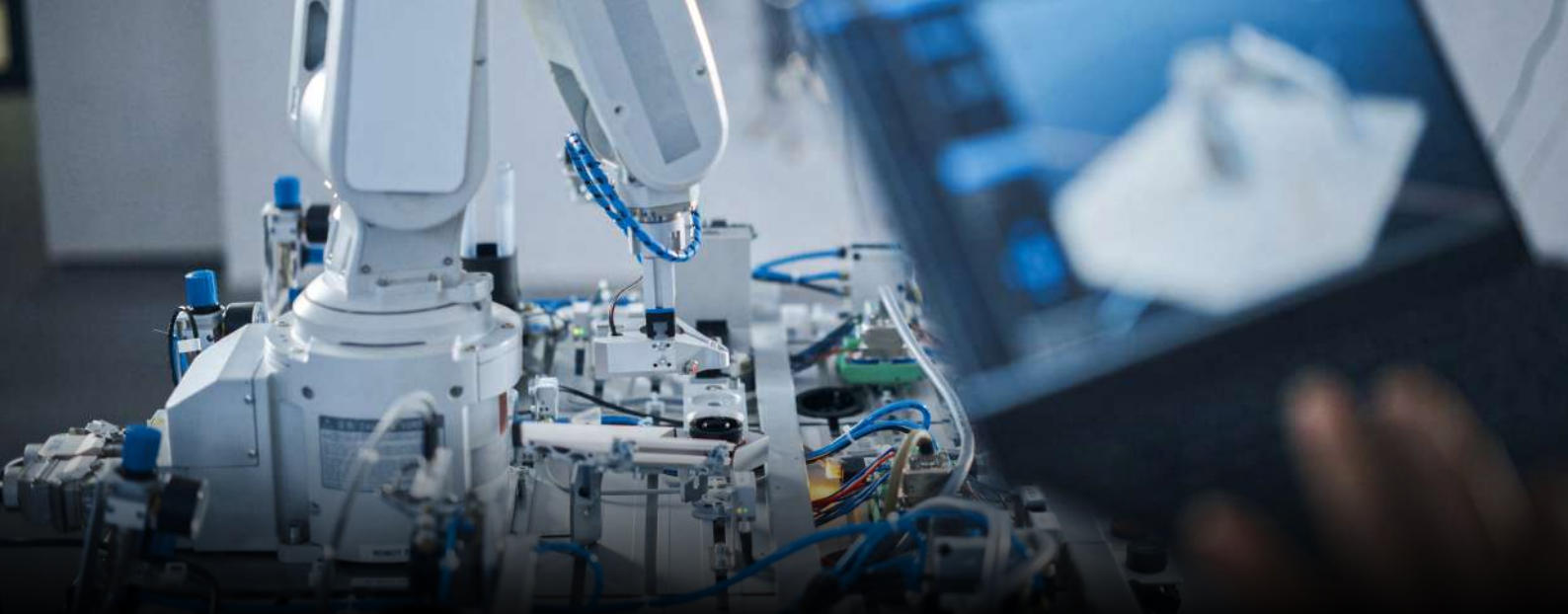


IMPROVE MATERIAL FLOW IN INDUSTRIAL EQUIPMENT

Leverage an integrated solution to bridge the gap between warehouse and production management.





THE MODERN INDUSTRIAL EQUIPMENT LANDSCAPE

Industrial Equipment manufacturers are now operating in a landscape that is ever-changing and more complex than ever. With the climate change agenda taking center stage globally, IE manufacturers are evaluating and implementing new power technologies such as electric and hydrogen. In addition, the industry is demanding more autonomous equipment, and the demand for unique product configurations continues to increase. All of this drives greater product complexity and increased pressure to transform their global operations.

This has sparked heated competition between companies racing to out-innovate each other. The quickest Industrial Equipment manufacturers to adapt to today's complex industry trends will be in the best position to capture the greatest market share and cement their place as an industry leader.

However, most organizations are held back from maximizing their full potential in this race as they struggle with:



Beyond that, the landscape has also been reshaped by geopolitical events, climate-related hazards and public health crises—which adds another layer of complexity that best-in-class manufacturers have turned into opportunities by leveraging the right solution.

In this white paper, discover how to:



Provide accurate inventory replenishment synchronized to real-time activities on the shop floor



Increase visibility to improve responsiveness to inventory issues driven by supply chain disruptions



Reduce or eliminate inventory buffers and obsolescence



Improve traceability while maintaining efficiency and throughput



Remain cost-effective while accelerating efficiencies

INDUSTRY TRENDS AND BUSINESS DRIVERS IN INDUSTRIAL EQUIPMENT

PRODUCTION OF ONE

Rising customer demand for customized products require manufacturers to be more flexible and agile.

SELF-AWARE SOFTWARE DRIVEN SYSTEMS

Having a smarter, more connected system supports autonomous equipment to improve production performance.

ENTERPRISE AGILITY

Agile enterprises can respond quickly and effectively to changes in market demand and increase the speed of delivery.

PRODUCT AS A SERVICE

Product as a Service offers more effective business operations and a simpler financial model based on pay-per-use or pay-per-outcome.

ENTERPRISE RISK PLANNING

In a highly disruptive business environment, more effective risk management has become a necessity for companies.

CIRCULAR INNOVATION

With the world shifting towards sustainability, companies need to meet the increased demand for sustainable equipment and products.



THE KEY TO SUSTAINABLE GROWTH

As we see a shift in consumer demand from mass production to mass customization, the deployment and successful implementation of best practices across multiple sites globally has become more crucial than ever.

There is a pressing need for improved visibility, efficiency and control of manufacturing production and operations, within and across global/local plants. Monitoring target cycle times and adopting a “Design Anywhere, Manufacture Anywhere” model are key points to managing and future-proofing growth successfully.

THE WORKFORCE GAP

Post-Covid, all industries, especially manufacturing are currently facing these issues:

- A significant number of older workers are retiring, leaving behind a skills and knowledge gap
- A sharp increase in employee turnover due to high job demand and a much smaller available workforce
- An increase in manufacturing complexity due to the demand for mass customization with a corresponding increase in new employee on-boarding time
- A job in manufacturing is viewed in a negative and antiquated light



HOW DELMIA HELPS COMPANIES DRIVE OPPORTUNITIES IN INDUSTRIAL EQUIPMENT

Every day, the shop floor experiences unplanned events such as missing parts, non-conformances and machine breakdowns. These disruptions disturb operations and hinder efficiency—translating into increased lead times and Work in Process (WIP) inventory levels, as well as increased “just in case” inventory in raw materials and components.

That’s why DELMIA’s integrated solution targets one of the weaker links in the value chain: the gap between production and warehouse management.

With DELMIA, a digital thread runs throughout the chain, connecting and improving the inbound material flows, line-supply and outbound material flows.

It coordinates production orders and manufacturing bills of material with inventory management inside plants and across the supply chain, which includes:

- ✓ **Work in Process (WIP)**
- ✓ **Raw materials**
- ✓ **Purchased parts from suppliers warehoused on-site or off-site**
- ✓ **Semi-finished inventory residing at a feeder production line or work cell**

Manufacturers can now gain full visibility into orders, inventory, resources and quality status—all consolidated and easily accessible on the same platform. The solution also alerts and alarms operators when issues arise—providing optimal decision support and increasing responsiveness to disruptions.

This seamless workflow is known as material synchronization, a term trademarked by DELMIA to empower companies to fully master the production process with the following capabilities.



1

ELIMINATE INVENTORY BUFFERS AND OBSOLESCENCE

The solution supports pull-based (demand-driven) and one-piece flow production. Parts are either made one at a time or in small batches when there is demand—eliminating buffers, shortening lead times and reducing the amount of scrap in the event defects or non-conformances are found. This unlocks Just in Time manufacturing.

In addition, the solution supports multiple inventory management techniques for different types of inventories as well as Engineering Change Management to prevent obsolescence. This includes:

- **First In, First Out (FIFO)**
- **Kanban**
- **Product-specific kitting**
- **Revision controlled inventory**
- **Inventory with short shelf life or time sensitivity requirements**

2

JUST IN TIME AND SEQUENCE (JIT/JIS) MANUFACTURING

The system first generates the pull signal and tasks from the final assembly—giving operators oversight into all the inventory and materials required. Then, through business processes, the solution determines the timing, sequence and individuals needed for performing all required manufacturing tasks.

Material flow automation ensures that the sub-assemblies and right parts arrive at the right time at the right place and in the right sequence for production/assembly to begin immediately with no downtime in between.

REAL-LIFE VALUE OF IMPLEMENTING DELMIA



A tractor manufacturer and agricultural equipment company switched its final assembly line management to JIS and increased the number of models produced from 8 to 16. This marked a 100% increase in models with no increase in inventory or production space.



A manufacturer of automotive seating and automotive electrical systems supplies 1,400 seats daily within 40 minutes of ordering and provides JIT delivery with no finished goods (FG) inventory on hand and minimal raw materials.

AUGMENTED REALITY: A CATALYST FOR GROWTH

Imagine if you could democratize knowledge across the shop floor, ensuring the right information is delivered to the right person at the right time in a form that is meaningful to frontline workers.

DELMIA's new Augmented Experience solution can make it happen with an immersive real-time application. AR/VR is a natural extension of 3D-based manufacturing engineering and industrial engineering, providing the visual representations needed to connect engineering with the shop floor.

Augmented work instructions reduce time, error and operational latency between departments while converging the virtual models with real-world operations—consequently, driving up the quality of work, productivity and customer experience.



3

LEAN MANUFACTURING

DELMIA provides the technology needed to drive lean manufacturing principles and achieve manufacturers' sustainable and profitable goals. Not only can organizations embrace a paperless system now, but they can also follow the best practices provided by Lean organizations such as the Kanban framework.

All stakeholders will have full real-time visibility and control over the material flow within the supply chain. This reduces excess inventory, overstocking and avoids shortages.



4

ACCURATE INVENTORY REPLENISHMENT

Multiple sub-assembly and material kitting operations are synchronized with the main assembly processes in real time. This allows manufacturers to coordinate material replenishment based on the production status and material handling requirements needed to fulfil production orders.

Manufacturers can also configure business rules into the system to ensure accuracy and full control. For example, a user may only request a specific material issue to the production line based on a change in the production schedule. This cuts down material handling and delivery errors as well as prevents the wrong material from being issued.



REAL-LIFE VALUE

A company which specializes in diesel and alternative fuel engines and generators leveraged DELMIA and is now able to synchronize 10,000 kits to drive the production of 350 engines daily. They were also able to reduce the rework on line by 75% and reduced line stoppage and excess WIP.

5

BETTER TRACEABILITY AND QUALITY ASSURANCE

Using labels, electronic tags and automatic tracking technologies (RFID, barcodes and more)—all materials are scanned and validated each time they are received and transported. This ensures the quality, traceability and genealogy of all components are accounted for and continuous throughout the plant and assembly process.

6

MINIMIZE SHIPPING AND RECEIVING ERRORS

Deliver a superior customer experience by leveraging DELMIA's capabilities for real-time error proofing for print, packaging and labeling inventory in shipping and receiving. DELMIA can also ship in sequence based on a specific order set required by the customer demand signal.

CAN YOUR SOLUTION SUPPORT DIFFERENT MANUFACTURING MODELS?

DELMIA supports:



Make to Stock (MTS)



Build to Order (BTO)



Configure to Order



High volume/low mix



Low volume/high mix



WHY DO WE NEED A WAREHOUSE MANAGEMENT SYSTEM (WMS) AS AN INTEGRATED PART OF MES / MOM?

There are two major gaps in a traditional environment where ERP or WMS manages materials and a typical Manufacturing Execution System (MES) / Manufacturing Operations Management (MOM) system is used in a production environment:

- **A typical WMS or ERP does not provide visibility when it comes to WIP and operation status on the production floor which leads to higher inventory costs and lower productivity**
- **A traditional MES solution does improve visibility in WIP and operation status on the production floor but does not provide insight into component and raw material inventory, completed sub-assemblies or finished goods—which results in lower productivity and increased material handling costs in the case of disruptions**

By integrating the traditional MES functionality and a manufacturing-based WMS solution in a single platform, manufacturers gain complete visibility across the entire materials process—from receiving through production and shipping.

THE PROVEN VALUE OF AN INTEGRATED SOLUTION

Synchronizing materials and logistics with the shop floor in real time unlocks the following benefits:

24-45%
reduction in
inventory

25%
increase in
throughput/
productivity

Significant
quality and
safety
improvements

WMS AS A STAND-ALONE SYSTEM IN A PRODUCTION ENVIRONMENT IS INSUFFICIENT

WMS in a warehouse is focused on receiving, internal movements and shipping. However, for a warehouse to effectively support manufacturing, the complexities multiply. It must:

1

**Provide multiple supply
and line replenishment
methods**

2

**Manage buffers on the
shop floor based on
actual production**

3

**Be able to support
sub-assembly areas
in support of final
assembly**

4

**Track packaging
materials especially
returnable containers**

Having WMS as an inherent part of your MOM solution fills the gaps and enhances a manufacturer's capabilities—making this an effective, sustainable business model to support a complex manufacturing environment.

THE REAL-LIFE VALUE OF IMPLEMENTING DELMIA

A wide range of industrial equipment manufacturers have implemented DELMIA to transform industry challenges and trends into business opportunities.

To better illustrate the true value and benefits of material flow control derived from using an integrated planning and optimization platform—here are two case studies.



KOBELCO

Kobelco Construction Machinery is a Japanese producer of hydraulic excavators and crawler cranes with nine manufacturing plants across Asia and the United States, as well as a sales network with an almost global reach.

Kobelco quickly recognized the value of 3D process planning and simulation, as well as standardization in smart factories to drive shorter lead times and a more flexible production process that could meet their requirements for quality, cost and delivery.

By implementing DELMIA, they were able to:

- ✓ **Reduce product development lead time by half**
- ✓ **Reduce rework during production by 60%**
- ✓ **Optimize processes to reduce back-office staff operations by 50%**

To learn more, [read the full customer story.](#)



COORSTEK

CoorsTek is a US-based manufacturer of technical ceramics—a durable material that can be used in a wide range of applications from automotive fuel injection technology to aerospace jet propulsion systems.

Faced with high demand for high quality products, CoorsTek sought a solution to drive fast-paced production while maintaining equipment uptime and product quality levels.

Since implementing DELMIA, they were able to:

- ✓ **Maintain equipment uptime with preventive maintenance**
- ✓ **Improve product quality while reducing scrap levels**
- ✓ **Drive productivity with a single source of truth for all information, including work orders**

To learn more about their success, [read the customer story.](#)

THE PROVEN VALUE OF IMPLEMENTING DELMIA



-30%
Cycle time



-50%
Production
premium freight



-25%
Material handling
staff reduction



-35%
Inventory



X2
Number of models
built with...



0%
increase in
on-site inventory

THE FUTURE OF INDUSTRIAL EQUIPMENT

Ensuring business continuity in such a complex and volatile landscape means being able to improve quality, facilitate sustainable innovation and cater to customization demands—all while remaining cost-efficient.

Closing the gap between production and warehouse with real-time material synchronization enables this.

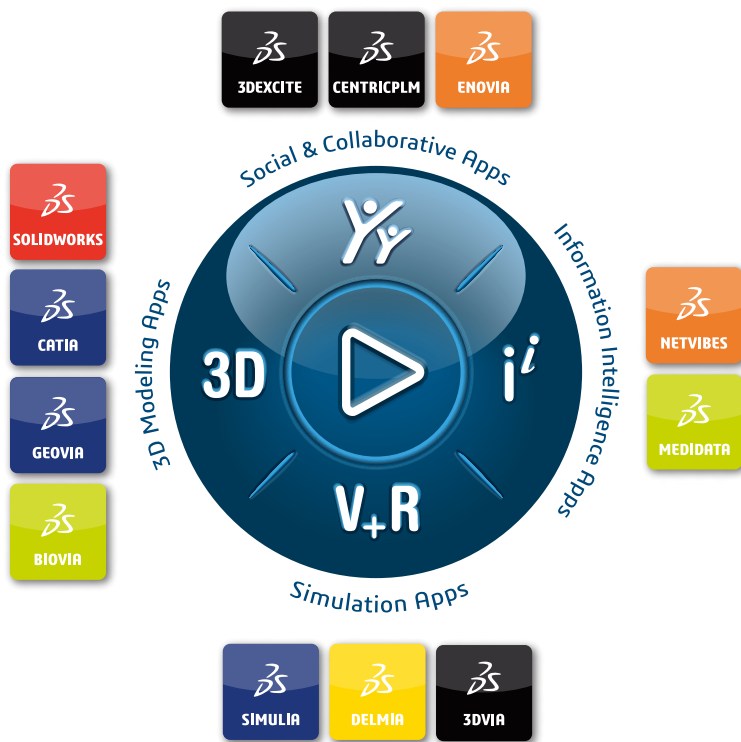
DELMIA is designed to help Industrial Equipment manufacturers achieve their goals of driving agility and efficiency to unlock operational excellence—making it the strongest link in their value chain.

WHO WE ARE



Dassault Systèmes' DELMIA, powered by the 3DEXPERIENCE platform, helps industries and service providers connect the virtual and real worlds of value networks to collaborate, model, optimize and perform. DELMIA provides solutions to leverage the virtual world of modeling and simulation with the real world of operations to provide a complete solution to value network stakeholders from suppliers to manufacturers, logistics and transportation providers, as well as service operators and the workforce.





Our **3DEXPERIENCE®** 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 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.

Dassault Systèmes brings value to more than 300,000 customers of all sizes, in all industries, in more than 150 countries. For more information, visit www.3ds.com.

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