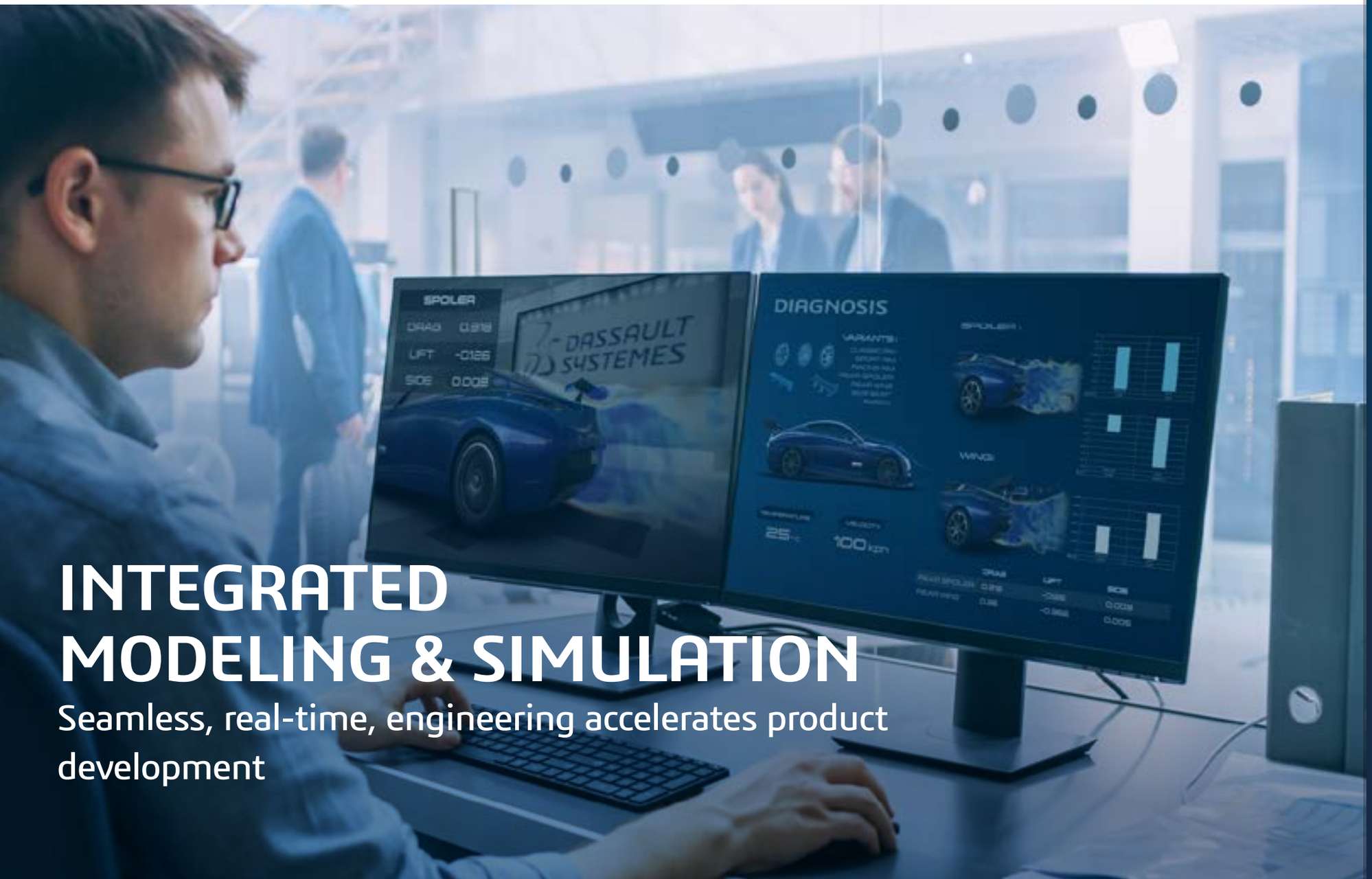


INTEGRATED MODELING & SIMULATION

Seamless, real-time, engineering accelerates product development

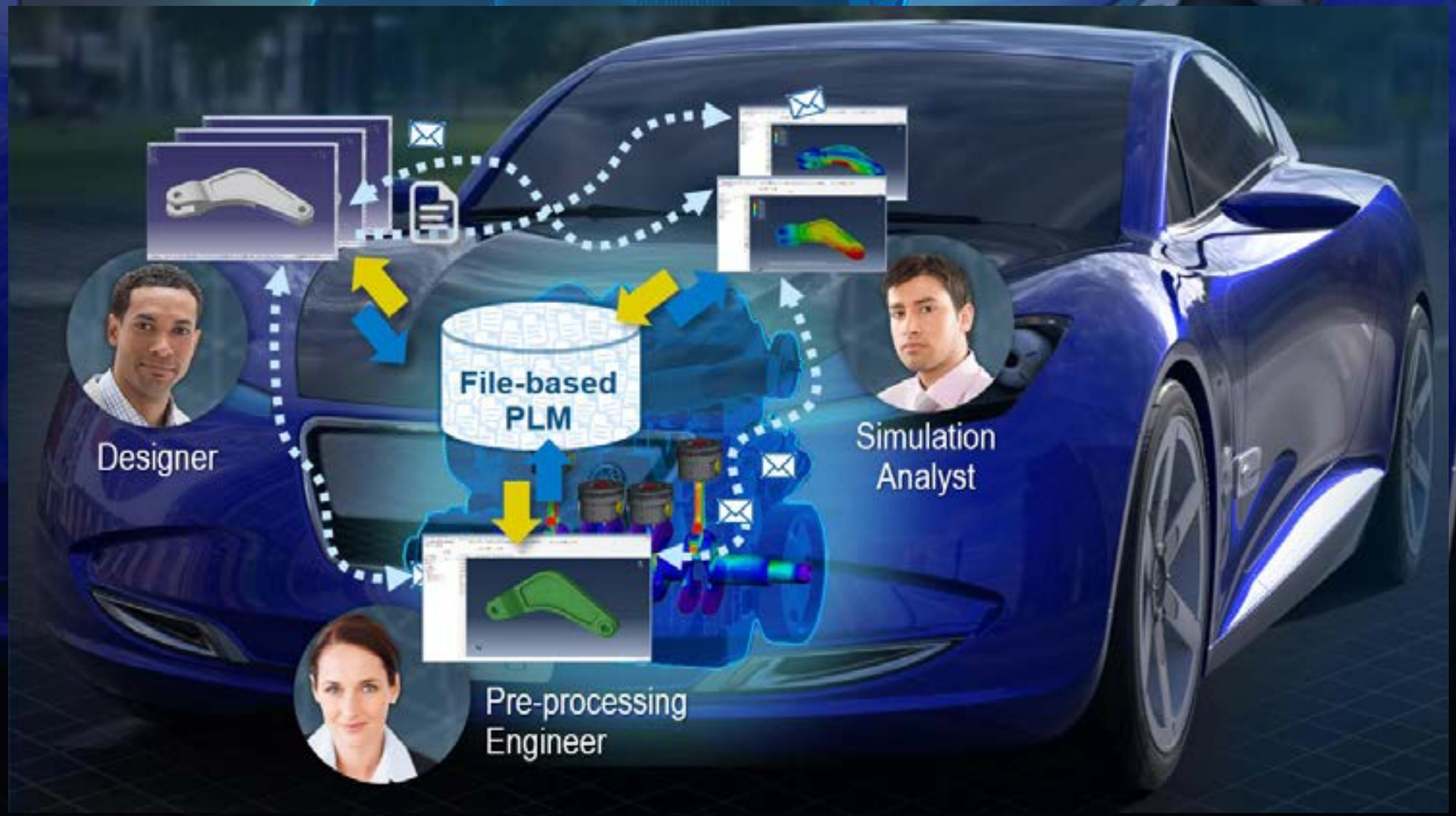
INTRODUCTION

Product Design at a Breaking Point

As customers demand products that cost less with more capabilities coupled with growing product complexity, companies see new technology as the way to compete. Innovators that provide a compelling and intuitive user experience have a competitive advantage. However, today's product design process is at a breaking point. No longer can a company easily meet tight performance, quality, time-to-market, and budget constraints using legacy processes and tools.

Outdated File-Based PLM

Product development and manufacturing planners using file-based PLM must navigate around many obstacles.Rigid handovers that require translation and rework take days. Plus, teams must manage version control issues. Worse still, functional teams work in silos so collaboration between designers, analysts and preprocessing engineers is lost.



Eliminate Late Discoveries

The old school approach requiring handoffs between designers and analysts grew from functions using different tools and IT environments.

Allowing designers and analysts to work together from the early concept phase fosters innovation and minimizes discovering issues late.

Early analysis allows the design to be optimized early which lows the risk of developing sub-optimal products or delaying product launches.

Break Down Barriers

Removing the wall between design and simulation allows engineering to accurately experience products as early as possible in the development process. MODSIM – integrated modeling and simulation - ensures full exploration (including product behavior) of a design early in the process. Many more concepts can be explored and validated ensuring the best design for meeting requirements.

1. INTEGRATED MODELING AND SIMULATION

Increase Design Confidence

Simulation IS design. When designers and analysts work together, with fully integrated modeling and simulation from the beginning of the design and validation process, the result is greater product insight and reduced uncertainty about the performance of the final product.

This is because more design alternatives can be explored and accurate simulation of the product's behavior guarantees that manufacturing constraints are respected and the design is optimized to meet requirements. The result is the ability to converge on a better product.

Accelerate Design

Not just simulation-driven design, integrated modeling and simulation changes the design paradigm. With integrated modeling and simulation development teams avoid wasting time on translations between systems and repeating tedious preparation tasks when designs change. All teams use the most up to date product version and risk and delays are avoided.

2. A NEW WAY TO WORK

Experience Your Design

Integrated modeling and simulation (MODSIM) allows engineers to fully experience the product and its behavior in the early design phases. This allows them to deliver more complex and sophisticated products while meeting product performance requirements and time-to-market deadlines.

With MODSIM, specialized materials, operational context and manufacturing processes are considered from the beginning. Cross-disciplinary teams collaborate and interact efficiently and iteratively to ensure maximum know-how is contributed to the development process.

These leading edge technologies can accurately predict, compare and simulate multiple product behaviors which is essential to deliver products quickly when there is little time for extensive physical prototyping and testing and risk and delays are avoided.

3. REDUCE COSTS AND RISK

MODSIM Lowers Costs

In the traditional approach, product design and simulation are performed by different departments with different schedules and priorities. This often results in simulation analysis occuring in the later stages of design.in order to make the right design choices, avoid potential design dead-ends, increase confidence that the design is on the right track, and reduce risk of re-work during the detail phase.

Figures 1 and 2 show product development costs with the traditional design and simulation approach.

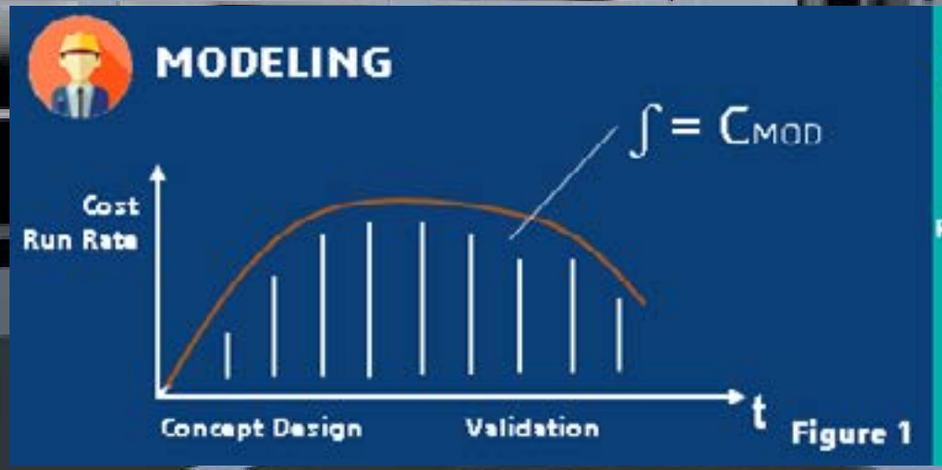


Figure 1

Figure 2

MODSIM Lowers Costs

Figure 3

The orange line shows the combined cost across the full lifecycle of a product when modeling is followed by simulation.

Figure 4

The blue line shows the cost with integrated modeling and simulation or MODSIM. MODSIM shifts costs earlier in product development and lowers the overall total cost of product deveopment. Having the insight of simulation as early as possible in development provides engineers the benefit of making the right design choices, avoiding late issues and, ultimately improving quality while reducing costs.

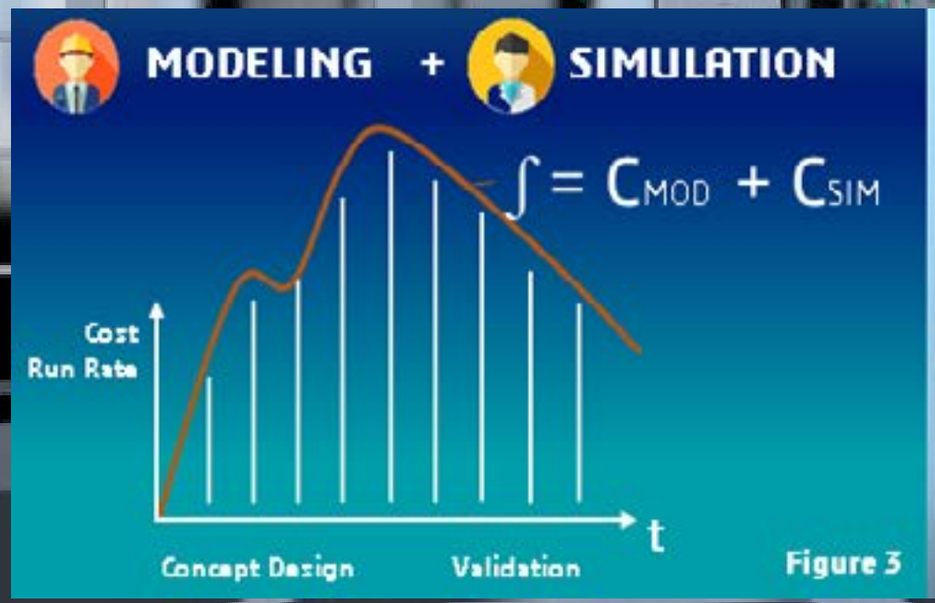


Figure 3

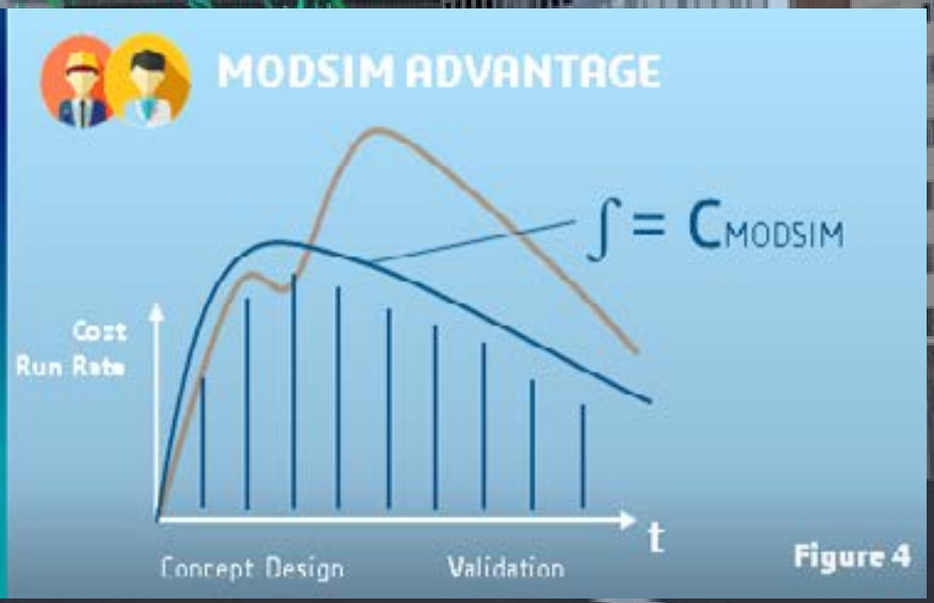
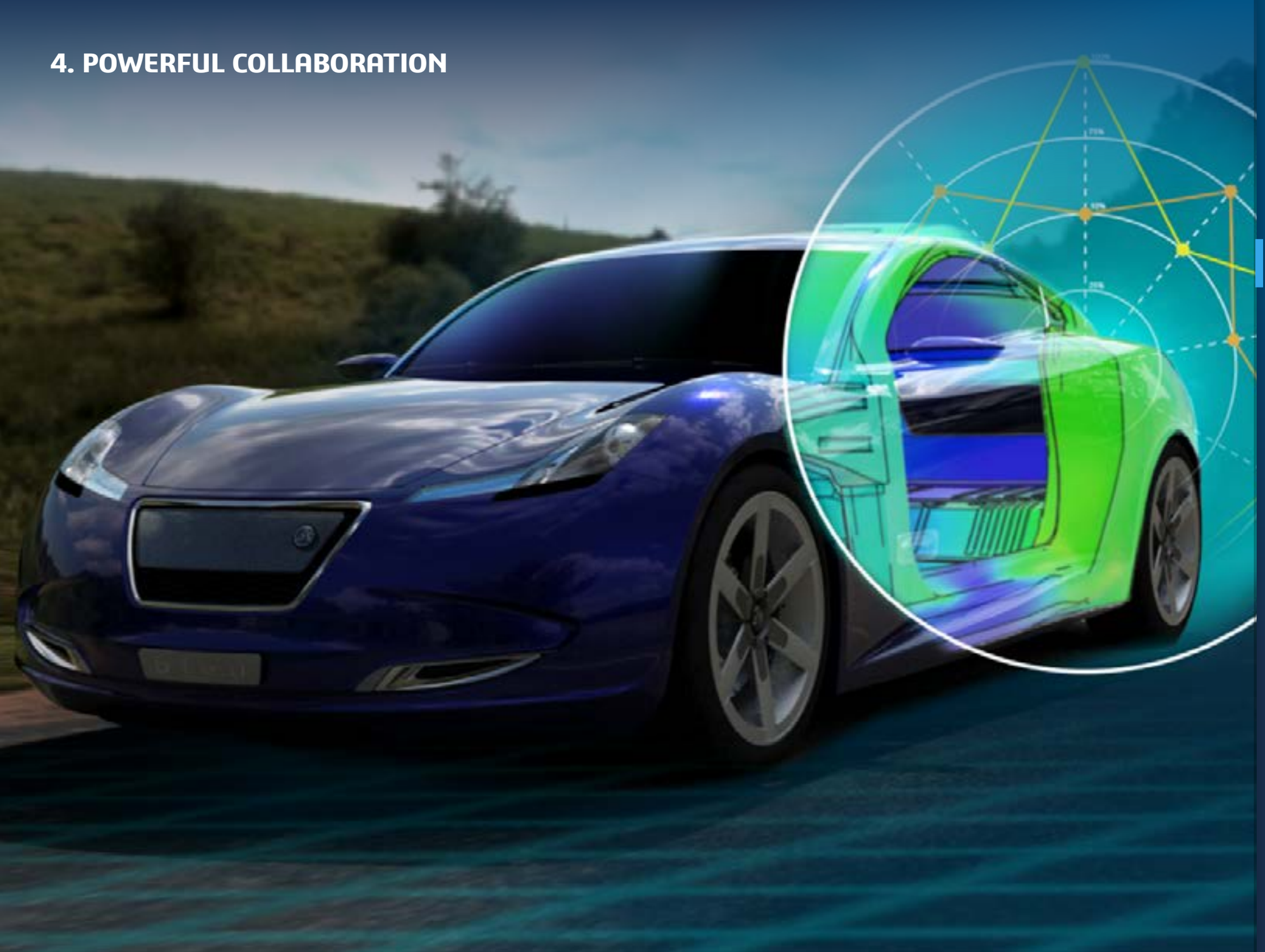
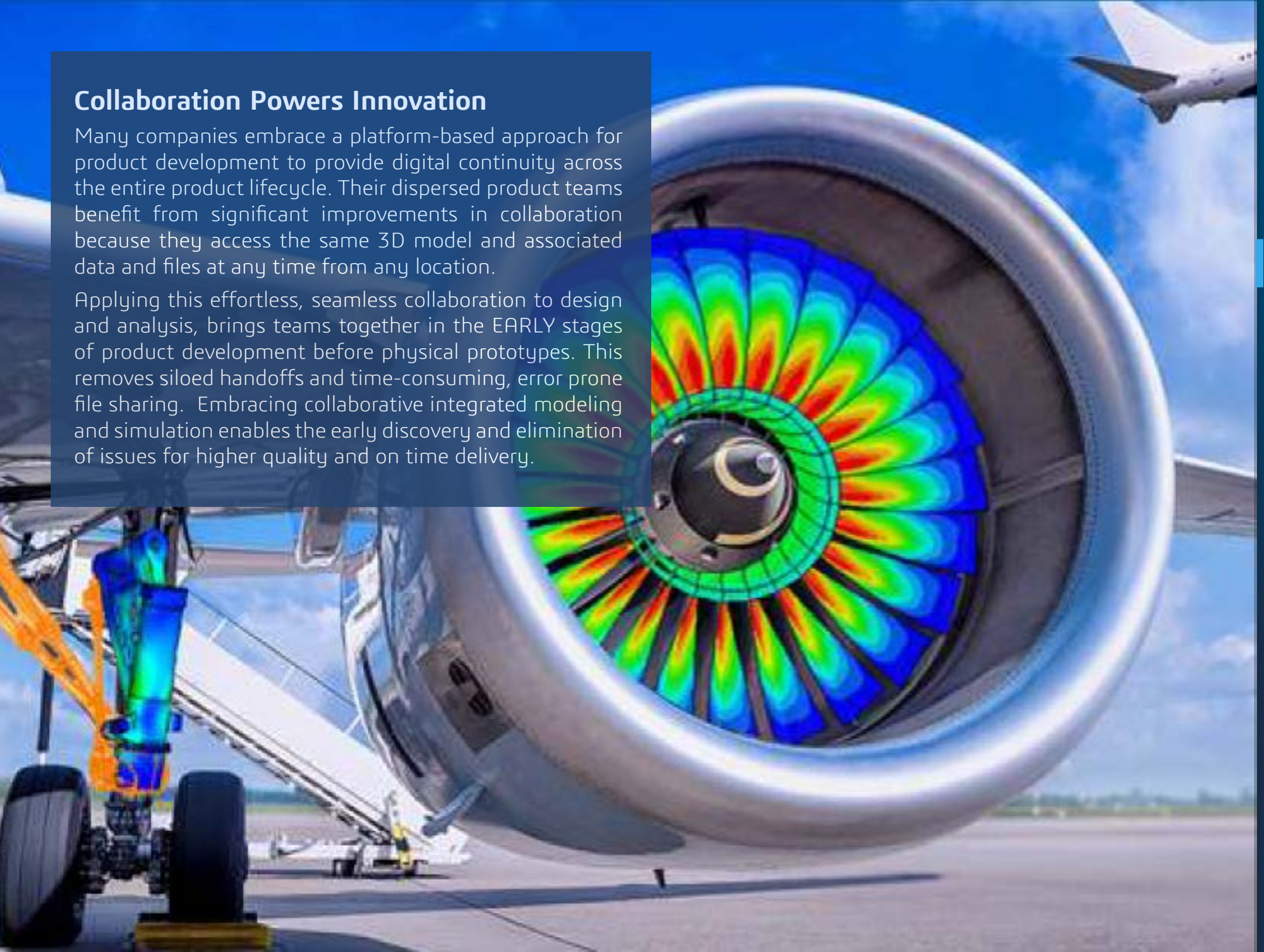


Figure 4

4. POWERFUL COLLABORATION





Collaboration Powers Innovation

Many companies embrace a platform-based approach for product development to provide digital continuity across the entire product lifecycle. Their dispersed product teams benefit from significant improvements in collaboration because they access the same 3D model and associated data and files at any time from any location.

Applying this effortless, seamless collaboration to design and analysis, brings teams together in the EARLY stages of product development before physical prototypes. This removes siloed handoffs and time-consuming, error prone file sharing. Embracing collaborative integrated modeling and simulation enables the early discovery and elimination of issues for higher quality and on time delivery.

5. MODSIM STORIES

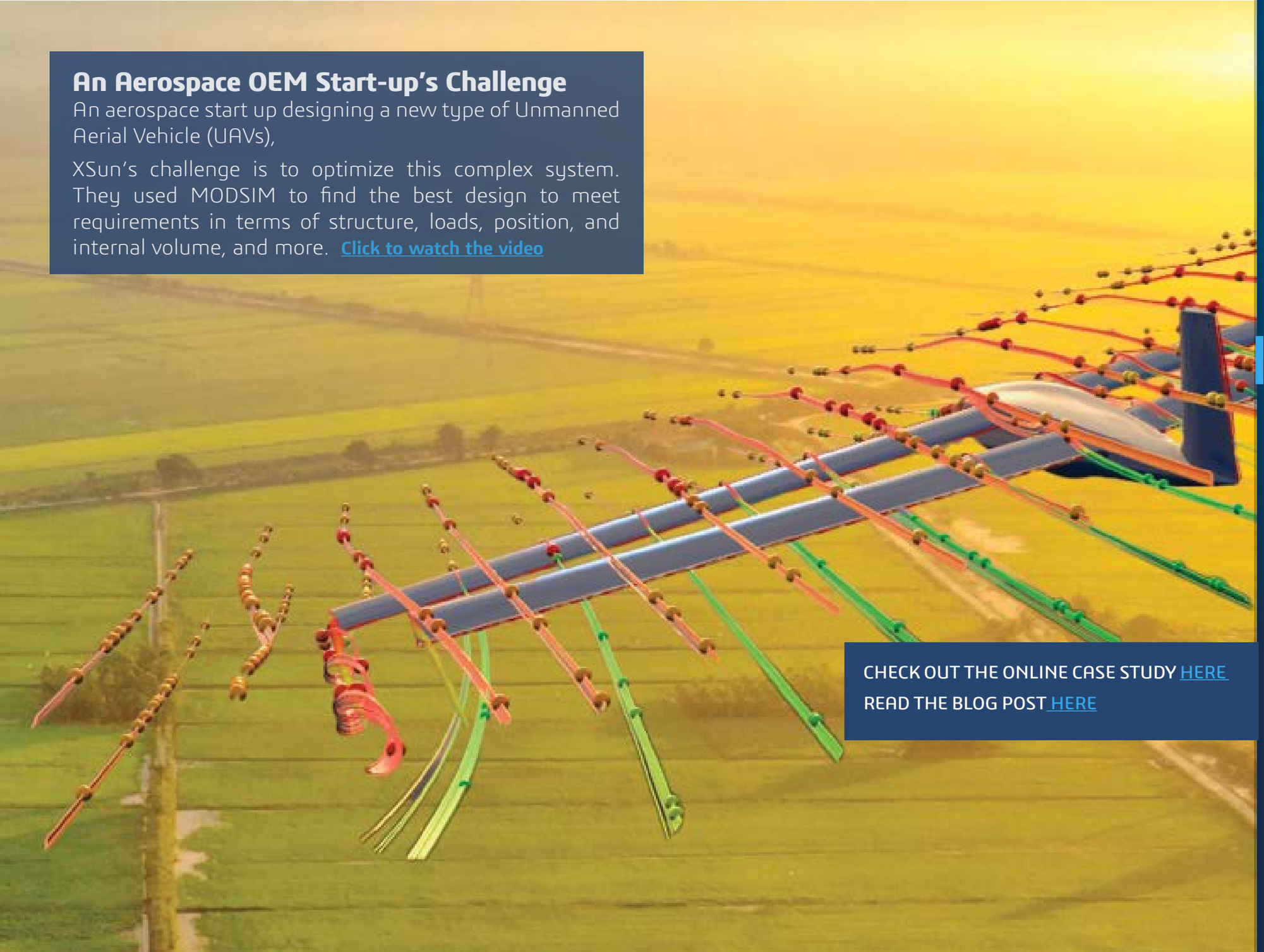
An Olympic Yacht Design Challenge

Part of the International and Olympic dinghy sailing team for the last six decades, the Finn class continues to challenge sailing teams. The French sailing team used MODSIM to improve the mast design for better aerodynamics in time for the summer games. See how the team optimized the parametric design and composite layup to better predict the behavior of the composite structure. **Click to watch the video**

An Aerospace OEM Start-up's Challenge

An aerospace start up designing a new type of Unmanned Aerial Vehicle (UAVs),

XSun's challenge is to optimize this complex system. They used MODSIM to find the best design to meet requirements in terms of structure, loads, position, and internal volume, and more. Click to watch the video



CHECK OUT THE ONLINE CASE STUDY HERE

READ THE BLOG POST HERE

6. MODSIM SOLUTIONS

Featured MODSIM Solutions

Simulation-driven Conceptual Design

Study product performance in-depth at the conceptual level

The CATIA SFE Portfolio provides parametric geometry capabilities for high-performance science-based processes. Powerful tools for simulation-driven design processes bring design and analysis together in real-time. With fast geometry creation and re-use, CAE and CAD teams can produce a quick first model that represents the product status very early in the process.

Function Driven Generative Designer

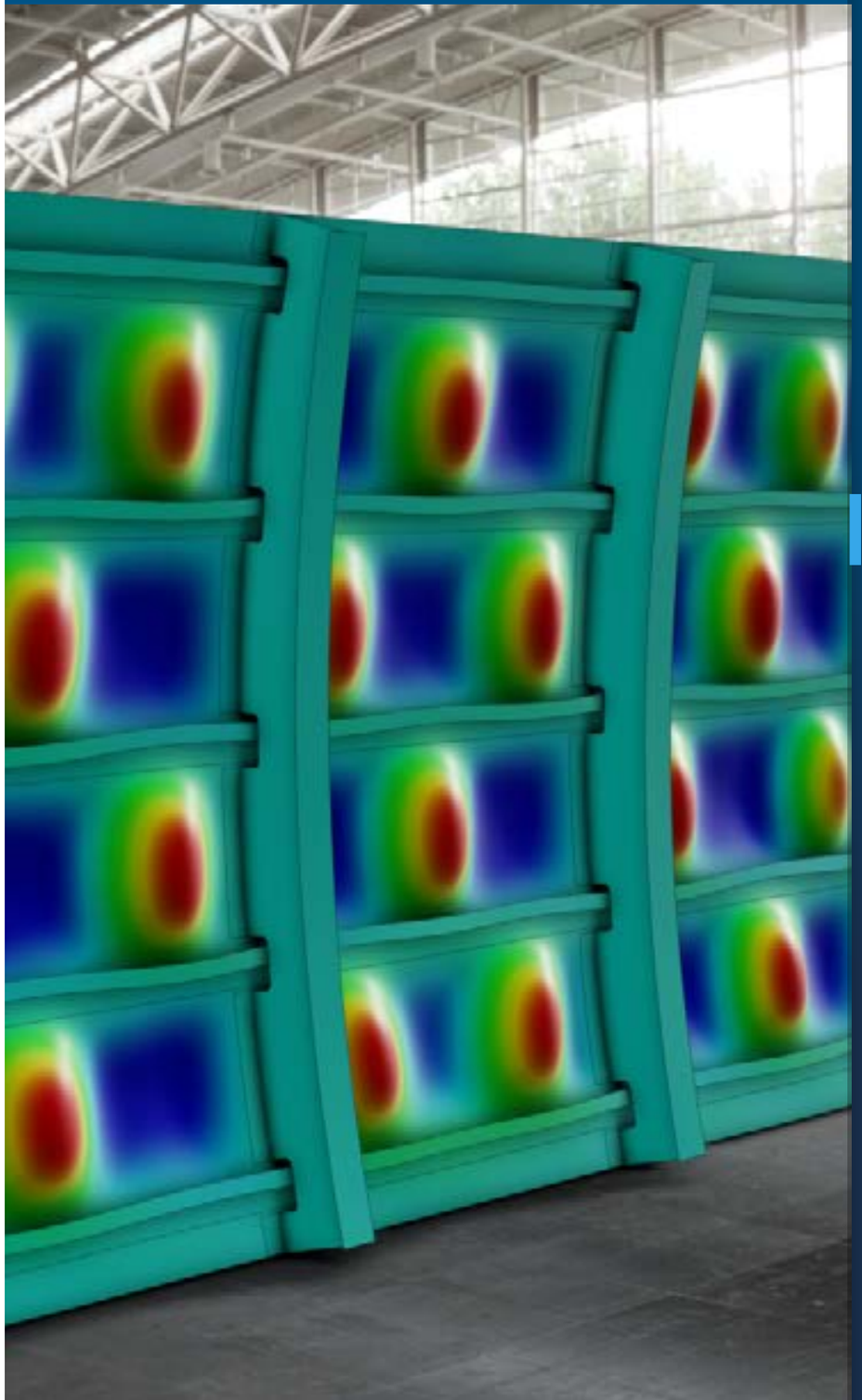
Design and simulation for lightweight optimized design

CATIA Function Driven Generative Designer allows a non-specialist designer to automatically generate optimized conceptual parts and assemblies from functional specifications. The designer simply provides a set of requirements and the desired manufacturing process. The push of a button runs a simulation and generates the optimized concept assembly shapes

Composites Design and Manufacture

Design and simulation for right first time composite parts

Composites Design and Manufacture solution provides process-oriented applications to design, simulate, and manufacture composites structures on a single virtual platform. This integrated approach streamlines composites part engineering to lower costs and free up resources for innovation.



Featured MODSIM Solutions

Powertrain Strength, Durability & Vibration

Design, analyze and optimize powertrain components

Integrated modeling and simulation applied to powertrain system development ensures the system meets reliability and performance requirements. With Dassault Systèmes SIMULIA apps on the **3DEXPERIENCE®** platform designers and analysts to evaluate stress and vibration performance using a virtual experience twin early in design to identify and eliminate potential problems before physical testing

Aircraft Communication and Detection System Performance

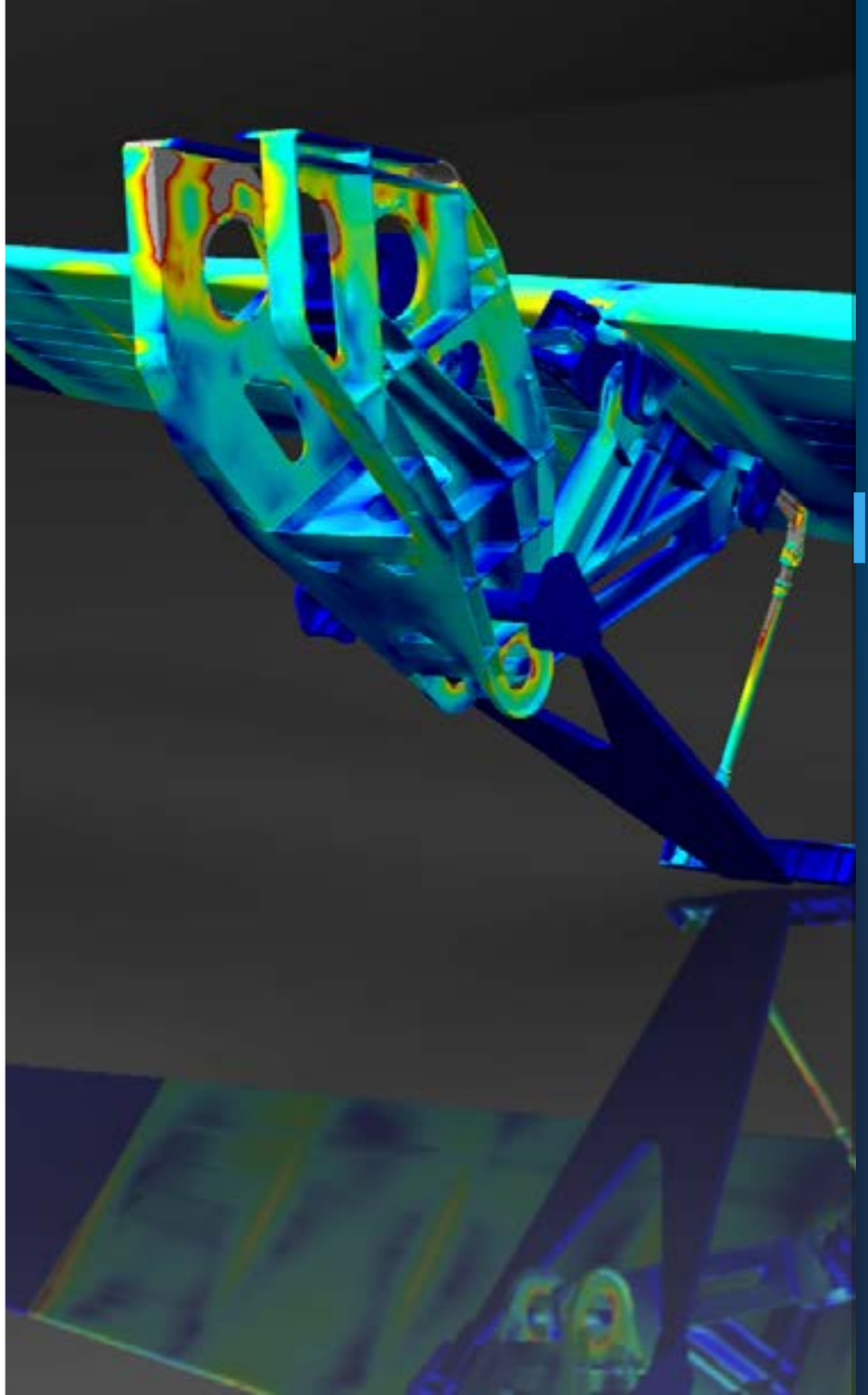
Design and analyze antenna performance

From air traffic control to onboard entertainment, antennas are crucial to nearly all flight systems. Using simulation in the design process informs antenna placement by analyzing performance virtually in the early stages of development. Dassault Systèmes SIMULIA apps on the **3DEXPERIENCE** platform breaking down the silos between design and simulation so development team work more efficiently.

Tire Engineering

Simulation gives engineers a better grip on tires

Engineers in the tire industry can optimize tire performance, reduce costs and develop innovative products, with integrated design and simulation tools coupled with Product Lifecycle Management on the **3DEXPERIENCE** platform. Applying simulation as part of design, expensive redesign and physical prototypes are avoided.



CONCLUSION

Product development engineers embrace digital continuity in the quest to continuously improve the way they design and deliver systems and products to market. Companies implementing digital continuity seek a consistent source of data throughout the product lifecycle. The **3DEXPERIENCE** platform connects stakeholders in real-time allowing users to leverage the latest data whenever and wherever needed, increasing collaboration and fostering innovation and providing a virtual twin experience that allows product development to experience the product as they design it. By experiencing the design early by embracing integrated modeling and simulation, engineers can:

- **Experience all aspects of a design** by predicting a product's behavior much earlier ---removing the expense of physical prototyping.
- **Explore more design alternatives** to optimize the design to best meet functional requirements and manufacturing constraints.
- **Accelerate collaborative innovation** across dispersed teams enabling all team members to work on the same data in real-time.

Discover how **MODSIM** allows engineers and product teams to work together very early in the product development cycle. **Integrated modeling and simulation allows you experience your design** so you can deliver better products, faster.

Inceptra

Inceptra supports engineering and manufacturing organizations with best-in-class solutions to digitally design, simulate, produce, and manage their products and processes, enabling enhanced innovation and productivity.

As the largest Platinum partner in North America, Inceptra is dedicated to Dassault Systèmes' product development software portfolio, complementary solutions, and related services, including training, implementation, integration, support, consulting, and automation services. For more information, please visit Inceptra.com.

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Our 3DEXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE** Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual experience twins' of the real world with our **3DEXPERIENCE** platform and applications, our customers push the boundaries of innovation, learning and production.

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