

INTEGRATED MODELING & SIMULATION

Seamless, real-time, engineering accelerates product development



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WRY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION



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.

INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

OUTDATED FILE-BASED PLM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, engineers and preprocessing engineers is lost.

INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

ELIMINATE LATE DISCOVERIES

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

Allowing designers and simulation engineers 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 lowers the risk of developing sub-optimal products or delaying product launches.

INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

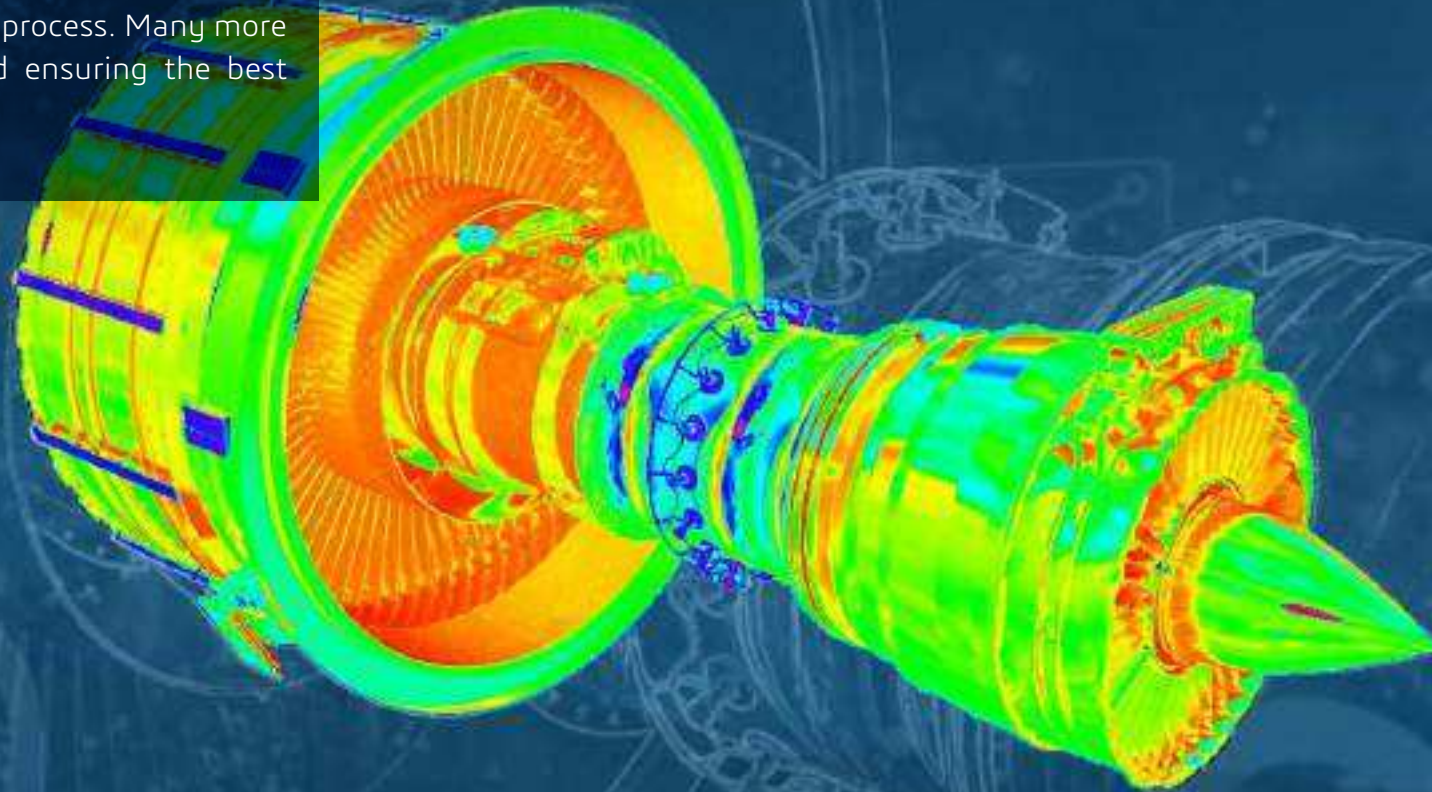
4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

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.



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

1. INTEGRATED MODELING AND SIMULATION



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

INCREASE DESIGN CONFIDENCE

Simulation IS design. When designers and simulation engineers 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 develop superior products.

INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

ACCELERATE DESIGN

Integrated modeling and simulation change the design paradigm. Development teams save time by eliminating the need to translate between systems and redo tedious tasks when designs change. Everyone can access and use the latest product version, reducing risks and preventing delays.

INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WRY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

2. A NEW WAY TO WORK



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WRY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

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 of development. Cross-disciplinary teams collaborate and interact efficiently and iteratively to ensure maximum know-how is contributed to the development process.

These advanced technologies can precisely predict, compare, and simulate multiple product behaviors. This capability is crucial for quickly delivering products when there is limited time for extensive physical prototyping and testing, helping to avoid risks and delays.



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

3. REDUCE COSTS AND RISK

INTRODUCTION

1. INTEGRATED MODELING
AND SIMULATION

2. A NEW WRY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

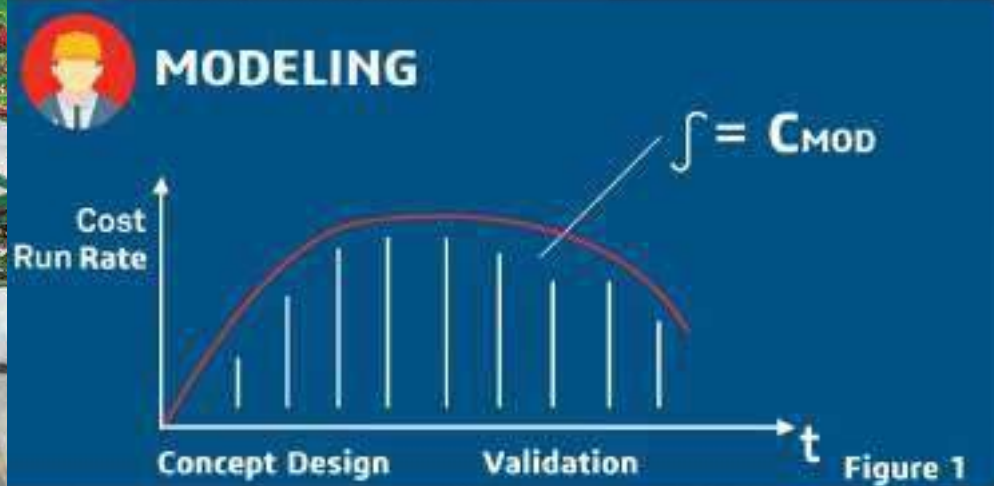
5. MODSIM STORIES

CONCLUSION

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 occurring in the later stages of design, in order to make the right design choices, avoid potential design deadends, 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.



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WRY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

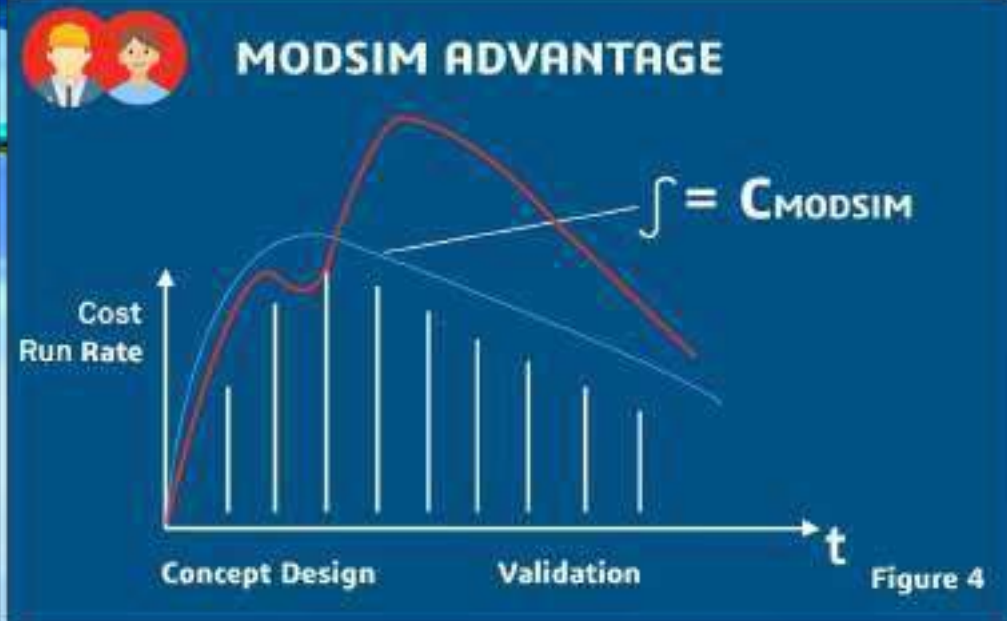
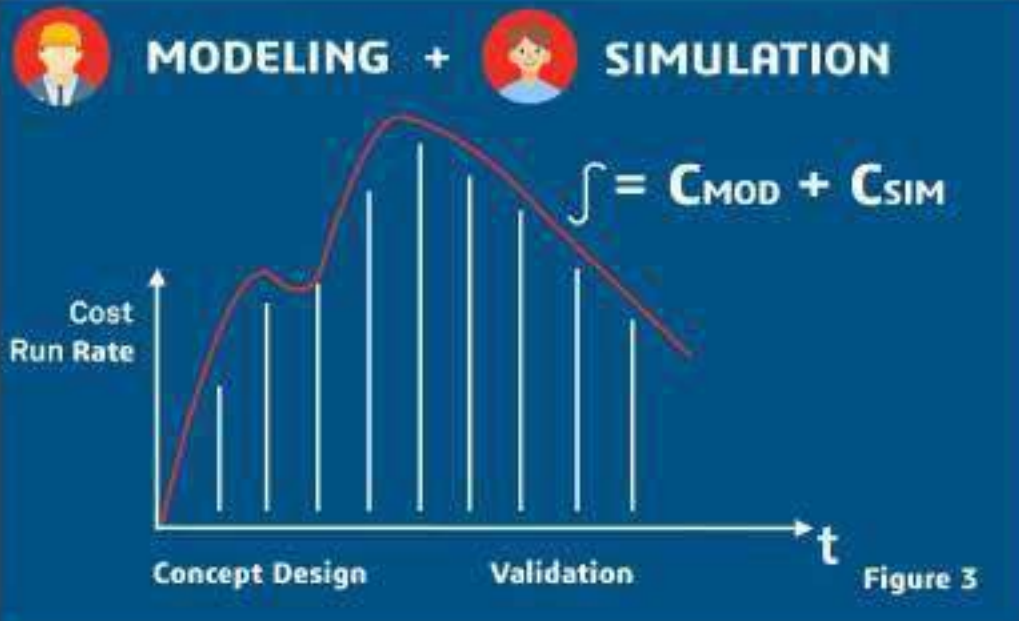
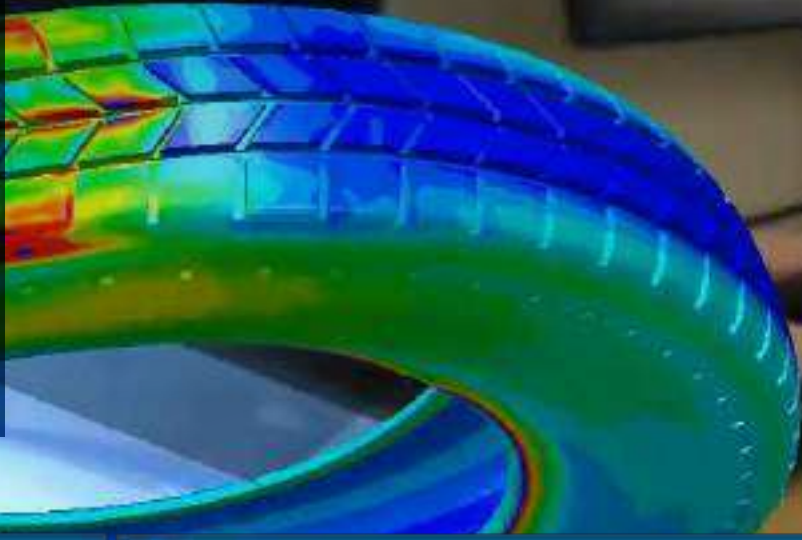
MODSIM LOWERS COSTS

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 development. 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.



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WRY TO WORK

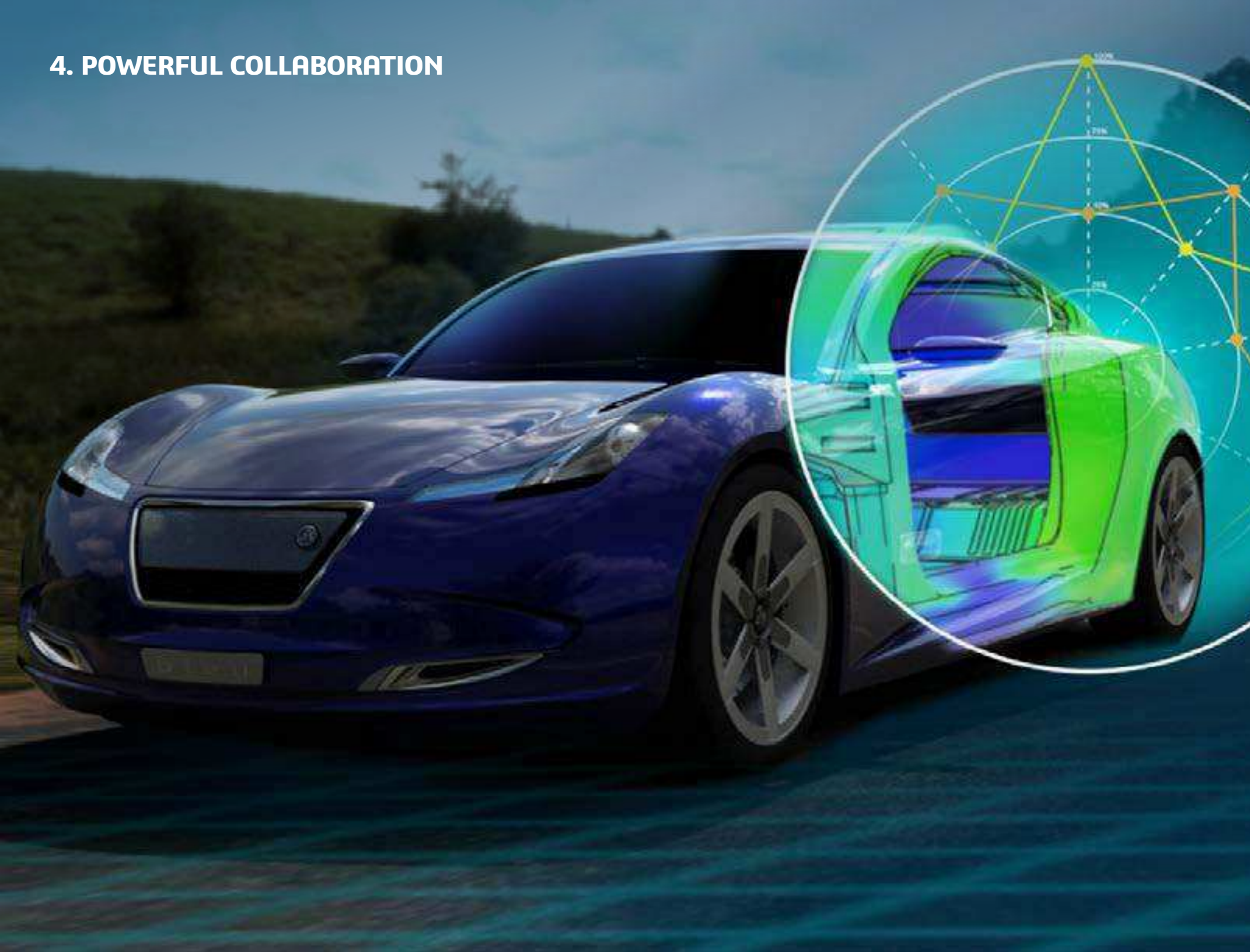
3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

4. POWERFUL COLLABORATION



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

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 simulation, brings teams together in the EARLY stages of product development before building physical prototypes. Embracing integrated modeling and simulation in a collaborative environment enables the early discovery and resolution of product development issues, resulting in higher quality products delivered on time.

INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WRY TO WORK

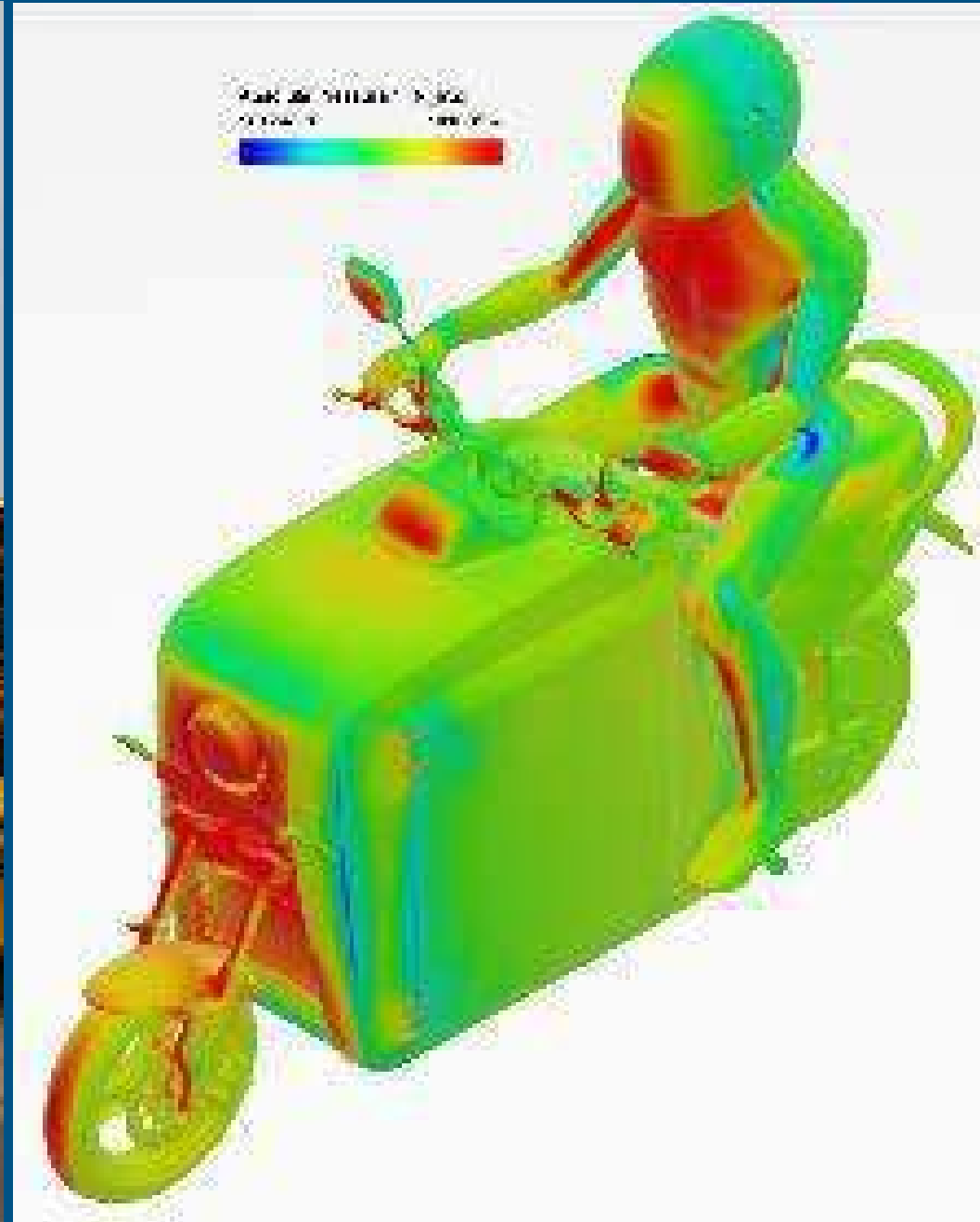
3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

5. MODSIM STORIES



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

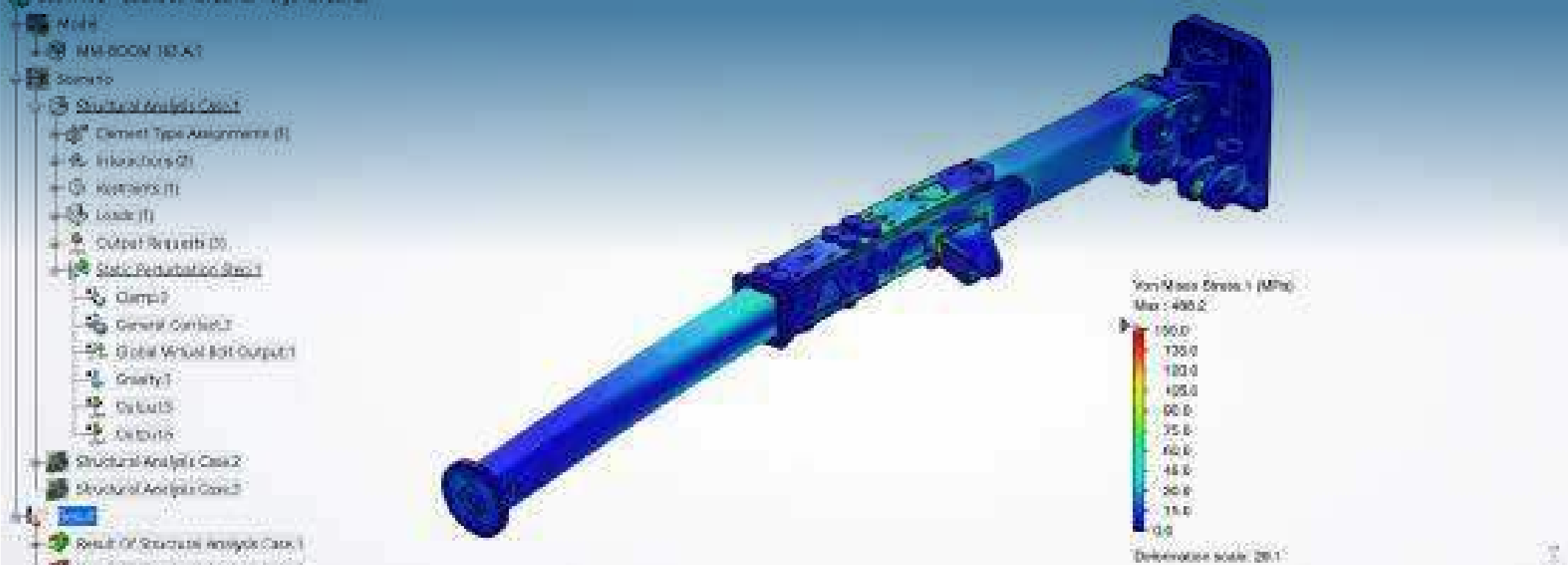
2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION



INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

RESEMIN DOUBLES PRODUCT DEVELOPMENT THROUGHPUT

Resemin products must operate safely and reliably in extreme underground mining environments. Therefore, the company leverages advanced design, engineering, and analysis technologies to ensure quality and dependability.

Shifting from AutoCAD® to SOLIDWORKS® in 2008 enabled Resemin to shorten analysis run times from two days to two hours, reduce prototyping by 70 percent, cut machine delivery times in half, and increase throughput, according to Engineering Manager Fernando Díaz.

“The productivity gains with SOLIDWORKS prompted us to evaluate **3DEXPERIENCE**® Works Simulation solutions from Dassault Systèmes when we needed to run nonlinear vibration

and fatigue analyses to extend the durability of our equipment and develop more innovative products,” Díaz explains. The company onboarded **3DEXPERIENCE** Works Simulation in 2021. “Working with Dassault Systèmes solutions, we’ve doubled throughput from 60 to 115 machines each year.”

The simulation tools support Resemin’s objectives for underground heavy equipment. “Top manufacturers in our market spend close to \$2 billion on product failures and warranty claims,” Díaz stresses. “Such claims result in a loss of revenue, customer trust, and market share, which we must avoid. Combining SOLIDWORKS and **3DEXPERIENCE** Works Simulation gives us a seamless solution for improving product reliability, durability, and performance.”

QARGOS LEVERAGES MODSIM TO ENHANCE VEHICLE DESIGN

QARGOS, a leader in innovative transportation solutions, has successfully reduced vehicle weight by 30 percent, improved aerodynamics, and lessened the dependence on physical prototypes with SOLIDWORKS and **3DEXPERIENCE** Works Simulation.

The QARGOS F9 Cargo Scooter addresses health and safety concerns related to carrying cargo in backpacks or boxes on two-wheel motorbikes, mopeds, or bicycles. Addressing the center of gravity was a crucial challenge in the QARGOS F9 design. To ensure dynamic stability when carrying up to 275 lbs, the development process was supported by extensive simulation, rigorous testing, and ongoing customer feedback.

“With seamless transitions between SOLIDWORKS design and simulation provided by **3DEXPERIENCE** Works Simulation, we refined our designs iteratively. We executed various simulations, significantly enhancing several performance areas,” stated Co-founder Alok Das. Simulations included aerodynamics, battery thermal management, and chassis strength. “We enhanced airflow, reduced drag, and used simulations to confirm a fluid cooling system’s superiority over air cooling,” Das added.

The collaboration of SOLIDWORKS and **3DEXPERIENCE** Works Simulation facilitated rapid development, with easy access to tools and cloud computing for complex simulations, ensuring that critical data was readily accessible and sharable by key stakeholders from any location.



CHECK OUT THE ONLINE CASE STUDY [HERE](#)
READ THE BLOG POST [HERE](#)

INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

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 and 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 to experience your design** so you can deliver better products, faster.

Leverage the power of **3DEXPERIENCE Works** to lead the next generation of product development.

To learn more, visit www.3dexperienceworks.com or contact your local SOLIDWORKS reseller.

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

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

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INTRODUCTION

1. INTEGRATED MODELING AND SIMULATION

2. A NEW WAY TO WORK

3. REDUCE COSTS & RISK

4. POWERFUL COLLABORATION

5. MODSIM STORIES

CONCLUSION

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