SOLIDWORKS

EBOOK: INNOVATING FOR HEALTH

Improving Patient Experiences and Outcomes via Smart Product Development and Manufacturing

DASSAULT SYSTEMES

The health-care/life sciences market is going through evolutionary changes related to the combination of more chronically ill patients, more diverse and demanding patients, and new technologies. These trends create distinct challenges as well as opportunities for health-care providers, manufacturers, and networks.

To deliver the medical discoveries, improved quality, and health-care innovation required to satisfy growing patient expectations for improved experiences and outcomes, health-care companies are embracing automation through smart product development and manufacturing.

Through greater automation, integration, and collaboration, health-care organizations can achieve the time savings, cost reductions, improved quality, and increased innovation that combine to create a competitive advantage. This ebook examines the challenges and opportunities of the evolving health-care/life sciences market, and the ways that the integrated SOLIDWORKS® 3D product development system—including design, simulation, communication, collaboration, visualization, workflow automation, quality assurance, and innovation solutions—can help health-care providers, manufacturers, and networks overcome the challenges of a quickly evolving market.

THE CHANGING HEALTH-CARE/LIFE SCIENCES MARKET

The very nature of the health-care market has always presented providers, manufacturers, and networks with greater challenges than those faced by other industries. Because the health-care market is the most highly regulated on the planet—with compliance with government regulations, professional standards, and industry best practices the minimum requirements for doing business—companies that operate in this space have long had to spend more time, money, and effort on developing and documenting products than any other type of enterprise.

When you add the pressures associated with growing patient demands for better health-care experiences, higher-quality and more innovative medical devices, and more consistently, positive outcomes, the challenges health-care providers, manufacturers, and networks face grow exponentially.

Yet, while the challenges related to this evolving market continue to grow for health-care companies, so do the opportunities for leveraging automated, integrated product development and production technologies to create new products and techniques, establish new and emerging business models, and deliver personalized and improved patient experiences. Whether your company operates as a health-care provider, device manufacturer, or network, you can be sure of two things: (1) competitive pressures and their attendant challenges will continue to increase; (2) automated, integrated, smart product development and manufacturing technologies can not only help you overcome competitive challenges but also reinvent health-care markets and ways of doing business.

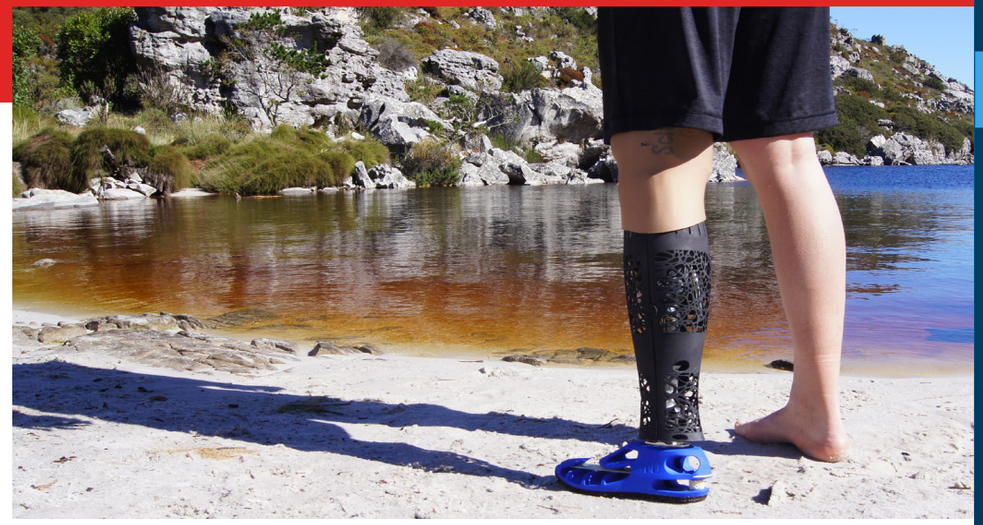
By leveraging investments in smart, integrated product development and manufacturing tools, such as the integrated SOLIDWORKS 3D product development system, health-care providers, manufacturers, and networks can collaborate more efficiently, develop more innovative products, define new business models, take advantage of emerging market opportunities, and deliver the improved experiences and outcomes that patients now demand. This ebook explores the impact of the evolving health-care/life sciences market; the challenges that health-care providers, manufacturers, and networks face; and the ways that investments in an integrated 3D product development system like SOLIDWORKS can help transform these challenges into opportunities.

ADDITIVE MANUFACTURING DRIVES IMPROVED PROSTHETICS AND ORTHOTICS AT MECURIS

Until recently, patients requiring orthopedic prosthetics or orthotics had limited options in terms of sizing, style, and customization. They'd have to select the closest size that fit, and then either live with the aesthetic appearance of the artificial limb, brace, or shoe, or pay exorbitant prices for a conventionally produced custom piece tailored to their specific situation. Mecuris, an innovative German company, was founded to overturn this paradigm by providing orthopedists and wearers with greater flexibility and more prosthetic and orthotic options through the power of automated design and 3D printing.

With origins in research conducted at the University Hospital of Munich (LMU), Mecuris has developed a solution platform for 3D-printed prostheses and orthoses that empowers orthotists and prosthetists (O&P) to improve patient care. In just three steps, orthopedists can order perfectly fitting prostheses from the company while avoiding the time and cost of traditional design and production processes.

According to Mecuris' head of product development, Jannis Breuninger, who was involved in the research that produced the world's first 3D-printed, above-knee prostheses, acquiring a robust 3D development platform that not only could drive 3D printing but also could power design automation of the



myriad configuration combinations possible was critically important to the company's success.

"I had used SOLIDWORKS design software while working on my master's thesis [at the University of Design Schwaebisch Gmuend] on 3D-printed prosthetics and was pleased to be able to use SOLIDWORKS at Mecuris [via the SOLIDWORKS for Entrepreneurs program]," Breuninger says.

By implementing SOLIDWORKS solutions, Mecuris has customized prosthetic and orthotic designs in seconds instead of hours and days, reduced production times to 24 hours instead of weeks and months, shortened new product development cycles to three to four months, and automated configuration of individualized prostheses and orthoses.

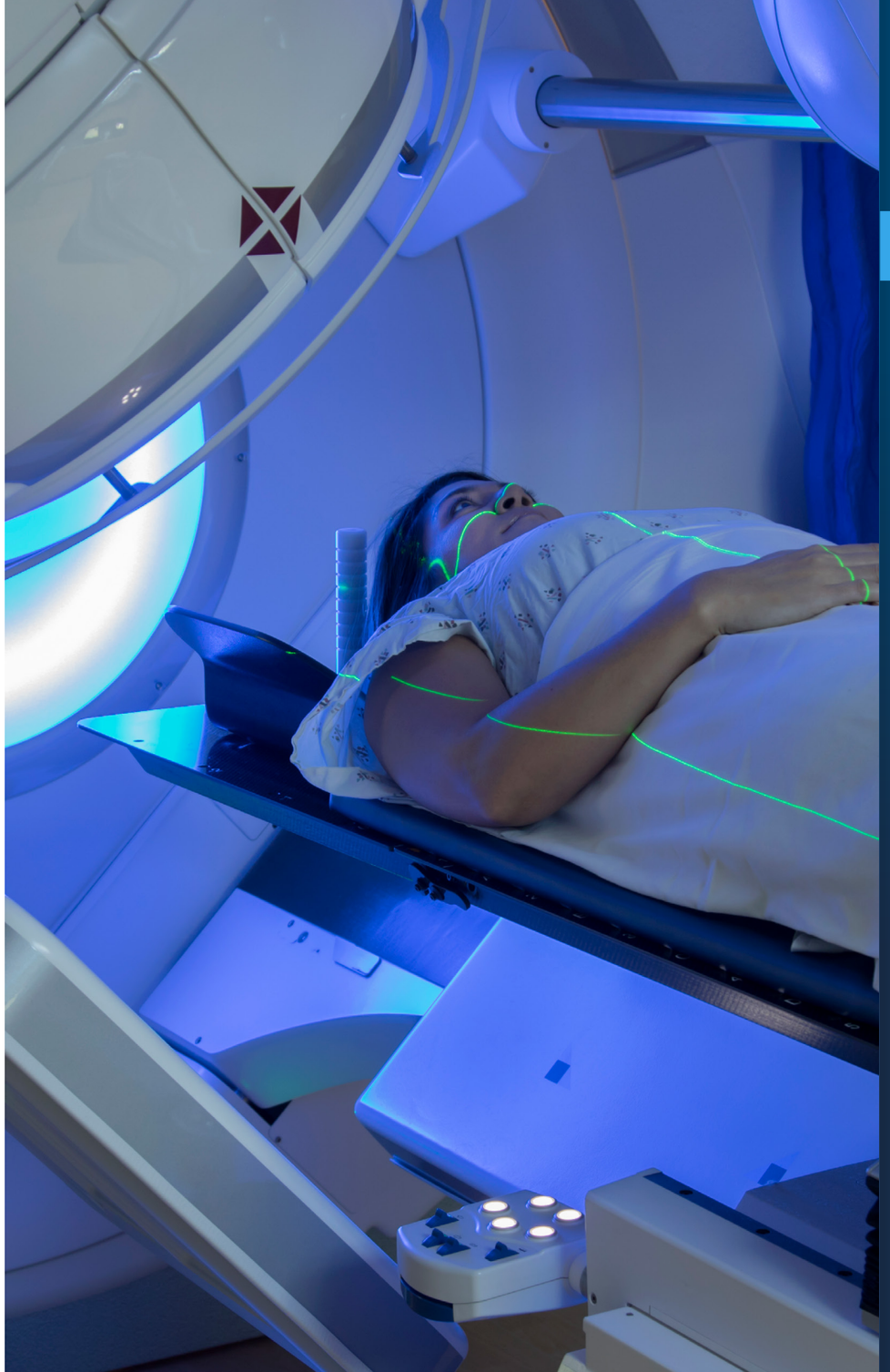
READ THE WHOLE STORY

To read the full Mecuris story, click here.

MECURIS

HEALTH-CARE PROVIDERS FOCUS ON PATIENT CARE

While doctors, nurses, and other health-care professionals have been described as "providers" for many years, this term now embodies a growing number of other entities that are involved in delivering patient care. In addition to the obvious health-care providers, such as hospitals, clinics, and inpatient and outpatient care facilities, these other entities include regulatory agencies, insurers, and governments, all of whom can contribute to delivering more effective, personalized levels of patient care. The primary challenges facing health-care providers in the evolving life sciences market are working with partners and medical device manufacturers that share a provider's commitment to delivering highly personalized patient care via automated product development and manufacturing; customized, patient-centric courses of treatment developed from individual patient data; and innovative therapies, technologies, and treatments.



ACCELERATING IMPROVED DIAGNOSTIC DEVICE DEVELOPMENT AT CAMLS

The Center for Advanced Medical Learning and Simulation (CAMLS) is dedicated to inspiring world-class medical education, training, and research that transforms the delivery of services for the benefit of patients. Based in Tampa, Florida, CAMLS operates a 90,000-square-foot, state-of-the-art facility providing every possible form of health professional education and training, including assistance with research studies and product development.

CAMLS integrates simulation technology, aviation science, team training, and evidence-based best practices into innovative programs with measurable outcomes. The organization's Tampa Bay Research & Innovation Center (TBRIC) collaborates with physicians and medical device manufacturers by combining cutting-edge simulation technologies with research and innovation to move the latest advances in health-care into practice.

To support its collaborative development programs, CAMLS needed an integrated 3D development platform with extensive design and simulation capabilities, according to Chief Engineer Mario Simoes. "Our mission is to work with physicians and manufacturers to accelerate development of innovative medical devices and procedures," Simoes says. "To achieve our objectives, we need robust yet integrated design and simulation capabilities—ranging from structural and thermal analysis to fluid-flow and mold-filling simulation—to streamline the development and accelerate the availability of new diagnostic equipment."

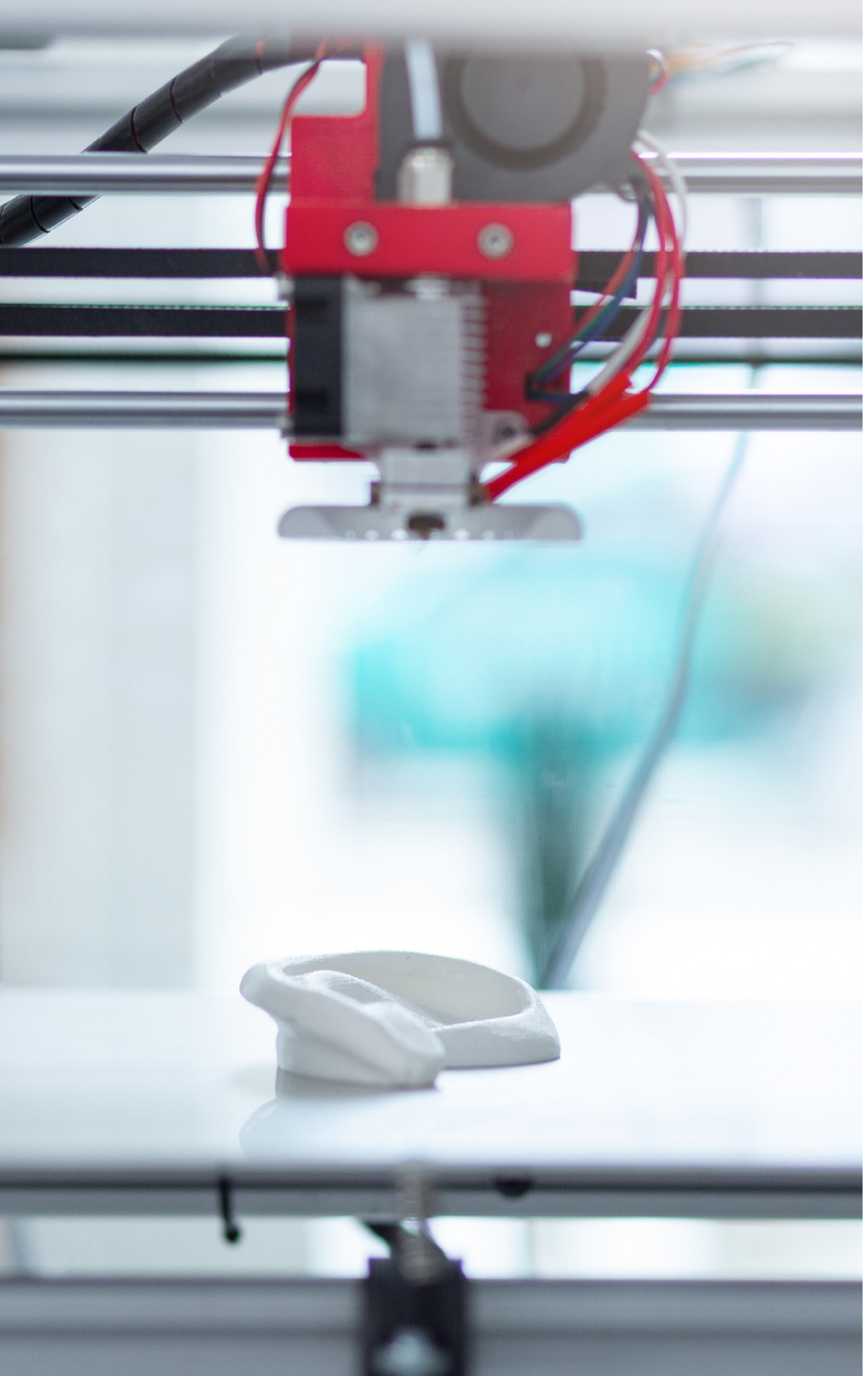
CAMLS chose SOLIDWORKS design, simulation, flow simulation, electronics cooling simulation, mold-filling simulation, environmental impact assessment, PDM, and technical communication solutions. "To speed time-to-market, we need to streamline the process for designing, validating, and manufacturing a medical device," Simoes notes. "Because SOLIDWORKS provides a fully integrated suite of design, simulation, data management, and communication tools, we believed it would best enable us to consistently achieve that goal."

By choosing SOLIDWORKS, CAMLS cut development time by 30 percent, accelerated time-to-market, improved quality, and optimized production mold performance.

READ THE WHOLE STORY

To read the full CAMLS story, click here.

CAMLS Center for Advanced Medical Learning and Simulation



HEALTH-CARE MANUFACTURERS AND NETWORKS FOCUS ON INNOVATION

Whether your company develops, manufactures, or sells medical devices, health-care supplies, or pieces of diagnostic equipment, innovation has become the mantra for success in all corners of the rapidly evolving life sciences market. This applies to the many varied manufacturers of medical products as well as the pharmaceutical and biotech firms and networks that pursue innovative drug- and biology-based therapies that improve patient experiences and outcomes.

MEDICAL DEVICES AND EQUIPMENT

The number and types of medical devices and equipment grow daily as manufacturers, academics, contract research organizations, and contract manufacturing organizations continue to develop new treatments, methods, and techniques for improving patient care. From in vitro diagnostics, advanced imaging systems, and radiation therapies to medical electronics, prosthetics, and orthotics, the development of medical devices and equipment continues to improve patient experiences in dramatic ways.

For these manufacturers, challenges to continued success include increasing development speed, advancing process automation, and introducing innovative features while realizing shorter design cycles, reduced development costs, and consistent quality.

Achieving these goals in an evolving market demands a fully integrated, highly collaborative development environment.

SPEEDING NEUROLOGICAL SURGERY PRODUCT DEVELOPMENT AT SYNAPTIVE MEDICAL

Synaptive Medical has introduced a range of products and systems that help neurosurgeons operate more precisely and effectively, offering technology that could lead to improved outcomes for brain surgery patients. With a talented team of scientists, engineers, business leaders, and customer care specialists, the Toronto-based medical device company strives to ensure the best possible patient outcomes, inspiring the innovations and advancements that the complex discipline of neurosurgery demands.

When the founders launched Synaptive Medical in 2012, they realized the company would need a 3D product development platform that not only provided extensive, integrated capabilities, but also was established enough to enhance recruitment efforts and support rapid growth. The company implemented SOLIDWORKS® Professional design, SOLIDWORKS Premium design and analysis, SOLIDWORKS Simulation Professional analysis, SOLIDWORKS PDM Professional product data management, and SOLIDWORKS Composer™ technical communication software solutions.

"SOLIDWORKS has helped us to quickly develop several products and expand our engineering and design staff from one to 100 engineers in just four years," notes Mechanical

Engineer Mark Morreale. "For example, we tapped SOLIDWORKS surfacing and Design for Manufacturability tools to develop our simulated brain, which uses a specialized, proprietary material to emulate the texture, consistency, and other physical properties of the human brain. The mold tooling for this product, which captures all of the fissures and folds of a real brain, is incredibly complex, and we heavily leveraged SOLIDWORKS capabilities to make it a reality."

By standardizing on SOLIDWORKS solutions, Synaptive Medical developed its comprehensive surgical product set in four years, grew its engineering staff from one to 100, enhanced recruitment of trained designers and engineers, and supported its rapid company expansion.

READ THE WHOLE STORY

To read the full Synaptive Medical story, click here.

synaptive

PHARMACEUTICALS AND BIOTECH

Fashion brands, goods, and accessories are the largest segment within the home and lifestyle market. As with leisure goods, brand loyalty is particularly strong in this category, which includes everyting from clothes and shoes to handbags and cosmetics. However, as consumers gain more information and become more discerning, the appeal of brand status is gradually giving way to brand substance, with younger consumers more likely to be interested in new, up and coming, innovative brands than older, more conventional and traditional brands.

To maintain and grow consumer loyalty, fashion brand manufacturers need to continually deliver quality, innovative products and product features before their competitors.

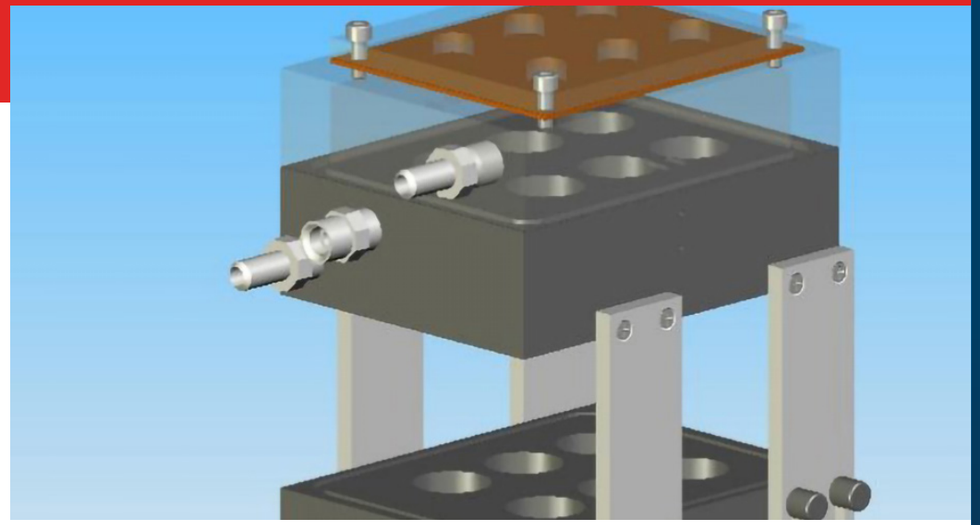
Fashion brand customers value design aesthetics and quality. Cost and customization are also becoming important factors as consumers who once gladly paid a premium for fashion brand status are increasingly seeking value in their fashion purchases. To satisfy customer expectations and grow brand loyalty, fashion brand manufacturers need to accelerate time to market while improving quality, objectives for which an integrated, smart product development and manufacturing system is an effective solution.

RAPID DEVELOPMENT OF RESEARCH EQUIPMENT AT BRISTOL-MYERS SQUIBB

As a leading global pharmaceutical supplier, Bristol-Myers Squibb (BMS) Company supports one of the most active and extensive pharmaceutical and medical research programs in the world. BMS scientists conduct research studies and experiments involving the entire scope of medical research in their quest to discover new drug therapies. Much of the equipment and instrumentation that company scientists utilize is commercially available. However, the research is often so singular that it requires highly specialized, custom-designed equipment, in which case researchers call upon the services of the company's Discovery Automation Group.

In 2000, the group decided to evaluate 3D parametric CAD packages to find a system that was easier to learn and use, and more affordable, than the system that the group had been using. After evaluating several leading 3D CAD systems, BMS selected SOLIDWORKS 3D mechanical design software for equipment development. Joseph Nolfo, one of the group's mechanical engineers, says his group chose SOLIDWORKS software because it was the easiest to use, was the most intuitive, and represented the best value.

"Virtually everything we do—including working with assemblies, generating drawings, and communicating with vendors—requires fewer steps in SOLIDWORKS than in the other



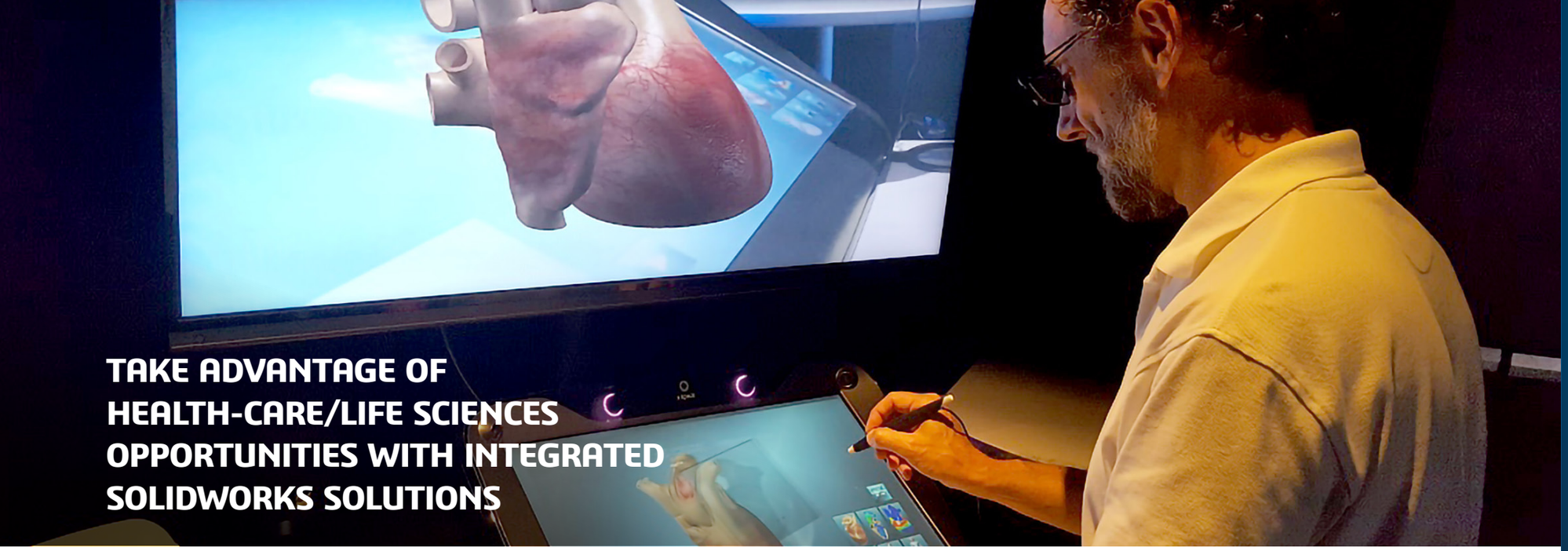
packages we used and evaluated," Nolfo stresses. "SOLIDWORKS software is helping us to meet our goals of developing research equipment that performs at a high level as quickly as possible."

By migrating to the SOLIDWORKS 3D mechanical design system, BMS' Discovery Automation Group reduced its design cycles by 75 percent, developed higher-quality equipment, improved design documentation and data management, and enhanced its interaction with BMS scientists.

READ THE WHOLE STORY

To read the full Bristol-Myers Squibb story, click here.

Bristol-Myers Squibb



TAKE ADVANTAGE OF HEALTH-CARE/LIFE SCIENCES OPPORTUNITIES WITH INTEGRATED SOLIDWORKS SOLUTIONS

Health-care providers, manufacturers, and networks can overcome the challenges accompanying the evolving life sciences market and achieve higher levels of automation and specialization through the use of a fully integrated, highly collaborative development environment like the integrated SOLIDWORKS 3D product development system. With integrated SOLIDWORKS design, simulation, communication, collaboration, visualization, workflow automation, quality assurance, and innovation solutions, medical and research equipment manufacturers can realize the agility, flexibility, and automation that they need to grow and prosper, while simultaneously improving patient experiences and outcomes.

- **Design** – SOLIDWORKS CAD, Electrical, and PCB
- **Simulation** – SOLIDWORKS Simulation, Plastics, Flow Simulation, and Electronics Cooling
- **Communication** – SOLIDWORKS eDrawings®, Composer™, PDM, and MBD
- **Visualization** – SOLIDWORKS Visualize
- **Collaboration** – SOLIDWORKS CAD, Electrical, PCB, PDM, and MBD
- **Workflow Automation** – SOLIDWORKS PDM and Manage
- **Quality Assurance** – SOLIDWORKS Inspection
- **Innovation** – SOLIDWORKS CAD, Simulation, Electronics Cooling, and PCB
- **Production** – SOLIDWORKS CAM

SOLIDWORKS

INTRODUCING FIRST DENTAL LASER IN RECORD TIME AT CONVERGENT DENTAL

If there's one thing on which dental patients agree, it's that they don't like going under the drill. That's why startup company Convergent Dental turned to engineering consulting company Tischler Resources to join their development team with the mission of delivering the Solea CO2 dental laser—the first device of its kind to receive approval from the U.S. Food and Drug Administration (FDA) for use on hard- and soft-tissue ablation in fewer than two years.

The Solea dental laser—which won the 2014 Medical Design Excellence Gold Award in the Dental Instruments, Equipment, and Supplies category—is revolutionizing common dental procedures, such as filling cavities and shaving teeth for crowns, because the laser's analgesic effect eliminates the need for anesthesia and is virtually pain-free in nearly 100 percent of the cases for which it is used. To fast-track the project and overcome difficult design and engineering challenges, the development team needed a common, integrated development platform, according to Neil Tischler, owner of Tischler Resources.

Tischler Resources and the Convergent Dental team selected SOLIDWORKS design and SOLIDWORKS PDM Professional product data management solutions to support

the project. "We chose SOLIDWORKS [design and product data management] software because it provides the best, simplest, and most straightforward integration of any design environment," Tischler says.

By choosing SOLIDWORKS, Tischler Resources and the Solea development team delivered the first FDA-approved dental laser in just two years, won the 2014 Medical Design Excellence Gold Award, facilitated collaboration across the team, and accelerated the engineering change order (ECO) process with an automated workflow.

READ THE WHOLE STORY

To read the full Convergent Dental story, click here.

SOLEA

TRANSFORM HEALTH-CARE/ LIFE SCIENCES CHALLENGES INTO OPPORTUNITIES WITH INTEGRATED SOLIDWORKS SOLUTIONS

Health-care providers, manufacturers, and networks face a host of new product development challenges due to the evolving life sciences market and the need for innovation, automation, and specialization. The introduction of new technologies combined with increasing specialization puts competitive pressure on medical device and equipment manufacturers to leverage automation to create more innovative and complex electromechanical-based treatment and diagnostic systems faster and more affordably.

Manufacturers of medical devices and equipment can turn the challenges of market segmentation into opportunities and improve their market position through investments in smart, integrated product development and manufacturing tools, like the integrated SOLIDWORKS 3D product development system. With integrated SOLIDWORKS solutions, medical device and equipment manufacturers can collaborate globally and more efficiently, develop more innovative equipment and processes, and define new business models and market opportunities. No matter what role your company fills in the evolving health-care market, integrated SOLIDWORKS product development tools can help you increase automation and improve productivity, providing the development agility, design flexibility, and product innovation necessary for improving patient experiences and outcomes.

To find out what's new in SOLIDWORKS product development and learn more about how integrated SOLIDWORKS solutions can help your company take advantage of the opportunities presented by the segmenting home and lifestyle products market, click here or call 1 800 693 9000 or +1 781 810 5011.

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