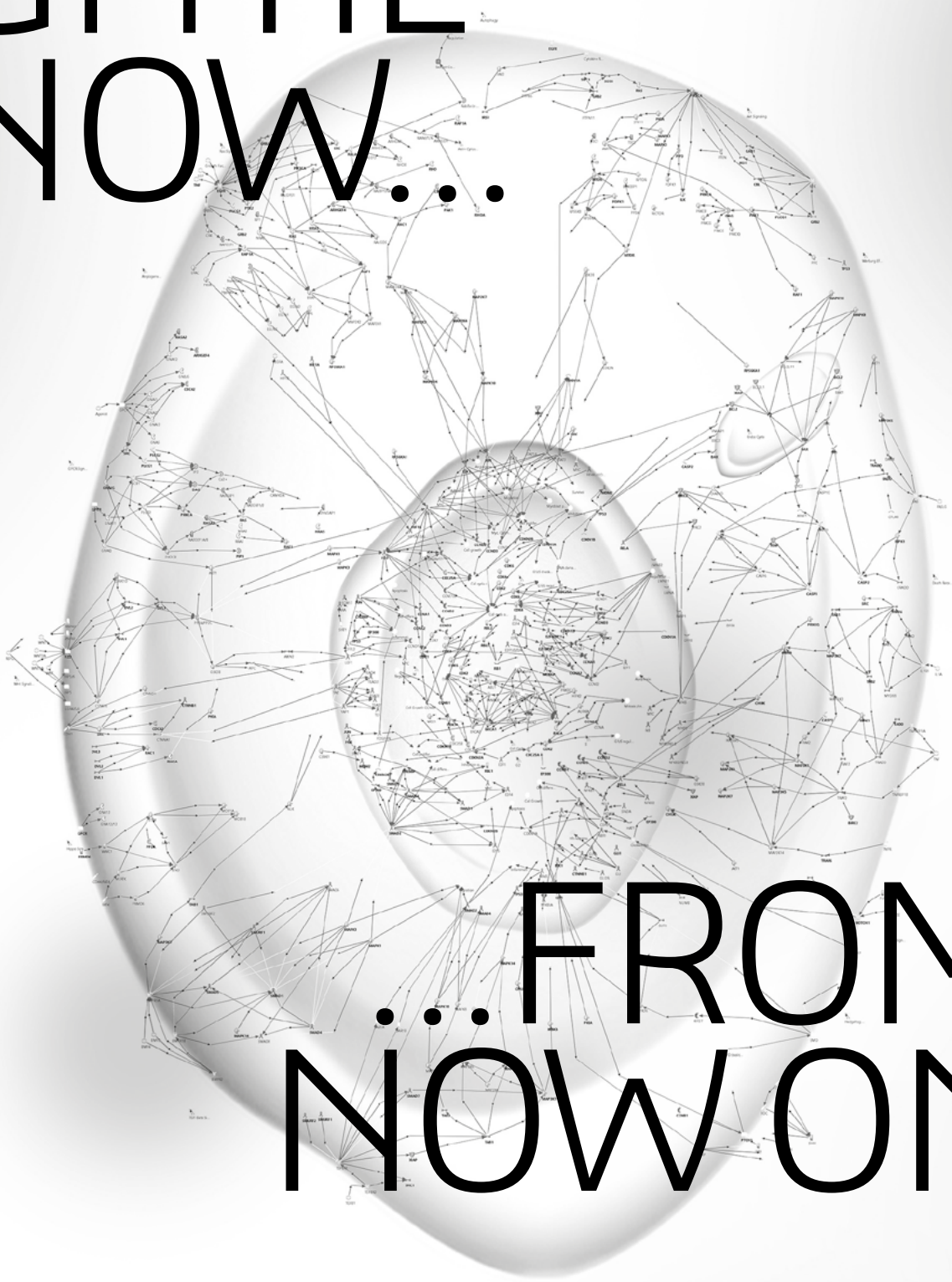
UNTiL NOW...

2021/2022/2023
Corporate Report



...FROM NOW ON

DASSAULT SYSTEMES | The **3D**EXPERIENCE® Company

COVER

Credit: Dassault Systèmes

This virtual twin of a human cell is a collaborative system model of interconnected biological pathways, linking chemical reactions between proteins. With the power of big data from scientific databases and multi-discipline simulations, it provides a new level of understanding of the sophisticated equilibria of a living cell, rendering a healthy or various pathological states of life.

UNTiL NOW...

We had to settle for what was possible. In Manufacturing, companies tended to focus entirely on production, with little thought to end-of-life and other sustainability issues. In Life Sciences & Healthcare, we made do with a one-size-fits-all approach because planning personalized therapies and surgeries was complex and error-prone. Infrastructure & Cities projects often faced delays because of customized assembly. Sustainability was not maximized because material choice was not at the forefront of design projects. And women tended to remain mainly in the background, especially in tech companies.

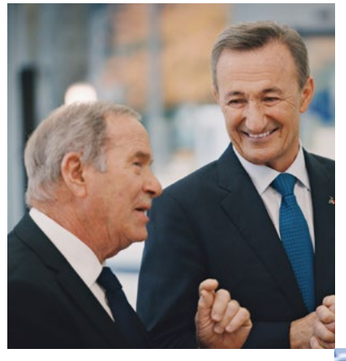
...FROM NOW ON

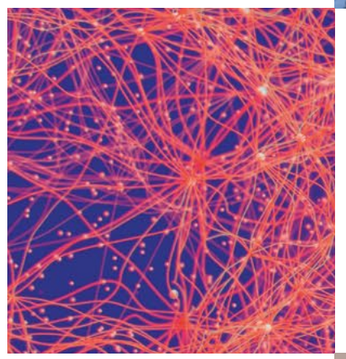
Empowered with insights revealed by virtual worlds and the ability to test ideas before we implement them, we can design a future of limitless human potential. Manufacturers will focus on product experience and manage goods over their entire lifecycles within a broad ecosystem. Precision medical care will make it possible to offer tailored therapeutics targeting a customized treatment for each specific patient. Construction will be achieved through repeatable processes, accelerated by closer collaboration with all stakeholders. Designers will be empowered to select renewable materials early in the design process, breaking the modern take-make-waste cycle. And women will claim their rightful place in the top management of tech companies.

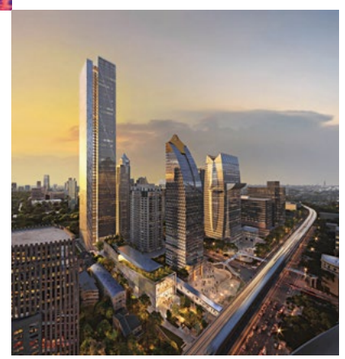
With the power of virtual twin experiences on the **3D**EXPERIENCE© platform, Dassault Systèmes and our customers are breaking down barriers and blazing innovative, sustainable new paths. By combining modeling, simulation and real-word evidence in virtual worlds, we are empowering innovators to discover, test and perfect transformative and sustainable new ways of thinking, of inventing, of solving.

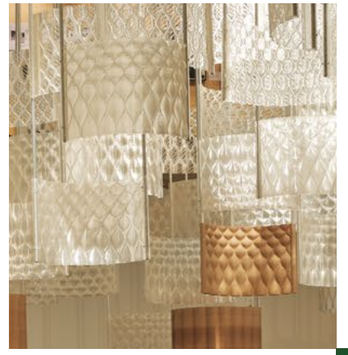
After two generations of continuous innovation, we have reached new heights. From here, we can clearly see that in many domains the best is yet to come: for our company, our customers and our planet.

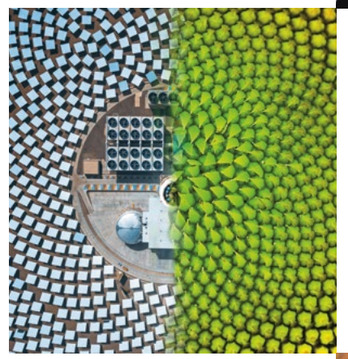
Table of Contents

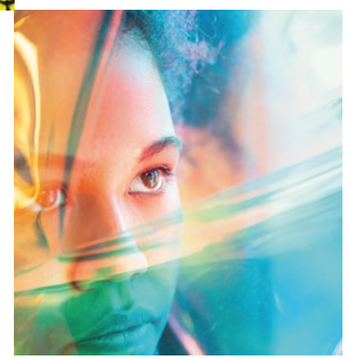












UNTiL NOW

We have been known for our leadership, excellence and performance in the Manufacturing Industries

FROM NOW ON

We extend our focus to put Life Sciences & Healthcare at the heart of our identity

The living world is our next frontier. We will move from things to life, applying the same passion and expertise as we do in Manufacturing. In Life Sciences & Healthcare, virtualization has become the catalyst and the enabler of groundbreaking, more precise products and practices in medical prevention, treatment and follow-up. **WE WILL PLAY A LEADING ROLE IN THIS TRANSFORMATION OF THE INDUSTRY, WHICH IS USHERING IN A NEW ERA OF PRECISION MEDICINE** that will be more inclusive, independent, accessible and effective, for the benefit of all. Our next big challenge: creating the first-ever virtual twin of the human body.

Charles Edelstenne
Chairman
of the Board of Directors

Bernard Charlès
Vice chairman of the Board
and Chief Executive Officer

Dassault Systèmes' Vision, Strategy and Performance

(All figures are non-IFRS and revenue growth rates are in constant currency).

40 years after the creation of the company and 10 years after stating its purpose, what is Dassault Systèmes' strategy?

Dassault Systèmes is proud of the creativity of its two generations of innovators. Our company's 40th anniversary is above all an opportunity to focus on our next horizon: 2040. What do we want to be recognized for in 2040? How do we intend to contribute to society? We will see two major shifts in the coming decades. First, a more sustainable, circular economy, and second, the virtualization of Life Sciences & Healthcare. Sustainable development is the very foundation of our corporate purpose to "harmonize product, nature and life", and is what drives our strategy. In 2020, following our decision to extend our focus "from things to life," we put Life Sciences and Healthcare at the heart of our identity. Our ambition is to deliver the same level of leadership, excellence and performance in the living world as we do in the Manufacturing Industries. Following the integration of MEDIDATA, we are already the world's leading provider of clinical trials solutions. Creating the first-ever virtual twin of the human body is our next exciting challenge and a major milestone for us all – patients, doctors and researchers alike.

This is in keeping with the legacy of Dassault Systèmes. Every decade since the outset, we have helped industrial firms disrupt how they design and make products. Starting with CATIA, designing 3D parts and assemblies and replacing physical prototypes with virtual testing. Next, we invented the virtual twin of entire complex systems, for example with Boeing to create a 3D mock-up of the 777. Lifecycle management, or the end-to-end product management from design through to recycling, including production and distribution, marked the third stage. Then, 10 years ago, we unveiled a key enabler to fulfill our purpose: the **3D**EXPERIENCE platform. With this platform, customers can create virtual twin experiences that combine modeling, simulation and real-world evidence. Virtual twin experiences enable firms to take their imagination beyond the confines of the real world, offering a powerful transformation enabler for them to become the solution to today's sustainable development challenges.

The Experience Economy, accelerated by the pandemic, triggers new expectations from citizens, patients, and consumers. For instance, tomorrow's mobility is no longer only a matter of vehicles: it is a matter of sustainable mobility experiences. Tomorrow's healthcare is much more than therapeutics: it is about the patient journey and precision medicine. Tomorrow's cities are not only a collection of buildings, streets and facilities: it is about quality of life and quality of service.

Our clients and partners are embracing the Experience Economy across our three sectors. They have made sustainability the cornerstone of their transformation.

In Manufacturing Industries, clients are stepping up their partnerships with us to virtualize their operations, improve data sharing and collaboration across their organization, reducing costs and time-to-market. In 2021, Renault Group embarked on a new stage in its technological and digital transformation by choosing the cloud-based **3D**EXPERIENCE platform to develop new products and mobility services.

In Life Sciences & Healthcare, virtualization is now the catalyst and enabler of groundbreaking healthcare products and practices. This transformation is spawning new usages and offering simpler, more precise experiences for people, as part of prevention, treatment and follow-up. To close the loop between research & development and usages, we connect the dots across molecule simulation, clinical trials, manufacturing and real-world data, across researchers, manufacturers, doctors and patients, illustrated by MEDIDATA's key role in Moderna's COVID-19 vaccine clinical trials. This opens up a new dawn in precision medicine, as it becomes more inclusive, more independent, more accessible and ultimately more effective.

Lastly, in Infrastructure & Cities, we are opening new horizons in making the construction industry more efficient and sustainable. This year, we expanded our partnership with Bouygues Construction to speed up the company's digital transformation, improving research & development of new cloud-based, mobile-enabled approaches using the virtual twin.

To better serve our customers and achieve our strategic objectives, we are implementing our own-virtual twin experience. All functions of our organization will be virtualized to provide us with a holistic view of our own processes, products, services and usages.

Could you comment on Dassault Systèmes' 2021 performance and the outlook for 2022?

Dassault Systèmes' performance endorses our long-term strategic vision and the investments made over the years. The Company has built strong competitive advantages to drive its long-term growth.

In 2021, total revenue grew 11%, driven by broad-based demand across product lines and geographies. The adoption of our strategic growth drivers, **3D**EXPERIENCE and cloud, has accelerated, notably thanks to large enterprise partnerships. From a profitability perspective, this past year we demonstrated the resilience of our business model with an improvement of about 4 percentage points in the operating margin to 34.3%, while investing in our workforce, which grew 4%. Earnings per share increased 26% to €0.95, thanks to good revenue growth and high profitability.

For 2022, we expect the demand dynamics we experienced in 2021 to continue, targeting 9% to 10% revenue growth. We anticipate double-digit license revenue growth and strong recurring revenue performance. We expect our operating margin objective to remain at a high level (between 32.7% and 33.1%), but more in line with normative levels (32.0% in 2019) because of significant workforce investments. Our diluted earnings per share objective is €0.98 to €1.00.

What is next for Dassault Systèmes? How does it address sustainable development challenges?

Our objective is to be the leader in sustainable innovation and to continue to position our clients at the vanguard of progress across the three sectors we serve so that they in turn can better serve patients, citizens, consumers, entrepreneurs and learners. To become a strategic partner for sustainable innovation, we have defined a path for 2025 and beyond.

First, with our solutions, we can be a tremendous lever for our customers. With Accenture, we co-authored a study that reveals the critical role of Dassault Systèmes' virtual twins, bringing 1.3 trillion dollars of economic value and an estimated 7.5 Gt reduction in CO^2 emissions between now and 2030 for five use cases. We are also committed to reducing our carbon footprint and operating our business in a more sustainable manner. We have therefore set a target to reduce our greenhouse gas emissions to meet the goals of the Paris Agreement and the goals we set for ourselves, which have been validated by the Science Based Targets initiative. We reaffirm our commitment to the UN Global Compact and its Ten Principles, which align with our corporate purpose.

We intend to play a decisive role in virtualization of healthcare, which will profoundly transform the industry, elevating the patient journey, boosting the capacity to innovate and strengthening competitiveness. We also support customers on the crucial issue of intellectual property and data management because, in the Experience Economy, health data and its intelligence and accessibility are all critical strengths.

We have demonstrated the power offered by the 3D representation of phenomena, i.e., the virtual twin of a real phenomenon that ushers in inclusive and open, collaborative processes. Taking this even further, we also believe the innovators of today and tomorrow have to think in terms of "universes," in terms of organic systems of systems that create, produce and deliver an experience in a circular economy. We can combine value creation and value experience, design and usage, to cover the full product and service lifecycle. This new approach to innovation will pave the way for the development of all three sectors.

Dassault Systèmes approaches its growth from an inclusive, long-term perspective. The Company has always prepared the future by ensuring managerial continuity and combining the talents of different generations of leaders. With this in mind, we have put in place the next generation of executive leadership to support Pascal Daloz in his mission as Chief Operating Officer to elevate and expand the value we deliver and to support our long-term vision. In 2021, we also introduced an employee shareholding program to enable our people to invest in our joint enterprise and continue to make it grow.

We would like to thank our customers and partners for their continued trust. Creating a more sustainable world sits at the heart of our mission. It underpins everything we do.

Governance

Bernard Charlès
Vice chairman of the Board and Chief Executive Officer

Elisa Prisner
Vice-President Corporate Strategy & Platform Transformation

Pascal Daloz
Chief Operating Officer

Florence Hu-Aubigny
Executive Vice-President, Research & Development

Philippe Laufer
Executive Vice-President, 3DS Global Brands

Florence Verzelen
Executive Vice-President, Industry, Marketing & Sustainability

Rouven Bergmann
Executive Vice-President, Chief Financial Officer

Olivier Ribet
Executive Vice-President, EMEAR

Laurence Barthès
Executive Vice-President, Chief People & Information Officer

Samson Khaou
Executive Vice-President, Asia-Pacific

Victoire de Margerie
Vice-President Corporate Equity, Marketing & Communications

Erik Swedberg
Executive Vice-President, Americas

Thibault de Tersant
Senior Executive Vice-President, General Secretary

Strategic Operational Elements. We roll out our strategy by calling on our Strategic Operational Elements: Brands, Sectors, Industries and Geos. Our Brands create great user experiences and build vibrant user communities and develop the apps that power the **3D**EXPERIENCE platform. Our Industries develop Industry Solutions, Processes and Roles which deliver specific value to companies and users based on what the value most. Industries are grouped into three sectors: Manufacturing Industries (Transportation & Mobility; Aerospace & Defense; Marine & Offshore; Industrial Equipment; High-Tech; Home & Lifestyle; Consumer Packaged Goods – Retail) – Life Sciences & Healthcare – Infrastructure & Cities (Infrastructure, Energy & Materials; Architecture, Engineering & Construction; Cities, Public & Business Services). Our twelve Geos are responsible for driving the development of our business and implementing our customer-centric engagement model.

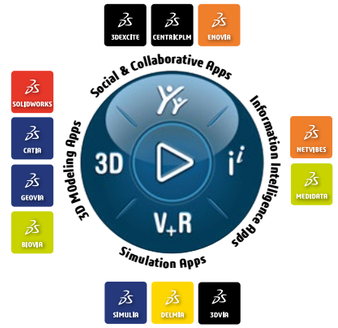
LIFE SCIENCES & HEALTHCARE
Tarek Sherif

MANUFACTURING INDUSTRIES
Philippe Laufer

INFRASTRUCTURE & CITIES
Florence Verzelen

RESEARCH & SCIENCES
Patrick Johnson

Dassault Systèmes is a science-based company, driven by the idea that deep sciences are the ultimate trustable foundation to build a better future. Moving towards harmonizing product, nature & life, the company provides unparalleled, sustainable virtual twin experiences for businesses and people, with combined model-based and data-driven elevated representations. Dassault Systèmes' passion for research draws on various branches of science – mathematics, biology, chemistry, physics, geology, humanities – breaking down domain silos and inventing innovative and disruptive solutions for its customers. Combining art, integrated research, and applied science, Dassault Systèmes operates a worldwide network of scientific alliances, to imagine and formulate new hypothesis, confront them with reality and reveal new knowledge, know-how and possibilities.



3D MODELING:
- SOLIDWORKS: Manish Kumar
- CATIA: Olivier Sappin
- GEOVIA: Michelle Ash
- BIOVIA: Jason Benedict

SIMULATION:
- SIMULIA: Philippe Laufer
- DELMIA: Guillaume Vendroux
- 3DVIA: Vincent Picou

INFORMATION INTELLIGENCE:
- NETVIBES: Morgan Zimmermann
- MEDIDATA: Sastry Chilukuri/Rama Kondru

SOCIAL & COLLABORATIVE:
- ENOVIA: Stéphane Declée
- Centric PLM: Chris Groves
- 3DEXCITE: Tom Acland

TRANSPORTATION & MOBILITY
Laurence Montanari

AEROSPACE & DEFENSE
David Ziegler

MARINE & OFFSHORE
François-Xavier Dumez

INDUSTRIAL EQUIPMENT
Philippe Bartissol

HIGH-TECH
Stéphane Sireau

HOME & LIFESTYLE
Philippe Loeb

CONSUMER PACKAGED GOODS - RETAIL
Philippe Loeb

LIFE SCIENCES & HEALTHCARE
Claire Biot

INFRASTRUCTURE, ENERGY & MATERIALS
Corinne Bulota

ARCHITECTURE, ENGINEERING & CONSTRUCTION
Rémi Dornier

CITIES, PUBLIC & BUSINESS SERVICES
Jacques Beltran/ Taherah Kuhl

Central Europe
Dominic Kurtaz

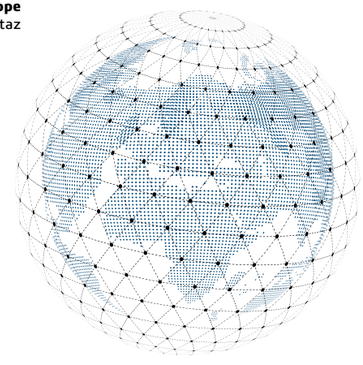
Northern Europe
John Kitchingman

Western Europe
Philippe Besse

Southern Europe
Guido Porro

North America
Erik Swedberg

Latin America
Alejandro Chocolat



Russia
Alexey Ryzhov

Korea
Youngbin Cho

Japan
Philippe Godbout

China
Ying Zhang

Southern Asia Pacific
Josephine Ong

India
Deepak Ng

2021 in a Snapshot

+11%
Revenue Growth[1]

34.3%
Operating Margin[1]

+26% EPS
at **€0.95**[2]

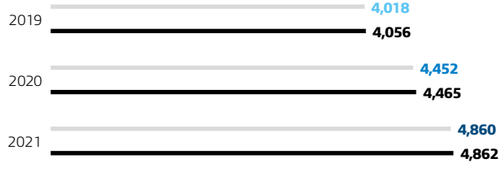
+30%
Cash provided
by Operations

Early Achievement of Deleveraging Target
(Adjusted Net Debt / EBITDAO ratio)[3]

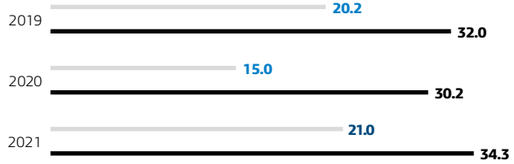
(1) Non-IFRS, revenue growth figures in constant currency.
(2) Non-IFRS, EPS reported growth, Figures have been restated in order to reflect the five-for-one share split of Dassault Systèmes' shares on July 7, 2021.
(3) The Adjusted Net Debt corresponds to the net financial debt position (borrowings net of cash, cash equivalent and short-term investments) adjusted of IFRS 16 lease liabilities. The IFRS EBITDAO corresponds to the IFRS operating income adjusted of amortization, depreciation and impairment expense of intangible and tangible assets and of non-cash share-based payment expense (excluding related social charges).

All financial information is reported according to IFRS. In addition, the Company has provided supplemental non-IFRS financial information, which excludes the effect of adjusting the carrying value of acquired companies' deferred revenue, share-based compensation expense and related social charges, amortization of acquired intangible assets and of tangible assets revaluation, lease incentives of acquired companies, other operating income and expenses, net, including the payment of goodwill and acquired intangible assets, certain one-time financial revenue items and the income tax effects of these non-IFRS adjustments.

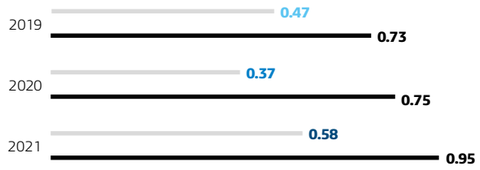
ORGANIC REVENUE GROWTH OF +11%[1] (M€)



STRONG OPERATING MARGIN IMPROVEMENT (%)



DILUTED NON-IFRS EPS[2] (€) UP +26%

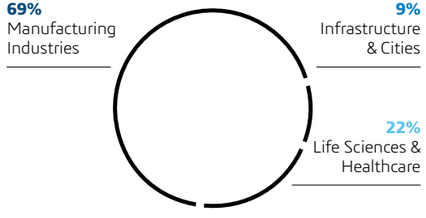


NET CASH FROM OPERATIONS (M€) INCREASED IN 2021

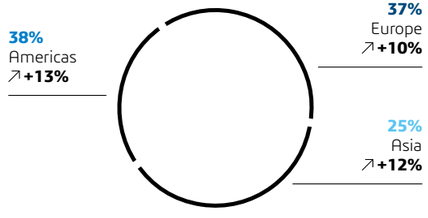
ADJUSTED NET DEBT / EBITDAO RATIO BELOW 1X[3]

IFRS non-IFRS

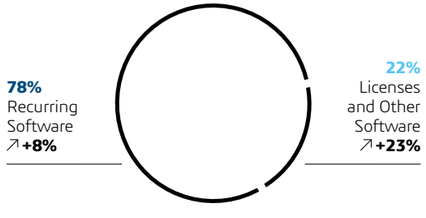
3 STRATEGIC SECTORS



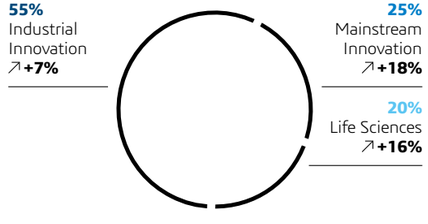
CONTINUOUS MOMENTUM IN AMERICAS, RESILIENCE IN EUROPE AND MARKET EXPANSION IN ASIA



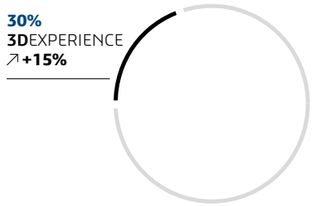
PREPONDERANCE OF RECURRING SOFTWARE REVENUE



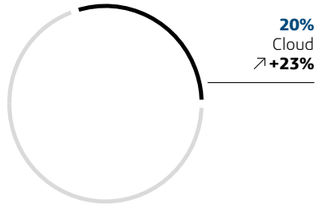
LEADING PRODUCT LINES



3DEXPERIENCE MOMENTUM



STRONG CLOUD GROWTH



DIAGRAMS LEGEND

X%
share of non-IFRS software revenue

↗+X%
non-IFRS software revenue growth in constant currencies

Our product line financial reporting includes: 1) Industrial Innovation software revenue, comprised of our CATIA, ENOVIA, SIMULIA, DELMIA, GEOVIA, NETVIBES, and 3DEXCITE brands; 2) Life Sciences software revenue, comprised of our MEDIDATA and BIOVIA brands; and 3) Mainstream Innovation software revenue, comprised of our CENTRIC PLM, and 3DVIA brands, as well as our **3D**EXPERIENCE WORKS family, which includes our SOLIDWORKS brand.

To measure the progressive penetration of **3D**EXPERIENCE software, we use the following ratios: a) for licenses revenue, we calculate the percentage contribution by comparing total **3D**EXPERIENCE licenses revenue to licenses revenue for all product lines except SOLIDWORKS and acquisitions ("related licenses revenue"); and, b) for software revenue, the Group calculates the percentage contribution by comparing total **3D**EXPERIENCE software revenue to software revenue for all product lines except SOLIDWORKS and acquisitions ("related software revenue").

2021, year of rebound

(All figures are non-IFRS and revenue growth rates are in constant currency)

"The strong business momentum we experienced throughout the year continued into the fourth quarter, resulting in performance well aligned with our objectives. Total revenue grew 10% with licenses and other software revenue increasing 15%, and support and subscription rising 8%. Services revenue was up 10%. Diluted EPS grew 17%. Operating margin expanded 80 basis points year-over-year to 36.8%, versus the high-end of our guidance of 36.4%. We continued to invest in expanding our team during the quarter.

Overall, for 2021, we achieved excellent performance. Our three product lines delivered with Industrial Innovation growing 7%, Life Sciences increasing 16% and Mainstream Innovation up 18% on the back of broad-based demand across regions and industries. In terms of strategic objectives, **3D**EXPERIENCE software revenue increased 15% with cloud software revenue rising 23%. Our **3D**EXPERIENCE platform has been a competitive advantage and key factor in driving new client wins. The cloud has been the preferred option for new entrants while we believe we're seeing an inflection point in incumbents recognizing the value of cloud deployment.

It's clear the strategic initiatives we undertook a decade ago – introducing our purpose and creating our **3D**EXPERIENCE platform and cloud infrastructure – are being validated. We are very well positioned to capitalize on the expansion of our total addressable market, expanding our footprint and leveraging our large, installed base with industry solutions.

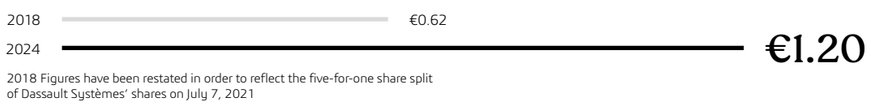
We are thrilled to have Rouven Bergmann in the role of Chief Financial Officer. Rouven's significant experience will be indispensable in ensuring continuity in financial operations as we continue to deliver and scale game changing innovation for our clients."

Pascal Daloz,
Chief Operating Officer

"For 2022, we expect the broad-based demand dynamics we experienced in the fourth quarter to continue into next year. We are targeting non-IFRS total revenue growth of 9% to 10% in constant currencies and software revenue growth in the same range. Our diluted earnings per share objective is 3% to 6% growth, reaching €0.98 to €1.00."

Rouven Bergmann,
Chief Financial Officer

2018-2024 NON-IFRS EPS OBJECTIVE



2018 Figures have been restated in order to reflect the five-for-one share split of Dassault Systèmes' shares on July 7, 2021

Shareholders' information

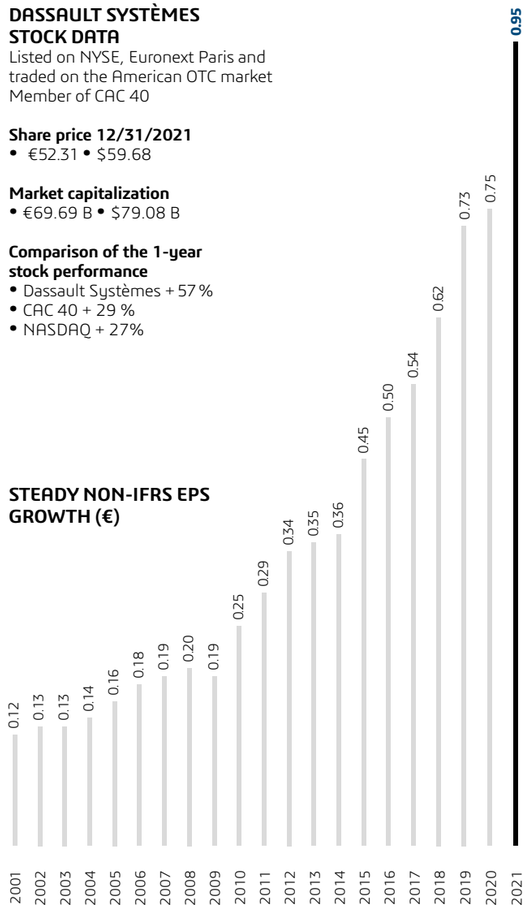
DASSAULT SYSTÈMES STOCK DATA
Listed on NYSE, Euronext Paris and traded on the American OTC market
Member of CAC 40

Share price 12/31/2021
• €52.31 • $59.68

Market capitalization
• €69.69 B • $79.08 B

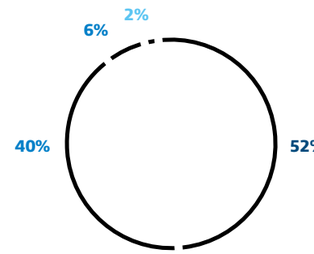
Comparison of the 1-year stock performance
• Dassault Systèmes + 57 %
• CAC 40 + 29 %
• NASDAQ + 27%

STEADY NON-IFRS EPS GROWTH (€)



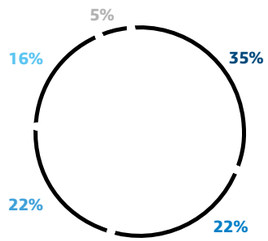
Figures have been restated in order to reflect the five-for-one share split of Dassault Systèmes' shares on July 7, 2021

SHAREHOLDERS' COMPOSITION (CONTROLLED CAPITAL)



52%	Free float
40%	Groupe Industriel Marcel Dassault
6%	Charles Edelstenne
2%	Bernard Charlès

SHAREHOLDERS' COMPOSITION (FREE FLOAT)



35%	North America
22%	France
22%	UK & Ireland
16%	Continental Europe (excluding France)
5%	Rest of world

KEY 2022/2023 EVENTS

Wednesday, April 27, 2022 Release of first quarter earnings
Thursday, May 19, 2022 Annual shareholders' meeting
Tuesday, June 16, 2022 Capital markets day
Tuesday, July 26, 2022 Release of second quarter earnings
Wednesday, October 26, 2022 Release of third quarter earnings
Thursday, February 2, 2023 Release of fourth quarter earnings

SHAREHOLDERS' CONTACT
Tel.: +33 (0)1 61 62 69 24
E-mail : investors@3ds.com
https://investor.3ds.com/

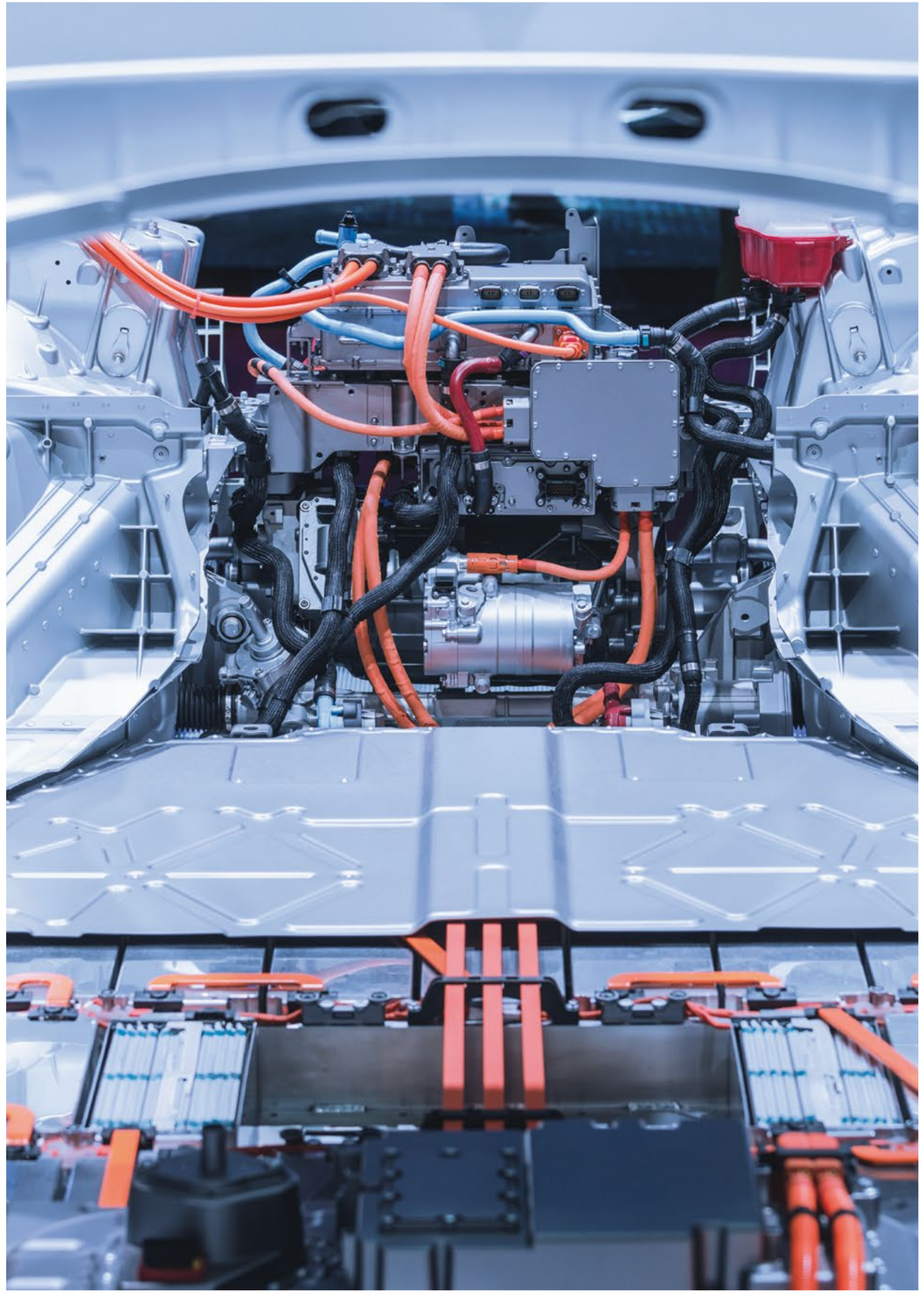
UNTiL NOW

Manufacturing was all about the product

FROM NOW ON

Manufacturers will put sustainability first

VIRTUAL TWIN TECHNOLOGY IS TRANSFORMING MANUFACTURING by changing the way products and services are developed in three significant ways: making sustainability and carbon footprint reduction an imperative; making the experience of a product or service the primary focus; and reinventing the way stakeholders work together to create new business models that include the entire ecosystem.



Making sustainability an imperative

Manufacturers are actively seeking new ways to manage products and services over the entire lifecycle. There are two main reasons for this: bring consumers new experiences and new solutions to climate change. This means rethinking every stage of the process, from design to usage and end-of-life management. Virtual twins have a critical role to play in accelerating sustainability. They help companies reduce costs, resources and carbon footprint, and can support disruptive innovation and agile, customer-centric, more circular business models. Virtual twins help shorten product development times and improve manufacturing quality, as well as support more efficient use and recovery of resources.

Reducing time-to-market and risk in complex projects are key reasons why virtual twins have been used in developing 85% of the world's electric vehicles, more than 75% of global wind power projects, and breakthrough sustainability pilots such as the world's first solar airplane.

This transformation impacts nearly every business across all sectors; a battery startup like Olenergies and a paperboard producer like Metsä Board share the same imperatives in terms of sustainability and can benefit from virtual twins to address their needs.

OLENERGIES The **3D**EXPERIENCE Cloud platform enables cobalt-free lithium battery manufacturer Olenergies to manage everything from customer collaboration to design, manufacturing and supplier integration. The French startup can accelerate engineering and validate new solutions, while reducing resources and project execution costs. Virtual twins created in the platform reduce the need for people and physical prototypes to be shipped around the world, since all employees, partners and suppliers can seamlessly and securely collaborate in real-time, no matter where they are located.

METSÄ BOARD Facing customer demand for more sustainable packaging (Fig.1), Finnish company Metsä Board, one of the top paperboard producers in Europe, needed an alternative to physical prototypes. To remove time-consuming testing procedures, Metsä Board used the advanced simulation technologies of the **3D**EXPERIENCE platform to create virtual twins of its packaging solutions and rapidly compare their performance in simulated conditions against customers' existing solutions.

"By analyzing the properties of packaging samples, we can recommend lighter weight that will perform equally well, while minimizing both carbon footprint and costs. We can also improve functionality, recyclability and brand impact, ensuring that we maximize the performance of the packaging. Compared to physical prototyping, we can deliver data-based recommendations 85% more quickly. Our customers now benefit from a much faster and far easier experience." **Markku Leskelä,** Senior Vice President of Development, **Metsä Board.**

3.

Making experience the primary focus

As they become conscious of the environmental impact of their choices, companies must also take into account not just what a product is but how it will be personalized to meet customer demand. They must also consider how it will be used over its entire lifecycle, including product second life or end of life.

VISCON Netherlands-based Viscon develops innovative machinery and complete production lines for the food and agro industries (Fig. 2). To better serve their existing customers, as well as adapt their solutions to new markets, the company decided to digitally map their processes, from ideation to manufacturing to virtual commissioning to services. Using virtual twins created on the cloud-based **3D**EXPERIENCE platform allows Viscon to improve their selling experience by showing 3D layouts of the configured modules and machines; this helps improves overall quality and decreases commissioning time.

VERTICAL AEROSPACE UK aerospace and technology company Vertical Aerospace is aiming for its piloted, four-passenger electric aircraft — the VX4 (Fig.3) — to achieve full certification and commercial flights by the middle of the decade. The company's exacting standards require every component of the aircraft to be carefully and flawlessly manufactured and the **3D**EXPERIENCE platform is helping their engineers and supply chain alike to design, test and validate each structure through virtual twins.

"The vehicle we're developing is an all-electric battery powered aircraft. We're seeing a massive transformation in the technologies that we're starting to use. We started with an aircraft that is fairly heavily automated, so much of the pilot workload is done automatically, but the pilot is ultimately in the vehicle and able to take control." **Michael Cervenka**, President, Vertical Aerospace

Reinventing the way we work together

The manufacturing sector is under pressure, reinforced by the COVID-19 crisis, to meet the expectations of a digitally advanced workforce. This requires adopting the new technology, tools and machinery that will define jobs in the years to come. It extends to the entire ecosystem of stakeholders, whose needs and demands must be taken into account at every stage of the production process. Thanks to virtual twins, companies can mirror their physical manufacturing value streams virtually, to quickly and cost-effectively create and test new concepts and ideas, and ultimately create a more customer-centric, agile and sustainable business model.


1.


4.


2.

5.

MEYER WERFT Leading cruise ship builder Meyer Werft used the **3D**EXPERIENCE platform to build one of the first LNG-fueled cruise ships. Creating a virtual twin of a highly complex ship lets hundreds of different teams collaborate on design, production, operations and maintenance. The integrated, open **3D**EXPERIENCE platform even enables Meyer Werft to automate selected design processes, and to integrate project data generated by legacy digital design tools used by its suppliers. This supports a smooth and gradual transition to a unified and integrated business experience.

"Extending our use of the **3D**EXPERIENCE platform is part of our ambition to more efficiently design and build innovative cruise ships. We aim to unify tools and processes across our sites. As we are in the construction phase for our first ship designed with the **3D**EXPERIENCE platform, our partnership with Dassault Systèmes continues to strengthen to achieve this." **Paul Meyer**, CIO, Meyer Werft

GEBERIT To drive collaboration further by taking a data-based approach across all disciplines, Geberit, a Swiss manufacturer of sanitary products, adopted the **3D**EXPERIENCE platform to standardize its ceramics development approach. The company created a virtual twin of its manufacturing equipment and buildings in order to simulate the trajectories of its machines when installing and moving them to ensure they work. In some areas it also simulated the machinery, including robot pathways, to avoid any errors in the production process.

Having a single platform helps Geberit launch new products (Fig. 4) more quickly, as their mold designers can explore a variety of ideas with the 3D data model. This allows them to come up with the best result early in the product development phase, avoiding the need for costly and labor-intensive physical prototypes. External product developers and ceramic experts across Europe can also use these 3D models to produce the molds. Geberit can now identify potential problems early on and avoid production reruns that can increase waste and drive up costs.

Our partnership with Renault

Indeed, virtual twins on the **3D**EXPERIENCE platform are enabling the transformation of the manufacturing industry. In 2021, **RENAULT** announced their "Renaulution" approach to develop programs for new vehicles (Fig. 5) and mobility services. The **3D**EXPERIENCE platform supports these initiatives through real-time sharing of all product-related data throughout the product life cycle, as well as managing the virtual twins of its diverse product configurations.

In the race to decarbonize, automakers are under pressure to accelerate time-to-market of electric vehicles. Virtual twins are helping Renault make a strategic shift from a product to a technology, services, and energy enterprise platform.

Renault will deploy the **3D**EXPERIENCE platform on the cloud to more than 20,000 employees in vehicle development functions such as design, product engineering, industrial process engineering, parts, and materials purchasing, costing and quality. The platform will provide real-time access to the same systems and software, 3D modeling and simulations across the world. The large-scale collaboration leveraging virtual twins promises to improve data sharing between different functions and increase agility within the company, while reducing costs and vehicle development time by approximately one year. Further, because the solutions are deployed on the cloud, Renault Group will benefit from continuous technological evolutions and functional enrichments, without having to wait for updates.

"The **3D**EXPERIENCE platform connects engineering to all disciplines in one digital company. We will gain agility, speed and effectiveness to develop new mobility faster than ever." **Luca de Meo**, CEO, Renault Group

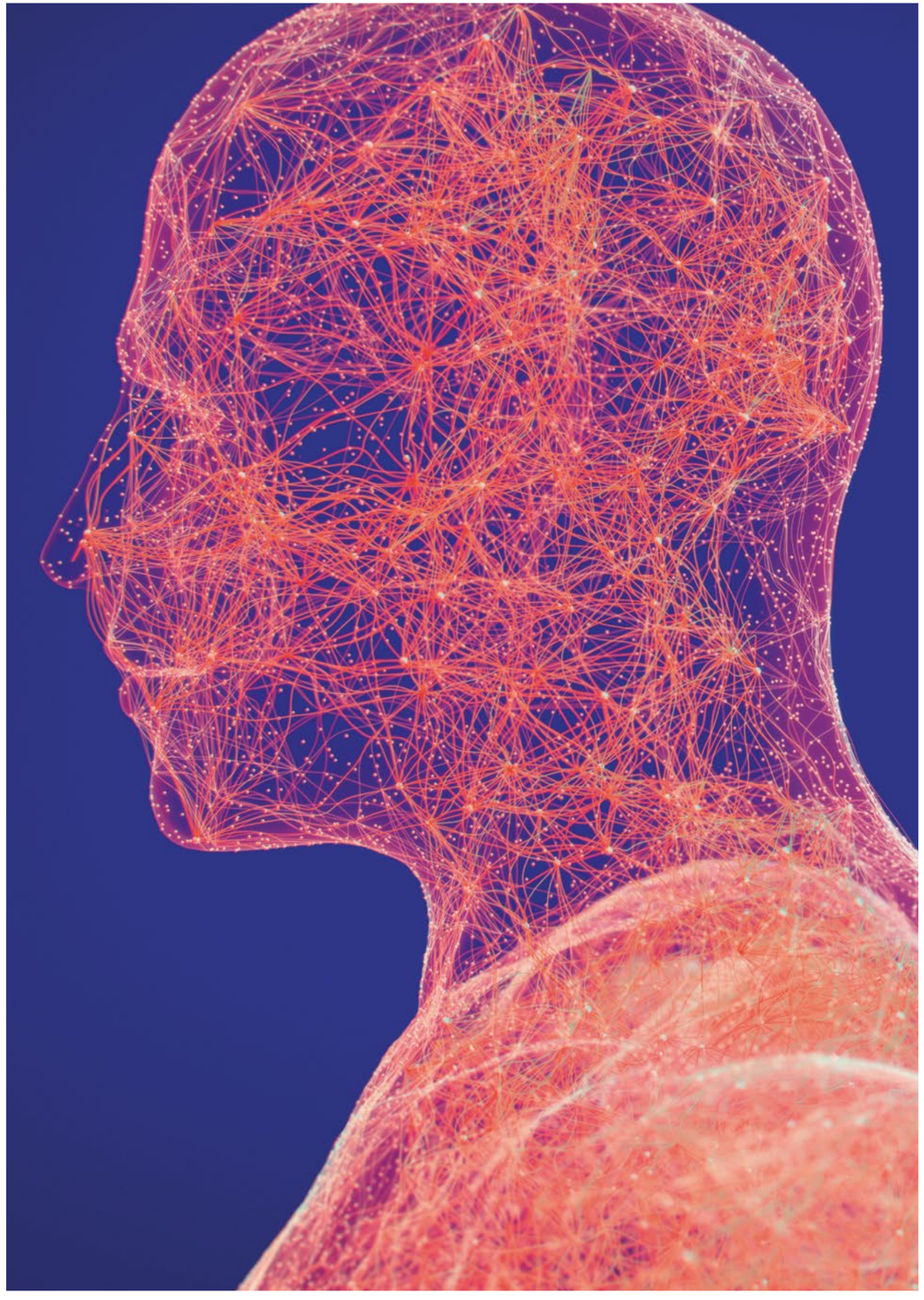
UNTiL NOW

Medicine was one-size-fits-all

FROM NOW ON

Virtual twins of the human body will enable precision medicine

3D mockups have revolutionized how companies in aerospace, automotive and shipbuilding design, optimize and produce complex products. Now Dassault Systèmes is using virtual models to transform how the human body is understood, diagnosed, treated and cured. **THE GOAL: TO CREATE A HOLISTIC AND INTEGRATIVE SOURCE OF PERSONAL HEALTH INFORMATION FOR PATIENTS AND HEALTHCARE SYSTEMS.**



Virtual twins of humans are the key to ushering in the next frontier in precision medicine. These experiential views of a patient's unique anatomy and health status give practitioners an entirely new way to study each person, along with new methods of collaboration within the fragmented medical community. Moving from the traditional one-size-fits-all approach to one that treats each patient as an individual creates the possibility for better patient outcomes, through therapeutics tailored to target a specific disease for a specific patient, surgery and interventions designed to fit their unique anatomy and devices and prostheses engineered or printed on demand.

Extending its legacy of pioneering 3D virtual twin technology to transform the inorganic world, Dassault Systèmes is working on advanced projects in the organic world for the heart, brain and skin. Indeed, many therapeutic areas (cardiology, neurology, orthopedics, pulmonary) are already showcasing major innovations, with patients benefitting from unique and unprecedented treatments. Thanks to these first achievements, we are on the brink of producing a full virtual twin of the human body, making possible a holistic view of all facets of an individual's health, fine-tuned by observations and measurements performed in the real world.

Toward a healthier future

"Modeling the human body is no longer a dream; it's a commitment by Dassault Systèmes that will no doubt change the future of life for generations to come." **Steve Levine,** Founder, Living Heart Project & Senior Director Virtual Human Modeling.

Several initiatives are already helping researchers, device manufacturers and doctors to develop highly accurate virtual models for understanding disease, developing therapeutic solutions and assessing treatment options. Three of these projects, are well underway.

A 3D model of the complete human heart

The Living Heart Project (LHP), launched in 2014, brings together researchers, educators, medical device developers, regulatory agencies and practicing cardiologists to develop a scientifically accurate and fully functioning virtual model of the complete human heart – and apply it to improving outcomes for actual patients. The goal is to ensure the right approach is chosen for each person prior to surgery.

Constructed from an understanding of human heart tissue, structure and electrophysiology, and completely adaptable to mimic an individual person or a population, this virtual medical reference is in use around the world, helping to understand structural and hemodynamic heart disease.

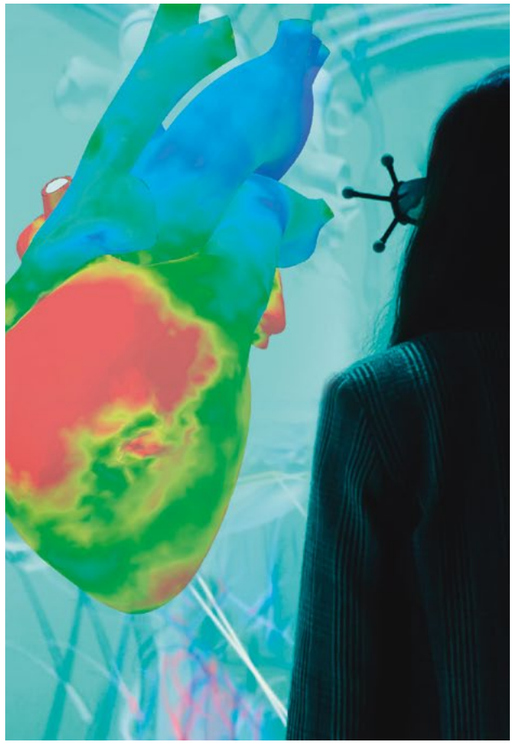
"I think there's a lot of ways 3D models can impact how we treat tiny hearts with incredibly complex defects to really transform the patient experience.

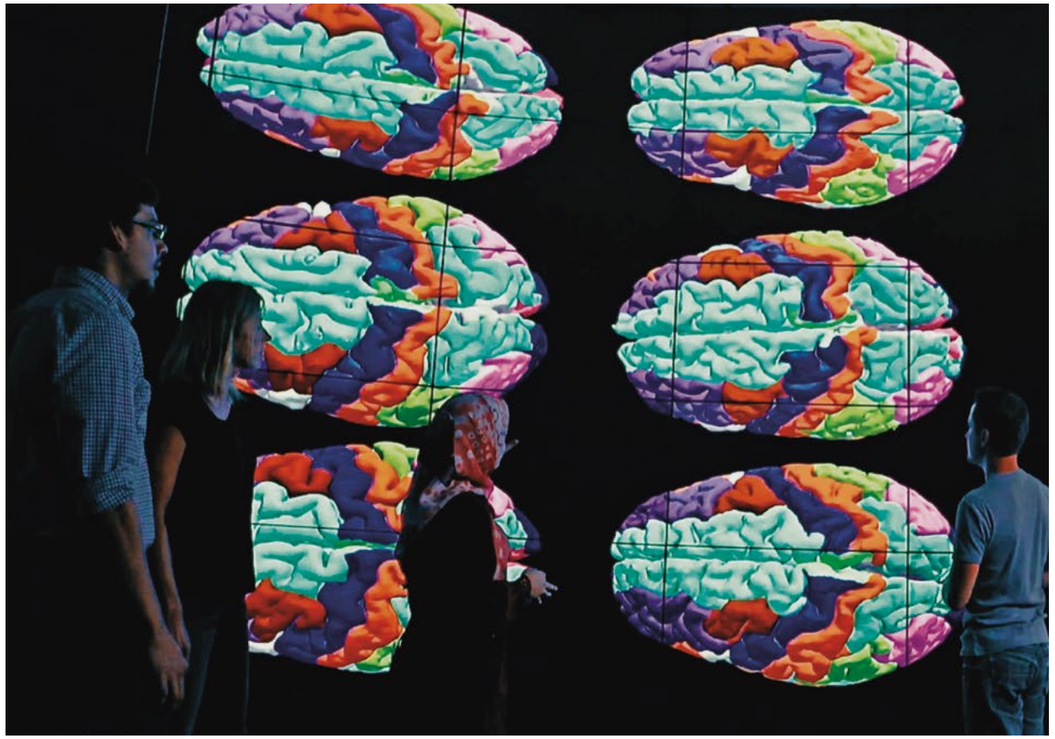
Dr. David Hoganson,
assistant in the Department of Cardiac Surgery
and director of the Computational 3D Visualization
Program at Boston Children's Hospital

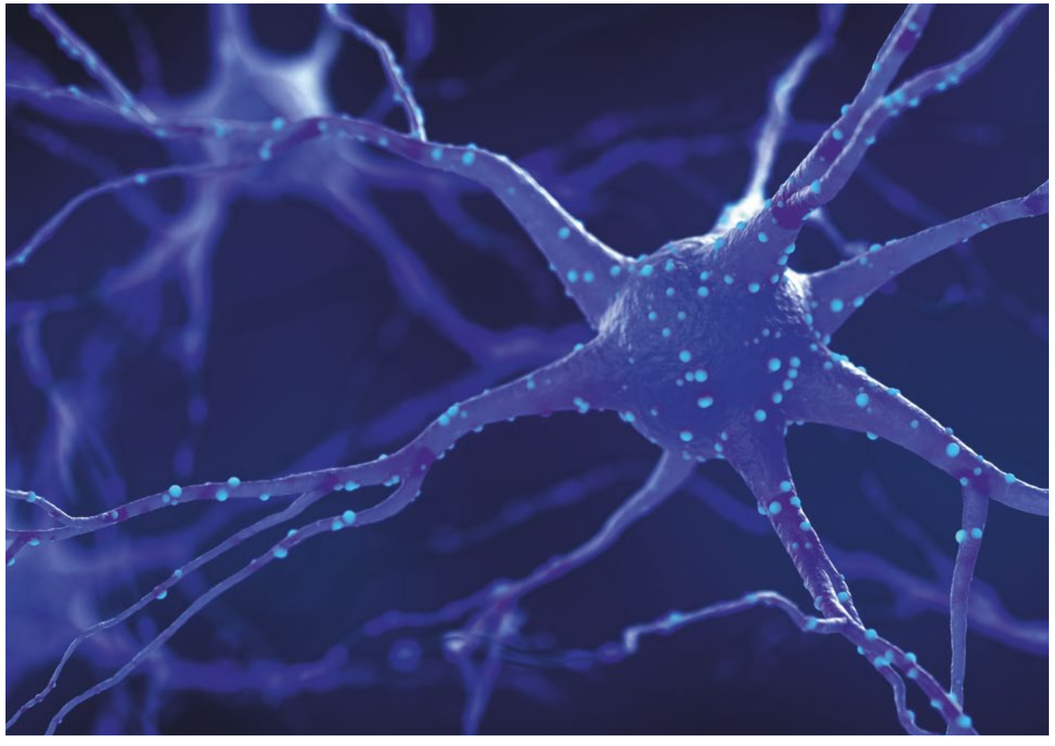
Surgeons at Boston Children's Hospital have used LHP technology to virtually plan surgeries, as well as to improve communication with the families of their young patients. Belgian digital health tech firm FEops has developed a virtual twin-based pre-operative planning platform for structural heart interventions. Researchers at McGill University, Montreal, used the model to understand the impact of COVID-19 on patients with heart conditions. And the US Food and Drug Administration (FDA) is leading a five-year project that will culminate in an *in silico* clinical trial using the 3D-simulated model to create a focus group of virtual patients. Experts believe the LHP has the potential to reduce human trials from years to days – a far more efficient method to achieve regulatory approval of cardiovascular medical devices while also reducing the burden on animal and human testing.

Modeling the brain in 3D

Discovering the success of the LHP prompted clinicians and neurologists to approach and get Dassault Systèmes involved in a project for help improving epilepsy surgery management and prognosis. The result: EPINOV, the Living Brain for epilepsy surgery project, a public-private partnership with French hospitals, especially the La Timone Hospital in Marseille (AP-HM), the Hospices Civils in Lyon (HCL), and the French Institute of Health and Medical Research (Inserm), under the lead of Aix-Marseille University (AMU).







A virtual twin of each patient's brain holds great possibilities in epilepsy surgery, where the success rate is low for some kinds of epilepsies and errors in estimating the parts of the brain to target can result in cognitive deficits. Since 2018, a clinical trial has used virtual twins of the brain constructed from patient imaging and electrophysiological data calibrated to the typical seizures of a patient. This novel approach has the potential to raise the success rate of surgery for drug-resistant epilepsy patients.

"Using virtual twins for epilepsy surgery has the potential to significantly improve some people's quality of life and reduce the burden for the system of care." **Dr. Nicolas Gazeres,** Virtual Twin of Human Technology Director, Dassault Systèmes

Living skin: healing wounds

As the largest organ, skin provides many essential functions: from shielding against external aggressions by pathogens, chemicals and radiation to thermoregulation, and serving as the body's alert system against harm. Dassault Systèmes has developed a multiscale model of skin, based on its fundamental molecular properties, that can accurately predict the penetration of chemicals through skin layers. This virtual model is being used to design predictable drug delivery systems for painless injections, secure wearables, and eventually, injectables that adapt to an individual's shape, size, body chemistry and mobility.

Even more complex models of skin are being used to understand the dynamic process of wound healing, a major burden on the healthcare system.

But that's just a start. In partnership with Urgo Medical and other experts, Dassault Systèmes has launched GENESIS, a project to create artificial skin for healing deep wounds, especially for burn victims. This represents an alternative to autografts, which require multiple surgeries, a long hospitalization and then ongoing treatment. The project also underlines the growing importance of virtual twins in advanced therapeutics for skin.

Accelerating precision medicine

Using regulatory grade, historical clinical trial data to augment or replace randomized controls, Medidata's Synthetic Control Arm® (SCA), a type of external control, helps advance targeted therapeutics and personalized medicine. Awarded "Best AI-based Solution for Healthcare" in the 2021 AI Breakthrough Awards, Medidata's SCA helps accelerate development of new drugs by combining virtual and clinical evidence, avoiding large randomized clinical trials. By merging personalized models with machine learning, the virtual twin will help sponsors develop drugs and patients get the best available treatment for them.

"We are convinced that by creating the virtual twin of the human body we can catalyze a transformation of the healthcare ecosystem and expand healthy expectancy within an efficient and sustainable healthcare system."

Claire Biot,
Vice-President, Life Sciences
& Healthcare Industry, Dassault Systèmes

UNTiL NOW

Craftsmanship was the main focus in the construction industry

FROM NOW ON

The industry is delivering tailor-made projects using industrial methods, including virtual twins

Dassault Systèmes joined forces with Bouygues Construction, a global leader in construction and services, to accelerate the digital transformation of the construction industry. **THIS INVOLVED LEVERAGING A VIRTUAL TWIN TO OPEN NEW HORIZONS WITH CLOUD-BASED, MOBILE-ENABLED APPROACHES FOR THE CONSTRUCTION INDUSTRY AND ITS ECOSYSTEM.**

Using technology to address industry challenges

Construction is one of the oldest industries, and also one of the last to become digitalized. The working process has remained largely unchanged, and productivity has stagnated. Bouygues Construction believes embracing digital technology is the way to address existing challenges and support customization at scale.

Bouygues Construction tested this idea with a renovation project for an Art Deco swimming pool in Pantin, a Paris suburb. The company used the **3D**EXPERIENCE platform to manage every element of the extensive transformation into a modern, dual-purpose facility for art and sports. This involved restoring the original swimming pool and constructing a new conservatory overlooking a landscaped garden.

Combining technical prowess, bold architecture and high environmental standards, the Pantin project offered an opportunity for Bouygues Construction to test new working methods and to improve collaboration among all stakeholders across the value chain using construction virtual twins.

Connecting the dots on the cloud

By bringing all data and information together in one place on the Pantin project, the **3D**EXPERIENCE platform helped to break down communication barriers, identify potential construction issues and delays, and address them before they became bigger issues on site.

"The objective of the virtual twin is to deliver on the promise of construction before construction. It means we can adjust all the irregularities that we imagine, have a model that is really constructible, and avoid mistakes when we are on site. Once the design is finished and executed, questions are no longer raised about its integrity." **Frédéric Gal,** Program Director of Business Transformation, Bouygues Construction

Supporting people and sustainability goals

Since all data related to the project is stored on the **3D**EXPERIENCE platform, stakeholders across the value chain – from design to execution, operation and maintenance – were connected. This facilitated collaboration among remote workers, connected people across the organization and brought multidisciplinary teams together within a single environment.

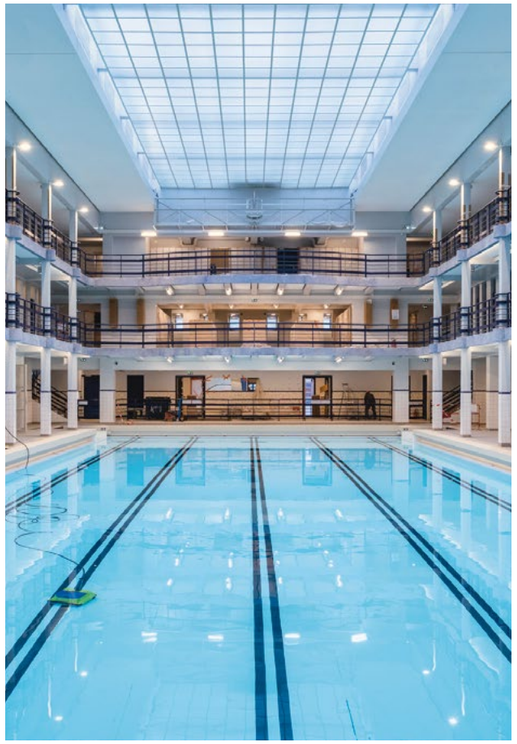
Team members everywhere could connect remotely to the platform, benefiting from constant updates and knowing they were working with the most up-to-date version of the project.

Sustainability also benefited. Bouygues Construction has committed to reduce its carbon emissions by 40% by 2030. The **3D**EXPERIENCE platform is helping the company meet this objective by making it easier to calculate greenhouse gas emissions. The platform also allows Bouygues Construction to improve traceability, optimize materials and enhance the layouts of different elements to reduce waste.

> "Pantin was a great adventure; together we are opening up an extraordinary field of possibilities. We expect this collaboration to help revolutionize the construction industry."
>
> **Frédéric Gal,**
> Program Director of Business Transformation,
> Bouygues Construction

Tailor-made construction with industrial methods

The two companies have formed a strategic partnership to encourage the construction industry to simplify and streamline project organization and interactions across the value chain, using cloud-based and mobile-enabled solutions. But the collaboration goes further, embracing in particular a more systemic and modular approach with the ambition of transforming the industry



at large. This involves the creation and modeling of building-system product lines using modular and parametric components embedded with the teams' knowledge and know-how. Each project becomes an assembly of these smart components, constituting a virtual twin that is fully created in the **3D**EXPERIENCE platform. Interactions among developers, architects, subcontractors and suppliers can then take place on the platform.

This approach makes it possible to achieve the most optimized and sustainable design for each project. Fabrication, supply, assembly and construction processes can then be streamlined, anticipating the various phases of a project at the earliest possible stage and planning their on-site implementation in the finest detail. The result: time savings and optimized allocation of resources, from materials to people.

Applying the virtual twin approach to the entire Infrastructure & Cities ecosystem

Dassault Systèmes' manufacturing legacy will transform more than just building projects; it is helping to usher in a new level of productivity and improvement in the materials used in construction processes, the energy that powers the infrastructure and supply chain, and even the communities in which they are built.

1. Materials: AES

The world is trying reduce reliance on fossil fuels and generate less waste, and AES Autonome Energiesysteme has an innovative approach to this problem: recycle waste where it is generated and use it for that site's energy supply. The German startup's small-scale recycling plants can improve material reuse by decomposing organic structures into gas, oil and ashes, and using that for on-site heat/electricity generation and energy consumption. As a member of our **3D**EXPERIENCE Lab, AES has access to the **3D**EXPERIENCE platform for project planning, part design, fluid simulation and more, helping its customers reduce CO_2 footprint and costs.

2. Energy: ISC

ISC Consulting Engineering needed to centrally store its extensive project portfolio and design catalog for offshore substations. "Creating a virtual twin is something we've always been hoping for. We'll need everyone in the supply chain to understand that it makes good sense to spend more time and money on the design upfront so it's complete and leaves no decisions to be made during fabrication. As the industry moves towards a turnkey construction contracts (EPC) approach, I can see the need for this more precise digital representation to carry out operations more efficiently."

Christian Barlach,
R&D Manager, ISC

3. Infrastructure: CRDC

China Railway Design Corporation (CRDC) needed to improve its win rate of large-scale railway projects in China and abroad by adopting a novel approach to improve design efficiency and quality. CRDC is using virtual twins on the **3D**EXPERIENCE platform to model projects based on design and engineering templates, to test more design alternatives, and to validate their possibility. "We believe that the integrated **3D**EXPERIENCE platform and its unified data source will improve efficiency and design consistency through better communication between our design, engineering and construction teams. It's a more seamless way of working."

Changjin Wang,
Deputy Chief Engineer,
CRDC

4. Region: Grand Est

The **3D**EXPERIENCE platform has helped Grand Est, a major region in France with 5.5 million inhabitants, monitor and anticipate the impact of the COVID pandemic. By collecting and analyzing anonymized health data, Dassault Systèmes information intelligence solutions helped political and administrative authorities make better-informed decisions. This cockpit also included a predictive algorithm capable of projecting the number of patients in Intensive Care Units (ICU) three months ahead, thus providing hospitals with very powerful insights to anticipate future waves and adapt their resources accordingly.

UNTiL NOW

Sustainability has been an afterthought in design

FROM NOW ON

Designers are playing a key role in accelerating the circular economy

To highlight the need and the means to break the modern take-make-waste cycle, Anne Asensio, head of the Dassault Systèmes Design Studio, teamed with London-based, French-born architect Arthur Mamou-Mani, a passionate advocate of renewable architecture. **THEIR GOAL: TO HIGHLIGHT THAT SUSTAINABLE DESIGN PROCESSES BEGIN NOT WITH "WHAT DO WE WANT TO MAKE?" BUT "WHAT RENEWABLE MATERIALS SHOULD WE USE TO MAKE IT?"**

"Designers always think about materials," Asensio said. "Unfortunately, designers are rarely invited to participate in a project until after the 'what is it' has already been decided, which locks in the material choices and therefore impacts a project's sustainability. We wanted to make material selection the starting point, not an afterthought."

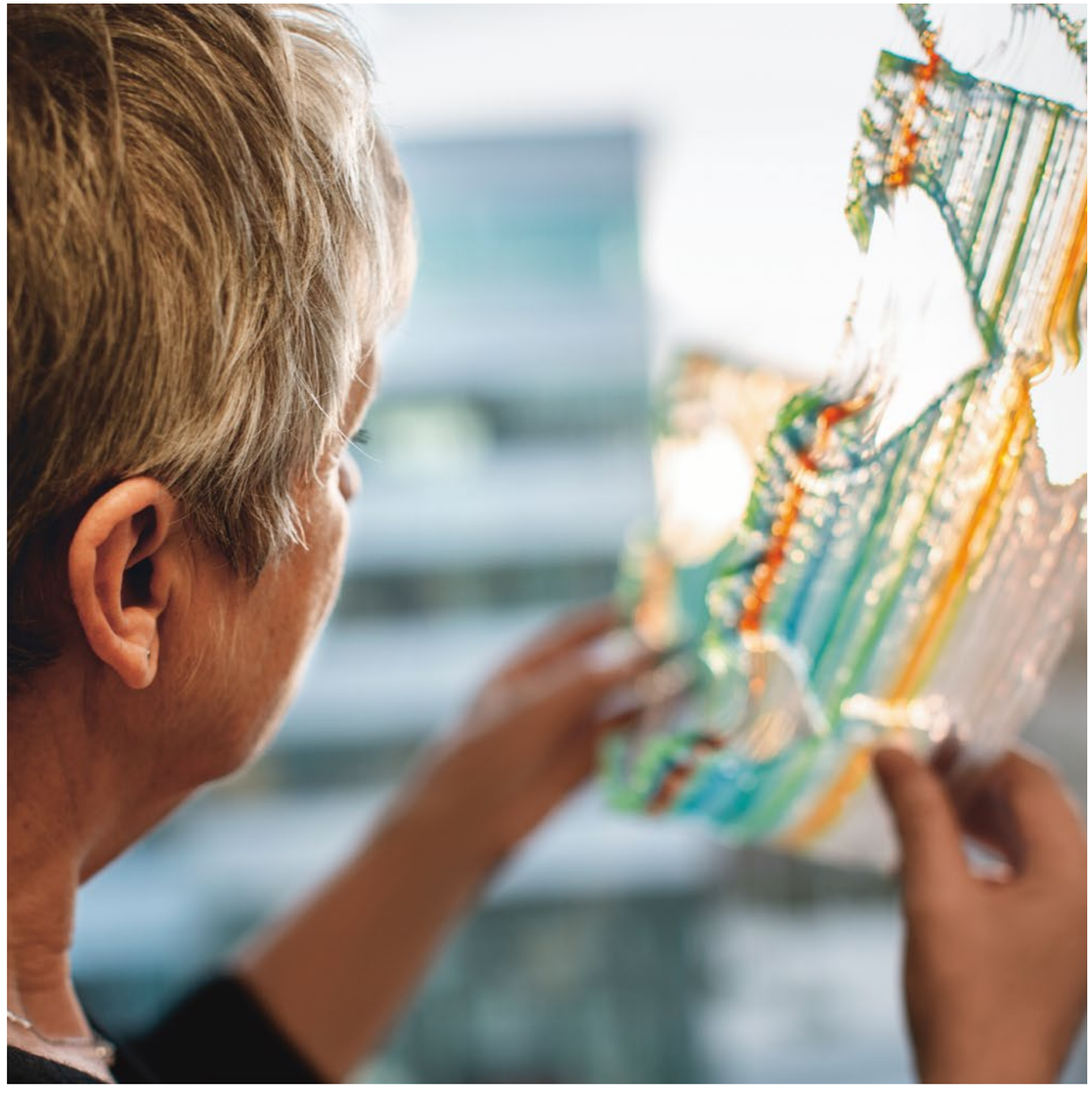
The result? AURORA, a fully renewable art installation of gold-and-crystal modules created from plant-based resin installed at Design Museum of London's atrium during its 2021 "Waste Age" exhibit.

AURORA embodies Asensio's regenerative "Design Thinking" approach to truly circular product creation. Using the **3D**EXPERIENCE platform, the globally dispersed Design Studio and Mamou-Mani team members designed the exhibit's components as virtual twins – scientifically accurate 3D computer models. The teams digitally scanned the museum's atrium, converted it to a virtual twin, and virtually assembled the components. This experience easily allowed for experimentation in arranging the modules and suspension structures, resulting in a design that was beautiful, structurally sound, safe for people to walk beneath and feasible to assemble and disassemble.

The platform's live-rendering capabilities allowed team members to view the virtual twin from any angle in different lighting, varying the textures and mixing opaque and clear materials. With just a few clicks, they repeatedly tweaked their selections to achieve the desired result.

They then output the modules to 3D printers that used PLA, a plant-based resin that can be crushed, re-melted and reformed into something new or recycled through industrial composting. Importantly, identifying PLA as the project's main material was the team's *first* step. Using the platform's Sustainable Innovation Intelligence capabilities, an integrated approach to life cycle assessment (LCA), designers understood the environmental impacts of their material and processes before they began to design, allowing them to create a visually stunning exhibit that embodies circularity.

AURORA was conceived as a collection of modular components that could be disassembled to build new products. And so today, its components serve as coffee-table bases, trellises and a host of other products. Unused components were crushed, ready to be re-melted and reformed into new shapes with new purposes.



"Design, sciences and industry are converging to conceptualize a new, unified practice in support of a limited planet."

Anne Asensio,
Head of the Dassault Systèmes Design Studio

UNTiL NOW

Women were under-represented in tech companies

FROM NOW ON

Companies are making conscious efforts to inspire, engage and empower women

As a company with 20,000 employees from 135 countries, we realize that disruptive innovation requires a diverse workplace – one in which women have an important role to play. That's why Dassault Systèmes is encouraging women by **GIVING THEM A VOICE THROUGH INTERNAL INITIATIVES.**

Women in top management of global technology companies are particularly conspicuous by their absence. Although a third of the workforce is female, that percentage plunges in leadership positions. Women hold only 10% of tech startup positions, for instance. This isn't due to a lack of interest or talent but rather a deficit of opportunities to develop certain skills.

Dassault Systèmes has championed the cause of gender diversity for more than a decade as part of our overall commitment to diversity, equity and inclusion (DE&I). In 2021 we committed to having 40% of executives and 30% of people manager roles held by women by 2025.

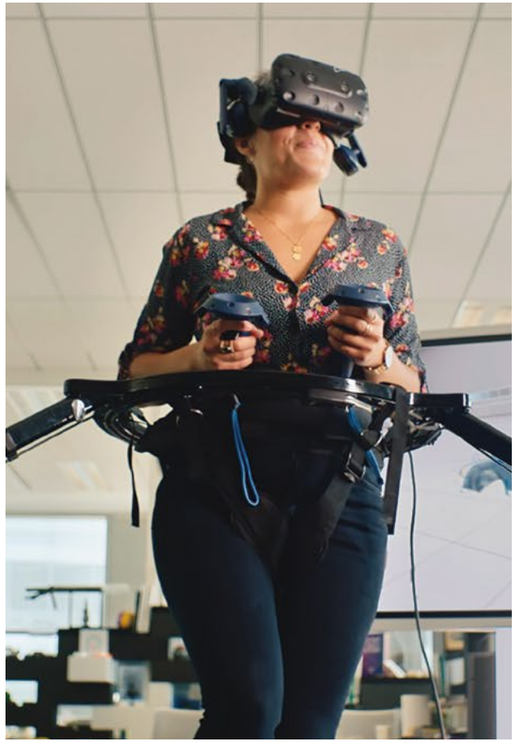
Those are ambitious goals; to reach them, we are relying on our decade-old women's initiative network, 3DS WIN, as well as the Rise Up! program, which aims to build an inclusive pipeline of future managers.

Rise Up! is a ten-month talent incubator integrating self, social, professional and inspirational learning. Thanks to self-awareness modules, co-development workshops and individual mentoring, Rise Up! enables women and men to accelerate the inclusive leadership skills they need to become successful managers. The target is to enroll +100 talents in this journey every year, with a ratio of 80% women and 20% men. In 2021, 96 diverse talents (84% women) and mentors all around the world joined the Rise Up! Program.

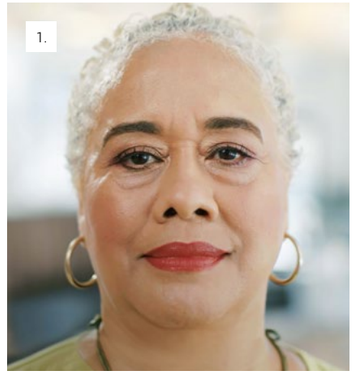
Testimonials from our talents reveal the value of the program:

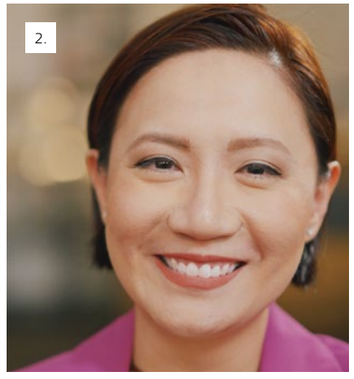
"The Rise Up! program allowed me to push myself to the next level, helping me improve my assertiveness, be a more effective listener and manager, and cope better with difficult situations."

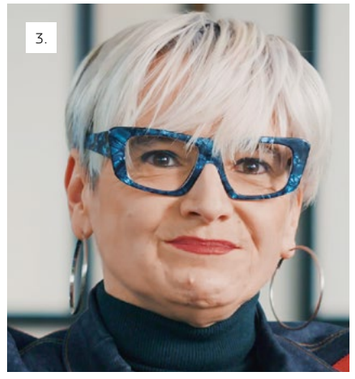
Amel Rahmoun
DELMIA Senior Solution Architect Manager



Dassault Systèmes also encourages women to explore careers in science through other avenues. Florence Hu-Aubigny, Executive VP, Research and Development, was featured in a recent book on women leaders, by Delphine Remy-Boutang, President, Global Entrepreneurship Network, France. Hu-Aubigny discussed her passion for science and her experience leading 3DS's global R&D team of 7,000 employees, encouraging young women to become scientists, engineers and leaders.







WIN Conversations

Launched to celebrate International Women's Day 2021, WIN Conversations is a video series that invites talented women from 3DS to talk openly and informally about their beliefs, career experiences and visions on gender diversity. Here are some excerpts:

1.

"It's vital to have people from different parts of life in your organization. We're a global economy, and to be effective in the marketplace, we need to have people who represent that marketplace in the organization. It's important to have a space for women to understand what their strengths are, where the opportunities are, and how to advance their career."
Linda Hassan,
Vice-President, Global Head of Diversity, Equity & Inclusion, MEDIDATA

2.

"The world of technology is very fast-paced and innovation is very important. But you can't have innovation without others. And there are bound to be people who disagree. What's at stake, if you don't bring people together, is that you tend to lose ideas. You can't debate and challenge each other for something that's much better than what you had originally thought of."
Josephine Ong,
Asia Pacific South Managing Director

3.

"In their studies, young women mainly choose biology, medicine or ecology in order to have a global impact in their day-to-day work. We need to convince them that they can also have an impact by choosing the virtual world and joining a tech company. Diversity is part of the Dassault Systèmes DNA. We find women in all functions of the company."
Pascale Montrocher,
Vice-President, Customer Solution Experience

UNTiL NOW

It was thought a company could not be both sustainable and profitable

FROM NOW ON

We are reinventing a sustainable economy where businesses can thrive while also pursuing science-based environmental goals

Dassault Systèmes not only provides customers with sustainable technology solutions: we also strive to be a sustainable company. We are committed to improving the impact of our environmental, social and corporate governance practices. Setting a clear, science-based path to 2025 and beyond **REINFORCES OUR COMMITMENT TO THE UN GLOBAL COMPACT AND ITS TEN PRINCIPLES, WHICH ALIGN WITH OUR COMPANY'S PURPOSE.**

Enabling sustainability with virtual twin universes

We strongly believe that virtual universes are a key enabler for our customers to imagine, design and test the radically new products, materials and manufacturing processes that drive a more sustainable economy, as quickly as possible. Our virtual twin solutions empower companies to calculate the environmental impact of every product decision while there's still time to make different, more sustainable choices. Specifically, applying a virtual twin can help support:

Decarbonization: create a carbon-free global economy through the targeted, technologically-enabled reduction of emissions across value chains, including alternative fuels, electrification, renewable energy, carbon-offset projects, lifecycle assessment processes and sustainable working practices.

Circular Economy: move away from the "take-make-waste" linear model by creating a new systems approach based on three principles: 1) eliminate waste and reduce pollution, 2) keep products and materials in use for a longer period of time and 3) regenerate natural systems.

Sustainable Production: do more and better with less, balancing resource management and the whole lifecycle of a product, from environmentally friendly raw materials to eco-design to recyclability.

Reduced Energy Use: make strategic decisions on how to reduce the amount and type of energy required by an organization to provide goods and services.

Sustainability performance

KEY 2021 RESULTS

83.7%
of employees have completed Ethics & Compliance training

38.5%
women in the Executive Committee

2.8 tCO_2-eq
per FTE of carbon intensity, down 58% from 2019 (includes COVID-19 impacts)

96.7%
employee pride and satisfaction rate measured by an internal annual survey

8%
decrease in GHG emissions from 2020, and down 18.1% from 2019

KEY RANKINGS

#19
Forbes Top 50 World's Best Employers

#5
Dow Jones Sustainability Index, 97th percentile in the global software sector

AA
MSCI ESG rating – measuring a company's resilience to long-term, financially relevant ESG risks

#9
Corporate Knights Global 100 Most Sustainable Corporations in the World

#7
Vigeo Eiris ESG Performance and Strategy Review, out of 83 in the software & IT services sector, with a score of 54

A-
CDP 2021 Supplier Engagement Rating

#Gold
Ecovadis Sustainability Questionnaire - 98th percentile, with a score of 72

La Fondation Dassault Systèmes

Since 2015, La Fondation Dassault Systèmes has supported the transformation of education, research, and the way we protect cultural heritage. It proudly sponsors projects that aspire to inspire future generation to reimagine and create a more sustainable and equitable world. We continued this mission in 2021, supporting projects across the world, including:

Mission Ocean: to facilitate student learning through virtual universes that allow them to deepen their knowledge in scientific disciplines while discovering the major challenges of the oceans.

Self-sufficient Smart Villages: to address challenges in India's rural villages created by a scarcity of continuous access to electricity, water, and waste disposal; students are developing circular economy solutions to produce, consume and recycle and reduce dependence.

Jumpstart Fellowship Program: to provide education and mentoring to diverse Boston high school girls, teaching them technical skills in the robotics industry – from programming to design and simulation, to hands-on building, prototyping and testing – helping build their confidence and future paths.

UNTiL NOW

We approached modern challenges by studying the past

FROM NOW ON

We will rely on virtual worlds to navigate humanity's most pressing social and environmental challenges

Dassault Systèmes is shedding light on 10 major challenges faced by humanity. Victoire de Margerie, Vice-President Corporate Equity, Marketing & Communications, has invited the world to **DISCOVER HOW VIRTUAL UNIVERSES CAN SPARK INNOVATIVE IDEAS AND GAME-CHANGING SOLUTIONS TO AGE-OLD CHALLENGES.** For each challenge, we respond with an Act that symbolizes and highlights our commitment to help our planet survive and thrive. Because we believe The Only Progress is Human, we also seek to inspire others to act in their own spheres, for the good of all.
Our latest Act: Heritage & Future.

Understanding the future by reconstructing the past

The arc of human progress is etched with inventions and innovations, many of which are driven by lessons from our shared history. As a science-based and purpose-driven company, Dassault Systèmes has been a catalyst for human progress for 40 years – two generations. Our passion, creativity and enthusiasm has helped develop the virtual world to improve and extend the real world. Many of our achievements can be seen through the lens of technology, but they were ultimately realized by people and for people.

Over the course of 2021, we seized the opportunity to leverage our rich knowledge and know-how to spark conversations to build bridges between the generations; those who made our past achievements possible, and those who will imagine the virtual twin experiences for future generations. Internally, this took the form of a podcast series where pairs of collaborators share their vision for innovation on topics ranging from the evolution of diversity, equity and inclusion to the rise of virtual clinical trials. Externally, our **3D**EXPERIENCE EDU team launched a global student exposition (on 3ds.com from May 2022) giving new life to iconic places and lost masterpieces. The most recent Act in our The Only Progress is Human campaign, Living Heritage enables current and future generations to experience historic sites and monuments as they may have existed in ages past by exploring virtual worlds created by students using the **3D**EXPERIENCE platform.

This celebration of our shared heritage invites us to explore how today's solutions can give us a greater understanding of our common past, unlocking countless learning opportunities, bridging the generations and helping map our way to a better future.

Student teams worldwide nominated projects they wanted to develop, and our judges chose six:

1.

Konark Sun Temple (Team India), a UNESCO World Heritage site dating to about 1250 AD. Dedicated to the Hindu sun god Surya, the temple complex was carved from stone to resemble a massive chariot, complete with wheels and horses.

2.

The Colosseum of Rome (Team USA), begun in 72 AD under emperor Vespasian and completed eight years later by Titus. Despite its immense size and age, it remains the world's largest standing amphitheater, capable of hosting an audience of 65,000.

3.

Shurijo Castle (Team Japan), a UNESCO World Heritage site that served as the Ryukyu Kingdom's palace from 1429 to 1879. Although repeatedly destroyed by fire and conquests over the centuries, nearly destroyed in the Battle of Okinawa in 1945, and heavily damaged by fire in 2019, the temple was always rebuilt.

4.

The Hanging Gardens of Babylon (Team Mexico), known in legend as a gift from the Babylonian king Nebuchadnezzar II for his homesick wife, Amytis. Although listed as one of the seven wonders of the ancient world, no archeological evidence of the gardens – rumored to have been destroyed by earthquake – has ever been found.

5.

Porta Nigra (Team Germany), a UNESCO World Heritage site, one of four Roman gates built as entrances to the city of Trier, Germany, around 170 AD. Although never finished, Porta Nigra is the last of the four still in existence.

6.

Pompeii (Team Netherlands), the ancient ruins of a thriving city of 20,000, was destroyed in a matter of minutes by the eruption of Mount Vesuvius in 79 AD.

Additional information

DASSAULT SYSTÈMES HEADQUARTERS
10, rue Marcel Dassault – CS 40501
78140 Vélizy-Villacoublay Cedex, France
Tel.: +33 (0)1 61 62 61 62

NORTH AMERICA
175 Wyman Street,
Waltham, MA 02451, United States
Tel.: +1 781 810 3000

LATIN AMERICA
85 Avenue Jornalista Roberto Marinho
13th floor – Suite 131
04576-010 São Paulo, Brazil
Tel.: +55 (11) 2348-9900

CENTRAL EUROPE
Meitnerstrasse 8
70563 Stuttgart, Germany
Tel.: +49 711 273000

WESTERN EUROPE
10, rue Marcel Dassault – CS 40501
78140 Vélizy-Villacoublay Cedex, France
Tel.: +33 (0)1 61 62 61 62

NORTHERN EUROPE
Riley Court, Suite 9, Milburn Hill Road
CV4 7HP Coventry, United Kingdom
Tel.: +44 (0) 247 685 7400

SOUTHERN EUROPE
Innovazione 3
Via dell' Innovazione, 3
20126 Milano Bicocca
MI, Italy
Tel.: +39 02 3343061

RUSSIA
Kuntsevo Plaza
Yartsevskaya Street, 19
121552 Moscow, Russia
Tel.: +7 495 935 89 28

SOUTHERN ASIA-PACIFIC
9 Tampines Grande Level 6
528735 Singapore
Tel.: +65 6511 7988

INDIA
Rajiv Gandhi InfoTech Park Phase 1
Industrial Area, Hinjewadi
5th Floor, Tower A, Plot No. 15/A
411057 Pune, India
Tel.: +91 20 6690 1144

CHINA
Foxconn Building, Unit 1701-04, F17
No.1366, Lujiazui Ring Road
200120 Shanghai, China
Tel.: +86 21 3856 8000

KOREA
ASEM Tower 9F,
517 Yeongdong-daero
06164 Gangnam-gu, Séoul,
South Korea
Tel.: +82 232707800

JAPAN
ThinkPark Tower 20F
2-1-1, Osaki, Shinagawa-ku,
141-6020 Tokyo, Japan
Tel.: +81 3 4321 3500

For more information, visit www.3ds.com

Investor relations
Tel.: +33 (0)1 61 62 69 24
Fax.: +33 (0)1 70 73 43 59
E-mail: investors@3ds.com

Design and production: HAVAS PARIS

10, rue Marcel Dassault
CS 40501
78946 Vélizy-Villacoublay Cedex, France

Tel.: +33 (0)1 61 62 61 62

3DS.com