



IMPROVE MATERIAL FLOW IN MEDICAL DEVICE MANUFACTURING

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





A NEW ERA IN THE MEDICAL DEVICE INDUSTRY

Medical Device manufacturers are now operating in a landscape that is ever-changing and more complex than ever. With the increased adoption of personalized medicine, combination devices and 3D printing as well as the growing demand for new discoveries, advancements in high-tech, regulatory guidance, AI and automation, medical device manufacturers are under greater pressure to transform their global operations. This has led to new and innovative personalized approaches to manufacturing healthcare devices. However, most organizations are held back from maximizing their full potential in this race as they struggle with:

1 Managing growth while maintaining market share on a five-year trajectory	2 Dealing with labor shortage	3 Addressing ongoing supply chain disruptions	4 Paper-based tracking resulting in waste, errors and non-value-added work	5 Poor inventory management and low visibility
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Beyond that, the landscape has also been reshaped by 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 MEDICAL DEVICE MANUFACTURING

AGILITY

Medical Device manufacturers are under constant pressure from customers seeking product diversity and new healthcare and medical device options delivered at an increasing pace. What is needed are solutions that enable manufacturing businesses to produce and deliver at a customized level with efficiency and speed. To meet these modern day demands, companies need to embrace flexibility and agility throughout their value chain.

BETTER QUALITY ASSURANCE

In their quest to accelerate profitable new opportunities, manufacturers must still ensure quality and adhere strictly to global and local requirements—all while keeping costs low.

Besides this, with customers calling for a shorter time-to-market, great importance is placed on achieving first-time-right quality, which also results in scrap reduction.

LOWER COSTS

While it may not be impossible to achieve all the demands and capabilities listed down so far, checking all these boxes simultaneously means exponential costs. Companies must now choose between absorbing these costs or transferring them to their customers unless they implement a solution that enables them to remain cost-effective.

PUSHING THE BOUNDARIES OF INNOVATION

With the accelerating demand for diverse and customized medical devices, manufacturers will need to embrace advanced creative design, shared intelligence, systems engineering and multi-domain collaboration.



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 MEDICAL DEVICE MANUFACTURING

Every day, the shop floor experiences unplanned events such as inventory uncertainty, 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. Devices 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 material waste 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 the 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.

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.



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.

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.

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)?

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 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 THE MEDICAL DEVICE INDUSTRY

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.

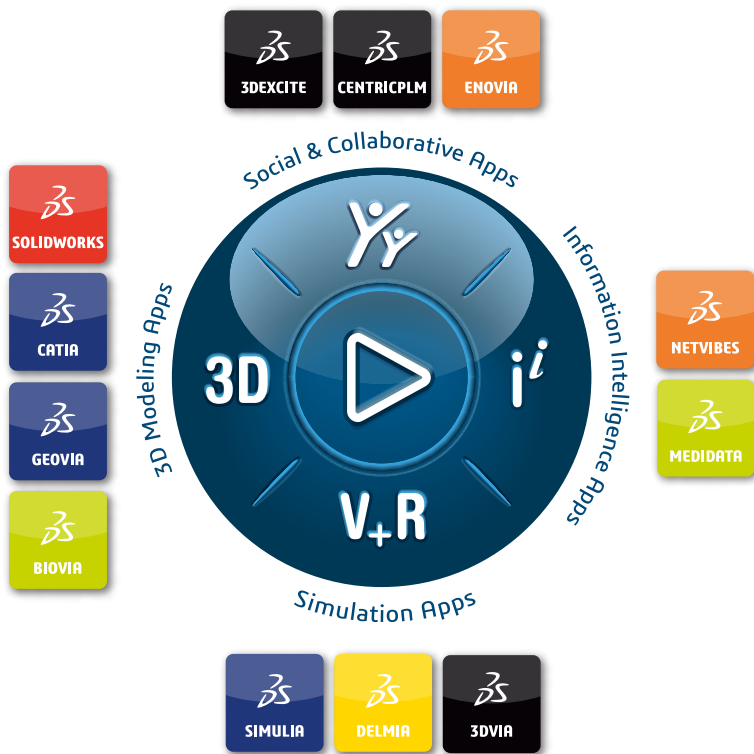
DELMIA is designed to help Medical Device manufacturers achieve their goals of driving agility and efficiency to unlock operational excellence—making it the strongest link in their value chain.

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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