# HOW AUTOMOTIVE COMPANIES CAN ADAPT AND THRIVE IN EXTRAORDINARY TIMES

Digitalization delivers agility in vehicle engineering, testing and production — the very things that secure business continuity and profitability even in extraordinary circumstances

# NAVIGATING THE INDUSTRY'S NEW NORMAL

The automotive industry is in an era where change comes at unprecedented speed and volume. Automotive companies that have long optimized their processes for lean and just-in-time production now face an important question: How can they effectively manage global disruptions and evolving customer demands?

In these extraordinary times, success belongs to those who can adapt and respond quickly, preparing their operations for all eventualities.

While the automotive industry faces increasingly difficult challenges, the goal remains the same: Optimized and profitable outcomes in vehicle development.

The biggest change for companies who want to succeed is a transition to cloud-based, digitalized operations. This new strategy allows companies to be flexible and make the best of every twist and turn that lies ahead. Yet, opportunities are there for the taking, but only if companies have the best solutions for today's challenges.

# DISCOVER OPPORTUNITIES IN DISRUPTIONS

"It's a moment of tremendous opportunity in the automotive industry," said Frederic Merceron, transportation and mobility solutions director at Dassault Systèmes.

"Accelerated changes are pushing companies to be more flexible and cost-efficient. Different types of players — OEMs, suppliers, innovators — need to come together to contribute their expertise and create a strong value network. It must happen on an integrated digital platform that's accessible by all stakeholders and simple to use, with low upfront investment."

This integrated platform is where opportunities in the digitalization of vehicle development, testing and production can be capitalized. By connecting these three areas and equipping them with the right digital capabilities, companies can:

· **Collaborate remotely** to engineer new, innovative vehicles and tap into talent across the world

· **Validate designs with affordable virtual simulation** instead of costly physical models

· Rely on **agile production modeling** that's ready to tackle supply chain disruptions and market changes

· Respect the requirements for **healthy distancing and ergonomics** throughout global operations

"Progress in today's disruptive environment is not possible without agility," said Henri Beringer, transportation and mobility consulting director at Dassault Systèmes.

"Companies want to evolve, and they need to be supported by the right technology. The way I see it, most companies still have not maximized the potential of their capabilities. They need digitalization to help them get there."

Frederic added, "We see that the automotive companies who were most prepared to respond to industry-wide disruptions were those who had invested in digitalization technology earlier.

"Imagine the new value that can be unlocked when companies use a single, accurate digital twin of their products or even manufacturing plants. Our **3D**EXPERIENCE® twin is the answer, which helps innovators simulate the impact of any decisions before implementing them."

Read on to find out how you can thrive in the current market by digitally transforming your operations.

# CO-ENGINEER
# ANYWHERE, ANYTIME

Automotive companies now operate in a time of constant disruption that forces them to redefine how, where and when they work.

The way forward is remote-office engineering collaboration that's supported by an **integrated digital platform on the cloud.** This is an environment without physical walls, stationary computers and time zone disadvantages. The platform provides a **secure environment for stakeholders to work concurrently** on the most up-to-date version of vehicle development with full traceability.

**Imagine the level of efficiency when an engineer in Munich can simultaneously collaborate on the same 3D vehicle model with a supplier in Tokyo. Working anywhere they please, they can improve on the model that was modified by the team in Michigan the day before.**

This collaborative and iterative engineering experience results in compressed cycle times and fewer late changes. Companies that use an integrated digital platform not only enjoy business continuity, but they can go to market faster while constantly improving vehicle quality.

## COMPANIES THRIVE ON
## THE CLOUD-BASED PLATFORM

**Lightyear**, a company based in the Netherlands that develops long-range solar electric vehicles, is one of our many customers who've overcome disruptive forces in the industry.

"The Lightyear team is working very well from home," said Bas van Goch, IT and PLM Manager at Lightyear. "It's a major advantage to have a platform on the cloud, so our data is available from everywhere."

And instead of manually searching for parts or recreating existing components, teams can save time by relying on a catalog of standardized parts. On our platform, they're able to:

- **Access all related documentation and information** as well as compare and analyze components
- **Explore multiple options** for both single parts and large assemblies
- Make **data-driven decisions** with ease

Working on an integrated digital platform has greatly benefited another electric vehicle innovator, **Canoo**. This Californian startup chose our cloud-based platform to facilitate global collaboration in design and engineering in order to bring its game-changing ideas to the automotive market.

"The main benefit of concurrent design and engineering is the ability to leverage the expertise that resides in different companies, or on different continents, and have everything feed into one product," said Alexi Charbonneau, who is in charge of skateboard and cabin at Canoo.

Canoo's teams can share databases and project files with more than 150 collaborators worldwide through our cloud-based platform. With no need to maintain a server and networking infrastructure, the company can devote more resources to competitive product development.

Alexi continued, "Designing on the cloud improves time to market. There are no more files to be exchanged with suppliers. We can work on the same database."

"We can have a collaborative design process, where our internal users model and change designs. And then our vendors and contractors can see those alterations in real time," Alexi concluded.

# TEST VEHICLE VARIANTS WITH THE VIRTUAL ADVANTAGE

Previously, larger automotive companies relied on wind tunnels and physical labs for vehicle testing and validation. They later discovered the value of sophisticated virtual simulation, but this capability was still out of reach for small and medium sized companies including innovative startups.

Today, advances in cloud-based technologies have made powerful virtual simulation tools **more affordable and accessible** to companies of all sizes. It's an exciting time as companies today are no longer constrained by the limits of yesteryear.

## QUICKER PROCESSES, FEWER RISKS

With virtual testing, it's all systems go. Even when disruptions hit and physical facilities become unavailable, companies can continue testing their vehicles virtually. Instead of testing physical prototypes, engineers can work on the majority of today's laptops to get on the cloud and predict a vehicle's performance by virtually simulating a multitude of conditions and requirements.

Virtual testing on an enterprise scale encourages **robust and fast design exploration**, which is critical in the race for market-ready vehicles. It promises to reproduce real-world settings and conditions on almost any device, anywhere.

These simulation and testing processes become more cost-efficient with minimal need for physical prototypes and expensive test chambers. Virtual simulation allows teams to perform a higher amount of vehicle tests and investigate many more types of use cases from the comfort of the office or any remote work location. By the time they perform the final physical test, they are confident of getting the expected results.

From physical to virtual, the transition is seamless as teams can **virtually create and test the entire cabin experience**, including the ability to:

- Analyze air movement within the cabin then predict how the vehicle heats up and cools down, and even visualize particle dispersion in air flow
- Test against wind noise, predicting the level of noise caused by exterior elements and the sounds passengers will perceive
- Ensure that the vehicle seats provide the best posture and comfort for a diverse variety of passengers
- Simulate sound package optimization to ensure an ideal infotainment experience

## DETERMINE BEST TRADE-OFFS

As buyers become more health-conscious, companies want to incorporate new features (better cabin air quality, as an example) to vehicles that are currently in development. In doing so, their teams need to know how these new features will impact the overall design.

Teams also need to find the right balance between **vehicle comfort and safety**. When designing a heating, ventilation and air conditioning (HVAC) system for a public transport vehicle, for example, they need to determine the right air-mixing ratio to provide a comfortable temperature within the cabin space while minimizing the risk of contagion.

**In these and many other situations, teams need support in making optimal decisions. Virtual simulation can help them analyze different options to arrive at the best trade-offs that satisfy all goals — anytime, anywhere.**

## MORE BENEFITS AHEAD

The possibilities that come with virtual testing don't end here. Regulatory agencies have begun allowing virtual simulation tools to **certify critical aspects of the car**.

A global standard is on the horizon for more efficient vehicle certification processes, where virtual simulation will be widely accepted as a way to swiftly ensure regulatory compliance. That is yet another example of cost and time savings for automotive companies.

**RAMP UP PRODUCTION IN A SAFE AND PRODUCTIVE WORKPLACE**

For a positive ramp-up of their production, automotive companies need to update their strategy to reflect drastic shifts in market demand, material flows and workplace safety requirements.

**Unpredictability has become the norm. Companies that continue to succeed are those that rely on digitalized manufacturing for added flexibility and better decision-making.**

Companies can **accelerate production ramp-up** by **increasing process agility** and **supply chain management flexibility.** It can happen when companies implement planning on an integrated digital platform. They are also able to efficiently reposition workers and machines for a safe workplace. The best part is that these goals can be managed online, on almost any device.

# AGILE PLANNING AND DISRUPTION MANAGEMENT

Digitalization forms the foundation of agile production planning, allowing companies to integrate various planning areas and **achieve end-to-end visibility**.

Full visibility helps their teams to detect disruptions that happen at second- and third-tier supplier levels, which can negatively impact production schedules at higher levels.

Plants can be affected, for example, by a lack of parts from a just-in-time supplier plant that needs to shut down for a few days due to a tornado.

Access to an integrated planning overview allows teams to **quickly assess alternative options** and **depend less on traditional supply chains**.

Digitalized manufacturing supports what-if scenario planning so that teams can evaluate the outcomes of different options before making decisions. This mitigates risks across supply chain levels, planning horizons and functional areas. Companies can respond swiftly to disruptive events with effective contingency plans so that they avoid hitting snags — or worse, coming to a complete halt in production.

As digitalization connects the development and manufacturing processes, teams also gain early visibility into engineering data on parts to build. If parts supply issues come up, they can rapidly identify and reuse substitute parts for production.

# PRIORITIZING EMPLOYEE HEALTH AND COMFORT

To improve the safety of workers at manufacturing plants, companies may need to change production line configurations and reposition resources. However, manual planning without the aid of visual capabilities is time-consuming and risky.

This is where digitalization plays a vital role again by providing companies the ability to model and plan their factory operations with a digital twin. However, not all digital twins are created equal. What will truly make a difference is a holistic and executable digital twin that becomes a single, accurate underlying model of the operations. This is what the **3D**EXPERIENCE twin offers.

When companies rely on the **3D**EXPERIENCE twin, they can **scan their facilities, create 3D layouts and see how workers move and interact with equipment**. The digital twin facilitates what-if experimentation in the virtual factory so that teams can evaluate the impact of different decisions and **be confident in implementing new configurations**.

The **3D**EXPERIENCE twin enables companies to evaluate all planned changes on the shop floor, such as:
- Implementing safety shields
- Spacing out workers to ensure physical distancing
- Adjusting positions of workers and machines to improve ergonomics
- Allocating capacity to produce new products such as masks, gloves and respirators

The 3D plans that have been validated in the virtual world can be automatically shared with teams in charge of execution on the shop floor. This creates a responsive environment that allows companies to implement changes much more quickly and confidently. Through the same platform, plants can rapidly deploy updated processes around the world.
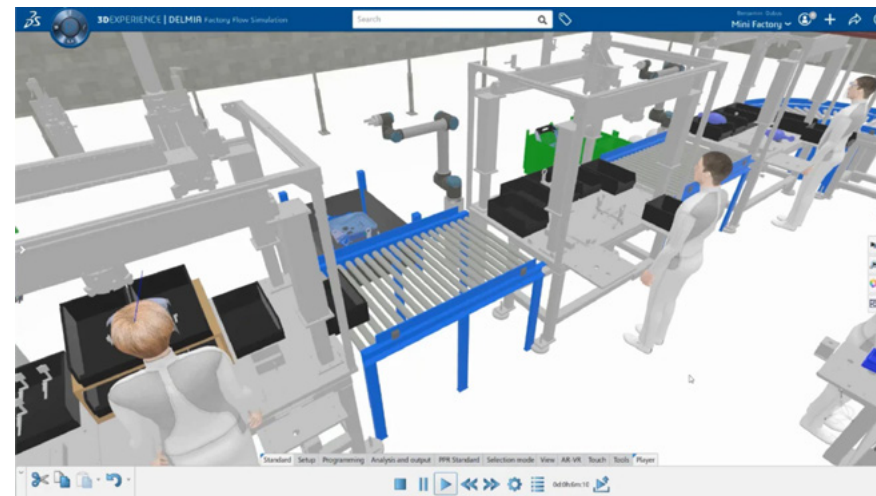


Create an accurate representation of machines, processes and workflows with the **3D**EXPERIENCE twin

# THE SOLUTION THAT GETS YOU THERE

The **3DEXPERIENCE** platform on the cloud paves the way for digitalized operations, so that automotive companies can remain resilient and empower their teams to produce high-quality output even in unpredictable times.

By integrating automotive processes on the cloud and providing a complete suite of industry-leading applications, our platform enables companies to create a virtual world to improve results in the physical world.

The platform offers scalability and a cost-efficient transition, which means that companies can begin using it for a small program before moving to bigger initiatives. No matter the size of the project, they can count on consistent performance and profitability, from engineering to production:

## ENGINEERING

With today's internet connection, teams can break free from physical barriers and work from wherever they are. The **3DEXPERIENCE** platform makes it easy to leverage expertise from around the globe as well as share work advancements, knowledge and best practices in a collaborative, up-to-date and secure environment.

## SIMULATION AND TESTING

Teams can shift to virtual testing with minimal costs and issues. They can access a scalable portfolio of realistic virtual simulations and rely on guided workflows to improve and validate vehicle designs. Trained engineers will appreciate our easy-to-use virtual simulation capabilities that help minimize physical testing and accelerate their work.

## MANUFACTURING AND PRODUCTION

Digitalized manufacturing ensures production agility and a safe working environment. Through an accurate **3D**EXPERIENCE twin of their operations, companies stand to save tremendous amounts of time and money while reducing production line shutdowns.

## THE KEY TO PROGRESS AND AGILITY

"We believe that the automotive business is human-driven," said Frederic Merceron, transportation and mobility solutions director at Dassault Systèmes. "Customers that use our platform on the cloud appreciate the fact that their employees can continue delivering their best work without being disrupted. Technology helps our customers ensure the well-being and comfort of their employees, whether they're working at remote offices or manufacturing plants."

Frederic continued, "Any vehicle innovations that companies want to achieve are motivated by the desire to delight buyers and meet their needs. All of this provides a true driving force for progress and agility, and we are here to give our full support."

With the **3D**EXPERIENCE platform, companies are equipped with the right digital capabilities to revitalize their operations, withstand disruptions and ultimately achieve success in the automotive industry's new normal.

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

Dassault Systèmes, the **3D**EXPERIENCE 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 **3D**EXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes' 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit **www.3ds.com**.

**3D**EXPERIENCE®

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