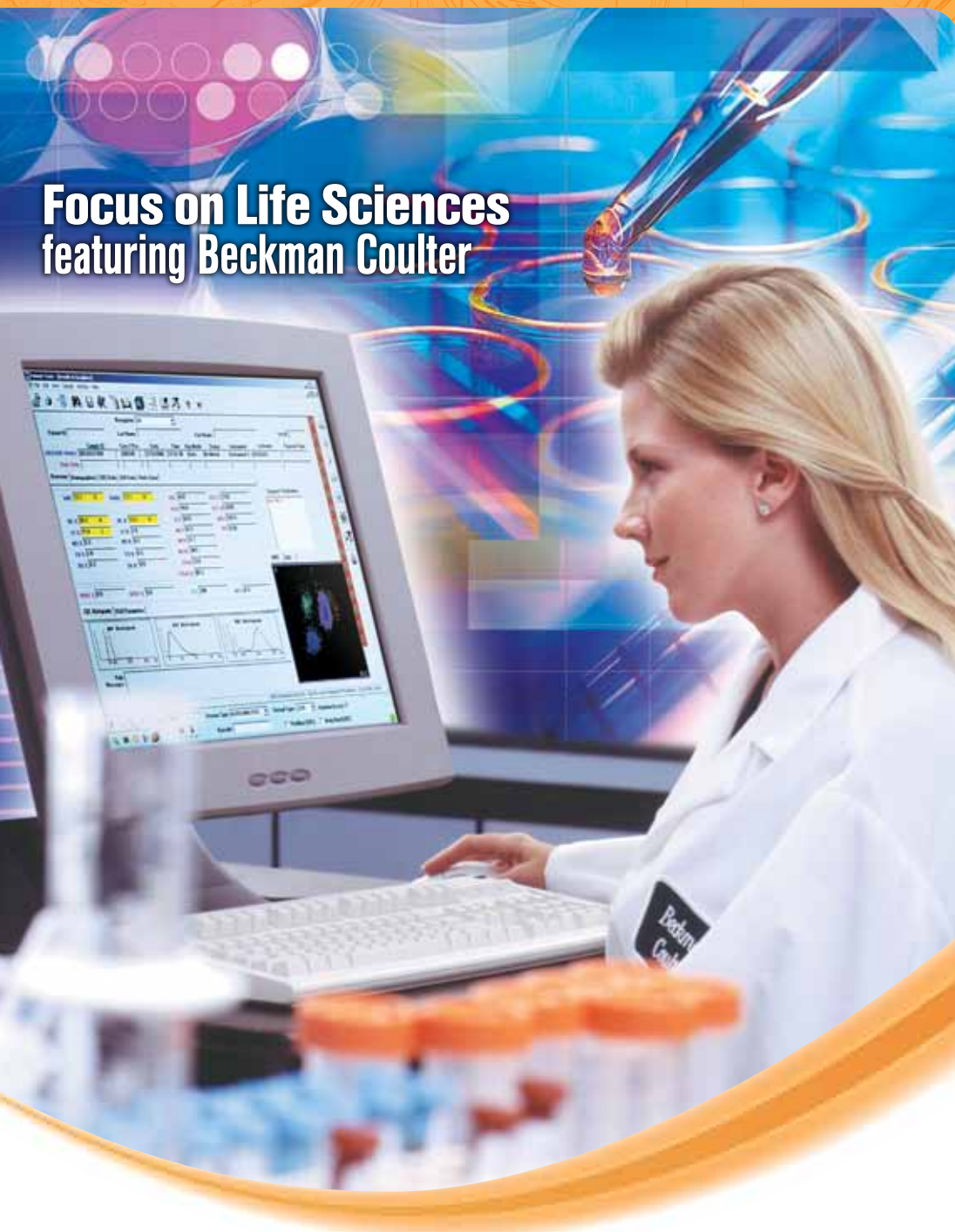
Contact^{mag}

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The Americas PLM Magazine

Focus on Life Sciences featuring Beckman Coulter



solution spotlight

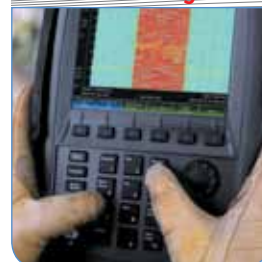


V6

V6R2010x: Accelerating Adoption with More Openness and Lower TCO

Page 6

success story

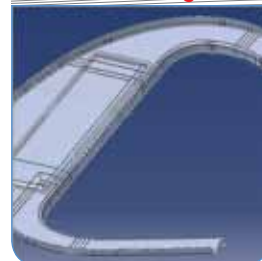


AGILENT

Agilent Technologies Inc. Protects \$1 Billion in Revenues with ENOVIA Materials Compliance Central

Page 22

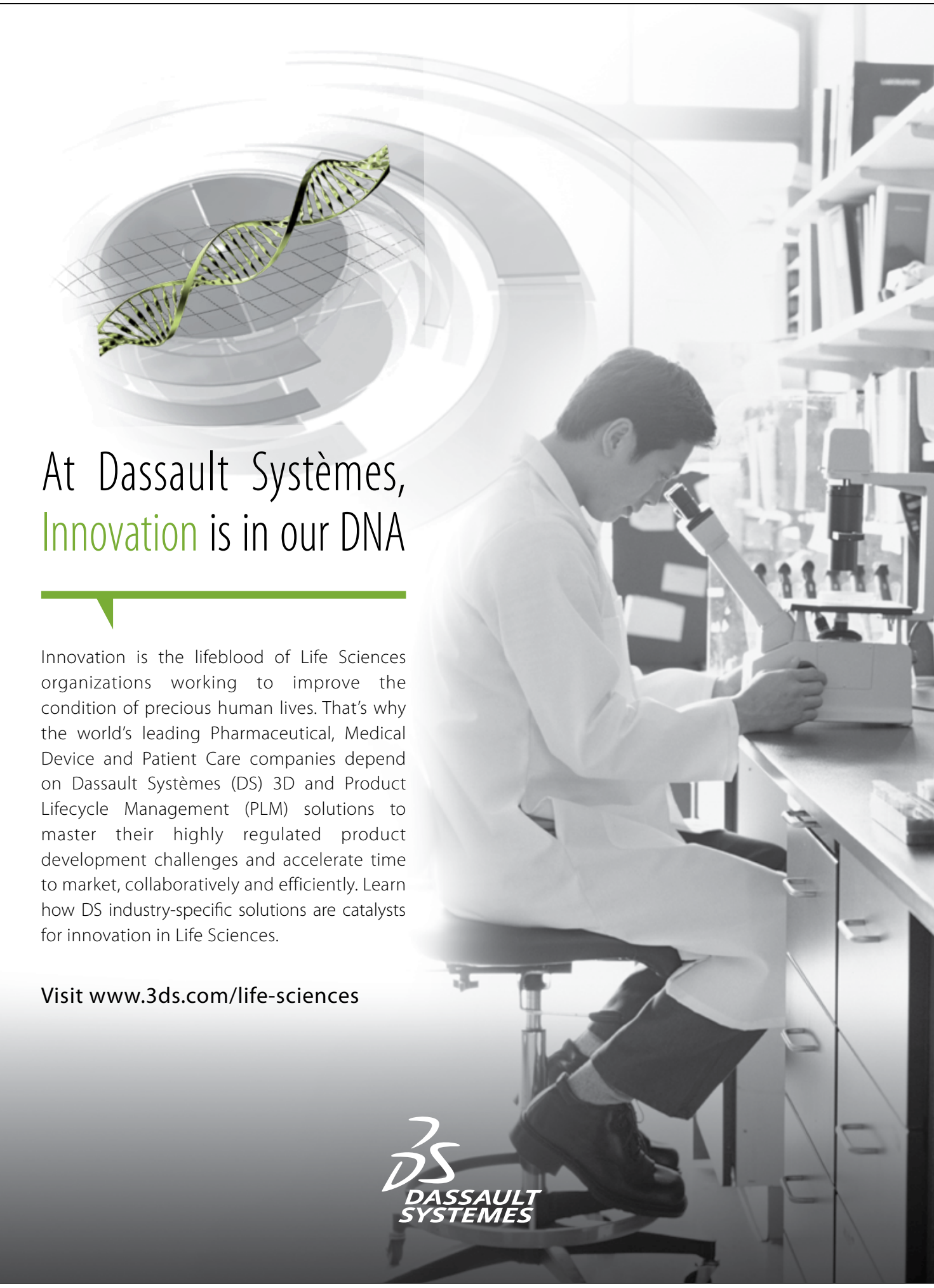
success story



GKN

GKN Aerospace Reduces Manufacturing Engineering Time 50% with DS PLM Solution for Composites

Page 24



At Dassault Systèmes, Innovation is in our DNA

Innovation is the lifeblood of Life Sciences organizations working to improve the condition of precious human lives. That's why the world's leading Pharmaceutical, Medical Device and Patient Care companies depend on Dassault Systèmes (DS) 3D and Product Lifecycle Management (PLM) solutions to master their highly regulated product development challenges and accelerate time to market, collaboratively and efficiently. Learn how DS industry-specific solutions are catalysts for innovation in Life Sciences.

Visit www.3ds.com/life-sciences

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Editorial



Welcome to the 10th issue of *Contact mag* for the Americas, an issue that marks a major milestone in the history of Dassault Systèmes: the integration of IBM PLM sales, marketing and operations into the company.

This integration is a logical next step in the evolution of the 28-year partnership between DS and IBM. It also is a major step forward in simplifying and streamlining the relationship between DS and its ecosystem of customers and partners.

Customers no longer need to ask themselves where the responsibility of DS ends and the responsibility of IBM begins. DS now owns the entire relationship with our customers, simplifying everything from account service to contracts. At the same time, however, it preserves the relationships, skills and deep knowledge of the IBM PLM team. DS offered positions to all full-time IBM PLM team members worldwide, and approximately 97% of them are now DS employees. Their knowledge and training will become part of the fabric of DS.

Although the relationship between IBM and DS has evolved, the two companies' proven and valuable partnership endures. The new IBM-DS global alliance will continue to provide PLM middleware, infrastructure technology, professional services, IBM Global Financing, and a future direction in new delivery models such as cloud computing. We also are actively investigating new areas in which to expand the relationship.

After spending more than 25 years with IBM, the last three as global vice president of IBM PLM, I am confident this is the right evolution for both companies, for our people, and – more importantly – for our customers. As the new managing director of Dassault Systèmes in the Americas, I look forward to meeting and serving you. Together, we will make your company – and ours – even more successful in the future.

In my new role at DS, I also am pleased to bring you this issue of *Contact mag*. Customers in the life sciences space, in particular, will find much in this issue to help them succeed in the face of unprecedented challenges. The potential of the virtual world made possible through 3D PLM is enormous, including digitization of complex phenomena, tests in virtual models, and an entirely new form of treatment called cybertherapy. DS customers are at the forefront of leveraging PLM to optimize new drug creation, establish new medical protocols, and improve the efficiency of patient care. We hope this issue of *Contact mag* will help you discover how these leaders in life sciences, and in other industries, are changing our world for the better with DS PLM.

Al Bunshaft
Managing Director
Dassault Systèmes Americas

Americas

ds digest

- 4 A Roundup of Recent DS News and Upcoming Events

solution spotlight

- 6 V6R2010x: Accelerating Adoption with More Openness and Lower TCO
- 26 Virtual Ergonomics: Designing for Human Factors

feature

- 8 The Evolution of Life Sciences
- 10 Beckman Coulter Advances Biomedical Device Development with V6 PLM
- 12 Elekta Ensures Regulatory Compliance with ENOVIA
- 14 Firsthand Technology Helps Doctors Reduce Burn Victims' Pain with 3DVIA Virtools
- 16 Sunshine Heart Helps Optimize Heart Pump with Abaqus FEA From SIMULIA
- 18 EwingCole DMG and BERCHTOLD Bring Operating Room Design to Life with 3DVIA Virtools

in practice

- 20 Tips & Tricks: CATIA Knowledgeware

success story

- 22 Agilent Technologies Inc. Protects \$1 Billion in Revenues with ENOVIA Materials Compliance Central
- 24 GKN Aerospace Reduces Manufacturing Engineering Time 50% with DS PLM Solution for Composites

Contact mag

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ds digest

HEAR DS LIVE AND IN PERSON AT UPCOMING CONFERENCES

Dassault Systèmes customers will have the opportunity to hear DS live and in person at a number of upcoming events, including PDx/amerimold, SAMPE, and IMTS.

DS will be in Booth 224 at **PDx/amerimold**, May 11-13 at the Duke Energy Center in Cincinnati. DS will present "Seven Ways to Thrive in a Competitive, Global Environment," along with a short "Tech Talk" in the Pavilion. For more information, visit www.pdx-amerimold.com

DS will be in Booth 124 at **SAMPE 2010**, May 17-20 at the Washington State Convention Center in Seattle. Rani Richardson of DS will present "Working with Carbon Fibers in a 3D World." For more information, visit www.sampe.org

Visit DS in Booth E4132 at **IMTS 2010**, September 13-18 at McCormick Place in Chicago. NC Kishore of DS will present "Advantages of an Integrated NC Programming & Simulation Strategy" and David Segal of DS will present "Using PLM to Enhance Value Stream Management for Competitive Advantage." For more information, visit www.imts.com

For a complete list of DS events in the US and Canada, please visit www.3ds.com/company/regional-spotlights/north-america. **And mark your calendars now for the next Dassault Systèmes Customer Conference, November 9-10 in Orlando. We hope to see you there!**



DS WHITE PAPERS OFFER PROVEN INDUSTRY STRATEGIES

DS is offering a collection of white papers for the medical device, consumer packaged goods (CPG), apparel, automotive, industrial equipment, and

energy industries, all available for download. The papers are:

- "Delivering Innovation and Quality with Common Processes: A Medical Device Manufacturer's Case Study," a look at bridging the gap between innovation and compliance. Download it at www.plmv5.com/MDCSwhitepaper/
- "Achieving Better, Faster, Smarter Innovation," which describes how CPG companies can use PLM to drive top-line growth. Download it at www.plmv5.com/cpgindustry/
- "Timing is Everything," a white paper by *Apparel* magazine that examines the need for strong PLM calendar management solutions. Download it at www.plmv5.com/globalcalendargmt/
- "The Future of Automotive Design and Development: 3D PLM for

All," a paper from SAE International on how PLM 2.0 brings real-time collaboration to life. Download it at www.plmv5.com/saepaper09/

- "Value-stream Management with PLM for Competitive Advantage," which explains how PLM can help industrial equipment companies achieve real efficiencies and savings. Download it at www.plmv5.com/valuestreamsPLM/
- "Business Value of 3D Virtual Planning, Simulation and Training in the Energy Industry," which explains how visualization technology can help energy companies reduce risk and cut costs. Download it at www.plmv5.com/energywhitepaper/



MEYER WERFT, OPTIMAL ENERGY ARE LATEST V6 ADOPTERS

MEYER WERFT, one of the world's leading builders of cruise ships, and Optimal Energy, a South African car manufacturer that is developing Africa's first battery-powered vehicle, are the latest companies to announce that they have adopted the Dassault Systèmes V6 PLM solution.

Building cruise ships requires design and production logistics to manage more than 10 million different parts, putting exceptionally high requirements on the features and performance of a PLM system. "Our decision for the V6 solution was based on several key factors, including its powerful combination of 3D and PLM infrastructure," said Lambert Kruse, managing director, MEYER WERFT.

Optimal Energy will rely on DS CATIA and ENOVIA V6 for product design and data management. "Everything is in the same platform and interconnected," said Anton Greeff, chief mechanical engineer. "If someone needs information on the product, there is only one place they have to go and look."

For more information, please visit www.3ds.com/v6

DS LAUNCHES RELEASE 20 OF V5 PLM PLATFORM

DS has launched Release 20 of its collaborative V5 PLM portfolio, including enhancements to and a new 3D viewer for its ENOVIA SmarTeam multi-CAD collaboration software, integration of SIMULIA's nonlinear and thermal realistic solution capabilities into the V5 platform, plus unique composites design and simulation capabilities in the CATIA and SIMULIA brand portfolios.

V5R20 also features various enhancements across the entire product portfolio, furthering support for production deployments and overall usability. For more information, please visit www.3ds.com/v5r20



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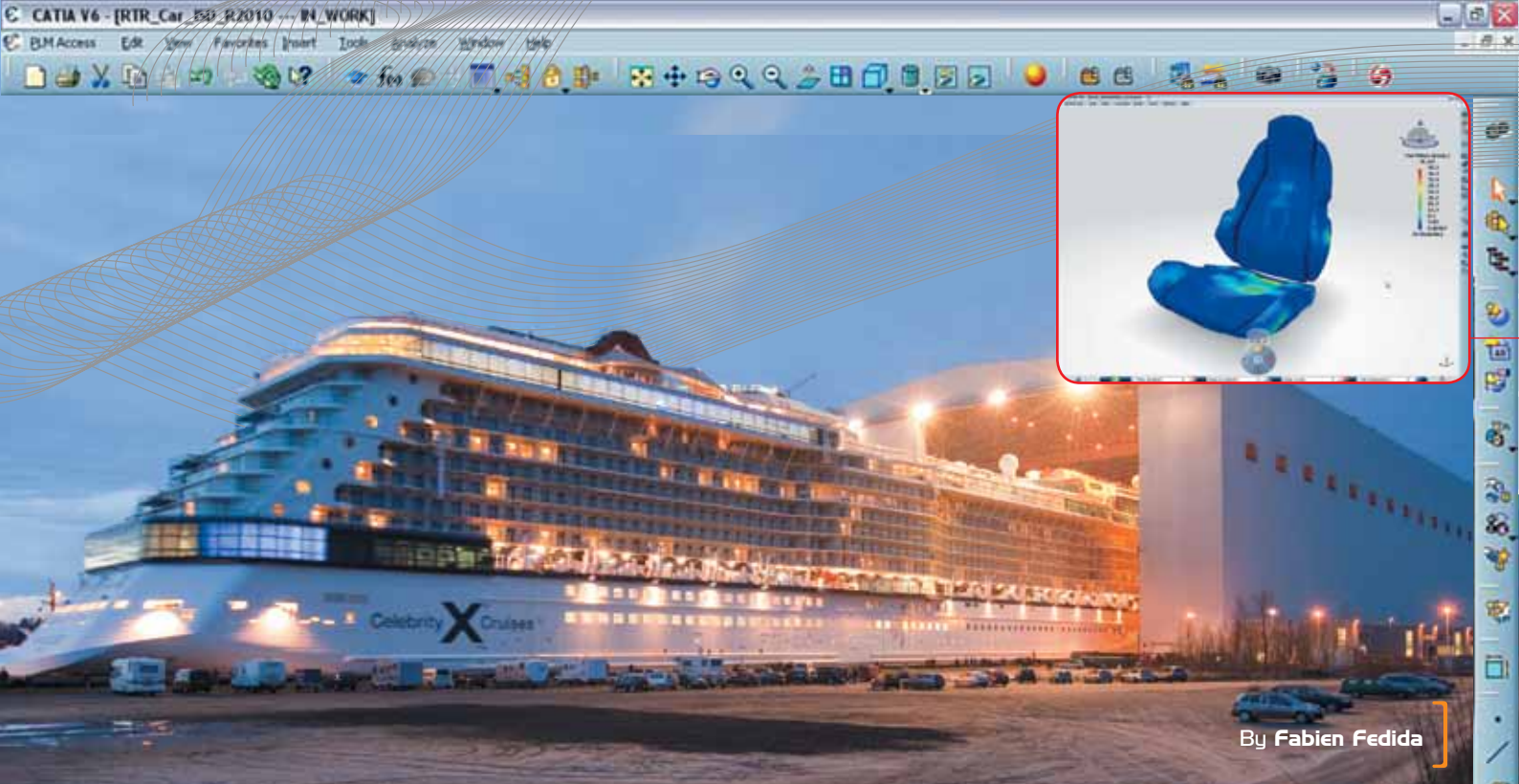
Watch the episodes and join the Tribe!

<http://thecollaborativetribe.3ds.com>



Dassault Systèmes presents an online series about a very creative Tribe who uses the power of collective intelligence to innovate, collaborate and experience, leveraging the universal language of 3D. Discover all episodes, download 3D models and online gadgets. Join the Tribe!





V6R2010x: Accelerating Adoption with More Openness and Lower TCO

V6 allows for continuous evolution of a company's business processes without interrupting the production workflow.

With approximately 250 customers worldwide, implementations that are being accomplished in a matter of days, and attractive total cost of ownership (TCO) results, Dassault Systèmes' open V6 platform is gaining significant momentum as the world's first to deliver on the promise of PLM 2.0.

That momentum is set to accelerate with the recent release of V6R2010x. As part of that release, DS has opened the V6 Application Programming Interfaces (APIs) to the more than 6,500 developers in the DS ecosystem. Opening the APIs will permit developers to build online PLM 2.0 applications, creating a multiplier effect that will extend the portfolio more quickly to more users in all industries.

The release also included several new "live" products for non-expert users, and new mid-market data management transition capabilities, delivering unparalleled openness, transition simplicity and ease of use for new and existing PLM users in nearly every industry.

"Our V6 solution was installed in just two days," said Robert Zuffada, CIO, Piaggio Aero Industries. "I must admit that I expected some sort of hitch. But the implementation went extremely smoothly. We only needed a day's training each. We did this on a seat-by-seat basis and made sure that we addressed any issues or concerns there and then. The speed with which we've been able to use the solutions has been remarkable."

CIMDATA: V6 USERS ACHIEVE LOWER TCO

Piaggio's experience is consistent with the findings of a new report from CIMdata, which documents that companies implementing V6 are achieving significant reductions in total cost of ownership. The V6 service-oriented architecture (SOA) is a major contributor to the savings. "In V6, administrators can update all data models, the common database scheme, and all user interfaces while the PLM solutions are running," CIMdata reports. "This reduces maintenance costs and minimizes work disruption." CIMdata also notes that V6 "allows for continuous evolution of a

CIMdata found that V6 users are experiencing savings of up to 83% in IT operations, 10-30% in IT development, 5-25% in IT infrastructure and software, and 10-50% in training costs.

company's business processes without interrupting the production workflow."

Other TCO advantages noted by CIMdata include integration among products in the V6 suite, a single logical data store, tools to aid tailoring and data migration, configuration tools, and a consistent user interface across all capabilities. CIMdata found that V6 users are experiencing savings of up to 83% in IT operations, 10-30% in IT development, 5-25% in IT infrastructure and software, and 10-50% in training costs.

INTEGRATE AND TRANSITION WITH EASE

The V6 open platform and its service-oriented architecture gives users unprecedented flexibility to integrate with other enterprise applications and data sources, such as CAD, ERP and CRM, and complete their implementations in record time, in keeping with the DS commitment to enable easy transitions for V6 customers in all industries.

"By following a clear path, the V6R2009 implementation team has been able to rapidly realize the business value for upgrading to V6R2009 by delivering demonstrable performance improvements and new feature benefits," said Gary Steiner, applications manager, Babcock & Wilcox Power Generation Group Inc.

EXPANDING PLM TO NEW COMMUNITIES

Consistent with the PLM 2.0 value of fully engaging an innovation ecosystem, the V6R2010x release continues to expand PLM to entirely new communities of users. V6's Live Distiller opens the use of PLM

assets to consumers and other collaborators by enabling the publishing of lightweight 3D models to the 3DVIA.com online community with a single click. V6R2010x also includes new solutions for non-expert users, such as DELMIA Live products for design for assembly and manufacturing device simulation, and SIMULIA's DesignSight Thermal for up-front, realistic thermal simulation. V6R2010x also enhances previously announced products, including CATIA Live Shape for non-CAD specialists, and SIMULIA DesignSight Structure.

New industry solutions include the ENOVIA Life Sciences Accelerator for Regulatory Affairs; apparel sourcing and material management capabilities for the fashion industry; an integrated platform for artwork, package and formula collaboration for CPG; and CATIA Circuit Board Design's new ECAD/MCAD collaboration functionality. The momentum of DS's extensive vertical solutions will also be enhanced by open APIs and the contribution of DS software partners to industry business process coverage.

In addition, V6R2010x extends the DS mid-market PLM Express offer to the shop floor with a full-featured machining CAD/CAM solution, and adds interactive 3D technical illustration capabilities. Mid-market customers also gain the ability to easily transition their V5 ENOVIA SmarTeam data management functionality to V6 PLM Express implementations.

"The V6R2010x platform delivers new and unique capabilities that connect users within their companies or with external online communities," said Dominique Florack,

solution spotlight

THE GROWING V6 FAMILY

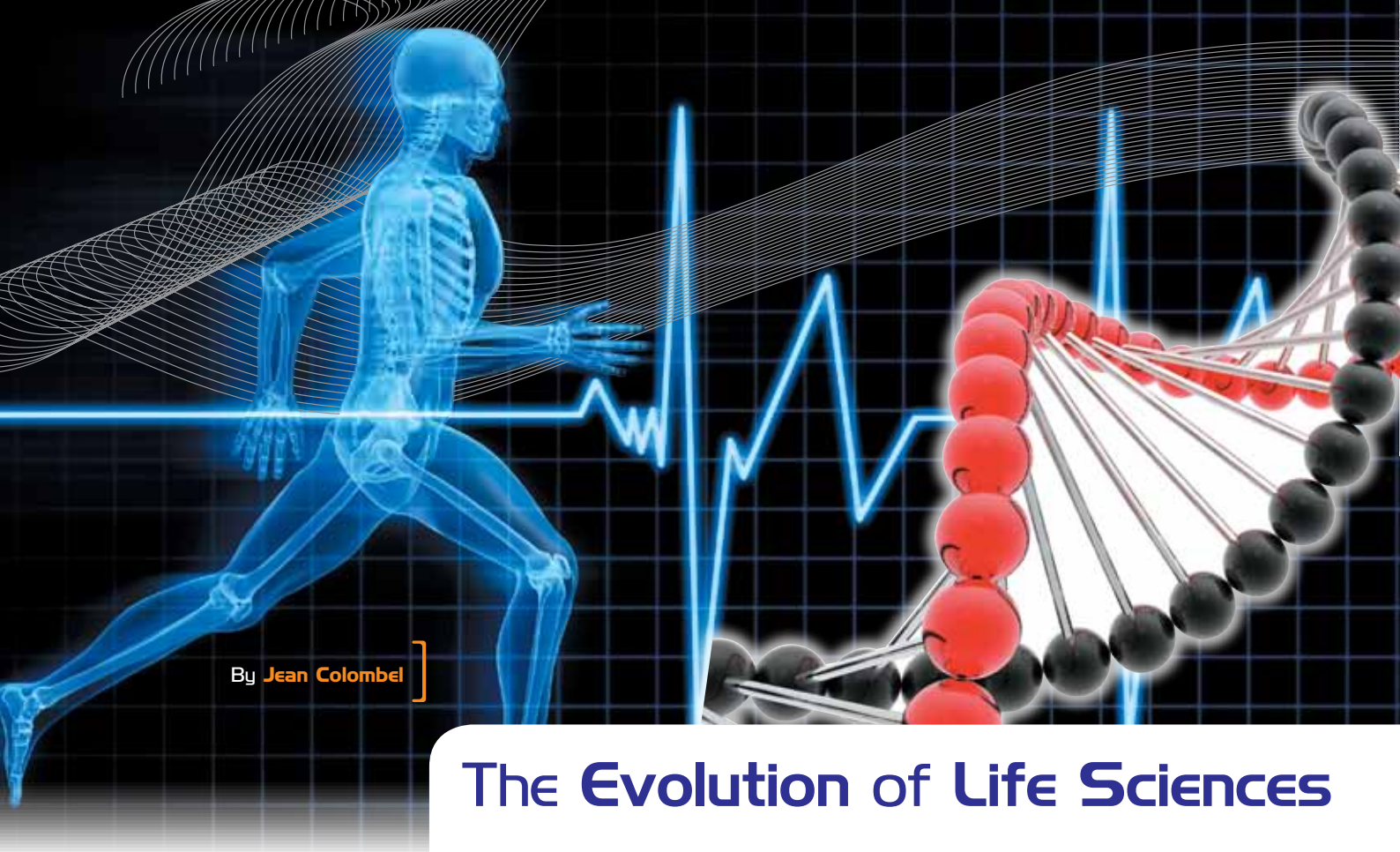
V6 has quickly gained adopters in almost every industry. Among the platform's announced users are: **Piaggio Aero Industries** and **Eaton** (aero); **Babcock & Wilcox Power Generation Group**, **Oceaneering**, and **Stork GLT** (energy); **Skanska** (architecture); **Procter & Gamble** (CPG); **novero**, **Nikon** and **Lexmark** (high tech); **Guess?**, **Under Armour**, and **Trent Ltd.** (apparel); **Hoffman Enclosures** (industrial equipment); **Johnson Controls**, **Great Wall Motors**, **Optimal Energy**, and **Renault** (auto); **Beckman Coulter** (life sciences); **MEYER WERFT** (shipbuilding); **Dialog Semiconductor** and **INSIDE Contactless** (semiconductor); and **TÜV Rheinland** (business services).

senior executive vice president, Products-Research and Development, Dassault Systèmes. "It enables them to create and share their IP and 3D experiences with the ease of use of common Internet tools and the control required in industrial companies".)

For more information:

A complete list of functionality enhancements in R2010x is available at www.3ds.com/V6

To download the CIMdata V6 TCO report, please visit www.plmv5.com/v6



By Jean Colombel

The Evolution of Life Sciences

The Life Sciences industry is moving toward connected communities of patients, doctors, researchers, pharmaceutical and medical engineering companies, working together with regulatory agencies to develop products where drugs, medical devices and services merge into a single combined product. This community approach will promote information sharing and capitalization. Among the challenges ahead: Giving these communities the tools and technology to shrink distances and grow collaboration.

In the discovery-driven world of life sciences, a profound transformation is afoot. Gone are the days of research, development, and commercialization teams operating in isolation. The hallmark of tomorrow's life sciences sector will be a comprehensive-care approach where diverse teams work in concert to improve life for patients through innovative therapies supported by new drugs and medical devices.

A clear illustration of this transformation is a major trend called "combined product." While pharmaceutical researchers work to develop the best drug, others actively explore how to combine drugs with medical devices or other therapies into a single, integrated treatment to provide new, innovative patient services. To achieve this vision, however, requires unprecedented collaboration. It will only occur if all actors can share information and build upon a common foundation.

Therein lies the challenge. The life sciences industry has myriad specializations, job profiles and processes. Laboratories and development sites span the globe. The diversity of patient profiles and needs is staggering. The only way to ensure that a comprehensive-care approach will succeed is to create a collaborative knowledge and know-how-sharing environment capable of pulling down isolated information silos to allow a free flow of knowledge and ideas.

WORKFLOW IS GOOD, PLM IS BETTER

Software can be the bridge that makes comprehensive care a reality, bringing together the molecule-driven care (pharmaceutical, phyto-sanitary, cosmetic), medical device, and patient care domains – the three pillars of life sciences – to the profound benefit of patients and physicians. Software, as well as access to public and

private research data, already plays an important role. Initially, 3D emerged as a powerful modeling tool for molecular structures, medical equipment, and as a way to illustrate how drugs interact in the human body. Today, however, managing the entire product lifecycle is essential. Product Lifecycle Management (PLM) provides precisely the collaborative data engine needed to drive the next great wave of patient care innovation.

HIGHLY REGULATED AND IN NEED OF RE-INVENTION

The life sciences industry is one of the most highly regulated sectors. Whether a company develops pharmaceuticals or designs and manufactures medical scanners, respecting an ever-increasing number of regulations chips away at productivity and forces companies to reinvent their ways of working. The goal is to reproduce the same phenomenal leaps in productivity and innovation in the life sciences sector that PLM brought to the automotive and aerospace industries.

SOLUTIONS FOR MEDICAL DEVICES

Dassault Systèmes (DS) has solutions to address all three life sciences pillars. For medical devices, DS offers an entire portfolio for a process-driven development approach. To address the industry's strict regulatory constraints, DS has developed life sciences accelerators in the ENOVIA product line that help companies adhere to quality criteria. The ENOVIA Life Sciences Accelerator for Quality Issues focuses on four high-profile, regulated business processes within the Quality Management System: Corrective and Preventive Action (CAPA), Nonconformance Reports (NCRs), Product Complaints, and Quality Audits. To address the industry's product development requirements, SIMULIA offers a product portfolio for realistic simulation of devices, robust designs, and simulation lifecycle management tools.

SOLUTIONS FOR PATIENT CARE

In patient care, cybertherapy offers tremendous promise, from helping devise new therapies for phobias to designing more effective operating rooms. With virtual reality, highly personalized treatments become more cost-effective and pervasive, and investments in facilities and equipment can be optimized through superior design.

The EU-funded VEPSY research project for clinical psychology, for example, uses simulation to bring patients face-to-face with four virtual worlds based on scenarios defined by psychiatrists specialized in treating a variety of social phobia. 3DVIA Virtools development solutions for realistic 3D environments enable all those involved in the research project to actively collaborate at a distance during simulation.

SOLUTIONS FOR MOLECULE-DRIVEN CARE

Molecule-driven care covers all the diverse areas where the molecule is the kernel of the industry. It ranges from the pharmaceutical industry to the phyto-sanitary sector to the cosmetics world.

While demand for new drugs continues, the molecule-driven care industry's current business model, often characterized by isolated research and development teams, is increasingly unsustainable and unable to produce treatments demanded by the global community, despite being feasible due to scientific progress.

Optimizing enterprise processes to facilitate new discoveries and increase business competitiveness through PLM is the goal of the DS molecule-driven care portfolio. It ranges from the Biointelligence Research Project, designed to advance the biological dimension of PLM, to solutions to optimize regulatory processes like drug labeling, allowing drugs to become available to patients sooner. A long-term objective is to complement

feature

Jean Colombel has more than 20 years of experience in the software industry for life sciences. He held executive management positions for sales and marketing in Europe, the USA and Japan. He is currently Director, Life Sciences Industry, for Dassault Systèmes, where he is responsible for defining, coordinating and promoting the DS offering and market positioning for the pharmaceutical, biotech, agrochemical, medical device, and patient care markets.

current *in vivo* and *in vitro* processes with computer-driven *in silico* R&D. Again, the goal is to spark the same productivity revolution that occurred in other industries with the introduction of PLM. Among other things, *in silico* R&D will help to accelerate the discovery and commercialization of new and safer drugs to save lives.

CONNECTING COMMUNITIES WITH V6

The life sciences industry is an aggregation of multiple communities, sometimes linked by the same science (medicine, biology, chemistry, mechanical), sometimes by the same goal (availability of a new drug, a new device). These communities generate and manage fantastic amounts of data in multiple formats around the globe every day.

Connecting these communities and opening up silos of information is possible thanks to the Dassault Systèmes V6 integrated platform, the company's next-generation PLM 2.0 environment that enables users to create and collaborate online in real-time via an immersive, lifelike experience. The enablement of this new community strategy with V6 is poised to become a catalyst for innovation and discovery in an industry faced with some of the biggest challenges confronting humankind.]

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www.3ds.com/solutions/life-sciences

Dassault Systèmes' V6 integrated platform, the company's next-generation PLM 2.0 environment, enables users to create and collaborate online in real-time via an immersive, lifelike experience.





Beckman Coulter Advances Biomedical Device Development with V6 PLM

As a leading developer and marketer of biomedical testing instrument systems, tests and supplies for clinical diagnostics and life sciences, Beckman Coulter is subject to strict regulations. To comply, this Orange County, California, company with 12,400 employees in 130 countries and 2009 annual sales of \$3.3 billion must precisely control and document data streams, processes, workflows, and audit trails at seven different sites across the US and in Germany and Japan.

» We consider V6 a key enabler of our ability to manage and integrate change in a rapidly evolving company.

Lora Kerr, Director of Business Process, Cellular Analysis Business Group, Beckman Coulter

The company has grown, including several mergers and acquisitions that brought with them a wide range of disparate systems that made collaboration and knowledge-sharing difficult. Therefore, Beckman Coulter sought a platform that would quickly integrate the operations of new acquisitions while enabling the company to better leverage its intellectual property across a global and highly matrixed organization.

In 2007, Beckman Coulter began standardizing on Dassault Systèmes (DS) Product Lifecycle Management (PLM), including SolidWorks for 3D product design, ENOVIA for global collaborative product lifecycle management, and 3D VIA Composer for virtual product documentation. In 2009, the company continued its standardization strategy by selecting DS PLM Version 6 (V6) to manage its product development and related compliance processes.

SOLIDWORKS AND ENOVIA STREAMLINE DESIGN AND DATA ACCESS

With product development spread across three continents, Beckman Coulter needed a way for different groups to share and re-use designs across locations and product lines. It also needed to securely store and back up critical design and manufacturing data. "With ENOVIA, we can access the large data sets our products require across several sites without bringing our corporate LAN to its knees," says Steve Campbell, director, Application Services at Beckman Coulter. "And because our data exists at all sites, we're never at risk of losing our compliance history or documentation."

In the past, a designer could spend several days locating all the data for a design and verifying that each piece was current.

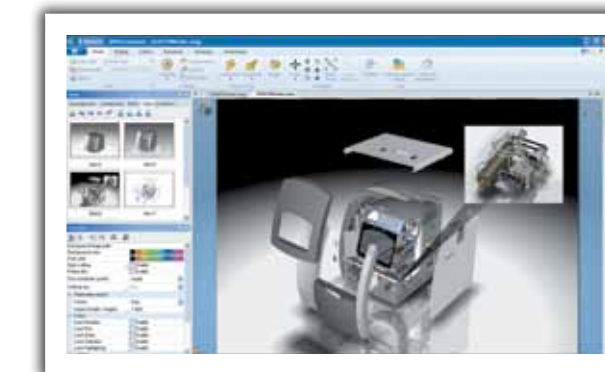
» The Dassault Systèmes product suite gives us a big advantage because it has all of the best-in-class solutions and a favorable cost structure and learning curve. Don Dorff, Senior Projects Administrator, Beckman Coulter

"ENOVIA does that same operation in less than 30 minutes, and there's no question that you have the right data," says Don Dorff, senior projects administrator at Beckman Coulter.

SolidWorks also contributes to substantial time and cost savings. "The large pool of available engineers with SolidWorks experience, its impressive support structure and its short training times all contributed to an attractive cost structure for implementation," Dorff says.

DS PLM makes it easy to reuse existing data and knowledge for new product innovation, which speeds time to market. With ENOVIA, "we've broken the boundaries of product development between sites, and we're sharing our knowledge so that everyone can benefit from it," Dorff says.

Because Beckman Coulter's products utilize many off-the-shelf components that can become unavailable, the ability to redesign quickly is imperative. ENOVIA allows Beckman Coulter to quickly identify the current design, substitute a part from another supplier, and modify the design to get the revised product into production quickly.



3DVIA COMPOSER DRAMATICALLY REDUCES DOCUMENTATION CHANGE TIMES

Beckman Coulter wanted a manufacturing and assembly documentation solution that could take design data from SolidWorks and maintain the data relationships, but keep it separate from the data set used for regulatory documentation. "When we want to make a change that has nothing to do with form, fit or function, we don't want to require engineering involvement or changes to the engineering data set," says Jernail Hothi, staff technical operations engineer, Instrument Assembly.

With 3DVIA Composer, users can easily manipulate documents, change them, and import design changes from SolidWorks. As a result, change order times on manufacturing assembly documents in Beckman Coulter's three pilot projects have been cut from as much as a week to two days or less. "3DVIA Composer paid for itself, including software, hardware and training, in less than 120 days," Dorff says.

First-pass yield – errors found by Quality Assurance (QA) after the first assembly attempt – has improved by more than 20%, Hothi says, which raises Beckman Coulter's end-customer satisfaction rates even higher. Improved production and process control and improved employee training with 3DVIA Composer also are contributing to impressive ease in complying with regulations. Animated instructions with isometric views reduce manufacturing errors, and traceability with associated ID numbers and time stamps are

incorporated in final assembly reports, providing detailed product traceability from the smallest part to a total assembly.

FASTER TIME TO MARKET AND IMPROVED QUALITY AND VALUE FOR CUSTOMERS

With 3DVIA Composer, Beckman Coulter routinely completes its assembly documentation in parallel with development of a new product design, streamlining instrument design and assembly document creation and release. Beckman Coulter's designers previously spent as much as 20% of their time working on documentation," Hothi says. "3DVIA Composer has freed up 15% of their time for higher-value tasks."

V6: THE EFFICIENCY ENGINE

Beckman Coulter perceives DS V6 as an enterprise-level solution for all of its product development and related compliance processes, and V6 as the engine to help enable additional efficiencies and continued excellence in its business. "Our goal is to achieve operating excellence by enabling operational autonomy for our various businesses while providing the appropriate level of corporate governance," says Lora Kerr, Director of Business Process, Cellular Analysis Business Group. "We consider V6 a key enabler of our ability to manage and integrate change in a rapidly evolving company. Dassault Systèmes is helping us drive our products to where we think they need to be".)

For more information:
www.beckmancoulter.com

feature



Elekta Synergy® is the first advanced multi-functional linear accelerator with intensity modulated radiation therapy and image guided radiation therapy.



By Erik Johansson

Elekta Ensures Regulatory Compliance with ENOVIA

Elekta relies on ENOVIA to consolidate all engineering data and processes across the product lifecycle and to provide its 2,500 employees and partners with a single digital source of information. With ENOVIA, Elekta can manage vast amounts of product data and easily locate documents and process information for audits.

Elekta is a pioneer in innovative clinical solutions for the treatment of cancer and brain disorders. Based in Sweden and with approximately 2,500 employees worldwide, Elekta is the global leader in image-guided and stereotactic clinical solutions for radiosurgery and radiation therapy, giving radiation oncologists and neurosurgeons an unprecedented capability to aggressively treat tumors with ultra-high precision without damage to nearby healthy tissue.

Introduced in 1972, Elekta's solutions in oncology and neurosurgery are used in more than 5,000 hospitals worldwide, which each day provide more than 100,000 patients with diagnosis, treatment or follow-up thanks to Elekta's advanced technology.

COMPLIANCE TO REGULATIONS: A PREMIUM CONCERN

Companies in the life sciences industry face

a unique challenge that sets them apart from other manufacturers – the high degree of regulation imposed by governments to ensure product quality. A crucial part of Elekta's activities is monitoring and adhering to regulations established by the U.S. Food and Drug Administration (FDA) as well as other international regulators. These regulatory bodies expect Elekta to master vast amounts of data. During an audit, for example, the company must be able to quickly provide any document related to its products and development processes. To improve its ability to respond, Elekta replaced its paper-based data management system five years ago with ENOVIA for product development and compliance.

EXTENDING COLLABORATION WITH ENOVIA

With ENOVIA, Elekta has a flexible, enterprise-wide PLM solution that covers all



Elekta Neuroscience continues to advance significant innovations for treating cancer and brain disorders.

feature



>> We're looking forward to V6 so that we can benefit from even more efficiency, thanks to a faster system, better maintenance, and a solution that is more adjustable to our needs. Bo Nilsson, R&D manager, Elekta

areas of product development, including administration, security, workflow and integration. It provides a single digital source of information, consolidating all engineering data and processes across the product lifecycle. "Even at an early stage, our management had big plans for ENOVIA," says Bo Nilsson, R&D manager, Elekta. "A global company like Elekta requires a robust PLM system."

Elekta has design centers in Sweden, the UK and China. Each office is responsible for designing different parts of a treatment system. Elekta uses ENOVIA Engineering Central to facilitate communication and collaboration among these teams, as well as with its sales, service, production facilities and external resources. It also uses Engineering Central to manage parts and bills of material (BOMs), and drive its global product development and change processes. "We have a very intuitive user

interface and a smarter view of our work," says Christian Rossby, design engineer, Elekta. "Thanks to ENOVIA, we can ensure that everyone looks at the single version of the truth."

The company uses ENOVIA Designer Central to integrate its CAD data. In addition, Elekta is planning to expand global collaboration between offices through PLM and integrate more partners in the system. "It's a big advantage for our purchasers to work with subcontractors who are already integrated in the system," Nilsson says. Elekta also plans to link its ERP system and ENOVIA so that data can be seamlessly transferred between the systems.

SUCCESSFUL AUDITS

ENOVIA has helped Elekta to more efficiently adhere to FDA regulations and provide auditors with the information they require immediately. A recent FDA audit was a total

success. "The inspectors were very satisfied with our system, which gave them a clear and honest view of our operations," Nilsson says. "Authorities don't have any reason to question anything since transparency in the system helps avoid mistakes and misunderstandings. As a matter of fact, the FDA praised us by saying that we have excellent control over our information."

Elekta will transition to ENOVIA V6 in the near future. "ENOVIA has saved us a lot of time," Nilsson says. "It's now much easier to find a particular document or plan than it was before. We're looking forward to V6 so that we can benefit from even more efficiency, thanks to a faster system, better maintenance, and a solution that is more adjustable to our needs," he says.]

For more information:
www.elekta.com



The non-invasive treatment is shaped by beams of ionizing radiation that have sufficient penetration to reach even the most deeply seated tumors.



The system delivers prescribed doses/shots of radiation in compliance with a pre-prepared treatment plan, to the exact site of the target, sparing the surrounding tissue.



Collimator close-up



Firsthand Technology Helps Doctors Reduce Burn Victims' Pain with 3DVIA Virtools



>> Our clients appreciate that they can see their concepts evolve quickly, which enhances the collaborative design process and the client's satisfaction with the final product.

Ari Hollander, CEO and Technical Director, Firsthand Technology



Burn patients must endure both their initial injuries and the excruciating wound care treatments that follow. But pain experts at the University of Washington School of Medicine are using a 3D virtual reality (VR) application called SnowWorld, developed by doctors and built by Firsthand Technology in 3DVIA Virtools, to distract patients from their pain. In many cases, patients experience not just a lowered perception of pain, but as much as a 50% reduction in pain-related brain activity, as documented by brain scans.

University of Washington researchers Dr. Hunter Hoffman, a virtual reality researcher, and Dr. Dave Patterson, a pain and hypnosis expert, created the first version of the environment they call SnowWorld in 1998 using video game technology. SnowWorld whisks burn patients away to an icy canyon where snowflakes fall and patients can shoot snowballs at snowmen and other targets.

"The immersive nature of SnowWorld is what makes it so effective," Hoffman says. "Watching the nurse work on their open burn wounds doesn't make for a positive experience, especially for children. Immersing themselves in SnowWorld draws patients' minds away from the pain and blocks their view of the real world for a while."

Although initial success with SnowWorld was impressive, researchers suspected that a more immersive environment would yield higher degrees of pain relief. So Hoffman and Patterson turned to University of Washington colleagues Howard Rose and Ari Hollander, then part of the university's Human Interface Technology (HIT) lab, for assistance.

Hollander, an expert in 3D immersion technology, and Rose, a designer of virtual environments, formed Firsthand Technology, a "serious games" company with a mission of "making technology work for people." The



>> Immersing themselves in SnowWorld draws patients' minds away from the pain and blocks their view of the real world for a while. 3DVIA Virtools has become an integral part of our research team's success.

Dr. Hunter Hoffman, Director of the VR Analgesia Research Center, University of Washington Schools of Medicine and Engineering

company also develops applications ranging from treatment of post-traumatic stress disorder to medical training scenarios, and optimizes software interfaces to extend the impact of factors such as sound, touch and visuals in VR environments.

FLEXIBILITY FOR CHANGE

"We originally built versions of SnowWorld in other software applications, but we needed something more flexible," Hollander says. "So we rebuilt SnowWorld with 3DVIA Virtools from Dassault Systèmes to make it simpler to modify. The flexibility of 3DVIA Virtools allows SnowWorld's creators to more easily test different experimental hypotheses and identify factors relevant to better pain control."

With 3DVIA Virtools, Hollander says, developers can easily manipulate what they already have. "Dr. Hoffman wanted us to alter the field of view, for instance. That would have

taken significant time on other platforms. But with 3DVIA Virtools, we can fine-tune quickly and easily."

"3DVIA Virtools is versatile enough to let us explore a variety of options without investing so much time and effort testing out an idea that we feel locked into keeping the change regardless of its usefulness," Dr. Hoffman confirms. "Virtools has become an integral part of our research team's success."

SIMPLY POWERFUL

The fact that 3DVIA Virtools is easy for non-programmers to use is one of its biggest advantages, Rose says. "I can put my ideas directly into practice. Rather than relying on a team of programmers, a small, nimble development team can achieve a lot with 3DVIA Virtools. Firsthand is a small company, and Virtools allows us to create a diverse range of applications for the widely varied needs of our customers."

3DVIA Virtools' rendering capabilities, which allow designers to create dynamic shader effects and character animation, set it apart from similarly priced VR solutions. "The cost-to-performance ratio and ease of use of 3DVIA Virtools are key factors," Rose says. "3DVIA Virtools allows us to employ particles, shaders and sophisticated textures to deliver a highly realistic experience."

feature



Firsthand Technology uses a range of graphics solutions from DS technology partner NVIDIA, the world leader in visual computing tools. "We prefer the professional-quality NVIDIA Quadro solution for our development environment, and the Geforce cards targeted to the consumer market enable us to deploy SnowWorld more affordably in hospitals," Rose says.

"In the 3DVIA Virtools version of SnowWorld, the snow-flakes are just incredible," Dr. Hoffman says, and increased realism helps contribute to improved immersion, which leads to greater the pain relief. "The software takes full advantage of the faster computers available today and really adds a lot of 3D depth."

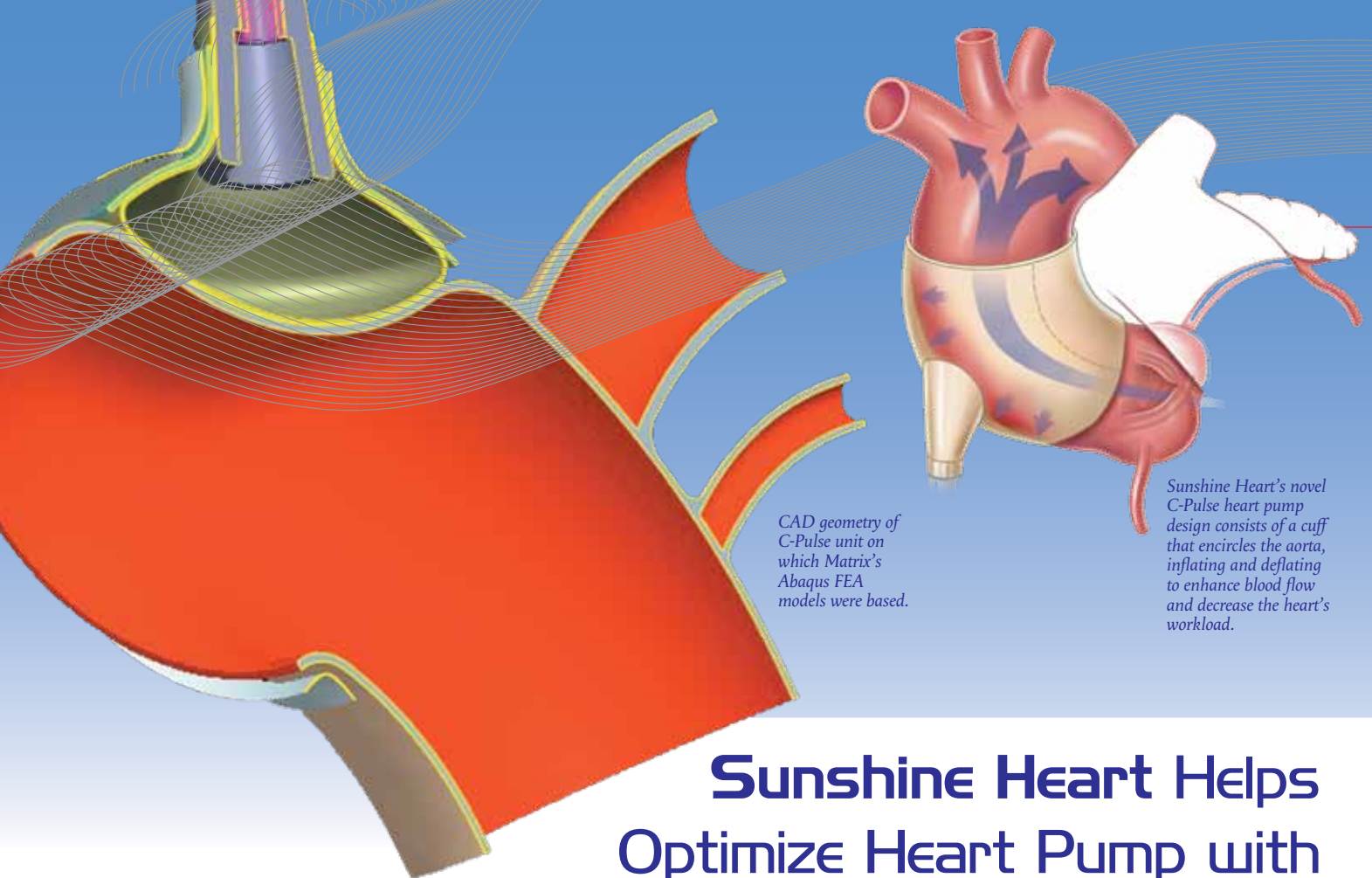
Programming speed is another key advantage. "3DVIA Virtools' built-in functionality and flexibility facilitate rapid prototyping," Hollander says. "Our clients appreciate that they can see their concepts evolve quickly, which enhances the collaborative design process and the client's satisfaction with the final product".)

For more information:
www.firsthand.com

<http://uwmedicine.washington.edu>

www.vrpain.com

To download the expanded flyer:
www.3ds.com/contactmag-extra



CAD geometry of C-Pulse unit on which Matrix's Abaqus FEA models were based.

Sunshine Heart's novel C-Pulse heart pump design consists of a cuff that encircles the aorta, inflating and deflating to enhance blood flow and decrease the heart's workload.

Abaqus FEA submodel solution showing variation of strain through thickness of balloon wall.

feature



Sunshine Heart Helps Optimize Heart Pump with Abaqus FEA From SIMULIA

It was a project with interesting physics, and the final model we came up with has performed very well in the test environment.

Don Campbell, Principal Engineering Analyst, Matrix Applied Computing Ltd.

Treatment for heart failure can range from drugs and defibrillators to internal heart pumps or a transplant as the final option. No single therapy works for everyone, and side effects and mechanical issues can arise for the implanted pump devices. Dr. William Peters, a cardiothoracic surgeon and research fellow at Auckland City Hospital in New Zealand, thinks there has to be a better way.

Peters, who invented a minimally invasive bypass system, says common implanted blood-contacting devices such as left-ventricular assist devices (LVADs) can be lifesavers for people awaiting transplants, but require that the patient remain on blood thinners which, although they prevent clots, can increase the risk of stroke. Reliability has also been an issue with some heart-assist device designs.

NOVEL PUMP WORKS FROM OUTSIDE THE HEART

As an alternative, Peters conceived of a novel pump system called the C-Pulse, which works inside the body but outside the bloodstream. It consists of a cuff that wraps around the aorta, with a membrane (balloon) that inflates and deflates against the vessel's external walls. The positive and negative

pressure of the balloon make the aorta pulsate in time with the heart, augmenting blood flow through the circulatory system and reducing total strain on the heart. A battery-powered pump worn outside the body powers the device.

Peters patented his pump concept and formed Sunshine Heart to develop and test the device. But once the balloon was ready to be scaled up to a human model, the company decided it needed a more sophisticated design and development approach to reduce lead time and provide a level of confidence that long-term performance would satisfy physicians' requirements.

FEA HELPS OPTIMIZE FATIGUE PERFORMANCE

"Because C-Pulse is essentially a permanent

We arrived at a design solution the first time through.

Scott Miller, Manager of Mechanical Engineering, Sunshine Heart

implant, we needed to ensure that our physical design solution was optimized to give us the long-term fatigue performance required," says Scott Miller, manager of mechanical engineering at Sunshine Heart. "We decided to look at it from a computational perspective using finite element analysis (FEA)."

Miller and his product development team worked with technical engineering software services firm Matrix Applied Computing Ltd., which recommended Abaqus FEA software from SIMULIA, the Dassault Systèmes brand for realistic simulation. The software was used to model the interaction of the C-Pulse cuff and balloon with the aorta. "The FEA analysis was an iterative process

that required some very unique approaches because of the way our device works, the materials we are using, and how the device is actually assembled," Miller says. The balloon had to be easy to manipulate during implant surgery; conform to the shape of the aorta; have the strength and flexibility to repeatedly "snap through" from concave to convex and back again; compress the artery; and perform reliably from initial inflation through years of use – all within a very limited space. The goal of the FEA modeling was to accurately represent the real-world behavior of the device to guide design decisions and optimize the C-Pulse's performance through every stage of this process.

ELEMENT AND MATERIALS CHOICES ARE CRITICAL

To determine the elements to use for modeling the artery, cuff and balloon, Matrix created a series of test models. The material modeling portion of the analysis was constrained by previously conducted physiology and anatomy studies. "We were given pre-existing data for the biocompatible material (a polymer approved for medical device applications) from which the device would be manufactured," says Don Campbell, principal engineering analyst with Matrix. "The Ogden hyperelastic material model in Abaqus provided an excellent fit with the experimental data."

With the FEA models of the C-Pulse set up, Matrix ran simulations to determine what shape the device's balloon should be during

surgical implantation. Next they simulated the complete balloon "snap through" motion of convex to concave and back again.

The ultimate goal of the design analysis was to arrive at a device shape that had the least variation of strain amplitude and the maximum mean compressive strain during an operational cycle. "It was a project with interesting physics, and the final model we came up with has performed very well in the test environment," Campbell says.

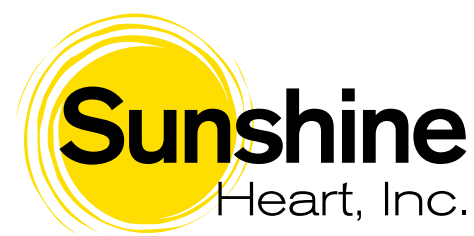
FEA PROVIDES FINAL DESIGN SOLUTION

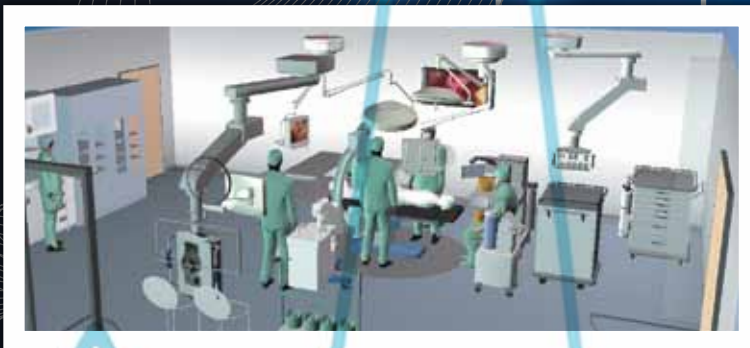
The FEA models more than met Sunshine Heart's requirements. "We arrived at a design solution the first time through," Miller says. His group has subsequently proven that the solution holds true for different sizes, important for tailoring the device to individual patients.

The durability of the C-Pulse design – simulated with Abaqus – is being borne out by ongoing testing, Miller notes. "We have been running devices day and night literally for years now. The test machine requires regular maintenance because the C-Pulse keeps wearing the test unit out".

For more information:
www.sunshineheart.com

To download the expanded case study:
www.3ds.com/contactmag-extra





feature



>> The interactive, immersive environments that we're able to create using 3DVIA Virtools really set us apart from our competitors.

Michael Schuldt, Principal and Director of Technology, EwingCole DMG

EwingCole DMG and BERCHTOLD Bring Operating Room Design to Life with 3DVIA Virtools

>> It lets BERCHTOLD's team get more input from people with greater ease and come closer to designing the 'ideal' facility the first time.

Dave Buchhofer, Technical Director, EwingCole DMG



As a division of EwingCole, a 350-person architectural and engineering firm headquartered in Philadelphia, EwingCole DMG (Digital Media Group) focuses on 3D modeling, animation and interactive applications development for a broad range of clients, from manufacturers and equipment designers to entertainment facilities and law firms. Using real-time 3D has helped EwingCole grow its business well beyond traditional architectural disciplines. And whether it is giving prospective buyers of luxury suites at a new baseball stadium a lifelike, panoramic view of the field before the facility is even built or providing 3D re-creations of crime scenes for legal trials, EwingCole DMG always relies on the same solution: 3DVIA Virtools from Dassault Systèmes.

In its work with medical equipment maker BERCHTOLD of Charleston, S.C., EwingCole DMG used 3DVIA Virtools to create a visualization application for operating rooms that allows Berchtold's sales

representative to work with hospital staff members to interactively design highly complex and functionally precise operating rooms.



SEE WHAT YOU MEAN

Before the 3DVIA Virtools application, BERCHTOLD presented customers with 2D drawings and scale models that were expensive, time-consuming, and difficult for non-architects to interpret. "We wanted to create an interactive planning tool that would run on a salesperson's laptop, allowing BERCHTOLD's designers and their customers to work collaboratively during meetings to evaluate infinite combinations of operating room equipment," says Michael Schuldt, principal and director of technology at EwingCole. "After doing the legwork on a variety of software solutions – gaming solutions, primarily – we decided on 3DVIA Virtools because of its ease of use and easy-to-learn scripting interface."

Dave Buchhofer, technical director at EwingCole DMG, says that while his background is primarily as an architectural artist, he found 3DVIA Virtools' visual development environment easy to learn on the fly. "3DVIA Virtools has a pretty extensive set of built-in building blocks to start with, but also offers the ability to expand with text-based scripting and flow chart-based scripting to create more custom and complex behaviors on your own," he says.

Jon Mueller, architectural design supervisor at BERCHTOLD, confirms that the operating room visualization application EwingCole DMG built with 3DVIA Virtools is everything his team hoped it would be. "We love it," Mueller says. "We think of it as our secret weapon. It's an amazing tool for our sales reps."

EASY DESIGN, NO SURPRISES

Today, a large percentage of operating room equipment is mounted on a boom suspended from the ceiling, to free floor space and simplify cleaning and traffic flow, Schuldt says. But such concepts are difficult to envision, especially for healthcare workers who might get one chance in a lifetime to help design a new operating room.

"These pieces of equipment articulate on the ceiling booms and move in every

conceivable direction," Schuldt says. "For each linkage on the hierarchy tree of possible equipment, you can grab it and move it to see the effect on that piece itself and everything else associated with it. Everything stays connected."



Mueller says many of BERCHTOLD's customers have never been involved in designing an operating room before. "The 3DVIA Virtools operating room visualization application really helps them see what they're trying to achieve," he says. "And it easily facilitates input from broad and diverse teams of hospital workers."

Buchhofer says user-friendliness is particularly important to ensure a wide range of input. "This kind of application allows hospital workers to get involved in a design meeting who might not have otherwise," he says. "It lets BERCHTOLD's team get more input from people with greater ease and come closer to designing the 'ideal' facility the first time."

The true value of 3D visualization in an architectural context is to eliminate design surprises, Buchhofer says. Employing 3D to visualize and validate designs before construction allows mistakes to be caught

early in the process, when they are easier and less expensive to correct. "You see things that you'd never catch in 2D renderings," Buchhofer says. "Using 3D models to do interference and clash detection makes the process more time- and cost-efficient."

3D ELIMINATES MISTAKES

BERCHTOLD executives quickly realized the advantages of helping customers experience their spaces in real-time 3D. "The 3DVIA Virtools application EwingCole DMG designed for us helps customers figure out what they are trying to achieve much faster and with fewer design 'mistakes,'" Mueller says. "It really helps people who aren't architects visualize these rooms."

The special beauty of 3DVIA Virtools is its broad applicability, Schuldt says. "3DVIA Virtools is capable of creating a wide range of real-time 3D applications for many different audiences and industries," he says. "We use a variety of applications in our work, but for interactive 3D visualization applications in real time, we rely on 3DVIA Virtools.")

For more information:
www.ewingcole.com/DMG

www.berchtoldusa.com

Tips & Tricks: CATIA Knowledgeware Shortcuts Ramp Up Efficiency

In response to reader requests, Contact mag is pleased to launch a new feature called "Tips & Tricks" to help you better leverage Dassault Systèmes solutions. Produced in cooperation with COE, this issue's feature focuses on CATIA Knowledgeware with tips from two of the COE Forum's most prolific posters and generous knowledge sharers: Michael Berry, an automotive OEM contractor and host of a CATIA V5 automation blog at <http://v5vb.wordpress.com> (Tip 1), and Cliff Johnson, a PLM consultant with TATA Technologies (Tip 2).

in practice

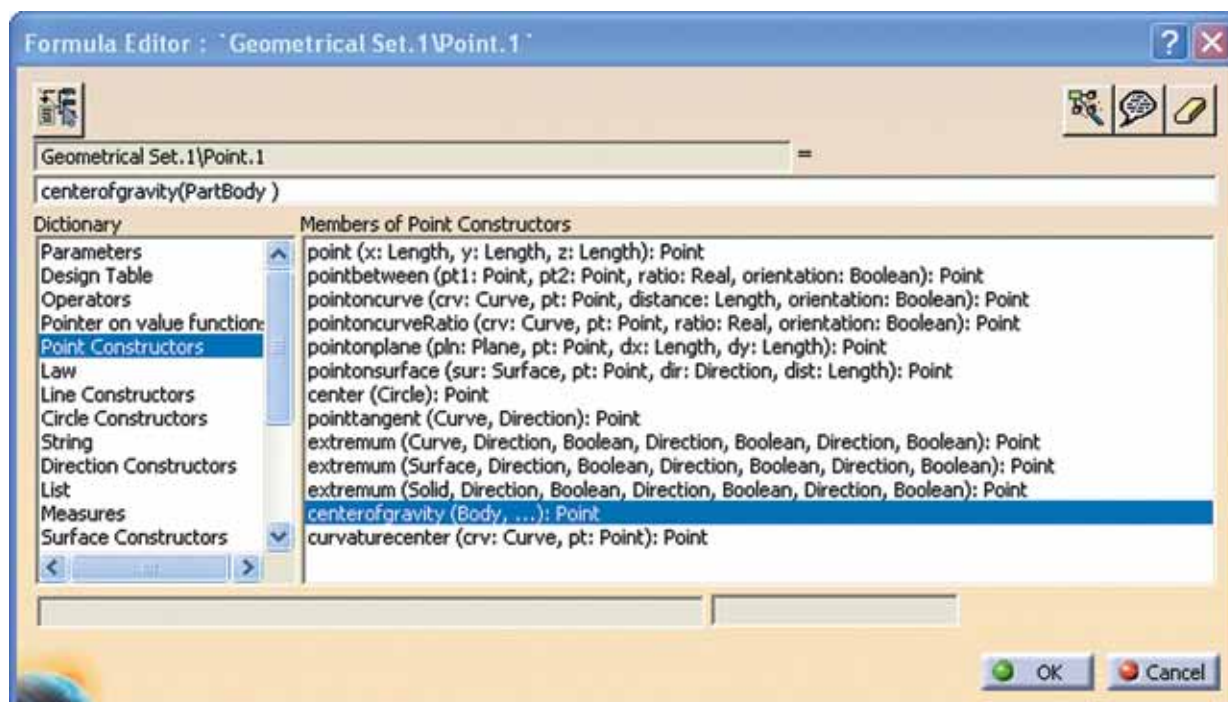


TIP 1: DEFINING GEOMETRY WITH FORMULAS

CATIA V5 users are probably comfortable using parameters and computing their values with formulas, but they may not know that all datum (non-parametric) wireframe and surface elements are also considered parameters. This means that their geometric definition can be defined by a formula. It is a fundamental concept to understand when working with the Knowledgeware tools in CATIA V5, and it yields some powerful advantages. As a very simple example, we will create a point that computes the center of gravity of a solid.

HERE'S WHAT YOU DO:

- 1 Open a part and create any solid shape.
 - 2 Make the in-work object a geometrical set and click the f(x) button to create a new parameter.
 - 3 Using the drop-down box, set the type of parameter to Point and click New Parameter of type, then click OK. A new datum point now appears in that geometrical set but it has no definition yet.
 - 4 Right-click on the point in the tree and select Edit Formula. The Formula Editor window will open.
 - 5 In the Dictionary column, choose Point Constructors.
 - 6 In the "Members of Point Constructors" list (see graphic below), double-click centerofgravity(Body, ...):Point
 - 7 The formula will now read, centerofgravity(.). Place the cursor inside the parenthesis and double-click the solid from the tree. Its name will automatically be entered into the formula as shown.
 - 8 When an Automatic Update prompt appears, Click OK and select Yes.
- Any time the solid is modified and updated, the point will be located at the new center-of-gravity location.

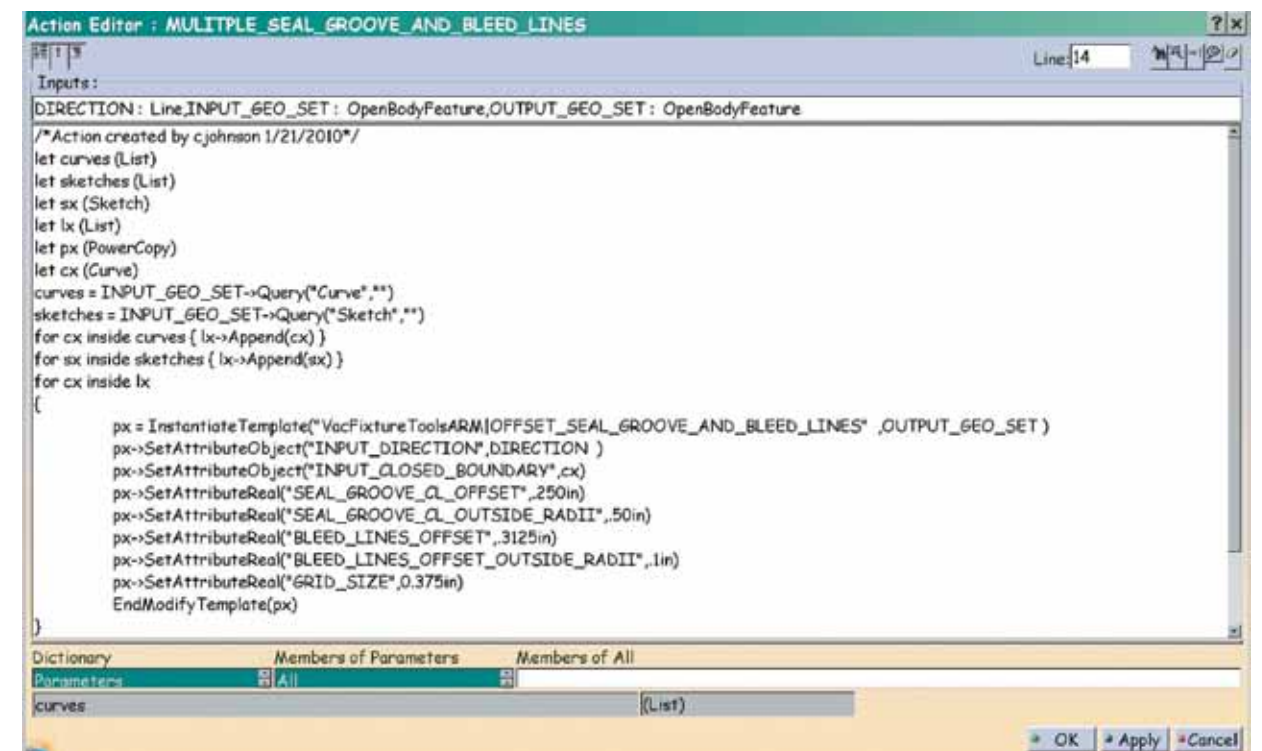
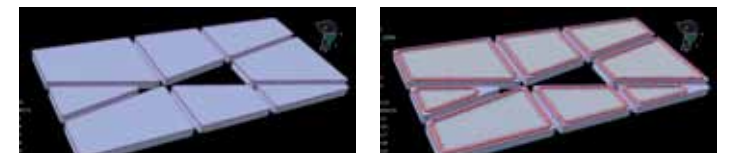


TIP 2: INSTANTIATE MULTIPLE POWER COPY INSTANCES IN ONE STEP

Power Copy is a powerful tool to replicate complex geometric constructions and knowledge features. If you need to instantiate your power copy multiple times in a design, however, it can be time-consuming – unless you know how to use the KWA Action feature to automate Power Copy instantiation, making it possible to create many instances of a Power Copy in a single step (Note: This requires PKT or KT1 in addition to KWA).

HERE'S WHAT YOU DO:

- 1 The key is to organize the inputs that vary between instantiations into Geometrical Sets so they can be compiled into a List parameter using a Query.
- 2 Once the inputs are organized, the Action script is fairly simple, and executing the action does all the work in a single step:



For more than 25 years, COE has served as the leading North-America-based, user-run community for users of Dassault Systèmes PLM solutions. COE provides one-stop access to experience-based design and product best practices for all DS brands. For free read-only access to the COE Forum, please visit www.coe.org/Default.aspx?tabid=210. Or join COE today by clicking on the Membership tab at www.coe.org for unlimited access to the collective knowledge, influence and insights of DS PLM users worldwide.





success story



Agilent Technologies Inc. Protects \$1 Billion in Revenues with ENOVIA Materials Compliance Central

➤ Purely from a risk-avoidance perspective, the value of confidently demonstrating compliance to regulatory agencies is huge. Billions of dollars are at stake.

Frank Elsesser, Director of Environmental Compliance, Electronic Measurement Group, Agilent Technologies Inc.

As the world leader in test and measurement systems in electronics and bio-analytic instruments, Agilent Technologies Inc. serves a wide range of industries, including consumer electronics, medical, chemicals, pharmaceuticals and telecommunications.

Agilent executives are keenly aware of the company's social responsibility in minimizing the ecological footprint of its products and in pursuing the most advanced strategies for complying with global restricted materials regulations.

Some of the world's most stringent environmental regulations are set by the European Union, including the Restriction of Hazardous Substances (RoHS) directive, the closely related Waste Electrical and Electronic Equipment (WEEE) regulation, and the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) act, currently in development. To comply, a manufacturer must track levels of restricted materials such as lead, mercury, cadmium and chromium in every part of every product throughout their supply chain.

If thresholds are exceeded – even in a single component such as a power cord or solder

joint – heavy penalties can be levied, and entire product shipments can be blocked from entering a port. Worse yet for manufacturers, non-compliance for one product could result in a ban on all products into a country.

At Agilent, separate groups such as Engineering and Procurement have traditionally handled their own materials data using a variety of ad hoc approaches ranging from manual lists and spreadsheets to home-grown database systems and complex mainframe programs. But as

➤ ENOVIA MCC is the cornerstone in our regulatory compliance initiatives. Ted Lancaster, Director of Engineering Services, Agilent Technologies Inc.

regulations tightened, legacy systems could not keep pace with the growing volumes of critical data from myriad sources.

MEETING REQUIREMENTS TODAY AND TOMORROW

With approximately \$1 billion in revenues at stake, Agilent developed an automated, enterprise-wide approach based on the ENOVIA Materials Compliance Central (MCC) solution, part of Agilent's overall ENOVIA product lifecycle management (PLM) solution from Dassault Systèmes. The compliance solution was selected based on Agilent ranking it as best-in-class for materials compliance; out-of-the-box functionality; embedded best practices; and features to handle Agilent's wide-ranging compliance requirements – now and in the future.

The system centrally manages materials data on more than 160,000 parts in all Agilent products and operates throughout the product lifecycle to collect, track, analyze and report critical compliance data, from initial concept through design, manufacturing and field maintenance.

Approximately 200 users in Engineering, Design, Procurement, Environmental and Regulatory Compliance and other groups access the system to enter relevant materials

data, some of which is extracted automatically from engineering and supplier databases within the ENOVIA PLM system. Agilent uses ENOVIA MCC to manage more 1,800 products and 160,000 parts from more than 7,000 suppliers, for a customer base spanning 110 countries.



and how various groups communicated," says Frank Elsesser, director of environmental compliance for Agilent's Electronic Measurement Group. "Retiring that tangled web of homegrown legacy systems significantly reduces the cost of IT support and is a significant savings in resources."

PLUGGING GAPS

ENOVIA MCC compares collected materials data with relevant environmental regulations to determine if substance thresholds have been exceeded in individual parts, specific assemblies or entire products. "With ENOVIA MCC, specialists can quickly determine environmental compliance, saving teams of people weeks of collecting and analyzing information," Elsesser says. "There is incredible value in having all compliance-related data centrally managed and controlled in an organized manner so we can get to it quickly. The system facilitates faster response to regulatory compliance customer inquiries, which have doubled in the past year alone."

Rapid analysis of compliance data also helps engineers make informed choices

in the early stages of development, when alternate designs and tradeoff studies are performed. ENOVIA MCC is therefore a central element in Agilent's proactive approach to ensuring compliance throughout development.

THE FINAL ARBITER OF TRUTH

Ted Lancaster, Agilent's director of engineering services, describes ENOVIA MCC as the final arbiter of truth for environmental compliance. "It provides not only verification that a product is environmentally compliant, but types of substances, their relation to directive thresholds, and links to support documents," he says.

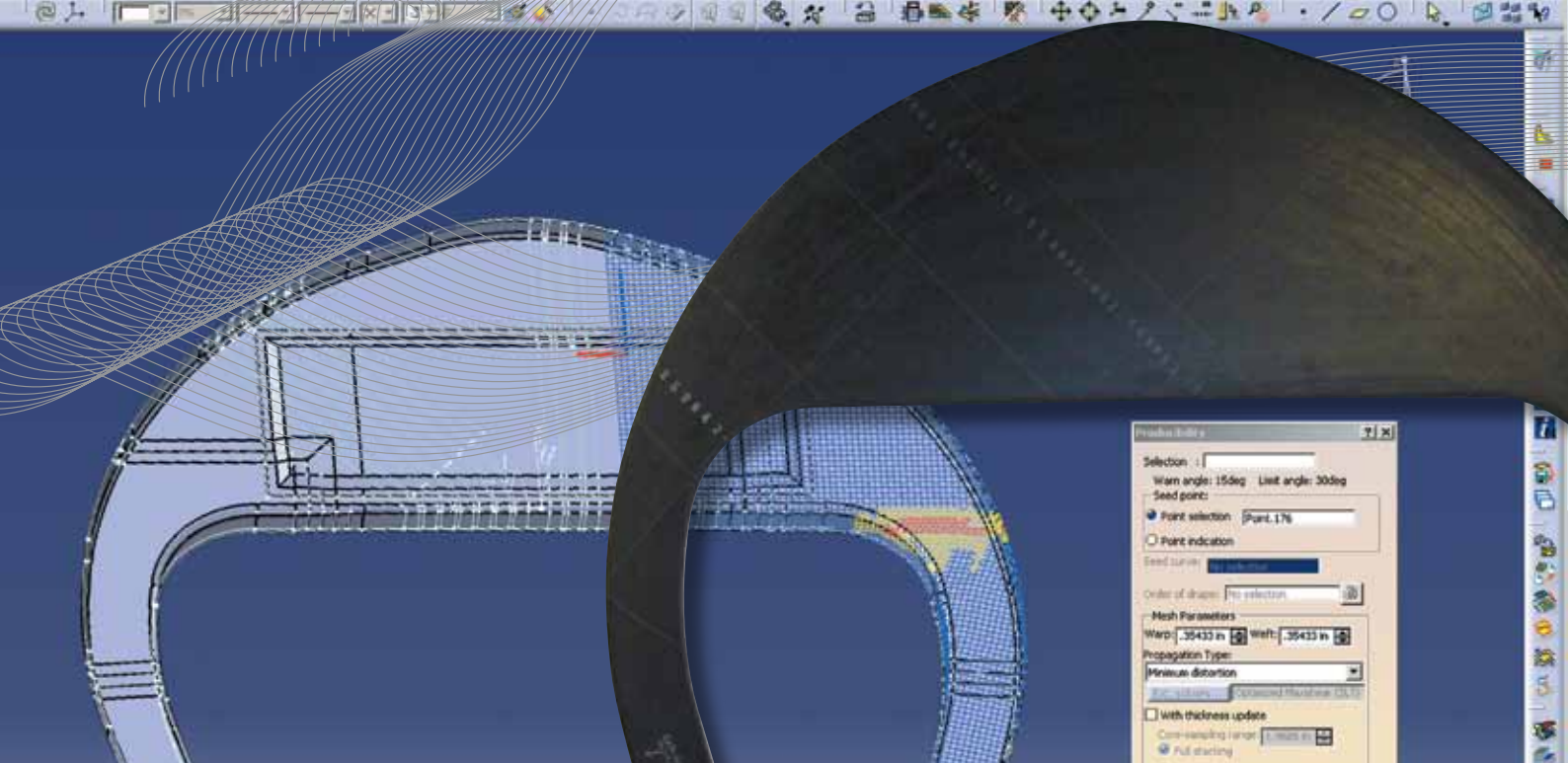
Because it generates confidence in the company's eco-sustainability, Lancaster says, "ENOVIA MCC is the cornerstone in our regulatory compliance initiatives. The software is necessary in paving the way for meeting our social responsibility and regulatory compliance obligations – both now, and what's anticipated for the future."

Lancaster notes that the longer Agilent uses ENOVIA MCC, the more ways the company finds to improve internal processes, integrate the solution with other software, and roll it out to new users. "All of this continues to bring greater value from the solution and sparks more ideas for improvement. The journey is just beginning".)

For more information:
www.agilent.com

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GKN Aerospace Reduces Manufacturing Engineering Time 50% with DS PLM Solution for Composites

Our integrated DS PLM solution helps our people stay connected throughout the entire process.

Tonya Cole, NC Programmer, GKN Aerospace

PROCESS INTEGRATED FROM DESIGN TO FABRICATION

GKN Aerospace is a major Tier 1 aircraft parts supplier specializing in complex composite and metal parts and aircraft assemblies. The company is acclaimed for its technological leadership on projects that include developing the first major composite wing spar, the first all-composite fan containment case, and the first all-electric ice protection system.

Like all pioneers in composite manufacturing, GKN used the traditional “paper-doll” approach to composites design, which involves cutting and re-cutting the initial design on the shop floor until the flat pattern conforms to the lay-up tool’s surfaces. Various applications have been developed over the years to simulate producibility, but data normally must be translated from system to system, adding time to the process, impeding communications and introducing the potential for errors.

To meet the demands of its complex composite design and build programs, GKN Aerospace recognized the need to introduce

more sophisticated methods and design tools. GKN Aerospace has subsequently developed a leading-edge process that integrates CATIA, ENOVIA, DELMIA and 3DVIA Product Lifecycle Management (PLM) solutions from Dassault Systèmes (DS) with third-party software from DS CAA Partners Intercim, Simulayt and Magestic Systems. This integration process is now used throughout the design and fabrication of GKN-designed parts.

PLIES WORK THE FIRST TIME

GKN engineers use CATIA Composites Design (CPD) to organize the ply buildup by creating sequence charts, material tables and lay-up books. Then they use producibility algorithms, either in CPD or using Simulayt’s Advanced Fiber Modeler (AFM) for complex shapes, to assess possible fiber deformations in plies. If the potential for deformation is identified, the design can be corrected with the addition of splices at the design stage. “Since we began simulating producibility up front, we have seen very few cases where the results were not as anticipated by the NC programmers,” said Tonya Cole, NC programmer on the project.



With CATIA, the ability to evaluate producibility on the computer rather than on the shop floor, without translating data, positions us at the leading edge of composites design and fabrication.”

Tonya Cole, NC Programmer, GKN Aerospace

As a part is designed in CATIA, the in-process data is managed in ENOVIA, where it can be accessed by design and manufacturing team members regardless of their location, as well as by the customer for electronic signoff. Once producibility is verified and the part is approved, CNC programs are generated directly from CATIA data.

“Maintaining all of the data in ENOVIA makes it easy to collaborate with designers that are hundreds of miles away,” Cole said. “When we make a change during the manufacturing process, everything downstream updates in CPD to stay in synch.”

GKN Aerospace is implementing DELMIA Assembly work instructions to automatically define manufacturing processes, generate shop floor work instructions directly from the design data, and reconcile the engineering bill of material (EBOM) to the manufacturing bill of material (MBOM). DELMIA will be used to create visualizations of the work

instructions for workers on the shop floor, making processes clearer and avoiding misunderstandings. GKN also plans to use DELMIA to simulate other operations, such as moving parts through the aisles of the shop to verify they will fit.

3DVIA Composer enhances CATIA data with exploded views, annotations, callouts, and other notes that add rich, interactive 3D information to the work instructions, replacing words and increasing understanding. Velocity, from Intercim, electronically delivers the planning and work instructions to the shop floor, monitors information, and generates activity and quality reports to tightly connect the physical world of Manufacturing Execution Systems (MES) with the virtual world of PLM.

The original CATIA geometry is used by TruNEST, a software from Magestic Systems, to nest the plies, which maximizes material efficiencies during the ply-cutting process. Magestic Systems’ TruLASER View software then uses CATIA data to program laser projectors that project ply boundaries onto the mold. These programs work as functions inside CPD and pull data directly from the CATIA tree. “With nothing to translate or input, there is no need to revalidate the CAD data,” Cole said.

FOCUS ON TATA TECHNOLOGIES

When it came to designing and integrating the solution, DS Value-Added

success story



TATA TECHNOLOGIES

Reseller Tata Technologies proved to be an invaluable partner, Cole said.

“Tata Technologies helped us configure the integrated solution and provided major assistance during implementation in getting everything to work together correctly,” Cole said. “We came to them whenever we had any type of problem during implementation, and they always provided us with a solution.”

IMPROVED VISUALIZATION CUTS TIME

With DS PLM, GKN Aerospace reduced manufacturing engineering time approximately 50%, to an average of four hours per part, and greatly improved collaboration throughout the extended enterprise.

“With CATIA, plus Simulayt and Magestic Systems working inside CATIA, the ability to evaluate producibility on the computer rather than on the shop floor positions us at the leading edge of composites design and fabrication,” Cole concluded. “Our integrated DS PLM solution helps our people stay connected throughout the entire process, regardless of location, while ensuring that downstream processes match the correct released engineering.”

For more information:

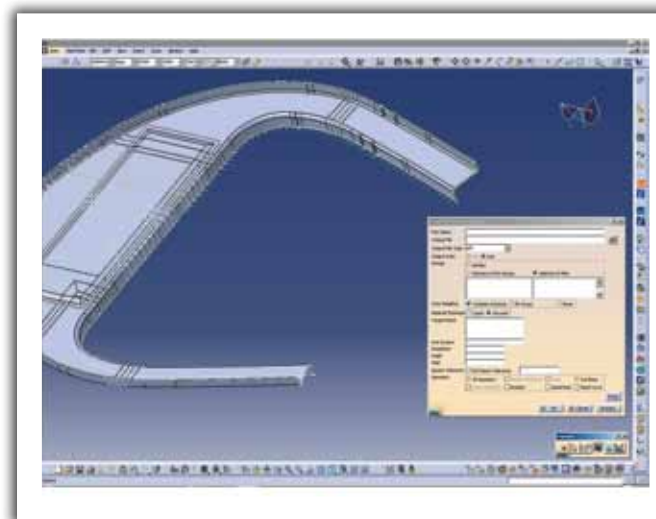
www.gknaerospace.com

www.intercim.com

www.magestic.com

www.simulayt.com

www.tatatechnologies.com





Virtual Ergonomics: Designing for Human Factors

Through the familiar CAD interface, engineers experience a quick learning curve, enabling them to immediately include human factors in the production equation.



Human interaction plays a critical role in how well any particular product is accepted by the market or how efficiently any physical system operates. How a human will function in relation to a product or system is difficult to predict, and ergonomic considerations traditionally have been addressed by intuition or rough calculations. Physical tests are performed long after the product or system can be easily or cost-effectively changed. All too often, this results in sub-par designs or massive cost overruns to correct deficiencies overlooked early in the design process.

To avoid these difficulties, organizations need a way to accurately and easily simulate the interface between humans and a product or system from the earliest stages of the design and engineering process. Evaluating alternatives from an ergonomic standpoint, when it is inexpensive to change the design, can improve the performance of the product or system, save time and money in the design engineering process, improve manufacturing efficiency, and reduce or eliminate the need for costly physical simulations.

Designers are trained to consider the people who will use the products and systems they create. However, designers also have a wide range of other mechanical factors to consider, including performance, cost, and robustness. Complicating their challenge is the fact that humans don't come in one-size-fits-all configurations. The wide range of human characteristics — proportion, anthropometry, ability, strength — means that ergonomics is often the most difficult variable to factor into the early stages of the design process.

This explains why ergonomic considerations often are not addressed until relatively late in the design process, after many technological choices have been made and changes become difficult and expensive. The result is that products with otherwise exceptional performance often achieve less-than-expected success in the marketplace. Man is



The capabilities of proven Dassault Systèmes Virtual Ergonomics solutions make it easy to embed digital humans into product design, manufacturing, maintenance and training simulations.

forced to adapt to machine, which may not be the most comfortable experience. Likewise in manufacturing, some systems that offer major productivity and quality gains may fail at achieving these advantages if workers have difficulty operating and maintaining them.

MAKING DESIGN WORK FOR PEOPLE

The rapidly emerging technology of solutions such as Dassault Systèmes Virtual Ergonomics can help designers and engineers overcome these issues by enabling the simulation of human interaction and ergonomic behavior with a product or system during the earliest stages of the design process.

Virtual ergonomics offers powerful solutions to perform analyses such as vision, space, reach, posture (e.g., comfort, safety, and strength). Simulated worker manikins can perform activities such as walking to a particular location, ascending and



even more realistic manikin representation and motion.

Companies that evaluate human interactions early in their product design process generally realize four profound business benefits:

- 1. Improved product usability:** The performance and customer acceptance of a wide range of products can be greatly improved by simplifying the process of designing these products for use by human beings.
- 2. More efficient design process:** In addition to improving the performance of the product, virtual ergonomic simulation can reduce engineering lead time and cost by getting the ergonomic design right the first time and avoiding the need to go back and make changes later, when they will be more difficult and expensive.
- 3. Reduced workplace injuries:** Companies that manufacture products or produce manufacturing equipment need to consider the effects of ergonomics to avoid workplace injuries, increase manufacturing throughput and productivity, and improve quality. According to the U.S. Bureau of Labor

and Statistics, U.S. employers spend more than \$7.4 billion in worker compensation costs, and untold billions more on medical treatment, litigation costs, hidden costs, and lost productivity.

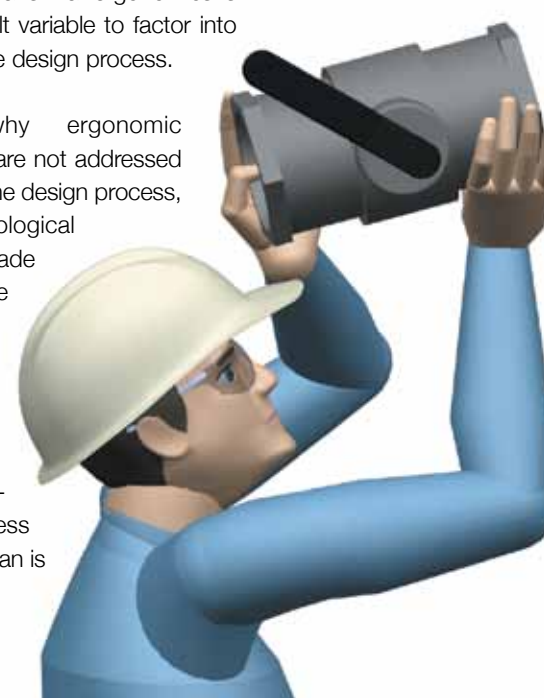
- 4. Increased manufacturing throughput and quality:** Virtual ergonomic processes can also be used to increase the cycle time or throughput of a manufacturing process. For example, the time required and energy expended by operators to perform various operations can be evaluated, increasing productivity without increasing the operator's workload.

The capabilities of proven virtual ergonomic solutions, such as those provided by Dassault Systèmes Virtual Ergonomics, make it easy to embed digital humans into product design, manufacturing, maintenance, and training simulations. Giving engineers the tools they need to consider the impact of human factors on products and processes will improve accuracy and reduce the need for physical prototypes and mock-ups, while ensuring worker safety and improving productivity. With these tools accessible through the familiar CAD interface, engineers experience a quick learning curve, enabling them to immediately include human factors in the production equation.)

For more information:
www.3ds.com/virtualergonomics

Download the white paper at
www.plmv5.com/ergo

www.linkedin.com/groupRegistration?gid=1792209



descending stairs or ladders, moving from one posture to another, following the trajectory of a kinematic device or path of an object, or picking up objects and placing them in another location. Future versions of the Dassault Systèmes Virtual Ergonomics solution in V6 will include

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