DELMIA

ENABLING DIGITAL CONTINUITY WITH THE ROBOTIC DIGITAL TWIN

Stay ahead of the manufacturing curve and achieve future-ready operations

DASSAULT SYSTEMES

THE MANUFACTURING LANDSCAPE TODAY

In the age of digital transformation and consumer demands changing at an escalating pace, manufacturers know they must embrace agility and flexibility for business continuity especially in a landscape that is shaping up to be a volatile one. The Manufacturers' Outlook Survey conducted by the National Association of Manufacturers for the fourth quarter of 2022 revealed that 65.7% of respondents listed supply chain disruptions as a major concern.

To achieve this, many have leveraged digital solutions and robots to drive up efficiency, cut costs and increase competitiveness. While it is a step in the right direction, numerous challenges still stand in the way of seamless digital integration—holding manufacturers back from maximizing the full potential of their solutions.

These challenges include:

- **A lack of internal collaboration**
- **Complex robot programming and installation**
- **Difficulty democratizing robotics expertise and knowledge**
- **Keeping up with consumer demands and manufacturing changes**

Realizing that these issues stem from a lack of digital continuity across manufacturing processes, teams, trading partners and IT systems—best-in-class manufacturers have started turning to a robotic digital twin to bridge the gaps.

In this eBook, you will learn how a robotic digital twin drives digital continuity to unlock the capabilities expected of manufacturers in steering future-ready operations.

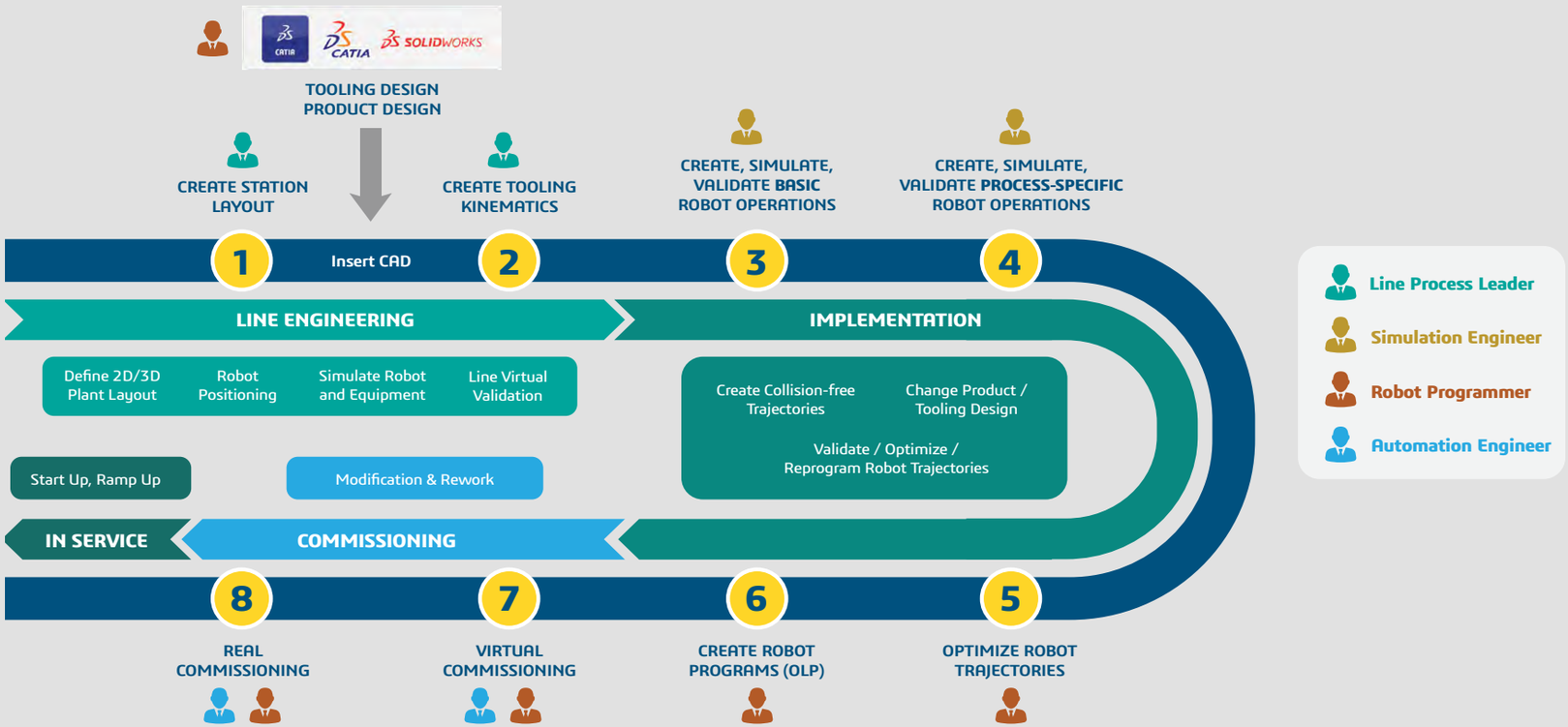
SEIZING OPPORTUNITIES WITH A ROBOTIC DIGITAL TWIN

A robotic digital twin is the essential link between the virtual world of design and process engineering, and the tangible world of production. This facilitates a seamless flow of information, data and knowledge—allowing users to gain a comprehensive and integrated view of the entire manufacturing process.

It provides manufacturers with:

- **A flexible and agile system that quickly responds to changes in product design, materials and production methods**
- **A shared platform for data exchange and collaboration of all stakeholders**
- **An intuitive and user-friendly interface that simplifies programming and reduces the need for specialized software and hardware**
- **Real-time data and insights into the performance of robotic systems**
- **A streamlined process for installing and maintaining robotic systems, which shortens lead times**
- **A centralized repository for data and information about robotic systems that can be easily accessed and shared by manufacturers**

Figure 1 shows how the robotic digital twin adds value across manufacturing stages and various stakeholders.



SHARPENING COMPETITIVE EDGE WITH DELMIA ROBOTICS

Unprecedented levels of interconnectivity

Any changes made to the product design are automatically reflected in the robots' trajectories. The system also takes into account changes made to the process plan, giving the ability to display each operation of the product in context. This level of interconnectivity ensures the production process is optimized and reduces the risk of errors.

Enhanced collaboration with the 3DEXPERIENCE platform

DELMIA Robotics operates on Dassault Systèmes' **3D**EXPERIENCE platform, which consolidates all information on a single source of truth. Stakeholders, including non-experts (managers and sales personnel) can review workcells through a web-client without the need for a robotics license. It also simplifies data and issue management on a dashboard for better visibility, while enhancing visualization with the use of Virtual Reality (VR) technologies, Head-Mounted Displays (HMDs) and Cave Automatic Virtual Environment (CAVEs).

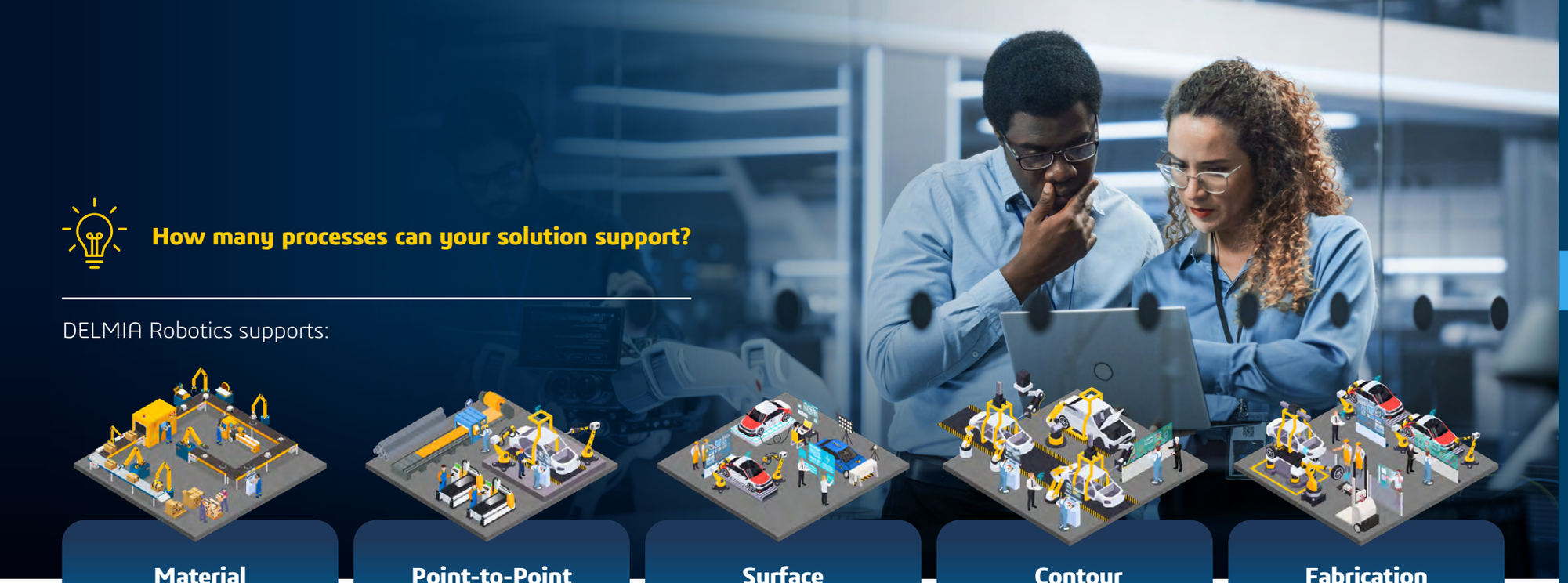
One solution for all robots

Customers today often use different solutions for different processes and robots, resulting in OEMs and suppliers working with dozens of robot programming solutions. This represents a huge cost for licenses, infrastructure, maintaining skills and best practices.

DELMIA Robotics is a **manufacturer agnostic solution** that can work with a variety of robotic systems—including the ability to design, program, simulate and control different types of robots. More importantly, it provides a huge robot library with all major robot vendors (ABB Robotics, Fanuc, Kuka and more) and is updated with new robots in the market regularly.

Knowledge sharing and retention

Stakeholders can create and share template workcells as well as set standards across plants globally. This makes it easier to manage complex processes and parameters, configuration and automation. Organizations can then develop a worldwide center of excellence and standardize best practices.



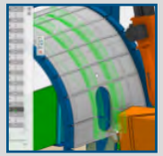
How many processes can your solution support?

DELMIA Robotics supports:

Material Handling

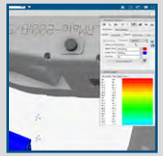

- Pick & Place
- Remote Handling

Point-to-Point Process




- Spot Welding
- Drilling & riveting

Surface Process

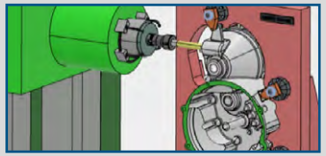



- Painting
- Non-Destructive Testing
- AFP/ATL for Composites
- Flaming
- Sand Blasting
- Shot peening
- Polishing

Contour Process


- Contouring
- Arc Welding
- Sealant Deposition

Fabrication Process



- Machining
- Additive
- Laser Cutting

UNLOCKING COMPELLING VALUES WITH DELMIA ROBOTICS

1 Reduce production start-up time and costs

Virtual testing and line commissioning allows users to identify potential problems and make necessary modifications before any physical resources are deployed. This also reduces re-work during the build phase. In addition, manufacturers can evaluate different production line configurations, ensuring they make the right investment in equipment or systems.

2 Maximize resource utilization

With a digital twin of the production line, users can simulate different scenarios and identify the most efficient resource utilization. It also reduces downtime by performing predictive maintenance based on real-time data and simulation results.

The real-life value of implementing DELMIA Robotics: Centerline Windsor Limited

Centerline Windsor is a Canadian company that specializes in advanced automation processes and joining technologies for resistance welding, metal forming and cold spray applications. They leveraged DELMIA Robotics on the **3D**EXPERIENCE platform to simulate products, processes and factory operations before deployment to avoid design errors. This enabled them to show customers how new products and processes can give them a competitive advantage as well as unlocked:

- Time savings
- Reduced tooling-related issues and rework up to 90%
- Reduced programming time up to 25%

To read the full story, click here.

3 Validate carry-over of production processes using the digital twin

Manufacturers can verify if the same processes can be used across different production lines, reducing the risk of errors and increasing efficiency. It can also be used to validate the process parameters are within the desired range, ensuring the production line operates at optimal efficiency.

4 Optimize the trade-off between cycle time and energy consumption

By simulating different production scenarios, manufacturers can evaluate the impact of changes to the production line on energy consumption and cycle time.

The real-life value of implementing DELMIA Robotics: Robot at Work

An Italian production line solutions specialist, Robot at Work turned to DELMIA on the **3D**EXPERIENCE platform to meet customers' increasingly complex requirements. They are now able to bring solutions to customers much quicker and show them a complete simulation of their production line upfront. This has elevated their customer relationship and revolutionized how they handle new projects.

To read the full story, click here.

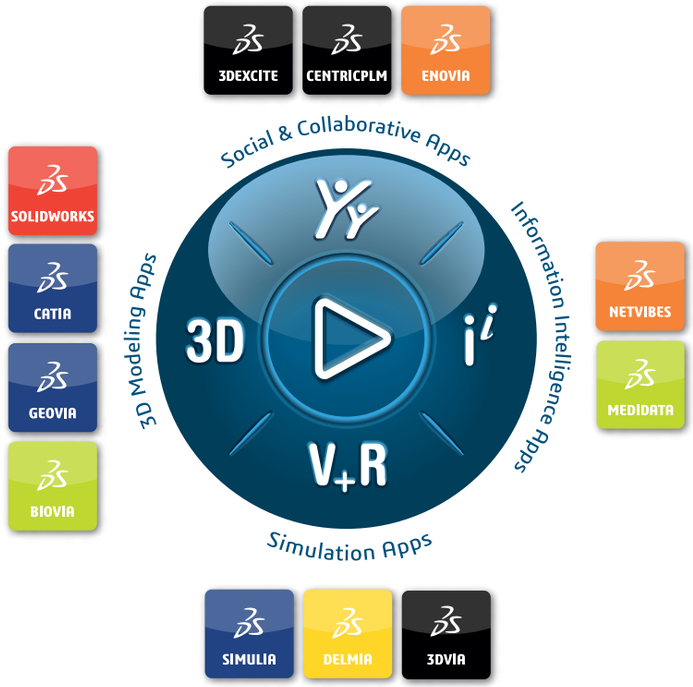
THE FUTURE OF MANUFACTURING

As the world continues evolving at an escalating pace and customer demands change, manufacturers must continue evolving or risk becoming obsolete. The implementation of digital solutions is no longer enough if they work in silo. Manufacturers are now compelled to embrace digital continuity by leveraging a robotic digital twin to make operations the strongest link in their value chain. This is essential in overcoming the challenges of today and being prepared for the disruptions of tomorrow. Manufacturers can then not only ensure business continuity, but also thrive and stay ahead of the curve.

Our **3D**EXPERIENCE® platform powers our brand applications, serving 12 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.

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**.



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