



Manufacturing Process & Production Simulation

Production Digital Twins optimize efficiency & quality in a virtual 3D world.
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Operational Challenges

As medical devices become more complex and customized products more common, keeping pace with efficiency standards, updated global regulations and rapid changes in the marketplace is increasingly difficult. Competitive pressure adds to the demands by compelling manufacturers to improve speed to market and predictability.

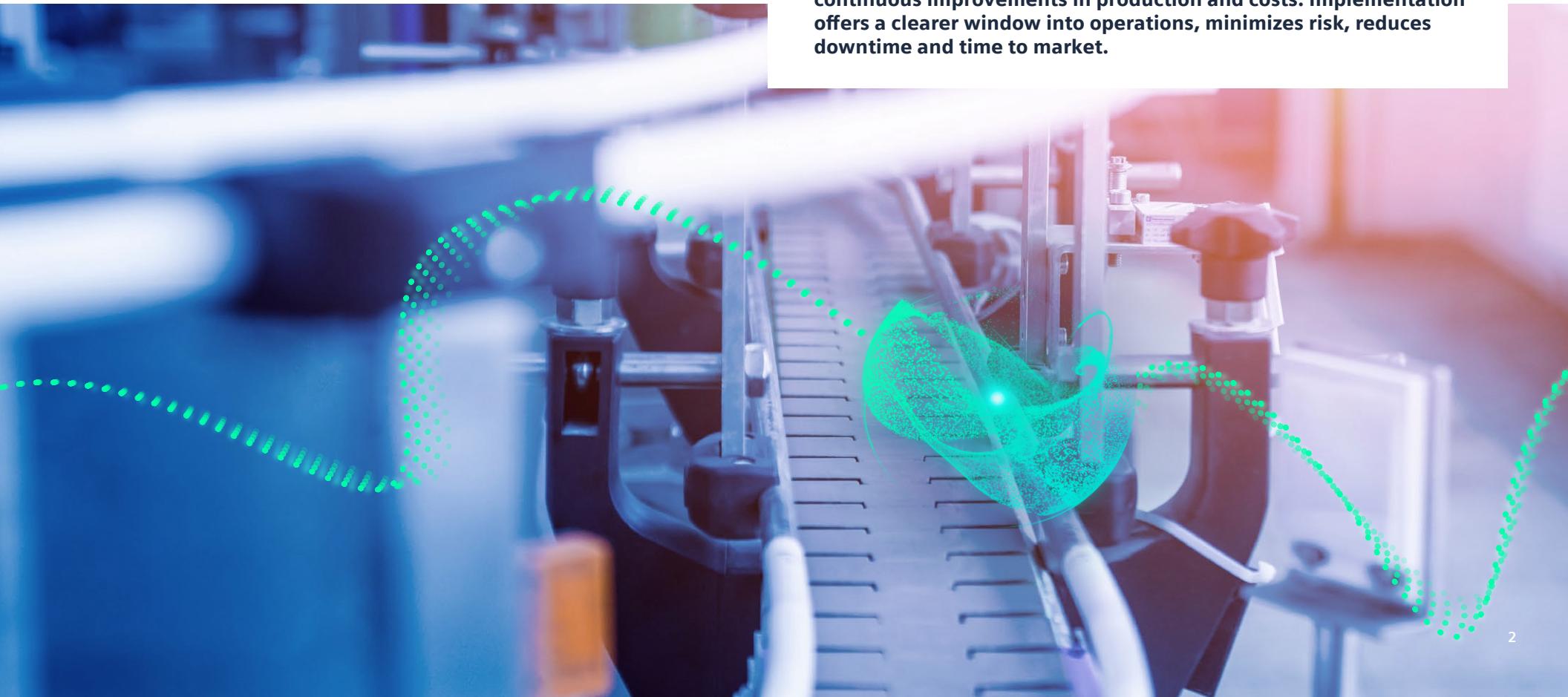
The Production Digital Twin simulates processes at every level:

- Layout design
- Robotics
- Material flow simulation
- Virtual commissioning
- Ergonomics

Successfully navigating these challenges involves a renewed focus on Operational Excellence by simulating scenarios in advance. Siemens Production Digital Twin can play an important role by connecting engineering and operations. It creates a digital representation of the manufacturing process and empowers teams to identify and work out quality problems before real production begins.

A digital twin offers medical device manufacturers the capability to conduct factory, plant and line simulation and process/workstation simulation. Companies gain the ability to digitally model all aspects of manufacturing operations for optimized efficiency in a virtual 3D environment.

The Production Digital Twin provides real-time visualization, machine-learning and what-if scenarios to enable closed-loop continuous improvements in production and costs. Implementation offers a clearer window into operations, minimizes risk, reduces downtime and time to market.



Production Digital Twin for Medical Devices provides better insights into your operations via 3D visual real-time representation



Siemens offers Operational Excellence tools to help with the challenges of today's medical device manufacturing market

Simulate processes to identify manufacturing bottlenecks

It's difficult to pinpoint production problems without real-time information from your shop floor. Implementing Siemens Production Digital Twin gives medical device manufacturers an accurate way to view and personalize the extensive data generated by their operations by locating obstacles, testing solutions and validating new scenarios.

A Production Digital Twin integrates computer-aided design (CAD), computer-aided manufacturing (CAM), product lifecycle management (PLM) and industrial IoT technologies to physical assets. Manufacturers can gather machine

data points in real time, aggregate it with data from other machines and deliver it back into the virtual models to improve products, production and performance in a continuous loop.

Creating a digital representation of production processes also enables easy data acquisition and storage of sensor, asset, equipment, process and production information for efficient, ongoing analysis and improvement.

Automated monitoring compares machine performance against established key performance indicators (KPIs) so that deviations can be identified and corrected before any products are made below standards.

Harness a virtual model of automation to:

- Layout and optimize assembly, material, tooling and workforce movement
- Use Augmented Reality/Virtual Reality to train and onboard
- Test ergonomics and workplace safety
- Program robot, test robot, visualize, analyze and evaluate options
- Employ what-if analysis to compare actual versus planned production conditions
- Look "backwards" in time and analyze historical model behavior
- Provide digital evidence for verification and validation

Actual customer value gained

30% faster time to market

\$2M savings in production costs

Eliminate errors, improve processes and verify specifications

Medical device companies can enhance their pursuit of Operational Excellence by digitally simulating scenarios in advance. Planning for optimized production efficiency can help companies find and error-proof the most effective plant layouts, line balance and work cells for both human and robotic operators.

A Production Digital Twin can help improve the flexibility and speed of operations for a range of markets and product configurations and improve surge manufacturing capabilities. Supercharging predictive maintenance with a digital twin can help reduce downtime, improve equipment performance, extended asset life span and more.

By simplifying quality systems, the Production Digital Twin improves the agility of operations and reduce the cost of physical process validation while ensuring safety and compliance to stay competitive in the medical device market.

The Production Digital Twin helps manufacturers:

- Create new business models
- Improve collaboration between teams and organizations
- Boost process and production efficiencies
- Increase product and production quality
- Speed time to market



About Siemens Operational Excellence for Medical Devices

Siemens Operational Excellence for Medical Devices enables operational agility, with real-time visibility, control and speed throughout the manufacturing process. It leads to high-quality, efficient medical device production that is regulatory compliant and provides perfect eDHRs.

Our solutions help companies of all sizes leverage digital systems to produce innovations that meet tomorrow's challenges.

For more information on Siemens Operational Excellence for Medical Devices, visit siemens.com/oe or follow us on [LinkedIn](#) and [Twitter](#).

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