2021/2022/**2023**
Corporate Report

UNTiL NOW...

...FROM NÖW ON

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

This virtual twin reveals a critical heart condition: mitral valve regurgitation or leakage of oxygenated blood backwards from the left ventricle to the left atrium (not shown) during the pumping of blood downstream to the body, potentially fatal if left untreated.
Created by the Living Heart team at Dassault Systèmes in conjunction with the US FDA Office of Science and Engineering Laboratories, researchers use multiphysics simulations such as this to recreate patient conditions to understand disease, provide more precise diagnoses and develop new treatments.

Credit: Dassault Systèmes

UNTiL NOW. . .

Dassault Systèmes has led the charge in virtualization, fundamentally reshaping industries. We've helped companies reinvent themselves to thrive in the Experience Economy, supporting our clients' move to experience-centric innovation over conventional products and services. From designing cutting-edge electric vehicles to rethinking shop floor operations to revolutionizing how the human body is understood and treated, our **3D**EXPERIENCE platform and virtual twin experiences have been the bedrock for companies looking to be more efficient, profitable and customer-centric. But we have not done enough to help those organizations consider the sustainability of our planet at every stage of the lifecycle.

. . .FROM NOW ON

We're propelling the shift to create the Generative Economy by 2040, a framework inspired by nature and the living world that transcends simple digitalization; it requires a sophisticated integration of technologies to merge the existing Experience and Circular Economies and deep alignment with societal and environmental values. Where products are developed with more economical and recycled raw materials, and it's possible to not just manufacture products but to grow them.

In the Generative Economy, the virtual world becomes the engine for innovation, sustainability and experiences that benefit people, citizens, patients, consumers and companies and the ecosystem we all inhabit. We're committed to fostering an infinite loop by seamlessly connecting the virtual and the real, where constant real-world feedback fuels continuous evolution. This creates what we call "the life of things": products are born, evolve and renew themselves through multiple lifecycles in harmony with nature and life.

Our dedication to helping our clients leverage the power of AI and data, and to work effectively in the virtual world, will transform the very fabric of industry, education, and urban development and redefine Manufacturing Industries, Life Sciences & Healthcare and Infrastructures & Cities.

We do all of this with relentless attention to social and ethical responsibilities. We protect the sovereignty of data, offering a secure framework for health, governmental and industrial data. We continue to provide programs to upskill the global workforce, helping to ensure people are armed with the skills needed as businesses evolve and technology redefines jobs – and we give special attention to supporting women's awareness of the breadth of opportunities offered by STEM careers.

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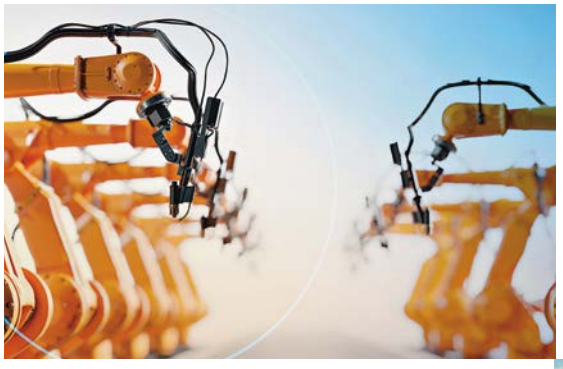

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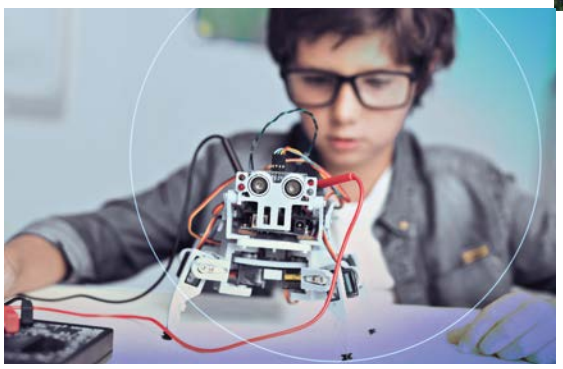

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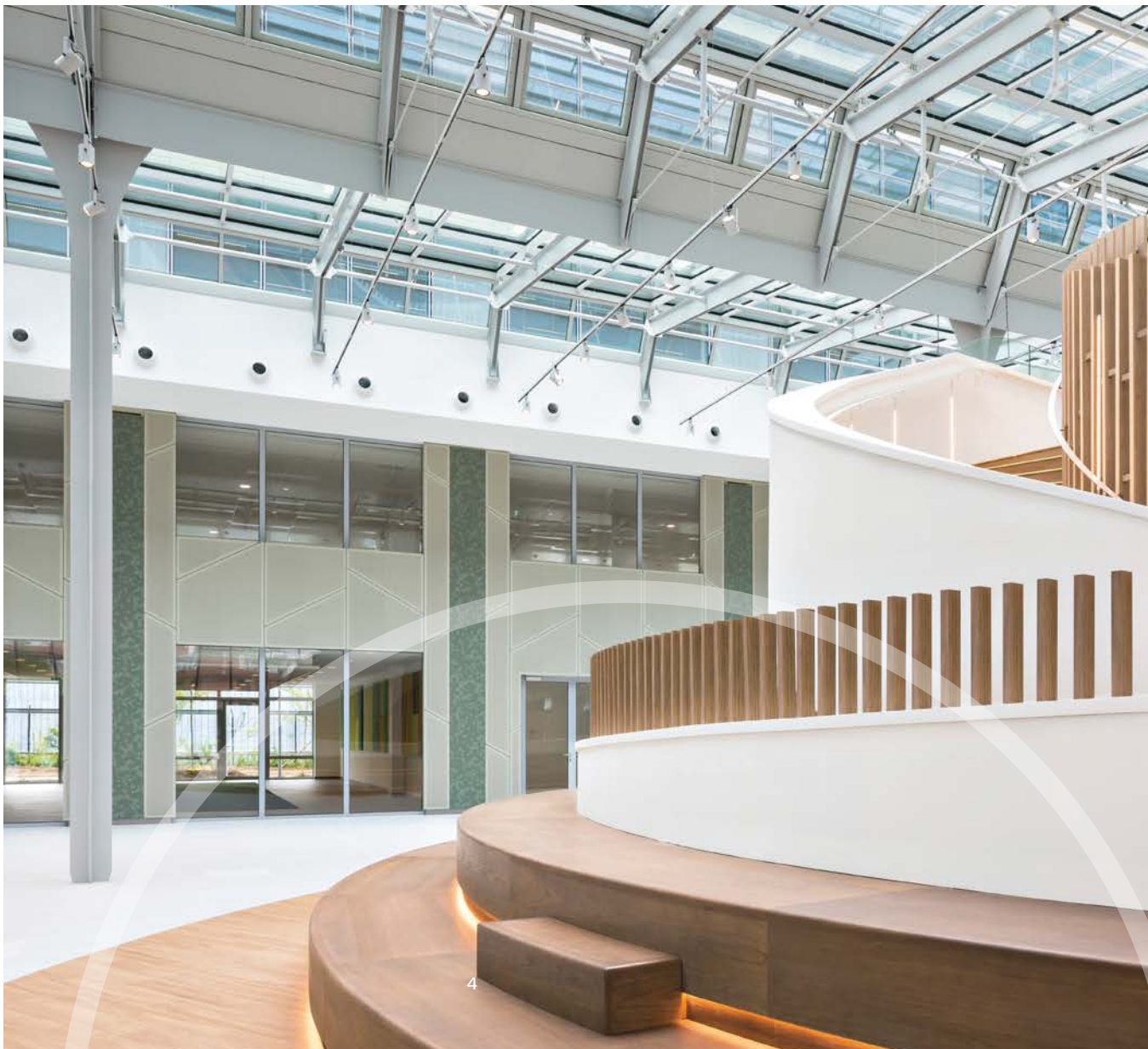
UNTiL NOW

Virtual twin experiences powered the Experience Economy, helping our clients meet customer demands from design to production and use of products

FROM NOW ON

UNIV+RSES – the combination of multiple virtual twins – will unify all stakeholders, facilitating the sharing of knowledge and know-how to shape the Generative Economy



Industry is undergoing a massive transition to enhance environmental responsibility and achieve climate neutrality. As more companies adopt a circular approach – breaking out of the take-make-waste model and moving to reduce-reuse-recycle-recover – they're increasingly thinking in terms of lifecycles and systems of systems. They're also challenged to keep a competitive edge through rapid innovation and operational efficiency, meet regulatory and sustainability deadlines, and decouple economic growth from resource consumption. Our science-based virtual twins tackle this complexity by combining data science, industry know-how, modeling and simulation boosted by AI. We've already helped organizations transform their design and manufacturing processes, and now we're their gateway to seamlessly connect the virtual and the real to form the Generative Economy: metamorphizing and reinventing how we create, produce and use for more sustainable ways of living.

Catalyst and enabler of the Generative Economy

Pascal Daloz
Chief Executive Officer

Bernard Charlès
Executive Chairman

As the Experience Economy and the Circular Economy are converging into the Generative Economy, our clients need not only to embrace a sustainable economy, accomplishing more with fewer resources, but also cultivate an economy characterized by personalization, contextualization, and automatic updates of experiences. For both our customers and Dassault Systèmes, this will create new possibilities in terms of markets, audiences and portfolio, just as **3D**EXPERIENCE did a decade ago. Our scientific approach, industrial know-how, modeling and simulation capabilities coupled with AI and data science, represent strategic assets for innovators to succeed in the new Generative Economy.

2023 marked an important stage in the transformation of the industries we serve as well as in our performance and strategy.

2023 reflected the successful delivery of our 2018-2023 five-year plan. We doubled our diluted non-IFRS EPS to €1.20, an increase mostly attributed to organic growth. This performance was achieved in five years as initially planned, despite the pandemic and geopolitical instability. Over this period, Dassault Systèmes proved to be a game changer in innovation and trusted partner for transformation in the three strategic sectors of the economy we serve – Manufacturing Industries, Life Sciences & Healthcare, and Infrastructure & Cities – thus strengthening our positions and laying a solid foundation for future success. We either established leadership positions or assumed strong positions in promising segments. As evidence, Dassault Systèmes solutions have become the asset of choice and de facto standard in EVs, pharmaceuticals, and nuclear technology.

Over the past five years, the scope of sovereignty has clearly expanded from defense only to energy, materials, industrial offerings and data – notably health data. Today, products are made of virtual and real. Therefore, virtual assets now hold more strategic value than the physical ones. The virtualization of society requires the highest levels of trust and services: data, as part of organizations' and nations' sovereign legacy, must be valued and protected. Dassault Systèmes, as a global player in virtualization and cloud services, has become a key strategic partner for sovereignty and trust, both of which being major factors of differentiation for our customers.

Focusing on 2023, we have delivered revenue growth of 9% and built momentum in subscription revenue with an increase of 16%, both in constant currencies. We have delivered on our profitability objectives, achieving a non-IFRS operating margin of 32.4%, all the while continuing to invest in our future growth. We increased our headcount by 6%, which sets us apart from many tech players.

Across the 12 industries we serve, we saw a renewed focus on investment in innovation and concluded a significant number of large commercial agreements for our **3D**EXPERIENCE platform. This is driven by the imperative for our customers to gain a competitive edge through rapid innovation and operational efficiency while staying profitable, meeting regulatory sustainability deadlines, and decoupling economic growth from resource consumption. Clients are turning to Dassault Systèmes to enable real-time analysis of raw material and part substitutions, as well as the reshaping of value networks.

These results have provided a very solid platform for us to embark on our new five-year plan to double again non-IFRS EPS to reach €2.40. Strategically positioned, we can leverage a vast market creating new opportunities.

This marks an important stage in our strategy, as we're introducing the "Generative Economy" as our horizon for 2040. It's a new milestone in our legacy.

In 2012, we stated that "product is no longer enough" to build a sustainable economy and opened up the Experience Economy, centered on product usage. In 2020, we declared that industry had to shift "from things to life" and extended virtual twin experiences to living organisms - including human beings.
Now, to support our customers' transformation, it's time to accelerate this shift to "life of things". Mirroring the metamorphic method of life is the driving principle of the Generative Economy: imagine self-healing materials; or products that are grown rather than manufactured; or net-positive business models giving as much back to society as they take away…

We see "generative" as the solution to "consumption". A consumption model is not sustainable because it entails negative eco-bills for customers – the eco-bill being the ratio between what we take from the planet and society and what we give back.
We believe that the industry can be the solution to circularity provided it reaches a new balance. All industries will have to go through this metamorphosis and Dassault Systèmes is mission critical for businesses to imagine, create, and deliver generative experiences to their consumers, patients, workers, citizens, and society at large.

As virtualization is the catalyst and enabler of the Generative Economy, we want to push our virtual twin experience approach further. Indeed, mobility is not about devices only, it's about environments involving passengers, vehicles, buildings, and air quality. Cancer is not just cells: it's the effect of an organic process, and to better heal cancer, we need to understand it in a more holistic manner. For all this, we have to connect multiple virtual twin experiences together.
This is what we call UNIV+RSES, a combination of multiple virtual twins, unifying all stakeholders, knowledge and know-how, and virtual and real.

The IFWE Loop is our lever in the short and mid-term to allow our customers achieve this strategic move. For forty years, Dassault Systèmes has powered the spiral of innovation, guiding innovation from design to manufacturing. Today, as our most advanced clients already think in terms of lifecycle and systems of systems, we extend this journey into an infinite loop by seamlessly connecting the virtual and the real with real-world data. In the Generative Economy, we can take advantage of data science to innovate and improve the users experience. This opens up new possibilities, such as giving life to things: powered by real-world data, physical objects become augmented objects. Cars can be monitored and optimized in real-time through their virtual counterpart. This will enable "software-defined experiences," shifting the value from physical assets to software, all the while empowering our clients to establish direct connections with their end customers, providing tailored experiences. Crucially, this software will be "cyber-software" to address cybersecurity. Dassault Systèmes brings together new ecosystems and fosters new public-private partnerships to tackle these challenges.
In addition, it will be possible to generate multiple lives of the things – waste is becoming a resource for new products. It's the PLM of the 21st century: Dassault Systèmes invented Product Lifecycle Management in the 1990s, and now we virtualize the multiple cycles of lives of things.
Doing so, we aim to leverage the power of the numbers to broaden our value proposition and make generative innovation accessible to all business users, consumers, patients, and citizens. This will substantially expand our addressable market and serve as a catalyst for accelerating top-line growth.

We are best positioned to catalyze significant transformations in the global industry. In Manufacturing Industries, we catalyze change with electrification. Moving from thermal to electric requires a metamorphosis

of the entire value network – from consumers needs to battery providers to materials providers to charging stations and grids.
In Life Sciences & Healthcare, we empower customers with generative therapeutics and bioreactors to meet rising demand at sustainable costs. We're also pioneering precision medicine and a shift from cure to care – from treatment to prevention.
In Infrastructure & Cities, our customers benefit from breakthrough innovation we bring to create alternatives to fossil energies such as nuclear, hydrogen or biofuels.

What sets us apart is our ability to provide a science-based representation of the world's complexity, combining data science, modeling and simulation. Our artificial intelligence (AI) engines elevate gigantic data into structured knowledge and know-how, intellectual property being innovators' most powerful competitive asset. We work hand in hand with the scientific communities to explore deep-coupling of AI, cyber systems and MODSIM at the core of which is bio science.
In harnessing the power of AI-driven virtual twin experiences, we are upskilling the workforce of the future. AI automates repetitive tasks, driving significant productivity gains, enabling informed decision-making, and nurturing imagination and creativity. AI shifts the responsibilities of workers from "doing" to "choosing", acting as a true cornucopia to driving innovation and success.

Finally, the governance organization carefully crafted over years and aligned with the company's long term strategy, is effective since 1 January 2024. Pascal Daloz now serves as Dassault Systèmes Chief Executive Officer, as announced last June, and Bernard Charlès is Executive Chairman.
As the CEO, Pascal Daloz, alongside a talented executive team, is engaged to build on the company's powerful legacy to lead Dassault Systèmes into a new chapter and increase the value we bring to our giant customer base. The role of Bernard Charlès as Executive Chairman is to organize the Board of Directors' work encompassing strategy, governance, risks oversight and corporate social & environmental responsibility. Furthermore, the Executive Chairman collaborates with the CEO on strategy, research, and developing our connections with governments and longstanding clients.
The two of us have worked side by side for twenty-five years. Today, we continue the successful tandem approach that Bernard Charlès and Charles Edelstenne formed for the past forty years. What matters most to us is that we share the same vision for Dassault Systèmes: pushing the boundaries of science and the imagination and inspiring significant transformations in the industry for the benefit of consumers, patients, citizens and learners. Our purpose – to provide **3D**EXPERIENCE universes to harmonize product, nature, and life – is our inspiration.
Since inception, Dassault Systèmes' leadership and trusted relationships with customers have been built on a solid, consistent and independent governance. We are committed to ensuring that Dassault Systèmes has the means and freedom to pursue innovative strategies.
We thank our teams for their dedication to our success. We thank our clients for their continued trust. We are proud to be continuing this journey together and have every confidence we will succeed.

Leading the metamorphosis to the generative economy

Bernard Charlès
Executive Chairman

Pascal Daloz
Chief Executive Officer

Elisa Prisner
Executive Vice-President, Corporate Strategy & Platform Transformation

Patrick Johnson
Executive Vice-President, Corporate Research & Sciences

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, Europe, Middle East, Africa

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

Grégory Abate
General Secretary

SUSTAINABILITY

Philippine de T'Serclaes,
Chief Sustainability Officer

Dassault Systèmes is steadfastly dedicated to realizing our ambition to promote excellence in our commitment to sustainability. This commitment extends not only through our internal initiatives but also in active engagement with customers and partners. We aspire to be a trusted ally in facilitating the sustainable transformation of our clients, working collaboratively towards shared environmental and social goals.

In 2023 our new climate objectives were approved by the SBTi.

- –35% by 2027 on scopes 1 and 2 emissions (vs. 2019 baseline in absolute value).
- –20% by 2027 on travel and commuting emissions posts of scope 2 (vs. 2019 baseline in absolute value).
- 50% of our suppliers by emissions covering PG & Services and capital goods get SBTi approved by 2025 (scope 3).

Scope 1 emissions are direct emissions from sources owned or controlled by a company; scope 2 emissions are indirect emissions from purchased electricity, steam, heat, and cooling; scope 3 emissions are all other emissions associated with a company's activities.

STRATEGIC OPERATIONAL ELEMENTS. Our strategic approach is carried out through three key operational components: Brands, Geos, Industries and Sectors. Our Brands are the architects of excellent user experiences, building active communities and developing apps to continually evolve the **3D**EXPERIENCE platform. Our 11 Geos are customer-centric, leading the growth and execution of our business strategy. Our Industry teams create unique Industry Solution Experiences, Processes and Roles to provide targeted value to businesses. These Industries are further categorized into three distinct sectors below:

Philippe Laufer

Tarek Sherif

Patrick Johnson

Florence Verzelen

MANUFACTURING INDUSTRIES

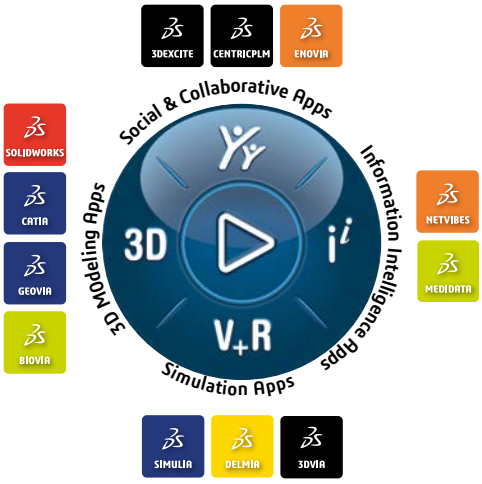
The Manufacturing Industries sector is tasked with inventing products and solutions for a more circular and sustainable economy.

LIFE SCIENCES & HEALTHCARE

The Life Sciences & Healthcare sector is undergoing a massive transformation by virtualizing its entire ecosystem – from research to production to clinical trials to patient experience.

INFRASTRUCTURE & CITIES

The Infrastructure & Cities sector is helping clients to unleash productivity and reinvent our environment for a sustainable planet.



3DEXCITE: Tom Acland
3DS OUTSCALE: Philippe Miltin
3DVIA: Vincent Picou
BIOVIA: Jason Benedict
CATIA: Olivier Sappin
CENTRIC PLM: Chris Groves
DELMIA: Guillaume Vendroux
ENOVIA: Stéphane Declée
GEOVIA: Mauro DelleMonache
MEDIDATA: Anthony Costello
NETVIBES: Morgan Zimmermann
SIMULIA: Philippe Laufer
SOLIDWORKS: Manish Kumar

Central Europe
Dominic Kurtaz

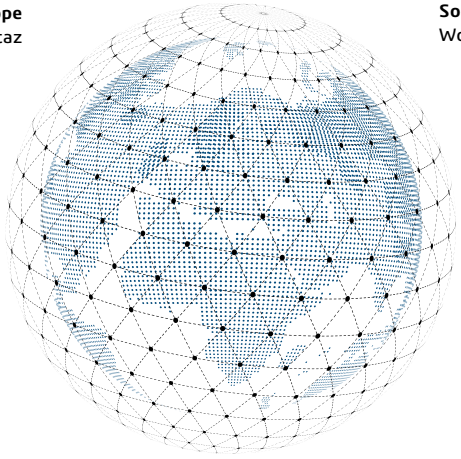
Northern Europe
Marc Overton

Western Europe
Philippe Besse

Southern Europe
Umberto Arcangeli

North America
Erik Swedberg

Latin America
Alejandro Chocolat



South Korea
Woonsung Jung

Japan
Philippe Godbout

China
Ying Zhang

Southeast Asia-Pacific
Samson Khaou

India
Deepak NG

TRANSPORTATION & MOBILITY
Laurence Montanari

AEROSPACE & DEFENSE
David Ziegler

MARINE & OFFSHORE
François-Xavier Dumez

INDUSTRIAL EQUIPMENT
Philippe Bartissol

HIGH-TECH
Stéphane Sireau

HOME & LIFESTYLE
Benoit Dauchin

CONSUMER PACKAGED GOODS - RETAIL
Benoit Dauchin

LIFE SCIENCES & HEALTHCARE
Claire Biot

INFRASTRUCTURE, ENERGY & MATERIALS
Corinne Bulota

ARCHITECTURE, ENGINEERING & CONSTRUCTION
Rémi Dornier

CITIES & PUBLIC SERVICES
Jacques Beltran

BUSINESS SERVICES
Taherah Kuhl

2018-2023 plan achieved*

Doubling EPS to €1.20…

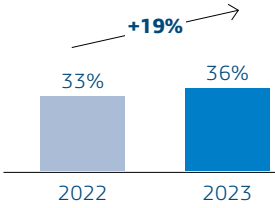
Delivering on all key financial objectives in 2023

	Revenue growth	Operating margin	EPS x 2 (2018: €0.62)
2023 results	+9%	32.4%	€1.20
Objectives	+8% to +9%	32.3% to 32.6%	€1.19 to €1.21

Key growth drivers

3DEXPERIENCE

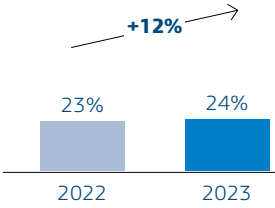
2 X
3DEXPERIENCE revenue 2018-2023



% of **3D**EXPERIENCE eligible software revenue(1)

CLOUD

40 X
Cloud revenue 2018-2023



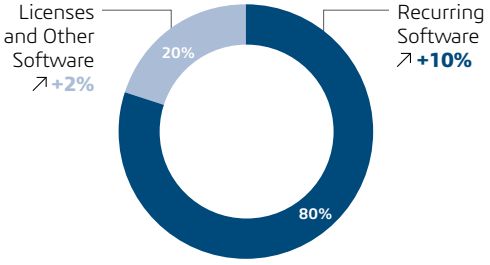
% of Cloud revenue

* Financial information on a non-IFRS basis, growth rates in constant currencies.

(1) Eligible software revenue excludes SOLIDWORKS, MEDIDATA, CENTRIC PLM and recent acquisitions.

… while embracing a subscription model

Software revenue



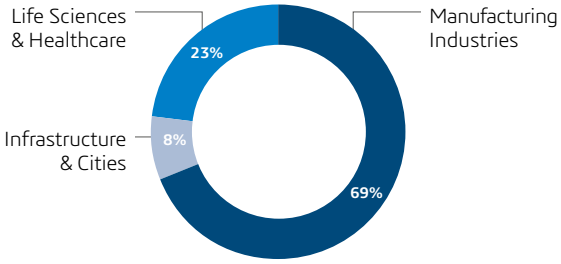
Recurring revenue now accounts for 80% of software revenue

Subscription

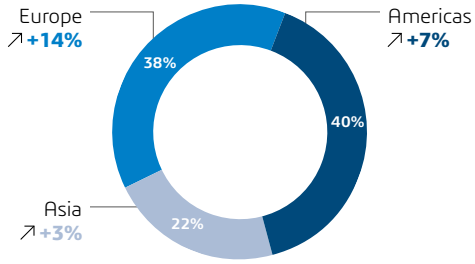
€1.9 B

4 X
Subscription revenue 2018-2023

Strategic sectors(2)



Software revenue by region



(2) Share of software revenue in 2023.

Rouven Bergmann
Executive Vice-President,
Chief Financial Officer

What are the key highlights from 2023?

2023 saw the successful delivery of our 2018-2023 five-year plan, doubling diluted EPS to €1.20 while embracing a subscription model. We delivered the anticipated acceleration in the second half, achieving our full year objectives with 9% organic revenue growth. This performance reflects an increasing focus on accelerating growth in our core industries and domains. This is evidenced in our numbers: Transportation & Mobility grew 12%, Aerospace & Defense 13% and Home & Lifestyle 23%. From a product standpoint, design, simulation, manufacturing and data science enjoyed double-digit growth throughout the year.

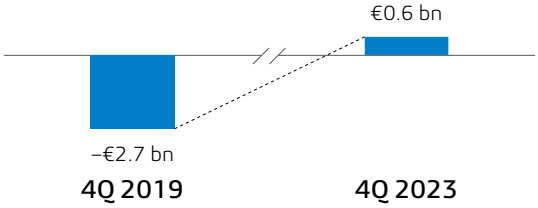
Dassault Systèmes experienced a sharp acceleration in adoption of the 3DEXPERIENCE platform. How do you explain this performance?

We see 2023 as an inflection point in platform adoption: **3D**EXPERIENCE revenue grew 19%, representing a 36% share of eligible software revenue. This reflects strong momentum in our key industries, driven by large transformation deals. We believe this trend will continue in 2024 and beyond.

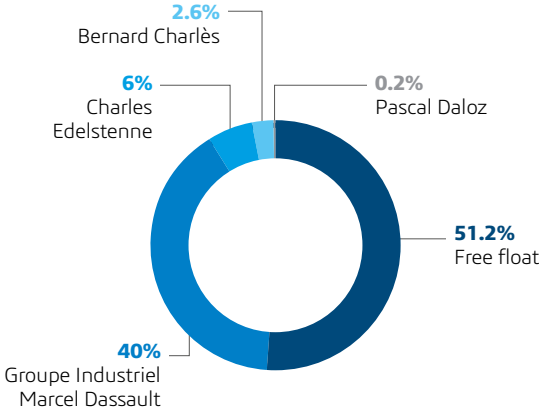
What are your expectations for 2024?

We continue to focus our investments on executing our strategy to sustain strong revenue and EPS growth. And clearly, our key highlights for 2023 demonstrate the strength of our five-year plan. In 2024, we're targeting revenue growth of 8% to 10%, driven by an acceleration of subscription growth, of 17-19%.

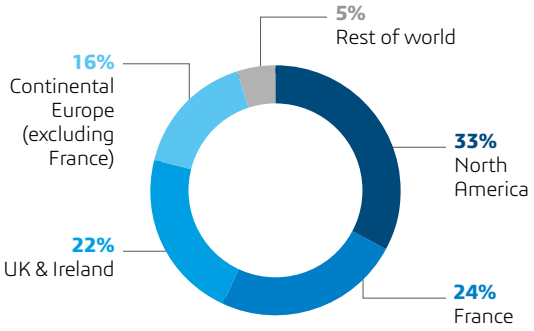
Net cash position



Shareholders' composition (controlled capital)



Shareholders' composition (free float)



Dassault Systèmes stock data	Market capitalization	Share price 12/31/2023	Comparison of the 1-year stock performance
Listed on Euronext Paris and traded on the American OTC market Member of CAC 40	€59.1 B / $66.1 B	€44.2 / $44.0	• Dassault Systèmes +32% • CAC 40 +17% • Nasdaq +43%

Committed to creating shareholder value

(Year ended Dec. 31)

	2023	2022	2021	2020	2019[1]
Dividend per share[2]	€0.23[3]	€0.21	€0.17	€0.11	€0.14
Dividend per share growth	9.5%	23.5%	54.5%	–20.0%	7.7%

(1) The Group adopted IFRS 16 for the fiscal year beginning January 1, 2019 using the simplified retrospective approach. Under this method, the transition effect is accounted for within the consolidated equity at the date of initial application, January 1, 2019, without any adjustment to the prior year comparative information.
(2) Figures before 2021 have been restated in order to reflect the five-for-one share split on Dassault Systèmes' share effected on July 7, 2021.
(3) To be proposed for approval at the General Meeting of Shareholders scheduled for May 22, 2024.

2024/2025 KEY EVENTS

22 May Annual Shareholders' Meeting
25 July Release of second quarter earnings
24 October Release of third quarter earnings
4 February Release of fourth quarter earnings

SHAREHOLDERS' CONTACT

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E-mail: investors@3ds.com
https://investor.3ds.com/

Helping industry leverage data science and AI to enter the Generative Economy

Information Intelligence has been core to Dassault Systèmes' strategy and portfolio for years. Today, we're harnessing the acceleration of AI to help our clients do even more with their data.

Discover more about our approach in a conversation with

Patrick Johnson
Executive Vice-President,
Corporate Research & Sciences

Morgan Zimmermann
Chief Executive Officer,
NETVIBES

What is Dassault Systèmes' approach to Artificial Intelligence?

M.Z.: While data science and AI are very hot topics, our work with AI started many years ago: our users are already augmented with AI through our Industry Solution Experiences.

As the Experience Economy and Circular Economy converge into the Generative Economy, our aim is to provide our customers with the means to create their own sustainable universes to address their greatest challenges. Our approach consists of observing and revealing insights about our complex world: learning from those observations, uncovering actionable evidence and truly elevating the understanding of our complex world through sharable, multi-scale, multidiscipline representations. We're thus bringing the power of modeling and simulation to data, delivered into the core of our customer's processes thanks to virtual twin experiences. Generative technologies are the key pillars and enablers of this new era. Ultimately, we're creating virtual universes – powered by representations, simulations and next-generation AI engines – in the three sectors of the economy we serve. We're helping organizations create next-generation products and services for people and for our planet. We do this by empowering our customers to connect the dots: structuring data into information, giving it meaning through contextualization and ultimately revealing the invisible. Maximizing the virtualization of knowledge and know-how opens new value and potential for industry, businesses and people. This is the power of virtual twin experiences.

What competitive advantage does Dassault Systèmes' virtual twins bring to AI?

P.J.: We're passionate about supporting industry knowledge and know-how. We've accumulated a wide set of industry-specific knowledge and deep understanding of processes and practices through massive investments. Consequently, our solutions enable customers to capitalize and leverage a profound "Knowledge Book" of data, information, relationships, models, semantics, ontologies, domain corpuses and experiences – providing an

industry-grade guiding path toward data-centric values and a Generative Economy. This approach opens a totally new category of solutions, with MOD/SIM/DATA acting as an unbreakable paradigm for shareable, explainable representations and meaningful experiences to transform business.

M. Z.: We believe in using AI in three complementary ways: for sustainability, by developing environmentally efficient products using circular business processes and maximizing value chains; for operational excellence, delivering efficiency and redirecting resources towards innovation for a more competitive business; and for the workforce of the future, upskilling with augmented contextual knowledge and know-how and role guidance. The general trend among businesses is to use AI primarily to reduce cost – but we're orienting AI with MOD/SIM/DATA to enable our customers to enter the Generative Economy.

Can you share some concrete examples of how AI-enabled virtual twins are helping Dassault Systèmes customers?

M. Z.: Absolutely. In the Manufacturing Industries sector, standards, regulations and competition are raising the level of expectations with automotive manufacturers. Every design decision must be weighed against large sets of critical KPIs that might be in contradiction: price, weight, CO2 emission, safety, etc. With MOD/SIM/DATA and AI, every designer can easily understand the impact of their decisions on all criteria. They can leverage knowledge, supplier and value chain content and catalogs, procurement, logistics, best practices, new materials definition and more to select the most relevant combination for a better product. Here, AI-enabled virtual twins help navigate high-dimension complexity and provide a new level of synthesis to guide decisions.

In medicine, our AI-powered MEDIDATA solutions allow pharmaceutical companies to model and simulate data to create virtual patients (simulants) and cohorts (synthetic control arms) for wider, more diverse and more effective clinical trials. MEDIDATA's Synthetic Control Arm (SCA) leverages cross-industry historical data from 30,000 clinical trials and 9 million patients, unleashing scientific research, lowering costs and accelerating timelines when a control group is hard to recruit or retain, such as with rare diseases. An SCA offers a vast improvement over the most common method: searching existing medical literature for comparisons. Here, AI-enabled data opens a new world of generative possibilities, fueling creativity, innovation and new business avenues.

Finally, our customers in the Infrastructure & Cities sector – including nuclear, oil and gas and renewable energy – use virtual twin experiences to elevate data, from engineering and construction through maintenance and operation. Virtual twins are a game changer, providing science-based models for interpreting, understanding and contextualizing real world data from sensors. AI is accelerating these levers by revealing the invisible. Customers can learn from the past to navigate the future using predictive models, such as anticipating deviation risks in construction phases.

How do you foresee data sciences shaping a more positive future for industry and our planet?

P. J.: We're focusing on catalyzing the convergence between the current Experience Economy – where experience counts more than product – and the emerging Circular Economy, an approach more respectful of the planet and its resources. We're convinced that the resulting Generative Economy requires the powerful opportunities provided by virtual worlds: enhanced, seamless collaboration, ability to foster imagination, and sharing understanding and experiences of any product or process before it's deployed in the real world.

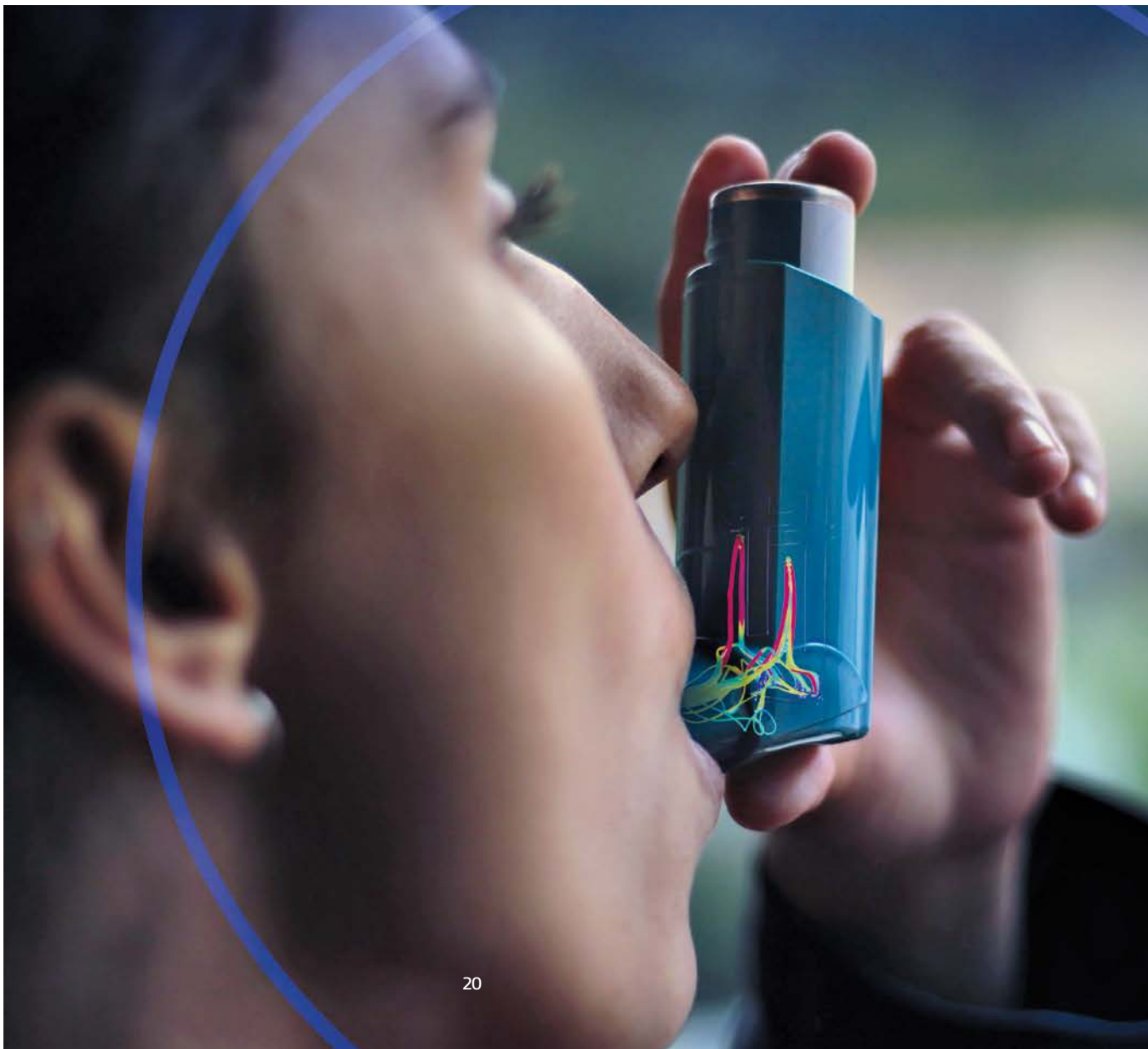
Data sciences provide one pillar – inseparable from modeling and simulation sciences – to create sustainable processes and products that benefit citizens, patients, consumers and companies, and our environment, society and world by elevating understanding through virtualization of companies' knowledge and know-how capital. As a scientific company, we leverage and orient those disruptive sciences in virtual twin experiences offering a new 21st century approach to creativity, innovation and responsible transformations.

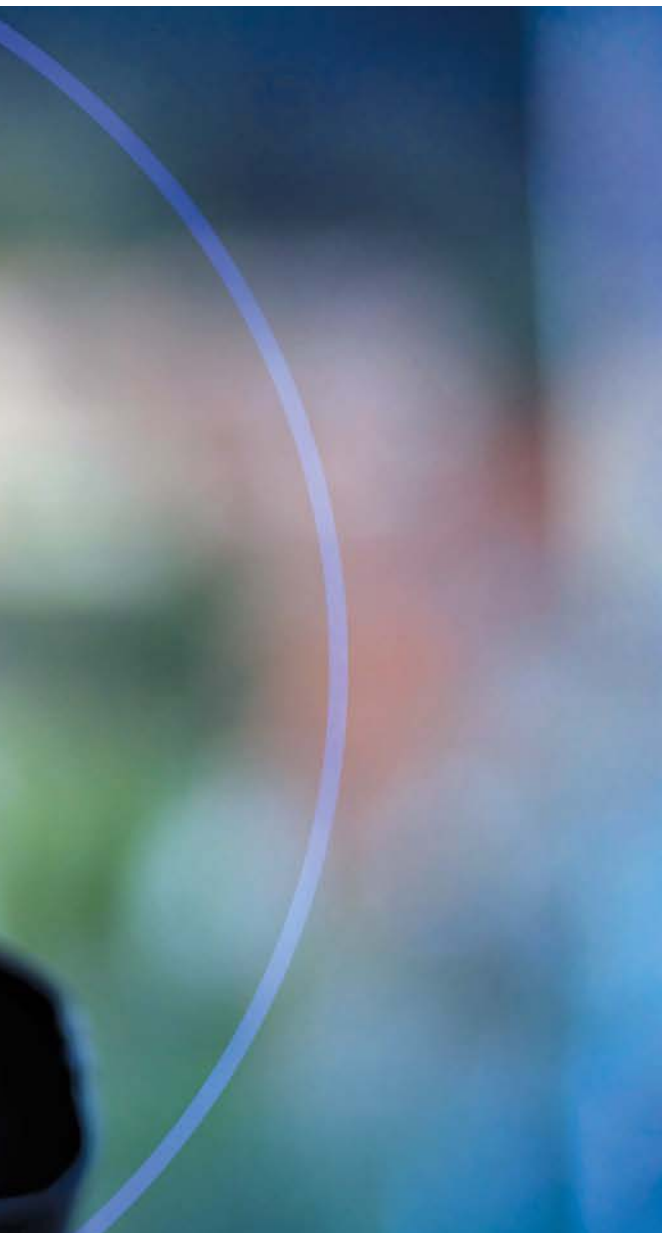
UNTiL NOW

Medicine lacked the tools to visualize and imagine how best to treat the human body

FROM NOW ON

Virtual twins help create generative therapeutics and bioreactors at sustainable costs, helping to pioneer precision medicine and shift from cure to care - from treatment to prevention





Helping people live longer, healthier lives has always been the goal of medical professionals. Virtual universes are opening unlimited new horizons to revolutionize our understanding of how bodies react to disease and treatment, and to guide safer and more efficient methods for running clinical trials and manufacturing pharmaceuticals.
From allowing key leaders to collaborate to scale up precision medicine, to preventing health hazards by modeling the circulation of airborne pathogens, to making clinical trials available to a wider audience, the **3D**EXPERIENCE platform and our MEDIDATA brand portfolio are key allies in the life sciences & healthcare industry. Virtual universes empower health professionals to gain unprecedented insights into under-researched issues while improving patient care and outcomes. They're also facilitating transformative approaches to healthcare, such as virtual twins of human organs to personalize medical diagnoses and treatments.

Leading the quest for precision medicine

Dassault Systèmes' mission to extend virtual twin technology to better understand and treat the human body takes a major step through a new initiative that promises to radically transform healthcare. MEDITWIN will draw on the expertise of public and private French medical players to create personalized virtual twins of human organs.

Bernard Charlès on stage with Bruno Bonnell, General Secretary for investment, in charge of France 2030 plan

"The MEDITWIN public-private alliance is a major step forward, mobilizing the best of medicine, science and technology to shape the future of healthcare. Virtual twin experiences are already a reality, and MEDITWIN will help standardize and disseminate them worldwide to benefit millions of patients."

Bernard Charlès, Executive Chairman

Cardiovascular diseases are the leading cause of death globally, with an estimated 18 million deaths per year(1). Since 2014, Dassault Systèmes has led the Living Heart project to unite leading cardiovascular researchers, educators, medical device developers and practicing cardiologists to create personalized digital human heart models.

Dassault Systèmes is now leveraging that success by partnering with top French public and private organizations to take virtual twin technology to the next level and unlock its potential for various fields of healthcare. The **MEDITWIN** project aims to create a unified experience for healthcare professionals and patients, bringing together a wide range of disciplines, diseases and treatment types. MEDITWIN will develop personalized virtual twins of organs, metabolism and cancerous cells, allowing doctors to simulate care scenarios for each patient, for improved diagnosis and treatment.

For over forty years, Dassault Systèmes has pioneered virtual twins to transform the industrial world. By applying this technology to the human body, projects like MEDITWIN open new possibilities to transform healthcare. This alliance mobilizes the best of medicine, science and technology to standardize and disseminate virtual twins worldwide, providing a decisive learning ground for progress in medical science. The project will be developed over five years and is receiving financial support from the French government as part of its "France 2030" investment plan designed to support emerging technologies. MEDITWIN is an example of how Dassault Systèmes is mobilizing public and private healthcare players to enable the industrialization, clinical validation and standardization of innovations to deploy technologies in a standardized way to benefit as many people as possible.

MEDITWIN builds on Dassault Systèmes' **3D**EXPERIENCE platform and leverages the expertise of the 14 members of alliance, which includes seven French university hospitals, startups and Inria, the French science and technology research center. The virtual twins of human organs will be used in seven medical practices in neurology, cardiology and oncology. The resulting virtual healthcare products will be deployed on a sovereign, secure industrial cloud platform.

Dassault Systèmes is convinced that virtual twins are essential to the future of medicine, as they will reveal secrets of the human body to transform and personalize treatments for the best possible results. They will improve the efficiency of care, quality of multidisciplinary decision-making and effectiveness and safety of medical practices and interventions. Just as virtual twins improve the safety and efficacy of industrial processes or buildings design, they could someday help patients with rare epilepsies, Alzheimer's disease, and cancer with personalized therapies.

(1) World Cancer Research Fund International.

Revealing invisible health threats at hospitals

How can a hospital protect fragile patients from airborne infections? Saint-Louis Hospital in Paris used our Virtual Twin as a Service (VTaaS) to understand how invisible pathogens circulated in a dialysis unit and then took the necessary steps to reduce respiratory transmission to protect higher risk patients.

Picture a large, open hospital dialysis unit simultaneously treating nine patients suffering from kidney failure. The staff takes great measures to protect these immunocompromised individuals who are highly susceptible to infections. Yet, despite their best efforts, it's difficult to avoid respiratory transmission of viruses.

This was the situation at **Saint-Louis Hospital** in Paris, triggering the hospital's infection prevention and control team, working in conjunction with the virology department, to investigate options to limit virus transmission. They studied the levels of particles circulating in the air at different times of the day. The months-long study revealed that virus particles were circulating during the day – despite bio cleaning in between sessions – while at night hardly any pathogens were detected. Not only that, but the positivity rate of the samples also varied enormously from one end of the room to another.

Dr. Guillaume Mellon, head of the hospital's Infection Control Unit, suspected an imbalance in the ventilation network. To identify the source of the issue, the team needed a tool to visualize the airflow within the ventilation system. Dr. Mellon turned to Dassault Systèmes, as he was familiar with our experience working on similar projects for flow modelization.

"We are at a turning point in terms of new technologies. Some viruses could be less dangerous for ordinary people but critical for hematology patients. Now it's possible to detect them and identify ways to prevent them from spreading. This could really help to reduce the risk of infection."

Dr. Guillaume Mellon, Head of the Infection Control Unit, Saint-Louis Hospital

Using our Virtual Twin as a Service (VTaaS) approach, the first step was to create an accurate, full-scale virtual twin of the room, combining building blueprints with a 3D scan made on site with our HomeByMe mobile app. They then simulated particle contamination, using SIMULIA solutions on the **3D**EXPERIENCE platform. This audit allowed Mellon's team to accurately visualize and predict the transmission of respiratory viral particles though the air, identifying specific areas of the room that lacked airflow, allowing virus particles to cluster.

Our teams next used augmented reality on tablets to present their findings and recommendations to improve ventilation flows. This allowed hospital staff to view the virtual simulations while walking around the real-life setting, deepening understand of exactly how virus particles are transmitted as they traveled towards the ceiling and into the air vents. It was a revelatory experience for Saint-Louis Hospital. The staff could confidently take measures to protect higher risk patients, such as improving ventilation in the dialysis department; a follow-up study confirmed that the hyper concentration of the virus in specific parts of the dialysis room had been eliminated. And this is just the start: Dassault Systèmes is now helping another unit at Saint-Louis Hospital on a similar project to prevent airborne infections.

Democratizing clinical trials

The combination of virtualization and data science is a driving force behind breakthroughs in clinical trials, from helping to identify candidates for innovative cancer therapies to ensuring diversity, equity, and inclusion is considered at every stage of a trial.

TRIAL DESIGN FOR CAR-T: Using AI and data for broader, safer and repeatable clinical trials

Each year, 19 million new cases of cancer are detected worldwide(1), and experts anticipate a 47% increase in new cancer cases between 2020 and 2040. Since 2017, CAR-T drug cell therapy has become one of the main therapeutic options for treating blood cancers. The problem is that this treatment can have adverse side effects, including a severe one called cytokine release syndrome (CRS), which requires treatment at intensive care units. To date, it's not been clear who is most susceptible to develop CRS, so CAR-T is limited to people able to access intensive care fast.

Through its rich heritage of supporting clinical trials, our MEDIDATA brand boasts the world's largest dataset of patients treated with CAR-T therapy. Combining the power of AI and data science, the team has developed **Trial Design for CAR-T** to give medical professionals actionable insights to identify patients likely to suffer from CRS. The tool, used by pharma companies in the US and the EU, has been submitted for FDA approval. With clinical trials under increased pressure to improve safety and efficiency, not to mention diversity, the ultimate goal is to develop a repeatable, efficient, valuable model for delivering data and insights to pharmaceutical companies so that they can design better trials that can be available to a wider population.

(1) World Health Organisation

"True success in clinical trials is achievable through embracing diversity. The Medidata Diversity Program enables sponsors and CROs to incorporate diversity into every aspect of their trial strategy."

Anthony Costello, Chief Executive Officer, MEDIDATA

MEDIDATA DIVERSITY PROGRAM: A multi-faceted approach to cultivate diversity across the clinical trial lifecycle

Historically and in modern times, clinical trials have lacked diversity in patient participation due to systemic barriers that hinder underrepresented groups from participating. This not only creates disparities in access to potentially life-saving treatments, but also hampers our understanding of treatment benefits and side effects among real-world populations. To address this underlying issue, in September 2023 we launched the **Medidata Diversity Program**, the industry's most comprehensive solution for improving diversity, equity, and inclusion in clinical trials.

Designed to embed diversity into every step of clinical trials, the Medidata Diversity Program comprises a suite of innovative and industry-leading solutions, including Medidata AI Intelligent Trials, Medidata's Patient Insights Board, myMedidata Registries and Circuit Clinical's site network.

Diversity challenges come in various forms, requiring a multi-faceted approach; our program enables sponsors, CROs, sites, and patients to address these complex issues. Through Intelligent Trials, sponsors leverage industry-wide, site-level data to identify sites with a historical track record of enrolling diverse patients. The Patient Insights Board co-creates and ensures the most inclusive trial protocols. myMedidata Registries fosters continuous patient engagement, and Circuit Clinical's site network facilitates trial access for underrepresented groups.

By championing diversity, this program positions Medidata as a catalyst for closing disparities and achieving true clinical trial success. We're pleased to report that we've been recognized for our endless pursuit of improving clinical trials for all patients; the Medidata Diversity Program received the Best of Show Award at the 15th annual Summit for Clinical Ops Executives (SCOPE) in early 2024.

Meet Emma Twin

Precision medicine will gradually make it possible for medical professionals to provide more precise diagnoses and treatment. But it requires the ability to visualize, test and predict. To help the public better understand how virtual twins can transform how the human body is understood and treated, we created an avatar and gave her an account on LinkedIn. Discover the Emma Twin campaign.

As the embodiment of a virtual twin, **Emma Twin** is able to test hundreds of treatments virtually to improve the lives of millions of real-life patients. Thanks to her 3D-modeled virtual body, doctors and researchers can analyze the effects of diseases and test new remedies without risk to real persons. She's paving the way to precision medicine. But who is she? Our virtual consultant showcasing the power of virtual twins talks with **Victoire de Margerie, Vice-President of Corporate Equity, Marketing & Communications.**

Victoire de Margerie

Emma, you may not be a real human, but you have nevertheless had a busy year as our virtual twin consultant with demonstrating how a virtual twin can help transform how the human body is understood and treated. Tell us about some of the projects you've been involved with.

Emma Twin

With pleasure!

Basically, I'm an avatar whose mission is to show how virtual twins like the one I embody can help create a more patient-centric healthcare model and improve healthcare for everyone. Trial and error testing takes time and resources, and can put human beings at risk. Virtual twins like me – 3D models of a human body – make it possible to visualize, test and understand how drugs affect a disease or the outcome of a surgery. So for example, running tests on an virtual twin of a human like me makes it possible to discover how a heart would respond in certain circumstances: running errands, exercising, or during deep sleep. How exciting is that?

V. M.: Very! People learn best from compelling stories. Through your posts on LinkedIn, you were able to share in a simple way a first-hand account of how virtual twins can impact a wide range of fascinating medical projects – from remote heart surgery to a cutting-edge corneal implant to exploring the effects of a drug under development on epileptic seizures. Our hope is that these examples will convince people of the benefits of virtual twin technology on healthcare. Emma, what do you think has been your biggest success so far?

E. T.: Hard to say, but one would be my participation in the MEDIDATA Synthetic Control Arm trial for recurrent glioblastoma (rGBM), an aggressive form of brain cancer. I took part in this hybrid external control arm to reduce the number of patients in the control therapy group, and I was able to provide rigorous scientific data to accelerate treatments and product development.

V. M.: We all appreciate your work with that test, Emma! Virtual twins are helping medical professionals quickly and confidently move away from the traditional "one-size-fits-all" approach to healthcare. And when they can treat each patient specifically, healthcare experts can gain deep insight into areas that have been under-researched while also improving patient care.

There's been a lot of work so far towards facilitating precision medicine thanks to virtual twins like you, Emma, and we're excited to continue to forge into the next big frontiers involving the heart, brain and skin. We're excited for you to continue as our virtual twin resource since we know you've got lots more to contribute. We can't wait to share more of your stories!

Throughout 2023, our virtual twin Emma Twin was involved in several projects that will positively impact healthcare. Scan the QR code to discover some of her work.

UNTiL NOW

Construction was energy-intensive, and environmental concerns were often addressed late in development or upon the completion of a project

FROM NOW ON

Integrated virtual twins enable innovators to imagine alternatives to fossil energies such as nuclear, hydrogen or biofuels as well as to accelerate the construction industry's transformation to scalable, sustainable approaches

We’re witnessing an exciting transition toward greener infrastructures and cities – marked by low-carbon energy, smart and connected buildings and sustainably designed materials. The way we live, work and relax in cities will be transformed. Virtual modeling is at the heart of this revolution, allowing for new ideas to be designed and tested within virtual twins before they are put into practice.
The **3D**EXPERIENCE platform brings virtual ideas to life, from a next generation meteorological tower in China, to micro nuclear power plants the size of a bus delivering carbon-free energy to industries or remote communities, to renewal of wood construction supported by digitalized processes in the lumber industry. Imagining all aspects of construction projects in the virtual world marks a huge departure from fragmented approach of the past, for the benefit of all stakeholders.

Paving the way for smart construction

Chinese construction company CSADI used the **3D**EXPERIENCE platform for project management of a sophisticated new meteorological tower, achieving record-breaking efficiency and safety while paving the way for wider adoption of integrated, smart construction.

Twisting skyward in a double spiral, the outer façade of the Wuhan Next Generation Meteorological Radar tower suggests a cyclone, one of the weather disasters it was built to monitor. It was designed and developed by **China's Central-South Architectural Design Institute (CSADI)**, and the **3D**EXPERIENCE platform expedited the process by embedding engineering and construction know-how at the tower's concept phase, reducing costs, accelerating schedules and improving worker safety.

Working in the **3D**EXPERIENCE platform allowed CSADI to determine the perfect rotational angle of the building and accurately calculate the shape and dimension of more than 1,000 glass-fiber reinforced concrete exterior wall panels. Designing and building first in the virtual world represented a departure from the fragmented project management approach that CSADI had used in the past. With its complex shape, the tower was the ideal pilot project to test the capabilities of a new smart, connected construction vision.

Having a virtual twin of the tower made possible real-time collaboration with multiple stakeholders at the construction site, covering all disciplines: structure, water, heating, electricity, geotechnical engineering and more. Thanks to a highly detailed dashboard, information was seamlessly shared across the value chain within a single environment, ensuring that everyone's requirements were taken into account and applying data-driven insights to anticipate risks.

Leveraging simulation allowed CSADI to test and verify all aspects of the project before construction, helping to ensure that all work orders were clear to enhance worker efficiency and safety. For example, CSADI simulated hoisting the façade components in the installation sequence running various scenarios, including the location of suspended platforms, obstructions and wind calculations, helping to determine the ideal conditions for workers to safely install the façade.

The **3D**EXPERIENCE platform gave CSADI a single data source for design, construction, operations and maintenance; this information is now part of a template library that the company will use to get new projects off the ground faster and to develop industry standards for smart construction.

VIRTUAL TWIN EXPERIENCE HELPED CSADI ACHIEVE

60%

FEWER CONSTRUCTION ERRORS

30%

TIME REDUCTION ON THE OVERALL CONSTRUCTION SCHEDULE

Delivering decentralized, stable, low-carbon energy

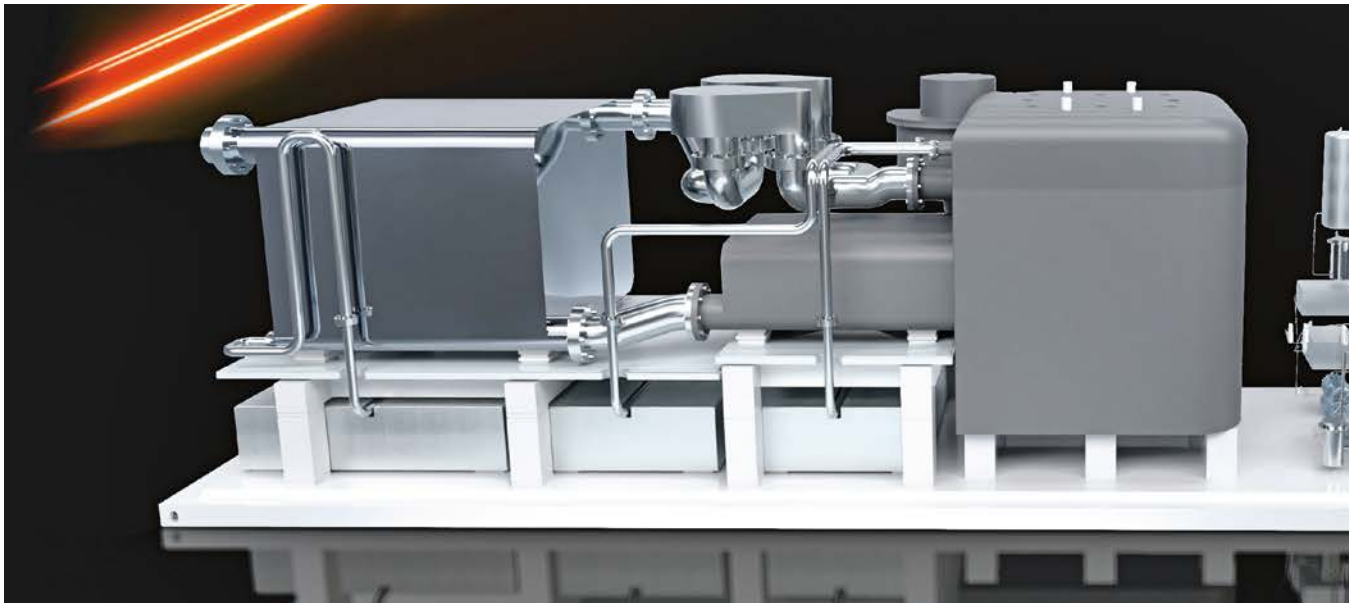
Micro nuclear power plants the size of a bus may offer a solution to sustainably bring low carbon energy to industry, especially in remote areas. Virtual twins are helping to accelerate their development.

Given the pressing need to cut carbon emissions to limit the effects of climate change, energy production sources must shift toward low carbon solutions, which provide cleaner and more reliable energy.

French startup **NAAREA** has come up with a revolutionary way to do just that. Its solution consists of delivering carbon-free energy directly to industrial companies through micro nuclear power plants. The company is developing XAMR®(1), a fast neutron and molten salt micro reactor that also embraces circular economy principles by using long-lived actinides coming from the reprocessing of nuclear spent fuel to produce both electricity and high-temperature heat without releasing any greenhouse gases. Each XAMR® reactor will be about the size of a bus, allowing it to be placed on sites without an external grid supply – perfect for delivering clean energy in remote areas.

Accelerating conception to manufacturing

To implement this pioneering energy solution, in just eighteen months NAAREA created a fully functional virtual twin of XAMR® on the **3D**EXPERIENCE platform on the cloud. Having an integrated virtual environment makes it possible to



(1) eXtrasmall Advanced Modular Reactor

"We're excited about how the virtual twin can be used as part of the regulatory process to demonstrate the reactor's safety."

Jean-Luc Alexandre, Chief Executive Officer, NAAREA

manage all design, engineering and manufacturing processes from anywhere. Engineers can securely collaborate on a shared virtual twin to validate the architecture, size and functionality of the reactor on multiple dimensions including operational and safety requirements, dynamic behavior and functional analysis, 2D schemas and 3D digital mockup.

"We want to be on the market by 2030, so we need to move fast," said Jean-Luc Alexandre, CEO of NAAREA. "The best solution to achieve our goal is the virtual twin. It's a fantastic accelerator. One of the best features is that we can design and simulate as we go, so we can test our ideas and see if they're worth progressing."

Detecting discrepancies earlier

The result is a gain of time for NAAREA, and the ability to scale as the company's business needs evolve. The virtual twin is also critical for getting XAMR® certified with regional and international safety authorities.

NAAREA is now running laboratory tests and feeding data from its experiments into XAMR®'s virtual twin to test its safety features and analyze its operational performance ahead of physical prototype production. "All our test data, simulation results and design modifications are logged in the virtual twin; this traceability is key for the safety authorities and helps us be sure that we can manage any changes and detect any discrepancies in the configuration management," Alexandre said.

18

MONTHS

FOR NAAREA TO DEVELOP AND MASTER THE LIFECYCLE OF ITS XAMR® REACTOR USING A VIRTUAL TWIN

Reshaping construction with sustainable approaches

Virtual twins are being used to make buildings more energy efficient and with a smaller carbon footprint. From creating the conditions for comfortable indoor temperatures to producing environmentally friendly wood, digital solutions are reshaping the construction industry.

SOLIDEO: Simulating heat flows to guarantee comfort for athletes

Antoine du Souich
Director of strategy and innovation, SOLIDEO: Société de livraison des ouvrages olympiques (French for "Olympic Delivery Authority"), the French public body responsible for long-term infrastructures and facilities, being built for the summer 2024 events

Summers in Paris are getting hotter. What does this mean for athletes?

It's important that we ensure that athlete's accommodations are cool and comfortable, so that they can rest and recover after competitions. To accomplish this we first needed to understand how the buildings would perform under extreme heat.

How did Dassault Systèmes help?

We collaborated through the use of SIMULIA to create a 3D model of an upper floor of one of the athlete residences. From there, parameters such as insulation, ventilation, solar shades and an ecological system to cool floors were simulated under different temperatures. The objective was to avoid needing to use air conditioning while maintaining an indoor temperature of at least 6 °C below the outdoor temperature.

We now have the key insights we need to optimize comfort inside the buildings – even if the outside temperatures soar this summer or later when the buildings are repurposed for future residents. We can identify and implement any additional energy solutions needed to keep the buildings cool, all while limiting impacts on the environment. Beyond guaranteeing healthy conditions for residents, we can apply these learnings about how heat performs inside other buildings, such as hospitals, creating safer situations and a higher quality of life for everyone.

AN INDOOR TEMPERATURE OF AT LEAST

6 °C

BELOW OUTSIDE TEMPERATURE,
THANKS TO AN ECOLOGICAL COOLING SYSTEM FOR FLOORS

PIVETEAUBOIS: Transitioning to sustainable wood manufacturing

Prefabricated timber is growing in appeal as an alternative building material to carbon intensive concrete and steel. Cross-laminated timber (CLT), a sustainable multi-layered wood panel, is showing architectural potential for making strong large-scale walls. Since CLT requires being 100% made-to-order, when French industrial timber product manufacturer **PiveteauBois** decided to meet customer demand for this material they needed to transform their entire manufacturing approach to gain the agility needed.

PiveteauBois adopted the **3D**EXPERIENCE platform to create a single 3D model for breaking down customer building models. This model could then be used to produce each individual timber part, as well as to optimize how they would be loaded onto the delivery trucks, reducing the carbon footprint of operations. Thanks to the platform's robust data and automation capabilities, PiveteauBois gained 50% to 60% in productivity. They can respond quicker to change in customer needs, delivering finished products faster. Collaborating on the cloud ensures product traceability and better internal communication. PiveteauBois plans to further use the platform to meet sustainability goals, calculating the lifecycle and carbon footprint of its products.

UNTiL NOW

Manufacturing production lines were physically installed, without any possibility to optimize or change the way they were operating once set up

FROM NOW ON

Embracing the power of immersive virtual modeling empowers manufacturers to drive innovation and growth to meet growing demands of customers, regulators and the planet, in tight collaboration across their value chains

Faster, cheaper and more sustainable production: these are just some of the enormous social and economic challenges forcing manufacturers to rethink their engineering platforms and processes. The rise of smart factories, digital manufacturing and proliferation of AI and data-driven technologies opens new opportunities for manufacturing industries to rethink operations while addressing emerging challenges. From optimizing car design or planned use of manufacturing robots on production lines, to empowering the food or shipyard industries to leap into the digital age, to providing a path for a new generation of sustainable aircraft, the **3D**EXPERIENCE platform is at the forefront of revolutionizing manufacturing. Virtual twins of machinery, processes and products are accelerating digital transformation, leading to greater operational efficiency and data-driven decisions through the product lifecycle, from conception to reuse.

Revolutionizing vehicle engineering

BMW Group has extended its strategic partnership with Dassault Systèmes to develop its future engineering platform with the **3D**EXPERIENCE platform at its core.

"We will only optimize our engineering process if we think digital, work connected and rely on an integrated data. For the BMW Group the **3D**EXPERIENCE platform will support this approach and help to reach a higher level of quality in our processes."

Julien Hohenstein, Vice-President, Processes, Digitalization, Governance Idea to Offer at the BMW Group research and development

Dassault Systèmes and **BMW Group** have extended their long-term strategic partnership to develop BMW Group's future engineering platform. Placed at the core of this project, the **3D**EXPERIENCE platform will empower BMW Group to rethink its engineering process to accelerate the development of all vehicles, streamline company-wide collaboration and enable more efficient data management.

Mastering the complexity of car variants

For decades, Dassault Systèmes and BMW Group have built a strategic partnership, pooling their knowledge and know-how to advance technological innovation in areas including production planning and scheduling, part design and production efficiency. With the **3D**EXPERIENCE platform at the core of BMW Group's future product development environment, all engineering disciplines will now work on a virtual twin of a vehicle that can be configured for variants of each model using real-time, integrated data. Teams can reuse components more easily, master the complexity of car variants and accelerate engineering to manufacturing cycle time. In addition, BMW Group can seamlessly migrate data from existing IT solutions and extend its engineering platform to other disciplines, such as modeling and simulation.

Accelerating sustainable mobility

Speeding time to market of sustainable mobility solutions using advanced technology like the **3D**EXPERIENCE platform is a competitive differentiator in the automotive industry. Extending the partnership between Dassault Systèmes and BMW Group is testimony to the fundamental and transformative role of the platform's virtual twin experiences to streamline enterprise-wide collaboration and deliver data-driven approaches to manage the exponential complexity carmakers are facing during engineering connected, autonomous vehicles.

MORE THAN

17,000

BMW GROUP EMPLOYEES ACROSS ALL ENGINEERING DISCIPLINES WILL RELY ON THE **3D**EXPERIENCE PLATFORM TO ACCELERATE THE DEVELOPMENT OF ALL VEHICLES, FROM THEIR IDEATION TO THEIR PRODUCTION.

Improving the efficiency of industrial robots

Virtual commissioning allows Robot at Work to meet its customers' increasingly complex requirements more easily and help them run their manufacturing operations more efficiently. Now, virtual twins on the **3D**EXPERIENCE platform on cloud help Robot at Work improve its customers' production line setups.

Manufacturers are feeling increasing pressure to streamline operations to create products at a lower cost, accelerate time to market and maintain the highest levels of efficiency – while also increasing employee productivity and maintaining business relationships. It's a tall order, and for Italian production line solutions specialist **Robot at Work**, it meant finding a way to meet customer requests for complex automation needs with standard robots.

Robot at Work used to receive a customer request, then had to imagine how a robotic cell would operate within the context of their customers' shop floor operation. Seeing the success of their automotive customers using virtual commissioning – the testing, verification and validation of automation control systems through a digital model of the plant and equipment – the company knew they too could use virtual models to test their robots' capabilities, evaluate their functionality and identify issues and improvements to meet all their customer's needs.

Defining robotic cells virtually

DELMIA applications on the **3D**EXPERIENCE platform provide Robot at Work sophisticated features to program robots in the context of a specific production line and simulate in depth behavior of all

"Our customers can now see a complete simulation of their production line upfront and know exactly how their investment will pay off. It's bringing us much closer to our customers."

Lorenzo Codini, Administrator, Robot at Work

robotics. Other solutions on the **3D**EXPERIENCE platform allow them to create virtual plants where they can run unlimited scenarios to check setup and design before a customer commits to building or reconfiguring physical production lines. And because the solutions could be deployed on the cloud, Robot at Work could get started without a major upfront investment in IT infrastructure.

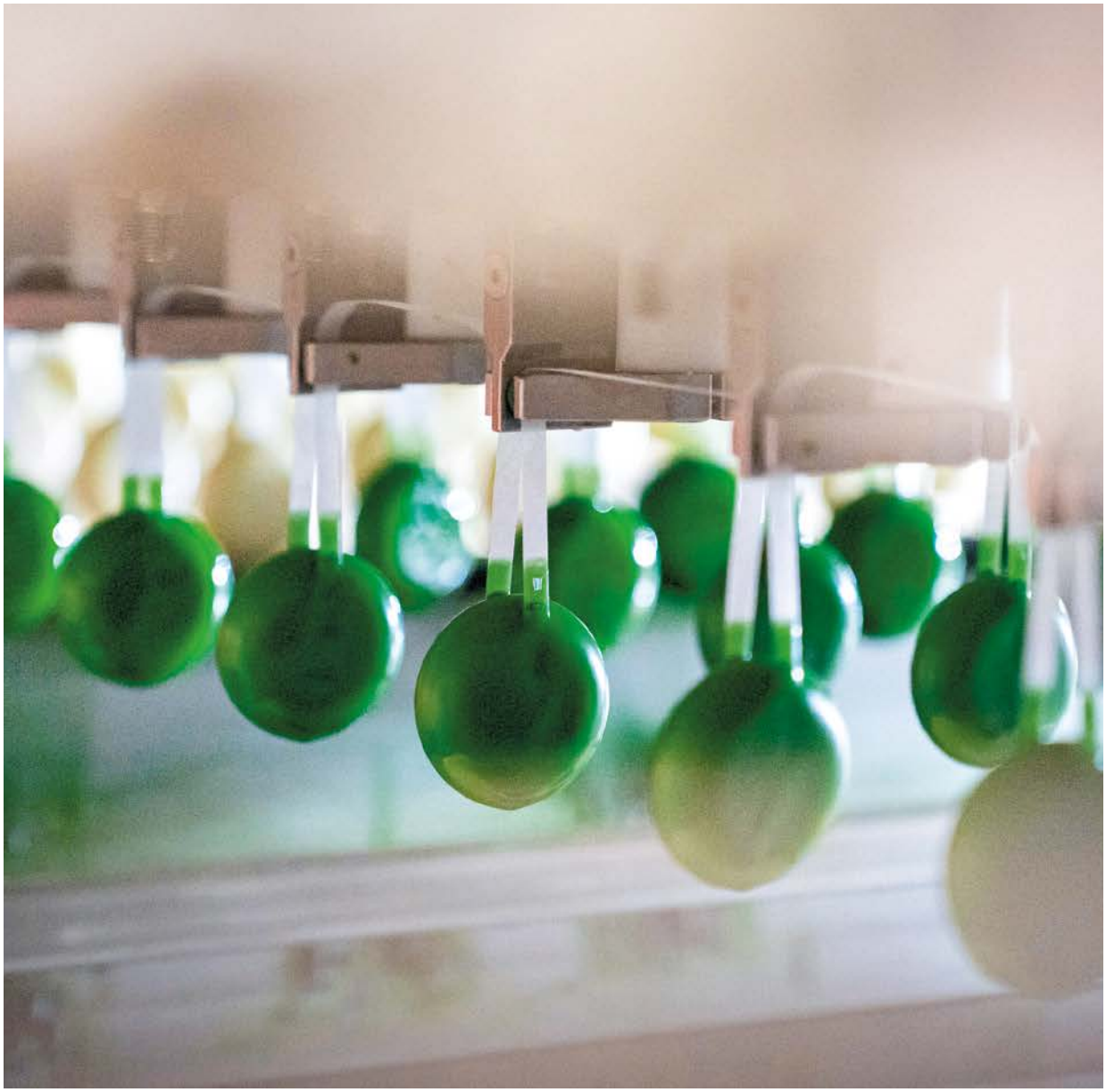
Robot at Work can now simulate in-depth the behavior of all the robotics on a production line, integrating many robot brands and comparing to see which one is best suited to a customer's needs. By defining each production line solution in great detail, they can determine which robots are best suited for different tasks and combine several different functions into one cell. With this approach, Robot at Work can establish the optimal solution for each of its customers' requirements without the costs, delays and mistakes that come from a traditional approach of physically installing a new line and then trying to debug and optimize it on the shop floor.

Creating new aftersales offerings

The transition to virtual commissioning has been transformational for Robot at Work, not only in meeting its customers' increasingly complex requirements, but also in opening new service opportunities once a production solution is fully up and running. Many customers change production two to three times a month. Using our solutions allows Robot at Work to help a customer get a new cell up and running more quickly, strengthening their relationships: their customers trust that they are getting the best solution before they must commit to building it, showing early on exactly how their investment will pay off.

Becoming a leading food-tech company

Among the leaders in the food industry, the Bel Group, a French company, is known worldwide for its emblematic brands such as Babybel and GoGo SqueeZ. Bel and Dassault Systèmes have joined forces to bring a healthier, more innovative and responsible diet based on milk, fruit and plant-based products.



Bel's mission is to positively impact the food industry and ensure everyone has access to healthier, more sustainable offers, including a wide range of dairy, fruit and plant-based portions of goodness. As a 150-year-old French family company, Bel is committed to transform food models towards sustainability and regenerative agriculture, with a focus on minimizing food waste and offering healthier choices.

In pursuit of this ambitious goal, Bel has formed a powerful alliance with Dassault Systèmes to capitalize on their combined strengths and expertise. The complexities of meeting the world's food demands have propelled the need for innovative technologies like precision fermentation and sustainable agriculture. Through this partnership of these two French and Family groups, Bel aims to enhance its operational efficiency, implement cutting-edge online platforms, and advance digitalization efforts across manufacturing and product lifecycle management.

Dassault Systèmes is powering Bel's data science capabilities across 11 factories in different regions, propelling the journey towards greater operational efficiency and breakthrough R&D. Together, we're working to standardize industry solutions and leverage AI to bring healthier, more sustainable food choices to people worldwide.

11

PLANTS INVOLVED,
BENEFITING SEVERAL THOUSAND OPERATORS OF BEL GROUP

200

R&D RESEARCHERS
INVOLVED WITHIN BEL GROUP

Standardizing processes to unlock efficiencies

Damen Group is focused on becoming the most sustainable and connected shipbuilder in the world. This international shipyard group is using the **3D**EXPERIENCE platform to facilitate their transition from a product-centric to a service-centric company.

Shipbuilders are under pressure to meet demand for customized, sustainable and cost competitive vessels, making digital transformation a critical path for this complex and labor-intensive industry. With 12,000 employees across 35 shipyards and a goal to be the most sustainable and connected shipbuilder in the world, **Damen** adopted the **3D**EXPERIENCE platform to consolidate its IT applications and bring its engineering offices, shipbuilding sites and other stakeholders into a centralized digital environment.

The platform helps empower Damen to meet its mission of putting customers at the heart of their approach, allowing its engineers to handle complex vessel configurations and design changes with agility, and plan manufacturing, assembly and maintenance early in the design phase. They can collaborate more efficiently with industry partners to deliver higher quality, pioneering products on time and within budget, and test options to increase vessel sustainability. Damen plans to extend the **3D**EXPERIENCE platform to its workboats division. But, its ultimate goal is to develop a complete virtual twin of a ship to extend across the vessel's lifespan, from component ideation to designing monitoring equipment that enables predictive maintenance.

Designing a next-generation hybrid aircraft

French startup VoltAero is taking electric aircraft to an entirely new level with electric-hybrid propulsion. Founder Jean Botti describes how the company worked with our DesignStudio to develop a proprietary design for its aircraft while also developing a unique branding proposition.

Jean Botti
Founder, VoltAero

What challenges, from design and organizational aspects, did you face in designing the Cassio 330 hybrid aircraft?
VoltAero develops high-performance aircraft for multiple purposes: to carry people, goods and medical evacuations. A dedicated collaborative space on the **3D**EXPERIENCE platform allowed us to use integrated design practices for sustainable innovation, throughout development.

What were the operational and sustainability benefits of working with the 3DEXPERIENCE platform?
Co-designing the Cassio 330 with Dassault Systèmes allowed us to optimize the aerodynamics while making something beautiful. The Cassio 330 brings safe, eco-friendly flight to connect communities. The use of immersive virtual modeling ensured that the design was both aesthetically pleasing and carbon efficient.

How did Dassault Systèmes' DesignStudio contribute to defining your brand identity?
Through the VR experience solution provided by Dassault Systèmes, we were able to showcase to our clients and stakeholders the interior and exterior design of the Cassio 330. This was a crucial milestone in demonstrating how our product will reflect our brand and the unique value proposition of our innovative aircraft.

20%
FEWER GHG EMISSIONS
BY THE CASSIO 330 WHEN FLYING IN FULL HYBRID MODE

UNTiL NOW

Businesses were operating with a consumption model that took more from the planet than it gave back

FROM NOW ON

Through partnerships and software solutions, we're helping our clients – and our employees – to imagine, create and deliver a circular approach that puts people and the planet at the heart of everything

It's become clear that working on sustainability in isolation isn't enough: collaboration is required to deliver a systemic transformation of the global economy. A network of sustainability-minded stakeholders, with complementary know-how and a wide scope of expertise, are joining forces to seize new eco-friendly possibilities revealed by combining science and virtualization.
Our **3D**EXPERIENCE platform provides a holistic view of production chains, to identify ways to make them more circular and carbon efficient.
Our science-based virtual twins allow unlimited opportunity to experiment virtually on the design of products and processes to manage operations and apply circular design principles at every step of a product's lifecycle.
And promoting STEM jobs to women is key to unlock a more diverse talent pool to lead the sustainable innovation of tomorrow.

Accelerating climate action through partnerships

Our sustainability strategy is based on three priorities: committing to environmentally sustainable operations, designing solutions that enable our customers to reduce their environmental footprint and developing human capital with respect to diversity and ethics. Partnerships help fuel our mission.

Collaborating for sustainable innovation

At Dassault Systèmes, we're focused on driving sustainable innovation through transformative solutions. One way we accomplish this is by building trusted, mutually enriching partnerships with institutions, academia and systems integrators. Collaborating with these organizations provides an environment for sharing knowledge, advocating for beneficial policies and co-creating solutions for maximum impact. Here are two examples of how we team with leading organizations and initiatives:

Reducing e-waste with EECONE: the European ECOsystem for greeN Electronics

EECONE is a collaborative public initiative which aims to reduce e-waste in Europe. Forty-nine entities in 16 countries are working together to propose effective ways of reducing e-waste across the entire value chain. Dassault Systèmes brings the potential of virtual twins to navigate this complex problem, by considering generation of waste from the earliest stages of the design lifecycle to end of life of electronic equipment.

Scale up circularity with the Ellen MacArthur Foundation

Dassault Systèmes is a member of this NGO whose mission is to accelerate the transition to a circular economy by working with businesses, governments and academia to promote the adoption of circular practices and processes in the global economy. This relationship has helped us better understand how the **3D**EXPERIENCE platform can help organizations facilitate transformations applying a systems approach to eliminate waste and pollution, keep products and materials in use longer and regenerate natural systems.

ELLEN MACARTHUR FOUNDATION Member

Analyzing conversations on climate change

In the fight against climate change, two elements will make a difference: accurate scientific measurement and collaboration among all stakeholders. To achieve the latter, we need to carefully listen to ongoing dialogue to support everyone looking to contribute within their realm. Dassault Systèmes, with Capgemini and Bloom as co-authors, set out to explore the chasm between talk and taking climate action, and in turn to study how to turn talk into action. Conducted over eight months, *Social Intelligence for Climate Action* analyzed English-language climate conversations on social media:

14 million posts and comments and 480 interactions, including likes and comments. A sophisticated algorithm analyzed tone and emotional content – a model so refined it even considered the emotional complexity of emojis.

The study revealed that greenwashing by companies and institutions generates consumer skepticism which in turn discourages individual action. It also examined the belief held by many that technology will solve the climate emergency. Other obstacles expressed include a lack of reliable and useful information, fear about the downsides of taking action and a delegation of authority: the belief that tackling climate change is someone else's job.

Ultimately, the study encourages organizations to consider its key learnings to better understand how to build an efficient and actionable strategy that convinces and enables individuals to do their part to tackle climate change, while – in their professional capacity – still putting business efficiency at the heart of their daily operations. Further, it encourages collaboration and social listening to help industry innovate differently by mobilizing the collective imagination.

LEARN MORE ABOUT THE STUDY *SOCIAL INTELLIGENCE FOR CLIMATE ACTION*

Coaching our employees to reduce carbon footprint

We believe and take an active role in developing well-informed employees to become actors to meet the challenges of transitioning to a carbon neutral society. To this end, we organize events designed to help our people discover better actions to improve their own carbon footprint.

How can virtual universes contribute to building a more sustainable world? Understanding this question was part of our 2023 internal learning program aimed to make our more than 23,000 global employees the best advocates of our commitment to sustainability. We offered workshops, conferences and collaborative challenges to raise awareness on key issues and how we're addressing them – and sharing tangible ways they can make a difference in their personal and professional lives.

Our **April Sustainability Month** featured local, global and educational opportunities to guide employees to do their part to minimize their individual footprints and protect the planet for future generations. One global event taught about the importance of data clean-up to help employees be more mindful of the carbon impact of their digital footprint. More than 60 offices participated in local challenges such as garbage cleanups and food donations, led by members of the 3DS Green Team, our global community of employees actively advocating for a more sustainable future. Challenges across all participating sites resulted in 40.8 tons of CO_2eq saved!

Our **September Sustainable Innovation Month** included programs to demonstrate how innovation can help bring about sustainable transformations. More than 1,400 employees participated in "individual impact" workshops to discover in a concrete and fun way what it will take for society to become carbon neutral by 2050. People learned how individual actions can have a positive impact, such as improving their carbon footprint and doing their part to reduce e-waste.

A COMPANY WIDE MOBILIZATION

MORE THAN

23,000

EMPLOYEES PROVIDED BOTH GENERAL AND ROLE-SPECIFIC LEARNING PROGRAMS ON CLIMATE AWARENESS

40.8

TONS OF CO_2EQ SAVED THROUGH ACTIONS OF THE GLOBAL COMMUNITY OF EMPLOYEES DURING SUSTAINABILITY MONTH

Addressing the gender gap in STEM jobs

It's imperative to encourage young women to pursue studies and careers in scientific fields so that they, too, can work to build a more sustainable future for our planet. Our commitment to promoting women in STEM is aligned with our ESG commitments and aims to create a more diverse talent pool.

Jobs in the fields of science, technology, engineering and math (STEM) are set to explode in the years to come, yet women remain underrepresented in academia and professional tracks to fill these opportunities. Dassault Systèmes is committed to addressing this gender gap by promoting STEM curricula and careers for women. Here are a few examples.

We have a longstanding partnership with **Sophia Academy**, an all-girls school in Providence, Rhode Island (RI). Over the past ten years we have provided funding to allow underprivileged students to attend STEM events, including an annual interactive learning day. Last year's event at our campus in Johnston (RI) gave girls a chance to learn about our company, explore the field of engineering and try interactive technologies, offering exposure to career paths that they might not have otherwise considered.

Through our MEDIDATA teams, we support **Girls Who Code**, an international non-profit designed to interest young girls in STEM. Last November, volunteer employees conducted virtual technical interview prep sessions with more than a dozen career-age women to aid them in successfully negotiating this part of the hiring process.

On April 27, our team in Munich opened its doors to offer girls aged 11 and older a peek behind the scenes of our **3D**EXPERIENCE Lab. This was part of Germany's nationwide **Girls' Day**, a career-orientation project to expand the spectrum of vocational choices for women and boost girls' self-confidence to choose a STEM path. Under the theme *Your Skills, Our Future,* the girls explored the world of 3D modeling and technology at hands-on centers where they learned how to digitally build their creative design ideas.

WOMEN MAKE UP ONLY

28%

OF ENGINEERING GRADUATES WORLDWIDE

SOURCE: UNESCO SCIENCE REPORT.

Making circularity desirable, achievable, scalable and profitable

Circularity is radically transforming the global economy by redefining the way products are designed and manufactured and how materials are used and recycled. Technology plays a major role in inventing and facilitating the applications of circularity processes.

We've been living in a linear economy – a take-make use-waste model. But we're shifting to a circular economy – a continual loop of making/using and reusing/recycling. This transition requires rethinking how we design, manufacture and use products and services. For example, raw materials and products need to be conceived for multiple uses, because design determines a key part of the environmental impact of a product – and so integrating eco-design into product and service development allows companies to weave sustainability into the entire value network, driving a circular economy.
In this shift from product to usage, companies need to create "what if" scenarios, test novel solutions and measure their impacts before implementing decisions. Dassault Systèmes makes it possible for companies to find a balance between an organization's footprint – what they take from the planet to create products or services – and their handprint – the value they give back. In this way, companies can stop the value leakage that's in the traditional take-make-use-waste model, in which materials and products are discarded after one use. We call this new balance the eco-bill.

Delivering circularity

Our portfolio offers a framework where circular economy practices can grow and thrive through the adoption of eco-friendly practices, designing

for recyclability and exploring new materials. Our **3D**EXPERIENCE platform provides a holistic view of production chains. Our science-based virtual twins offer companies unlimited opportunity to experiment for maximum sustainability and to apply circular design principles at every step of a product's lifecycle.

Reaching scalable, profitable and desirable circularity

This is just a first step. We need to also help our customers design their waste to nurture circularity, to come up with materials that are biodegradable and easy to recycle. We're helping make the circular economy not only desirable, but achievable, scalable and profitable. Progress towards this is underway, but more can be done. Our new program "Circularity in Action" brings together expertise from 17 experts from our 12 industries and 6 of our brands to answer pressing questions on achieving circularity.

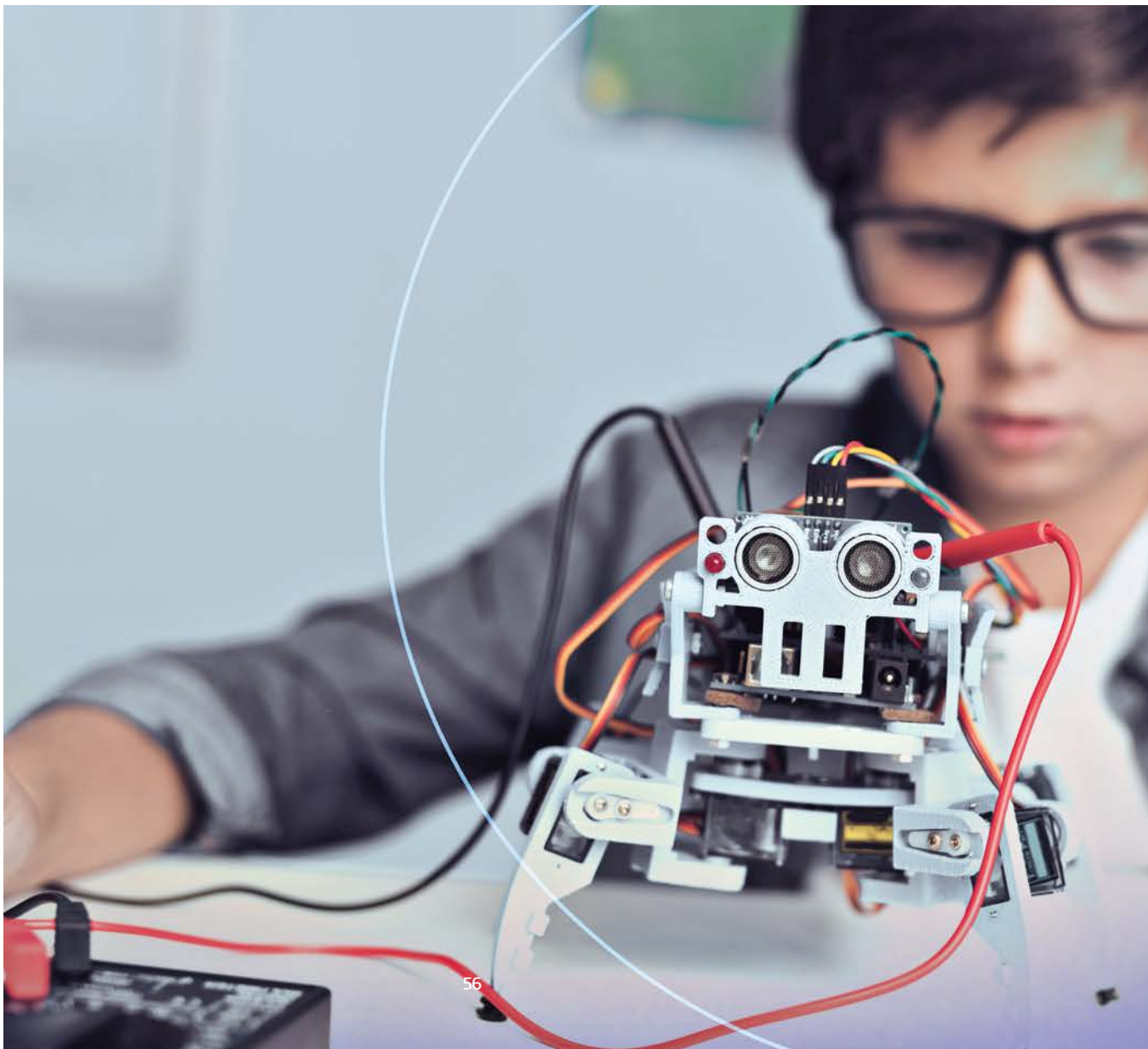
DISCOVER "CIRCULARITY IN ACTION"

UNTiL NOW

Virtual twins were limited to business purposes as tools for operational efficiency and models to design better

FROM NOW ON

Virtual twin experiences make it possible for companies to give back to society and support the next generation of workers, helping to ensure they have the right skill set to tackle global challenges



How can we find new renewable energy sources, combat debilitating diseases or reduce the skills gap in the workplace created by emerging technology? Working collaboratively within the **3D**EXPERIENCE platform generates innovative answers to these questions and others. Because we're resolutely attuned to ever-evolving needs of business and society, along with trusted partners we support and encourage not only today's visionary thinkers but we're laying the seeds for those in the generations to come. We believe in leveraging our technologies to bring positive impact to communities. We do this through our **3D**EXPERIENCE Centers of Excellence, our **3D**EXPERIENCE Lab network and La Fondation Dassault Systèmes.

Mentoring innovators in a vibrant, creative hub

Creating whale-safe fishing, turning crop residues into biochar… these are just some of the more than 70 disruptive projects by startups supported by our **3D**EXPERIENCE Lab network. These open innovation centers nurture and empower entrepreneurs and also host events designed for networking, exchanging ideas and encouraging collective intelligence.

Fostering innovation with MESHMERISE

At the heart of innovation lies the spirit of collaboration, a sentiment deeply embedded in the ethos of Dassault Systèmes. Our **3D**EXPERIENCE Lab in Boston put action behind this philosophy with MESHMERISE, an event to unite visionary minds to incite positive change. First held in our Munich location, MESHMERISE is an annual **3D**EXPERIENCE Lab event dedicated to creating strong community ties and empowering sustainable innovation among artists, startups, accelerators and other innovators from all walks of life, including Dassault Systèmes' largest clients and university professors. The September 2023 Boston event was an evening punctuated with inspiring pitches from startups including LiftLabs, Dynocardia, Smartweave, Augment Health and Behave!, all of whom showcased innovations poised to reshape the world for the better.

MESHMERISE also fostered a rich dialogue on the future of robotics and AI, featuring insightful speakers from MassRobotics and MIT Media Labs and sparking discussions to illuminate the transformative potential of these technologies to enhance work, education and mobility.

Next up: MESHMERISE Paris in fall 2024 where we'll celebrate the new **3D**EXPERIENCE Lab showroom and FabLab with more than 400 square meters featuring a prototyping area (3D printing, machining, robotics, etc.), demo and experimentation spaces and an "innovation showroom" that offers visibility to Lab-supported projects.

DISCOVER MESHMERISE

3DEXPERIENCE® Lab

Jillian Friot
Senior Manager, North America
3DEXPERIENCE Lab

What's a typical day like at the 3DEXPERIENCE Lab in Boston?

Just as the innovative ideas we support in the Lab are unique, so is every day in our facility. Of course, there's a consistent mission: supporting the entrepreneurs, makers and innovators working to achieve groundbreaking projects aimed at positively impacting society. We regularly host brilliant minds, guiding them on how they can harness Dassault Systèmes technologies and use hands-on access to our FabLab facilities to bring their ideas to life. It's exciting to work in such a vibrant hub of creativity among forward-thinking people.

How are Dassault Systèmes' employees involved with the Lab?

In addition to our talented Lab team, I'm proud to share that Dassault Systèmes encourages all employees to dedicate up to 10% of their time to mentoring Lab startups. There's power in bringing in a spectrum of disciplines to lend different perspectives! We believe this amplifies the impact of our program's goal to empower startups to solve problems differently.

What's one project you're most excited about supporting?

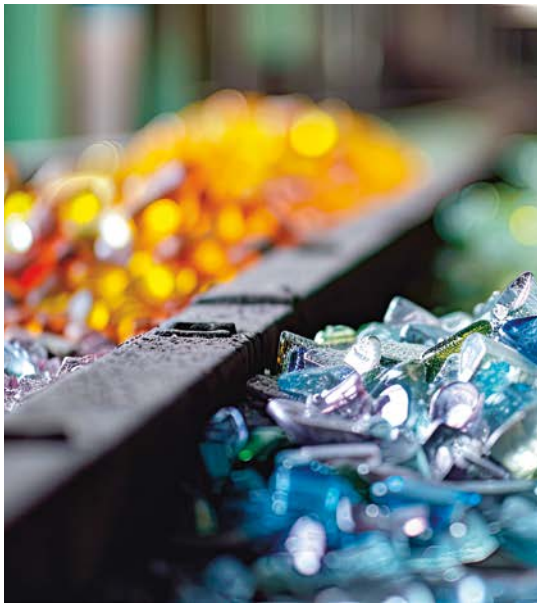
We have an inspiring community of startups in our Boston facilities, helping to solve so many of the world's top challenges. It's hard to choose just one startup, but as a New Englander I'm excited about what LiftLabs is doing to support sustainable lobstering and fishing in our area's waters. Also, I love that the Lab supports art as much as science! Colleagues often come in to create art or to make innovative projects for their homes. It's especially exciting to watch Chin-Loo Lama and Sal Lama of "Our Next Make" bring their next invention to life in the **3D**EXPERIENCE Lab!

Supporting entrepreneurial innovators

From inventing alternatives to single use plastics and packaging, to biometric implants, our **3D**EXPERIENCE Lab network supports dozens of startups, providing mentoring, marketing and communications and our technology to accelerate the development of their revolutionary ideas. Here are three organizations we supported in 2023.

ATACAMA BIOMATERIALS: Limiting single-use plastics

Plastic is bad for the environment because it can take hundreds of years to break down, and can release harmful chemicals into soil and water. And it's estimated that around 50% of plastic is used just once. Yet, there are no satisfactory sustainable alternatives to most single-use plastics, leaving industries seeking a low-cost alternative. **Atacama Biomaterials** is helping to meet this need with Woodpack, a flexible film for packaging made from recycled wood pulp. Woodpack combines the lightweight nature and performance of plastic with the renewable and low environmental impact of paper. With its natural compostability and low-carbon production footprint, Woodpack represents a viable alternative to traditional plastic films. By replacing with Woodpack, Atacama Biomaterials believes 30 million tons of plastic waste per year and 263 $MMtCO_2e$ can be eliminated. As a member of our **3D**EXPERIENCE Lab in Boston, the startup was provided SOLIDWORKS to test and optimize production for market competitivity, specifically to simulate thermal interaction and material flow to understand necessary reformulations. Through technology and mentorship of Dassault Systèmes, Atacama Biomaterials was able to scale Woodpack's operations to be commercially viable.



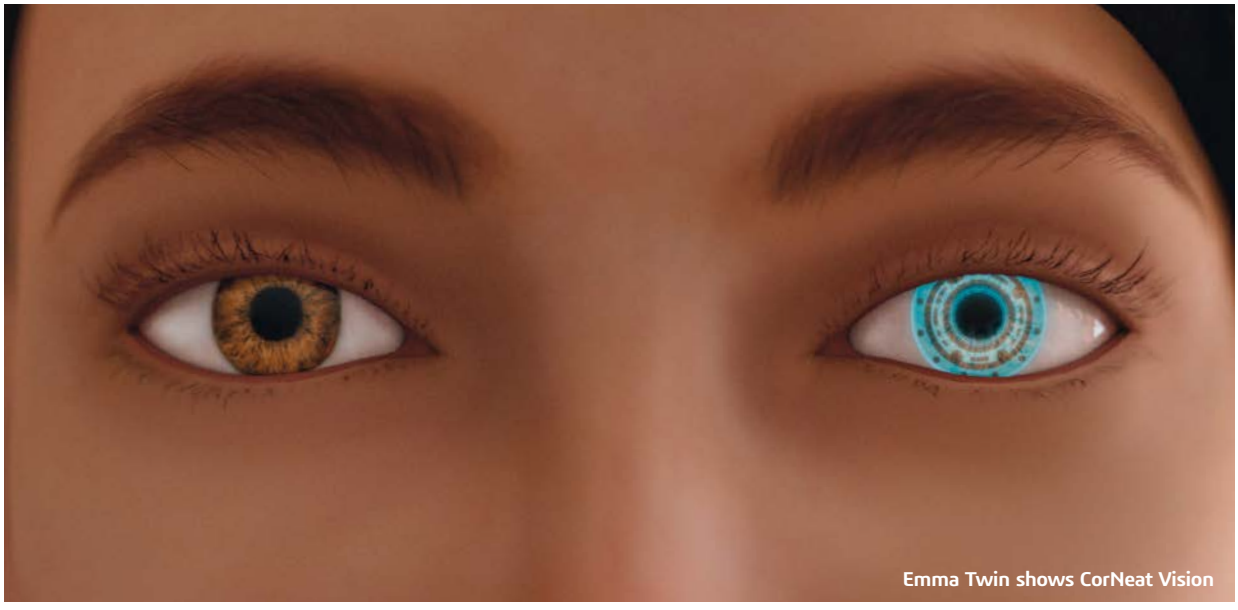
FLEXPENSER: Reducing spoilage with innovative packaging

The food and beverage industry has always faced a daunting problem: how to counter the spoilage that occurs when a package is opened and exposed to air, leading to contamination or oxidation. Swedish startup **Flexpenser** has developed innovative dispensing valve technology to address this challenge. Its unidirectional, air-tight membrane keeps liquids inside a leakage-proof container, making it possible to access the content of a package without opening it. This minimizes liquid waste and protects the integrity of liquid and semi-liquids. Flexpenser's solution also works in laboratories and biomedical settings. Through its participation in the **3D**EXPERIENCE Lab, Flexpenser uses the modeling, simulation and manufacturing capabilities of the **3D**EXPERIENCE platform and can collaborate to fine-tune designs and products.

3DEXPERIENCE® Lab

CORNEAT VISION: Accelerating revolutionary corneal replacement therapy

A major cause of blindness worldwide is corneal disease, striking 2 million people each year. Unfortunately, surgeries to correct this are hard to come by, and come with potential complications, a long healing time and varying success rates. But there is new hope. Israeli clinical-stage biometrics implants and technology company **CorNeat Vision** has developed a revolutionary artificial corneal replacement therapy: synthetic, non-degradable artificial corneal tissues can be implanted in a relatively simple surgical procedure to restore full vision to corneally blind patients. As a member of the **3D**EXPERIENCE Lab, CorNeat Vision used SOLIDWORKS for product and manufacturing design and MEDIDATA for electronic data capture and cloud-based management of medical imagining to run two joint clinical trials. Using virtual twins allowed CorNeat Vision to run unlimited tests of their products and production processes. They plan to extend use of the **3D**EXPERIENCE platform by creating a virtual twin of a planned manufacturing facility being constructed in conjunction with international clinical trials – all in all, helping more people restore their eyesight.



Emma Twin shows CorNeat Vision

Shaping tomorrow's science and technology talents

La Fondation Dassault Systèmes builds bridges between the education and business communities. In France, it's enhancing teachers' familiarity with career opportunities in STEM. In India, this takes the shape of a flagship program to make engineering students "industry ready".

PROFESSEURS EN ENTREPRISE: Bringing teachers to the office

It's clear that applying science and technology are essential routes to discovering innovative approaches to address the most pressing global challenges. But is the next generation aware of what this can mean for them and their career options?

Teachers play a crucial part in igniting students' passion for STEM and guiding them toward studies that can lead to rewarding careers in these fields. But with ever-evolving needs in the professional sector, teachers must have a deep and ongoing understanding of what scientific companies are all about. That's why, in line with its commitment to fostering STEM education, La Fondation Dassault Systèmes participated in **Professeurs en Entreprise** (Bringing Teachers to the Office), an initiative that builds bridges between the education and business communities, led by its partner, the CGénial Foundation.

Ninety-five teachers visited Dassault Systèmes company sites across France where they met with volunteer professionals to learn about the diversity of STEM careers, pathways into these jobs and essential hard and soft skills needed to succeed. This immersive experience provided educators

with concrete examples to share back with their students, empowering them to widen their horizons and make informed decisions about their future. It also fostered discussions about the importance of encouraging young minds – particularly girls – towards STEM fields.

CONNECTNEXT:
Empowering Indian students to become Future-Ready

Employability and engineering graduates' readiness have been important challenges for industry in India. La Fondation Dassault Systèmes is addressing this gap by fostering collaboration between local academia and business communities to create a vibrant ecosystem that helps students learn the skills they need to become "industry ready."

One form this takes is leading **ConnectNext**, a program designed to identify and encourage emerging engineering talents across India. Through a collaboratively designed curriculum, hands-on experience and mentoring from industry experts and Dassault Systèmes volunteers, students work on real industrial projects, using the latest innovative technologies from ideation to market delivery to usage. ConnectNext offers participating students a chance to demonstrate engineering skills, showcase projects to catch industry attention and gain proficiency via internship opportunities.

La Fondation Dassault Systèmes supplies a collaboration platform to participating universities, institutes and companies, and funds qualified projects to help students gain experience by building working prototypes. Not only does the program help students build experience in a rapidly evolving technology landscape, ConnectNext also keeps educators updated with the latest technological advancements and engineering trends to ensure they can nurture essential skills for successful career paths.

Empowering future innovators and scientists with 3D technology

La Fondation Dassault Systèmes encourages a culture of sustainable innovation and active learning among students, by introducing them to 3D technologies. La Fondation Dassault Systèmes is also empowering researchers to push boundaries with lifelike virtual models of the real world to help address economic, social and environmental challenges.

MADE IN 3D: Seeding a new generation of entrepreneurs

Marie-Pierre Aulas
Global Managing Director,
La Fondation Dassault Systèmes

What is the goal of the Made in 3D program?
La Fondation Dassault Systèmes and our partner **La main à la pâte** conceptualized Made in 3D to inspire students in middle and high school to become future innovators and entrepreneurs. The idea is simple: students create pseudo startups to develop their dream product, which they design, make and promote using 3D design and 3D printing technologies. After successful runs in France and India, in 2023 we also launched the program in the US.

How does Made in 3D benefit students?
With the help of committed Dassault Systèmes volunteers, students are empowered to use creative thinking. They're given access to professional 3D tools to develop innovative products that make life better. So not only do they gain skills, they're helping to improve the world around them! In the last edition, for example, students came up with powerful ideas to address inclusion and disability, sustainable housing and recycling, as well as concrete solutions to everyday challenges faced by villagers and farmers in rural areas.

What is the reach of the program?
The program is growing and getting international acclaim. In India, the grand finale was recognized as a G20 event and the top three teams were given the opportunity to present their innovative ideas at the Startup20 Summit. I'm confident that early exposure to 3D tools will result in a new generation of thinkers and entrepreneurs who will, one day, lead the way in sustainable innovation.

DASSAULT SYSTEMES
La Fondation

IMMERSEA LAB: Fostering ocean education

The effects of global warming are triggering an alarming rise in ocean levels, posing immediate threats to inhabitants of coastal regions. In the face of such challenges, we need a new generation trained in undertaking scientific and technological oceanic research.

That's the goal of **ImmerSea LAB**, a program led by the University of Western Brittany as part of ISblue, an interdisciplinary graduate school that brings together key players in marine science and technology with students from universities and engineering schools. La Fondation Dassault Systèmes supports ImmerSea LAB's innovative teaching approach that provides students with a collaborative learning environment based on 3D, simulation and immersive technology. Students in this program developed ImmerSea RADE, a 3D modeling and simulation of France's Brest harbor that traces its evolution over the last 12,000 years. This virtual tour provides insight into the changes the harbor and its surroundings have undergone.

From access to data on fisheries, pollution and temperature, to 3D modeling and simulation of coastal and open ocean landscapes, ImmerSea LAB enables researchers and students to collaborate, learn and experiment with ideas and forward-looking scenarios that could result from climate change. And it's not just educating future marine scientists; it's also fostering a deeper understanding of the ocean among the public by sharing with them immersive experiences, a crucial step towards better protecting this vital resource.

LIVING EYE VIRTUAL TWIN: Understanding blindness trough virtual twins

Two relatively common forms of blindness occur just behind the eyeball, where the optic nerve connects to the brain. Researchers know that every time the eye moves – a couple of hundred thousand times a day – the optic nerve wiggles a bit, but the potential damage inflicted upon the delicate blood vessels by eye movement over the course of a lifetime is not well understood. To enhance understanding of this organ and make it possible to develop new therapeutic tools to treat blindness, La Fondation Dassault Systèmes has approved a grant to the Massachusetts Eye and Ear hospital for a preliminary study to create a Virtual Twin of the human eye. Led by Dr. Joseph Rizzo, Professor of Ophthalmology at Harvard Medical School, the groundbreaking **Living Eye** virtual twin project will deepen understanding of this organ by developing a scientifically accurate 3D model allowing researchers to observe the optic nerve in new ways, as current techniques can't capture the complex dynamics of the eye.

Reducing the skills gaps with lifelong learning

Because tomorrow's jobs won't resemble today's, Dassault Systèmes has committed to offering people of all ages and experience levels the opportunity to gain skills and knowledge though our **3D**EXPERIENCE Edu Centers of Excellence, a global program helping students and professionals alike harness the power of virtual worlds within the workplace.

Xavier Fouger
Senior Director,
Global Academia Programs

Why did Dassault Systèmes establish the Centers of Excellence?

We realized that in a world evolving at dizzying speed, employees need new skills to thrive in new jobs, in established fields as well as domains that are emerging such as AI, digital thread and virtual twins. Our **3D**EXPERIENCE Edu Centers of Excellence are facilities around the globe dedicated to experiential learning for people of all ages and career stages, through a network of facilities that provide learners with the knowledge they will need to adjust to the rapid transformation of industry.

How do the Centers work with key stakeholders?

We established a charter with 10 essentials characteristics to ensure the needs of our key stakeholders are met. Through a tight working relationship with employers, we help educators identify workforce gaps and maintain awareness of emerging skills. With academic institutions, we develop hands-on project opportunities to offer students contextualized experience with the **3D**EXPERIENCE platform. And we empower learners to gain the knowledge they need about career opportunities and the skills required to get hired.

What makes the Centers unique?

Our Centers combine their own areas of expertise with the power of **3D**EXPERIENCE, creating ideal conditions to equip their learners with a thorough skillset relevant to transformative work practices. Our Centers use cutting-edge equipment in conjunction with virtual twins to offer relevant learning context in a range of industries. For example, Long Island University in the US focuses on applying **3D**EXPERIENCE in the fields of pharmaceutical sciences, precision medicine and digital health care.

3DEXPERIENCE® Edu

Putting 3DEXPERIENCE at the core of collaborative learning models

Hearing regularly from our customers that they were often facing a skills gap when it came to hiring triggered an idea in our Edu group: to partner with various types of institutions – from prestigious research universities, technical colleges and other learning institutions – to create project-based learning models structured around in-demand digital practices. Thus, in 2021, the **3D**EXPERIENCE Centers of Excellence program was born.

Students of all ages and levels of professional experience have emerged from their time in our Centers having earned Dassault Systèmes' certifications to prove their depth of knowledge of **3D**EXPERIENCE platform. In 2023, the program grew to include other institutions, such as:

- **India's KLE Technological University,** where engineering students can take several novel courses on modeling and simulation including product lifecycle management (PLM).
- **University of Southern California's Sonny Astani Department of Civil and Environmental Engineering,** for training on the application of computational tools for data analysis, visualization, modeling and simulation in the Infrastructures & Cities sector.
- **Cranfield University in the UK,** to aid in the acceleration of the digital and sustainable transformation of the aerospace and defense industry, with courses and projects designed in collaboration with aerospace employers and taught by platform-certified instructors to students and professionals wanting to upskill.

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3DEXPERIENCE **EDU CENTERS OF EXCELLENCE** AROUND THE WORLD

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