HIGH-TECH

High-Tech Smart Factory

INTRODUCE INDUSTRY SOLUTION

High Tech
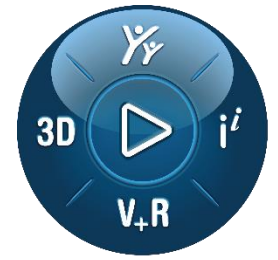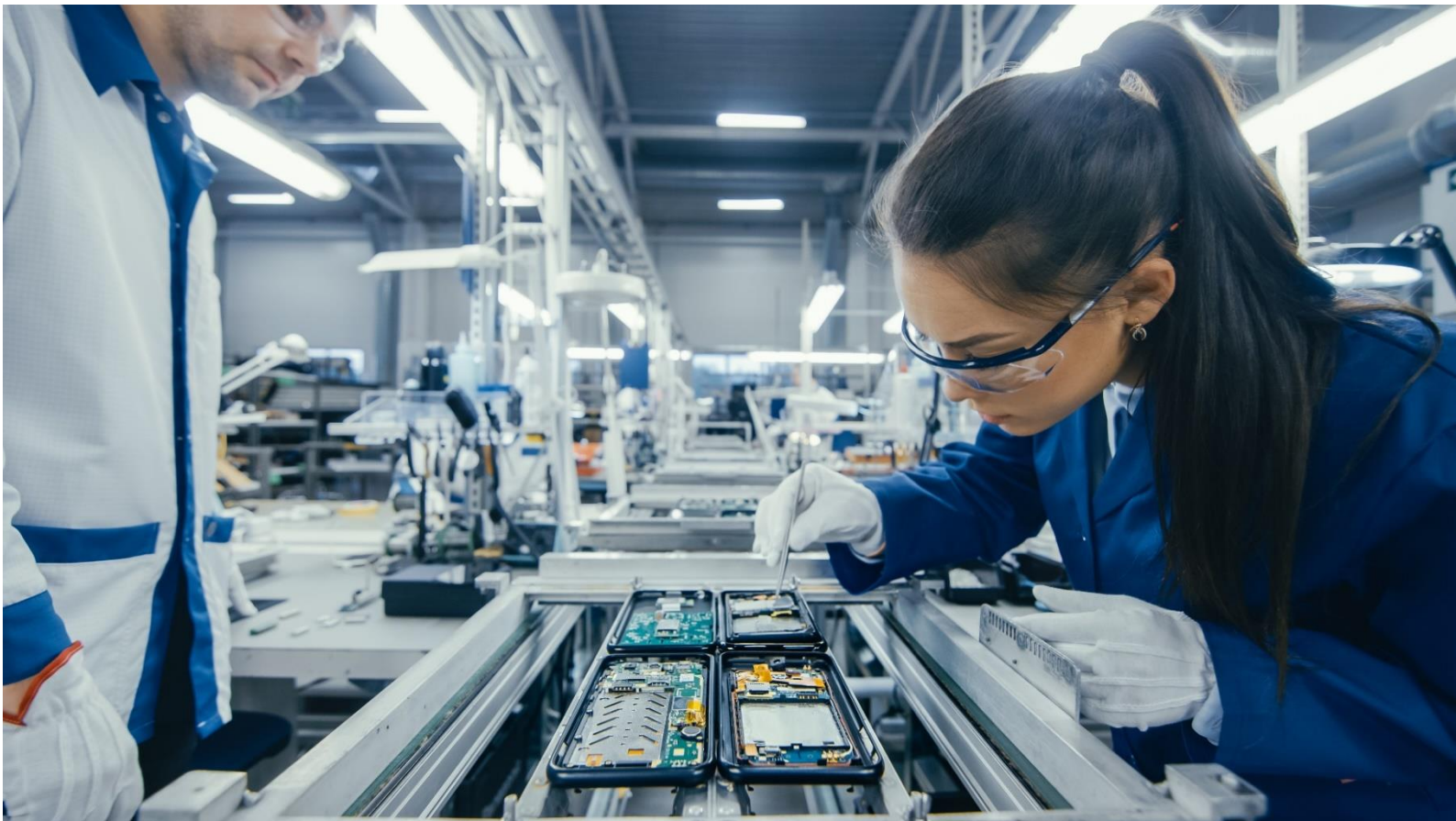
INTRODUCE INDUSTRY SOLUTION

Contents

Objectives:

- Describe the solution and its industry process experiences.

- Describe the solution's unique value and the game changers.

- Recognize the solution's Business Changes, Enabling Changes, and Enablers (that is, industry process experiences) that are required to ensure the desired benefits are realized.

- Describe the solution's KPIs and measurements.

CHAPTER 1: SOLUTION EXPERIENCE DESCRIPTION

1.1 Solution Description

- What is the description of the industry solution?

High-Tech Smart Factory offers both one integrated solution for all manufacturing preparation functions and the widest possible footprint for manufacturing operations visibility, control and synchronization – within the plant and across your entire supply network.

Performance is optimized across all aspects of the extended value chain, including your people, materials, machines and processes – and those of your suppliers with deployment flexibility that can be tailored to specific functional needs within a plant or globally.

By optimizing and communicating real-time data, signals, alerts, from any operations network location to any other location around the world, **High-Tech Smart Factory** empowers global manufacturers to respond quickly to strategy shifts, changing market conditions and unexpected events.
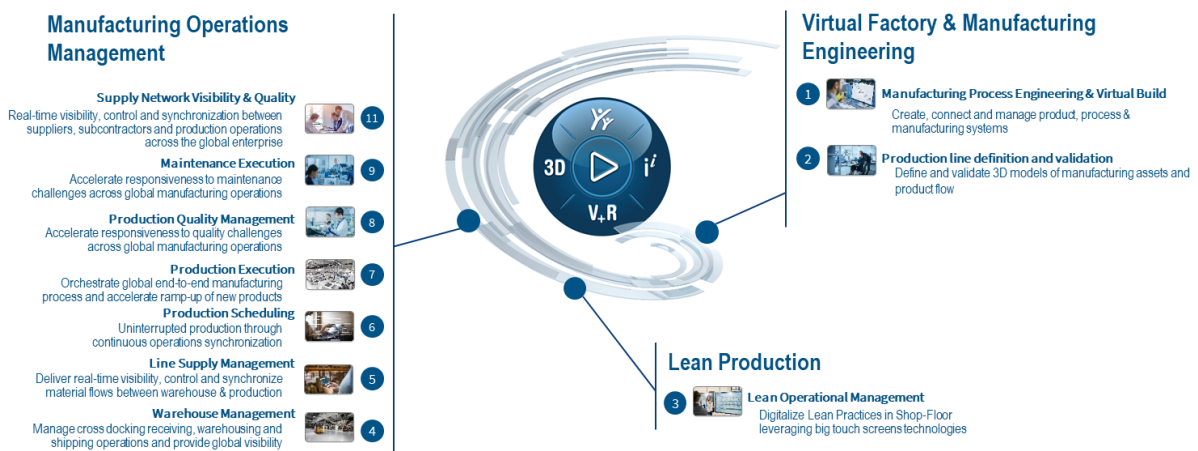
Based on the state-of-the-art of Digital Manufacturing, Ortems and Apriso, **High-Tech Smart Factory** can help you maximize margins, reduce lead times and improve product quality

1.2 Industry Process Experiences

- What is the description of each of the industry process experiences?

High-Tech Smart Factory | Solution

Transform your planning and global operations to gain responsiveness, flexibility, and efficiency

Manufacturing Operations Management

Supply Network Visibility & Quality — 11
Real-time visibility, control and synchronization between suppliers, subcontractors and production operations across the global enterprise

Maintenance Execution — 9
Accelerate responsiveness to maintenance challenges across global manufacturing operations

Production Quality Management — 8
Accelerate responsiveness to quality challenges across global manufacturing operations

Production Execution — 7
Orchestrate global end-to-end manufacturing process and accelerate ramp-up of new products

Production Scheduling — 6
Uninterrupted production through continuous operations synchronization

Line Supply Management — 5
Deliver real-time visibility, control and synchronize material flows between warehouse & production

Warehouse Management — 4
Manage cross docking receiving, warehousing and shipping operations and provide global visibility

Virtual Factory & Manufacturing Engineering

1 **Manufacturing Process Engineering & Virtual Build**
Create, connect and manage product, process & manufacturing systems

2 **Production line definition and validation**
Define and validate 3D models of manufacturing assets and product flow

Lean Production

3 **Lean Operational Management**
Digitalize Lean Practices in Shop-Floor leveraging big touch screens technologies

Industry Process Experience Name	Description of Industry Process Experience
Manufacturing Process Engineering & Virtual Build	Manufacturing Process Engineering & Virtual build IPE ensures the digital continuity from engineering to manufacturing by making the connection between the product, process, plants, resources and manufacturing systems As a native 3DEXPERIENCE application, the solution provides world-wide access from any engineering or production site and enables to manage : • Integrated engineering change and impact analysis which gives the ability to react fast to design changes. • Validated process plans and visual accurate work instructions which directly feed the manufacturing operations management of the shop floor.
Production Line Definition & Validation	Production Line Definition & Validation solution provides a collaborative approach to enable assembly validation of the product design in the context of factory layout. Leverage all existing input layouts either 2D or 3D elements from various resource catalogs, or point cloud, to fully define the digital twin of your plant and production line. Optimize and ensure safety of your resource layout as well as related Process Plans through simulation of what if scenario and analysis. The process plan is validated afterwards in the resource context and the workload is optimized for production resources.
Warehouse Management	This business process tightly unifies manufacturing operations with warehouse processes. It directs people and equipment to perform warehouse processes, such as put-aways and cross-docking materials directly to and from production. Efficiency and operations performance is improved while removing idle inventory; monitoring and reporting is provided on activities ranging from the receipt of raw materials through the shipment of finished goods.
Line Supply Management	This business process removes the constraints of traditional line replenishment systems by greatly expanding the scope of how line supply processes can be executed. What results is more intelligent process execution with greater accuracy and responsiveness, to significantly reduce waste and lead time while improving delivery performance. DELMIA Line Supply Management can deliver real-time operational intelligence into the design and execution of any "push" or "pull-based" line supply process, leading to new possibilities previously unattainable. By providing complete visibility and control to synchronize material flows with production processes, manufacturers can eliminate paperwork, improve productivity and reduce errors for a lower total cost of manufacturing operations.

Production Scheduling	This business process uses an optimization engine with 70 basic criteria to help maximize production sequences and dispatching over various plant resources. Quickly respond to contingencies and increase agility by reducing changeover times, raw materials inventory, and WIP. Improved controls allow you to quickly respond to production hazards and changes in demand. Collaborative features enable supply chain participants to stay engaged based on their level of responsibility. You can share planning and Key Performance Indicator (KPI) data with the entire organization, as well as partners, customers, subcontractors, and suppliers. This innovative and user-friendly design is an essential tool to help teams anticipate and control load fluctuations.
Production Execution	DELMIA Production Execution enables customers to achieve Operational Excellence by putting in place best manufacturing practices whatever their manufacturing model is (discrete, repetitive, batch...). The solution orchestrates the end-to-end manufacturing process, accelerates ramp-up of new products and responsiveness to production challenges across global operations.
Quality Management	This business process is dedicated to manufacturing operations and its global complexities. It can cover all manufacturing operations – production lines, warehouse, suppliers, shipping, packaging, genealogy, traceability, and more – so decision makers can see quality issues as they occur, and can then take quick action, from containment to process improvement. And, because DELMIA Quality Management can be deployed and managed from a Center of Excellence, it enforces quality best practices across the enterprise
Maintenance Execution	This business process provides the essential capabilities for shop-floor maintenance management, including the ability to schedule preventive maintenance, manage maintenance calendars, respond quickly to unplanned down time and manage parts and spares. It directs maintenance tasks while tracking actual time and labor per maintenance work order. And, it enables supervisors to track workloads while monitoring key performance indicators. DELMIA Maintenance is the perfect complement to Enterprise Asset Management solutions like Maximo as the real-time front-end maintenance solution on the shop floor.
Supply Network Visibility & Quality	

CHAPTER 2: SOLUTION EXPERIENCE UNIQUE VALUE

2.1 Value positioning statement

- What is the value positioning statement of the overall solution on the 3DEXPERIENCE platform?

For: medium and large sized manufacturers who currently have disconnect between product information for manufacturing engineering and plant production operations, **High-Tech Smart Factory** industry solution create a consolidated environment enabling key company stakeholder to collaborate and decide around up to date information.

At the core of the solution the 3DEXPERIENCE provide a single collaborative backbone for manufacturing engineering and simulation to all plants.

This referential can be used to :

- Perform industrial engineering (product planning) and validate product flow within factory
- Schedule plants operation for mid and long term horizons
- Execute operations with proven best practices while respecting local constraints
- Control product quality during production
- Provide feedback to the whole value chain from the shop floor through lean manufacturing practices digitalization

Unlike solutions from ERP/MES vendors, this solution provides "What If" scenario comparison and bring 3D to everyone in the manufacturing domain accelerating problem understanding and decision processes in complex organizations.

CHAPTER 3: SOLUTION EXPERIENCE GAME CHANGERS

3.1 Industry Solution Experience Game Changers

- What are the industry solution experience game changers and what is the competitive advantage?

To better position the game changes, we have to understand the major High-Tech Business Challenges related to **High-Tech Smart Factory** Industry Solution Experience:

- How to efficiently manage engineering to manufacturing ?
- How to include design changes efficiently?
- How to validate products manufacturability?
- How to respond quickly to customer demand or market changes within the warehouse ?
- How to respond to increasing demand variability in volume and models impacts line supply?
- How to insure time-sensitive quality performance within a production system across geos?
- How to produce "Any product / Anywhere" with flexibility & diversification / variant proliferation ?
- How to ensure the maximum assets readiness and utilization in the shop-floor?
- How to empower all teams with lean operational practices?

High-Tech Smart Factory is unique on the market. Having those disciplines in the same solution has no real equivalent on the market

Competitors in the PLM field (PTC, SIEMENS) does not have Lean operational solutions and the integrations of their digital manufacturing suite is weak with the product engineering applications. They do not share the same platform as they are mostly coming from acquired companies.

Dassault Systèmes build all our solutions on a real business platform with the data-driven philosophy at its core, which differentiates us from our competition. The way the 3DEXPERIENCE platform handles data enables true collaboration between a broader range of stakeholders formerly prevented from seeing the data they need to see. Even if the **High-Tech Smart Factory** solution today leverage some legacy tools in its portfolio those solutions will be progressively available on the 3DEXPERIENCE platform.

On top of these global solution values you can still leverage values of each domain solution embedded into **High-Tech Smart Factory** industry solution experience

- Comprehensive Digital Manufacturing Offering
    - Integrated engineering change and impact analysis which gives the ability to react fast to design changes.
    - Validated process plans and visual accurate work instructions that directly feed the manufacturing operations management of the shop floor.
    - Anticipate equipment commissioning constraints and issues
    - Enable early detection of manufacturing and production flow issue
    - Improve utilization of resources by balancing of operations
- Best in Class Manufacturing Operations Management
    - Visibility, control & synchronization across all manufacturing and supply chain operations, including production, quality, labor, maintenance & material flows
    - Comprehensive, embedded intelligence and traceability capture and reporting
    - Enterprise solution enables global sharing of "best practices" across sites

CHAPTER 4: BENEFITS & KEY MEASUREMENTS

4.1 Customer Key Performance Indicators

- What are the customer key performance indicators (KPI metrics) that are likely to be used in a business case to justify the solution investment?

Typical customer Return On Investment

PRODUCTION
- Throughput **+100%**
- Line assembly capability **+100%**
- OEE **+22%** the first year

QUALITY
- Defect identification and containment **from 2 weeks to 2 days**
- Quality claims **-90%**
- "1st time Right" **+ 400%**

STOCK
- Inventory accuracy: **99%**
- Availability: **99.999%**

GLOBAL OPERATIONS
- Assembly process creation time **-58%***
- Scenarii testing time **-87.5%***
- Production mix **+300%**
- From Make-To-Stock to Configure-To-Order > Operations time **-50%**
- Simultaneous mass production launch > Time-To-Volume **-50%**
- IT costs: **0.7%** of revenues

REVENUE
- Market coverage **+300%***
- Customer service: **98%***
- Margin **+2-6%***
- EBITDA + **~2%***

* Source:
Study of DELMIA customer results