

# BUILD QUALITY PRODUCTS WHILE NAVIGATING THE FAST-PACED TECH LANDSCAPE



## INTRODUCTION

Early computer pioneers made discoveries that have reshaped our world, leading to advanced communication and comprehensive monitoring systems, medical devices, smart gadgets, and modern transport solutions. All these high-tech innovations were born from the dynamic convergence of hardware and software technologies, and the internet accelerated their proliferation.

Development cycles in the high-tech industry require quicker turnarounds than in nearly any other industry. Organizations must develop products at breakneck speed or risk being outpaced by the competition. Releasing low-quality products or designs that lack the latest advances in technology can cause a company to lose market share, customer loyalty, and money.

Tech companies must adapt to evolving tech trends, customer needs, and a competitive global market where every new product must be smaller, lighter, faster, and smarter. To build a trustworthy brand, products must work reliably without breakdowns. As the demand for high-tech innovations grows, the complexities in design and manufacturing also increase significantly.



## OVERCOMING CHALLENGES

Numerous limitations are associated with the traditional sequential process of developing products. Your top performers from departments such as design, engineering, and manufacturing need an easy way to collaborate using unified tools to create, test, and deliver products more quickly and efficiently. Barriers between departments need to be eliminated.

With a set of cloud-based multidisciplinary technologies, you can automate much of the process. Unifying all parts of your business in a single collaborative space in the cloud can drastically boost your team's productivity and allow them to work and collaborate from anywhere in the world with an internet connection.

High-tech companies need to stay competitive and relevant while mastering design and operational complexities, quality delivery, and margin pressures in a fast-paced environment. Here are just some of the challenges high-tech manufacturers face:

**Fast-paced Innovation:** The sheer speed of tech innovations can quickly make products obsolete, which puts pressure on companies to produce new products faster. This rapid pace can strain R&D departments and manufacturing plants, which often require significant time to ramp up for new product designs.

**Complexity and Miniaturization:** High-tech products and electronics are becoming smaller yet more powerful and complex. For example, smartphones now include high-speed processors, high-quality cameras, long-lasting batteries, and more. Precise manufacturing and design are required to reduce the risks of heat and vibration affecting performance.



**Customization:** High-tech consumers want newer, personalized products faster. Mass customization combines the flexibility of custom-made products with the low unit manufacturing costs associated with mass production. This approach caters to the individual desires of customers while enabling efficient, large-scale production.

**Operational Agility:** Manufacturers need to use effective tools and strategies to keep all product development data up-to-date while streamlining design processes, optimizing workflows, and leveraging modern design tools to shorten product development cycles to bring products to market faster.

**Controlling Costs:** Investment in engineering keeps costs down. Identifying issues early on, reducing the number of prototypes, reusing designs, and making informed design decisions enable companies to competitively price their products, making them more attractive to consumers and leading to increased market share.

Read on to learn more about how advanced product development technologies can help meet challenges and opportunities while exceeding customer and market expectations in the high-tech market.



## FAST-PACED INNOVATION DRIVES MARKET LEADERSHIP

The emergence of new technologies, including artificial intelligence (AI), quantum computing, robotics, virtual reality, and machine learning, creates exciting opportunities but also increases pressure on product development teams to integrate the latest and greatest tech into every new product. What's more, to remain competitive, manufacturers of high-tech products need to slash development cycles to be first to market while increasing innovation.

Product design amid rapid technological advancement necessitates a paradigm shift. Innovation can no longer be viewed as a one-off project. The successful incorporation of emerging technologies—

both into the products you build and the digital tools you use in development—is pivotal to keeping ahead of fast-paced changes in technology.

The exchange of product ideas is simplified when product development takes place in a cloud-based environment because all team players at all levels, from engineering through manufacturing, can take part in the product development process from the earliest stages. Decisions are made faster and potential issues are discovered earlier, which streamlines the process and accelerates product development cycles to beat the competition to market.

## DDDROP B.V. STREAMLINES DEVELOPMENT WITH CLOUD SOLUTION

*This 3D printer manufacturer slices product development cycles in half and streamlines modular configurations production with SOLIDWORKS® and 3DEXPERIENCE® Works.*

Taking its name from a popular Dutch drop licorice candy, [dddrip B.V.](#) launches innovative advancements in 3D printing systems. The company's extensive background in 3D printing stems from experience in selling competitive 3D printers from 2004 until the establishment of dddrip in 2012.

"The team used different machines for many years but could never find the perfect balance between quality and price," according to CEO Alfred Uytdewilligen. That experience set dddrip on the path to making better-performing, more-effective 3D printers.

"We wanted an industrial 3D printer that is built for professional use, but is also affordable," recalls Uytdewilligen. "At the time, the market offered only two categories: large machines that deliver industrial results but were out of budget, or smaller affordable machines that were not able to deliver reliable results needed in the business and R&D market." After years of frustration, dddrip engineers decided to do what engineers do: Build their own.

"Rather than imagining the printing functionality and features that our customers need, we decided to quickly develop and deploy the Recon 3D printer as a way to survey our customer base," Uytdewilligen explains. Since then, dddrip has continued to innovate 3D printing technology.

In early 2020, dddrip started considering the addition of cloud-based solutions to the SOLIDWORKS product development ecosystem to support its geographically dispersed development team.



Uytdewilligen notes, "We needed a solid method for collaborating remotely on product development and for launching products, both of which 3DEXPERIENCE solutions provide. With these solutions, we were able to meet all of our development deadlines despite the pandemic."

Each team member has access to the tools and portions of the process that affect them. Dddrip now collaborates in a way not possible before. SOLIDWORKS and 3DEXPERIENCE Works solutions provide a powerful combination to bring new product innovations to market faster and more efficiently.

Uytdewilligen enthusiastically elaborates, "The 3DEXPERIENCE platform represents an entirely new way of working that has allowed us to reshape the company to support greater collaboration, innovation, and productivity."

## COMPLEXITY AND MINIATURIZATION PRODUCE INNOVATIVE PRODUCTS

Miniaturization in consumer and industrial high-tech products offers numerous advantages, including increased functionality, better portability, reduced energy consumption, improved user experience, and more. While the trend toward miniaturization continues to drive technological advancement and innovation, it also poses numerous complex challenges that manufacturers of high-tech products must thoughtfully address.

The density of complex, intricate components packed into smaller and smaller spaces creates heat management complications for design engineers. Too much heat can significantly reduce the life cycle of electronics integral to many consumer products and industrial applications. Consistently cool electronics will more likely run without interruption and meet warranty end dates.

Smarter and more connected products require a multidisciplinary engineering approach. Product designs can no longer be casually passed on to the next team for continued development. Industrial, mechanical, electrical, and software engineers must collaborate more closely as customers demand more advanced software and electronics for their products.

Furthermore, as devices become smaller, they also become more complex to manufacture. The assembly process for smaller devices can be more intricate and time-consuming and require advanced equipment or techniques. In densely packed electronic devices, the risk of signal interference and electromagnetic compatibility issues increases significantly. Smaller devices are more prone to damage from physical stresses, such as dropping or bending. These problems can disrupt device operation, so designers must implement shielding or other techniques to maintain signal integrity.



A cloud-based product development ecosystem can enable your entire product development team with the design, simulation, manufacturing, and data management tools to make highly complex products more efficiently.



...A CASE IN POINT

## RANGEAERO CUTS DEVELOPMENT TIME BY 40 PERCENT

***3DEXPERIENCE Works Simulation** integrated with **SOLIDWORKS** enables RangeAero to shorten design cycles by 30 percent, reduce prototyping costs by 40 percent, slash development costs overall by 30 percent, and lower landing gear weight by 18 percent while bringing products to market five months sooner.*

[RangeAero](#) develops innovative, unmanned, autonomous freight helicopters for regional, commercial, and military transport. The unmanned, coaxial, rotor-powered aircraft are flown and controlled by ground crews.

Designing rotor-based aircraft presents several unique engineering challenges, including complex mechanical and aerodynamic characteristics, due to the interaction between the rotors, the fuselage, and the surrounding air, leading to unsteady aerodynamic loads that can cause undesirable vibration and noise.

The structural design must also accommodate the rotor blades' flexibility and the dynamic response of the structure to unsteady aerodynamic loads. In addition, to achieve optimum performance and efficiency, rotorcraft must be lightweight and compact—an additional colossal challenge because reducing the weight and size of a rotorcraft can affect its structural integrity, stability, and controllability.

RangeAero uses **SOLIDWORKS** and the **3DEXPERIENCE Works Simulation** portfolio of solutions. According to RangeAero CEO Arpit Sharma, these simulation tools have enabled the analysis of complex mechanical behavior, including nonlinear material behavior, geometric nonlinearities, and contact mechanics. Its integration with **SOLIDWORKS** software has also streamlined the design process, greatly reducing the time and effort required to complete analysis tasks.

Sharma also notes that **3DEXPERIENCE Works Simulation** helps identify design issues and predict potential problems before expensive prototypes or production runs are made, reducing material usage and avoiding costly delays and rework, all of which save money.

To compete in the rapidly evolving unmanned aircraft (drone) industry, companies must be first to market with an innovative, quality product. Sharma concludes, "It's necessary to accelerate development and overcome engineering challenges more quickly. **3DEXPERIENCE Works Simulation** tools are helping RangeAero overcome these challenges, and the better we can utilize it, the more likely we will win the race to market and become a market leader."

## CUSTOMIZATION CULTIVATES BRAND LOYALTY

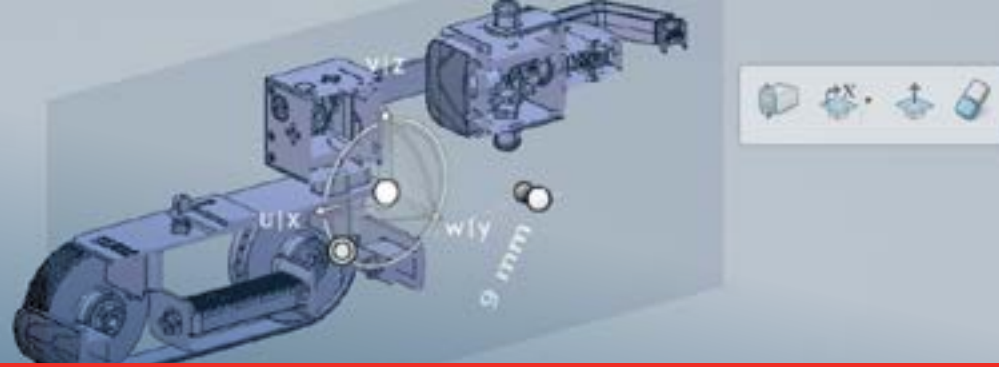
Competition in the tech industry is fiercer than ever. Businesses that design and manufacture high-tech products must prioritize the customer. Beyond creating happy customers, businesses must provide customized experiences to rise above their competition and instill brand loyalty. Product personalization is often the way forward for many high-tech businesses that produce products for both consumer and industrial markets.

Customized products typically take longer to produce and deliver and often require more manufacturing resources than mass-produced items. Customization may involve rethinking design, reconfiguring production processes, and investing in more flexible manufacturing systems. Companies need accurate, detailed information about product development and customer preferences to personalize products effectively. Collecting and managing such data is a significant challenge alongside scaling up customization—eventually to mass customization—while maintaining efficiency, profitability, and quality.

Product life cycles are getting shorter. To stay ahead of the pack, high-tech businesses leverage digital solutions to deliver innovation from concept and design to manufacturing and delivery. This means the ideation, design, engineering, manufacturing, and go-to-market functions must work together more efficiently. Companies rely on SOLIDWORKS connected to the cloud-based **3DEXPERIENCE** platform for all the tools they need in a single agile environment to create innovative products faster with digital continuity throughout the entire process.







...A CASE IN POINT

## EDUCATIONAL TOY MAKER IMPROVES DESIGN AND MANUFACTURING

*Roborisen shortens design cycles, reduces revision errors, and decreases manufacturing defects while improving quality with SOLIDWORKS and 3DEXPERIENCE Works.*

Dr. Sangbin Yim founded [Roborisen Co. Ltd](#) in 2017 after developing the single-module PingPong open-platform robot.

Each cube robot has its own controller, accelerometer, gyroscope, proximity sensor, origin sensor, stepper motor, servo motor interface, and battery. The PingPong robotic system teaches students to create, assemble, build, and control cube-shaped robots, effectively supporting STEM (science, technology, engineering, and math) instruction.

Roborisen used Autodesk® Fusion 360® design software to develop robotic components, links, and mechanisms until October 2021. As the number of innovative robot models and accessory parts increased exponentially, the company began having issues that led to design errors and delivery delays. Roborisen found the perfect remedy in SOLIDWORKS for design in conjunction with cloud-based 3DEXPERIENCE Works solutions for collaboration and data management.

SOLIDWORKS and 3DEXPERIENCE Works solutions enable Roborisen designers to easily collaborate and manage product design data without

significant investments in IT staffing or hardware. With 3DEXPERIENCE Works cloud-based data management solutions, the company also was able to resolve many quality and data management challenges.

3DEXPERIENCE Works solutions enabled Roborisen to dramatically improve and leverage its collaboration capabilities and utilize automated data management to shorten product development cycles by 20 percent. 3DEXPERIENCE also helped Roborisen eliminate its revision control issues. Fewer errors overall translated to fewer design errors and 30 percent fewer rounds of prototyping, resulting in cost and time savings as well as quality improvements. In addition, practical cloud-based revision management tools helped improve communication internally and with outsourced manufacturers, which helped Roborisen reduce its manufacturing-defect costs by about 20 percent.

Because educators that love the high-tech PingPong robot system demand more and more capabilities and products, Roborisen must design and release new products as quickly as possible. The accelerated productivity gains that Roborisen has realized since moving to SOLIDWORKS and 3DEXPERIENCE Works solutions are critically important for helping this high-tech toy producer meet its goals in serving the global education market.

## OPERATIONAL AGILITY ENABLES ACCELERATED DEVELOPMENT

The need for speed in the design and development of high-tech products must be mixed with a company's operational ability to adapt to change quickly. Not an easy task.

Many manufacturing companies still rely on legacy technologies and systems that can hamper agility as they often lack interoperability, do not support real-time data exchange, or require significant resources to update. Modernizing product development tools might seem like an easy fix, but if the new tools are difficult to learn and use, employees may resist change or even completely impede implementation. The dangers of not being willing to change can be catastrophic.

Poor data quality, data silos, and lack of data integration can hinder a company's operational agility. Further, as manufacturers move toward more digital operations, cybersecurity becomes a significant concern. Protecting sensitive IP while maintaining an agile operation can require a delicate balance.

To overcome these obstacles, manufacturers can invest in secure, cloud-based product development technologies that pave the way to operational agility by simplifying design access and processes, optimizing workflows, and leveraging modern design tools to bring products to market faster.





...A CASE IN POINT

## NASKA ROBOTICS DEVELOPS INNOVATIVE CARBON CAPTURE SYSTEM

*NASKA accelerates system development, substantially reduces costs, and continues development despite unforeseen market changes with **3DEXPERIENCE Works** and **SOLIDWORKS** solutions.*

Rock walls are prevalent throughout Europe. There are more than 24,000 miles of rock walls in Ireland alone. [NASKA Robotics GmbH](#) has received both European and German government funding to develop its innovative robotic RockFarm system to capture carbon dioxide (CO<sub>2</sub>) from the atmosphere to stem the effects of climate change.

NASKA needed a user-friendly mechanical design platform because its design team is primarily software developers—not CAD engineers—who write code to program robots to complete rock-farming tasks with mechanical extensions.

“We needed a design tool that was both easy to use and operated inside a browser in the cloud across our [geographically] distributed team,” notes Dr. Tobias Brett, CEO of NASKA. “We chose the design tools on the **3DEXPERIENCE** platform because they operate the closest to how **SOLIDWORKS** works.” In the summer of 2019, NASKA adopted 3D Sculptor and 3D Creator on the **3DEXPERIENCE** platform because the tools met the team’s industrial design, mechanical design, and data management needs, and function in a web browser in the cloud.

NASKA could not have predicted the cloud-based **3DEXPERIENCE** platform would be the perfect solution to enable continued development despite the pandemic lockdowns.

Further, Brett points out that their browser-based design tools and data infrastructure are in the cloud on the **3DEXPERIENCE** platform, therefore, the company has avoided the heavy upfront capital investment in hardware that startups have historically faced. “We’re saving additional money in the form of time savings ... related to [optimizing] our workflow. It gave us a fast start working with colleagues who are not experienced in CAD. If one person becomes a bottleneck, we can quickly hand off some of that work to another team member and eliminate potential delays.”

Brett concludes, “When we entered a more tightly focused design phase, we ramped up security by controlling what various team members could access or do. When we reach the point in the process when we need to protect intellectual property [IP], we’ll increase security even further. The flexibility of security in the cloud-based **3DEXPERIENCE** platform allows us to modulate and scale security as the design advances, enabling us to protect IP while preventing security protocols from slowing things down in the beginning.”

## CONTROLLING COSTS SUPPORTS BUSINESS GROWTH

All businesses struggle with controlling costs, a challenge magnified for companies that design and manufacture high-tech products.

Keeping pace with technological change can require releasing cutting-edge products with every single product launch—just to stay competitive. Traditional approaches to product development may lack the flexibility and agility needed to make changes on the fly. Speed is of the essence as market shifts can render a product outdated even before it is launched.

High-tech products often require significant investment in research and development, which is essential for staying competitive. Quality control is also critical in high-tech manufacturing, especially in health care, aerospace, and automotive industries, where strict regulatory standards can make compliance expensive.

Some of the best opportunities to reduce product development costs are during the design phase. The right tools—design, simulation, manufacturing, and data management—are essential to yield the best insights to identify opportunities to reduce costs. Quality issues found late in the design process waste time, drive up costs, and lead to scrap and rework. The earlier you identify and address problems, the more cost-effective the product.

Tech-Clarity, an independent research firm, reports that engineers work with outdated information 20 percent of the time, leading to wasted time, higher costs, and poor quality. A cloud-based data management system integrated with your design and production departments can help you avoid this risk. And a cloud-based system makes it easy to collaborate with everyone in the value chain, avoiding misunderstandings that can lead to quality issues while keeping valuable IP safe.





...A CASE IN POINT

## DEXAI ROBOTICS SHRINKS DESIGN TIME BY 66 PERCENT

*Dexai Robotics drastically cuts design time, doubles its product development team, and leverages a SOLIDWORKS digital twin with 3DEXPERIENCE Works collaboration and data management solutions.*

Robotic sous-chef Alfred helps restaurants and food-processing kitchens boost productivity while addressing specific food service business challenges. The robot automatically prepares food via machine-learning algorithms. Alfred also empowers kitchen staff, who control it via a tablet, to manage orders and its activity, while reducing waste through portion control. The robotic sous-chef helps restaurants meet ever-changing health and safety guidelines as well as compensate for staff shortages and turnover.

The company started with just four employees using SOLIDWORKS design software. As the company advanced robot technology, [Dexai Robotics](#) co-founder and CEO Dave Johnson and his team realized they would need product data management to continue to support growth.

“I was specifically attracted to the 3DEXPERIENCE platform because it integrates so well with SOLIDWORKS and does not require additional investments [including servers, IT staff, and training],” says Hardware Engineering Team Lead Justin Rooney.

Since adding 3DEXPERIENCE Works data management capabilities to its SOLIDWORKS installation, Dexai has grown from 10 to 25 employees.

The company uses the cloud-based platform not only for product life cycle management, but also to collaborate more efficiently and effectively. Mechanical Engineer Rana Odabas notes, “Working in the cloud in and of itself saves you two-thirds of your design time because you can have three people working on the design simultaneously. That’s a huge improvement from the days when we were passing CAD files back and forth.” For example, because the solutions work over the cloud, a few designers can work concurrently rather than sequentially on different aspects of a design, saving design time in the process.

Dexai also leveraged a complete SOLIDWORKS CAD model of the robot—Alfred’s digital twin—to teach Alfred about itself to advance machine learning and nurture artificial intelligence. Johnson notes, “We even use that SOLIDWORKS CAD model to tell the robot what it looks like, so the robot has this model of itself and knows where its arm and other parts are. We could then teach the arm how to prepare a meal or assemble a salad.”

## TRANSFORM YOUR BUSINESS TODAY

Intense competition, technological evolution, and the demand for personalized product experiences keep high-tech companies on a razor's edge. They must respond swiftly and constantly innovate their product development strategies to thrive in a relentlessly fast-paced landscape.

High-tech consumers have exacting requirements, including the latest technological advancements and high-quality construction that delivers an intuitive user experience. Consumers want to customize their devices and software to meet their specific preferences. In today's tech-laden landscape, AI technology, automated product features, and internet-connected capabilities have become standard features.

High-tech consumers want assurance that they're getting good value for expensive premium products and expect easy integration with their existing tech ecosystems while maintaining top-level security.





## MEETING THE DEMANDS

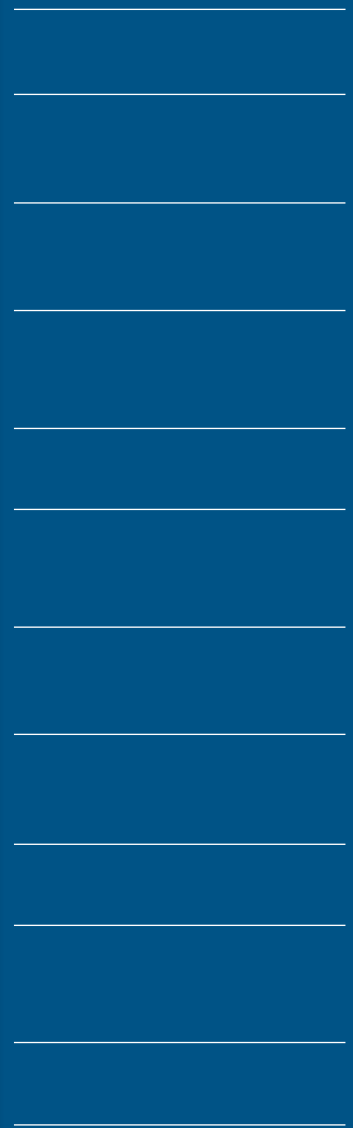
To stay relevant, high-tech companies need to rethink traditional business processes and embrace new methods for innovating and operating. High-tech manufacturers must shift from disconnected tools and processes to fully integrated, cloud-based 3D design-through-manufacturing solutions to keep pace with ever-changing technology and ever-evolving customer demands.

Rather than conduct business as usual, high-tech manufacturers can leverage integrated product development tools from the **3DEXPERIENCE** Works portfolio to increase agility and beat the competition in a shifting economic landscape. Now SOLIDWORKS customers can connect to the cloud-based platform to expand and optimize their current investment in SOLIDWORKS to increase efficiency, facilitate collaboration, foster innovation, and speed time to market.

The **3DEXPERIENCE** Works portfolio leverages the cloud-based **3DEXPERIENCE** platform to provide a unified collaborative environment connecting everyone involved in product development to all the applications and data needed to contribute to and expedite the innovation process from idea to delivery. Industry-leading tools and technologies are accessible to everyone on the team.

- **Design** – Create and share designs quickly, enabling key stakeholders to give and receive feedback throughout the product development process.
- **Simulation** – Quickly validate designs to gain insights into product performance, reliability, and safety at any point in the development process to inform decision-making.
- **Data Management** – Automatically capture and manage all development-related data to manage revisions, work through formal change actions and approvals, and monitor project tasks.
- **Manufacturing** – Streamline communication between departments—from the back office to the shop floor—to identify and reduce errors at any phase in the process for faster release to production.

Easy remote access to design data is vital for high-tech manufacturers who can easily and securely connect to design, simulation, and manufacturing data from the cloud-based **3DEXPERIENCE** platform,



a single source of truth for all product development data. Everyone on the team, including suppliers and customers, can contribute their expertise. Communications among team members are automatically tracked in one accessible location on the **3DEXPERIENCE** platform, eliminating the drudgery of tracking, organizing, and finding emails. Plus, data management is built in, so the unified product data updates automatically in real time so everyone on a project is always in sync.

Contact your local reseller for a demonstration of how you can grow your business by investing in the right tools to elevate your high-tech product development process to beat the competition.

Leverage the power of **3DEXPERIENCE** Works to lead the next generation of product development.  
To learn more, visit [www.3dexperienceworks.com](http://www.3dexperienceworks.com) or  
contact your local SOLIDWORKS reseller.

### Our **3DEXPERIENCE**® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating virtual twin experiences of the real world with our 3DEXPERIENCE platform and applications, our customers can redefine the creation, production and life-cycle-management processes of their offer and thus have a meaningful impact to make the world more sustainable. The beauty of the Experience Economy is that it is a human-centered economy for the benefit of all – consumers, patients and citizens.

Dassault Systèmes brings value to more than 300,000 customers of all sizes, in all industries, in more than 150 countries. For more information, visit [www.3ds.com](http://www.3ds.com).



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