

NTT DATA Business Solutions

Manufacturing 2027+

Optimize production and initiate innovations



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“Manufacturing is at a crossroads. To remain competitive in a rapidly changing world, companies must rethink how they manage their supply chains, adopt sustainable practices, and embrace digital transformation. Those who invest in flexible, data-driven solutions today will be the ones who thrive tomorrow.”

1. Starting Point: Today's manufacturing industry

The coming years will present significant challenges for the manufacturing industry. Fierce competition, unstable supply chains, and increasing cost pressures will make navigating this landscape difficult. Let's examine seven critical challenges across a typical value chain.

Overcoming acute and persistent supply bottlenecks

The fragility of global supply chains has become increasingly apparent in recent years. Sudden disruptions make sourcing materials from distant regions harder and complicate planning efforts. Manufacturers are adapting by integrating new suppliers, substituting raw materials, or even relocating production facilities. As transportation costs soar, some companies may also need to shift focus toward domestic and regional markets. This makes optimizing supply chains, expanding supplier networks, and maintaining flexible production capabilities more crucial than ever. These capabilities should be based on order priority, demand, and resource availability.

Improving warehouse management

Effective inventory management remains one of the most significant challenges in manufacturing. Inventory managers must maintain optimal levels of raw materials and work-in-progress inventory to ensure uninterrupted production, while also preparing finished goods for timely delivery to customers. Many manufacturers, particularly smaller ones, still manage inventory manually or rely on outdated systems, leading to inefficiencies and errors. This often results in stock shortages, overstocking, and inaccurate tracking.

Modern IT solutions provide a continuous, real-time overview of inventory, alerting supply managers when stock levels approach a predefined minimum, allowing for just-in-time reordering.

This ensures better alignment between production needs and inventory levels, reducing waste and improving overall efficiency.

Reducing cost pressures

Many manufacturers are under immense pressure to cut costs and improve efficiency. Some respond by cutting corners on product quality, which will likely lead to their downfall as customers seek better alternatives. To stay competitive, companies must modernize their processes and automate workflows. The goal is to reduce time-consuming, labor-intensive tasks, minimize material waste, optimize machine usage, and streamline logistics. Modern ERP systems and connected MES solutions play a pivotal role here by enabling production management to respond rapidly to disruptions or changes in order priorities.

Addressing the skilled labor shortage

The shortage of reliable, skilled workers is one of the greatest threats to the manufacturing industry. Companies producing high-quality goods must be selective in their hiring process. Many are leveraging online recruitment platforms and upskilling programs to enhance employee skills.

Competency management software can help close gaps in workforce capabilities, while integrated workforce scheduling ensures the best possible use of existing staff. Automation and robotics also alleviate labor shortages by taking over manual tasks.

Adapting to fluctuations in demand

Sudden spikes in consumer demand, like those seen during the pandemic, can't always be predicted. However, even in stable times, many manufacturers struggle to forecast demand accurately. Without advanced demand forecasting and analytics tools, they either fall short of production needs or produce too much. By analyzing customer behavior and considering external factors like market trends, supply bottlenecks, or rising fuel costs, manufacturers can better align their production planning with demand forecasts.

Achieving sustainability goals

Sustainability is now a priority for most businesses, especially manufacturers who face rising costs for energy, materials, and transportation. Stricter regulations and shifting consumer preferences toward eco-friendly brands are pushing companies to adopt more sustainable business models. However, businesses must prioritize the areas where sustainability optimization will drive the greatest impact, particularly within core processes.

Implementing new technologies profitably

Every year, new technologies like IoT, robotics, and AI emerge, presenting manufacturers with tough decisions about where to invest. Companies need solid IT and industry expertise to navigate these choices effectively, as implementing the wrong technology can lead to high costs with minimal returns.



From top floor to shop floor

For more efficient manufacturing processes and valuable insights, a cloud-based Manufacturing Execution System (MES) can provide immense benefits.



2. Vision, reality, deficits, and opportunities

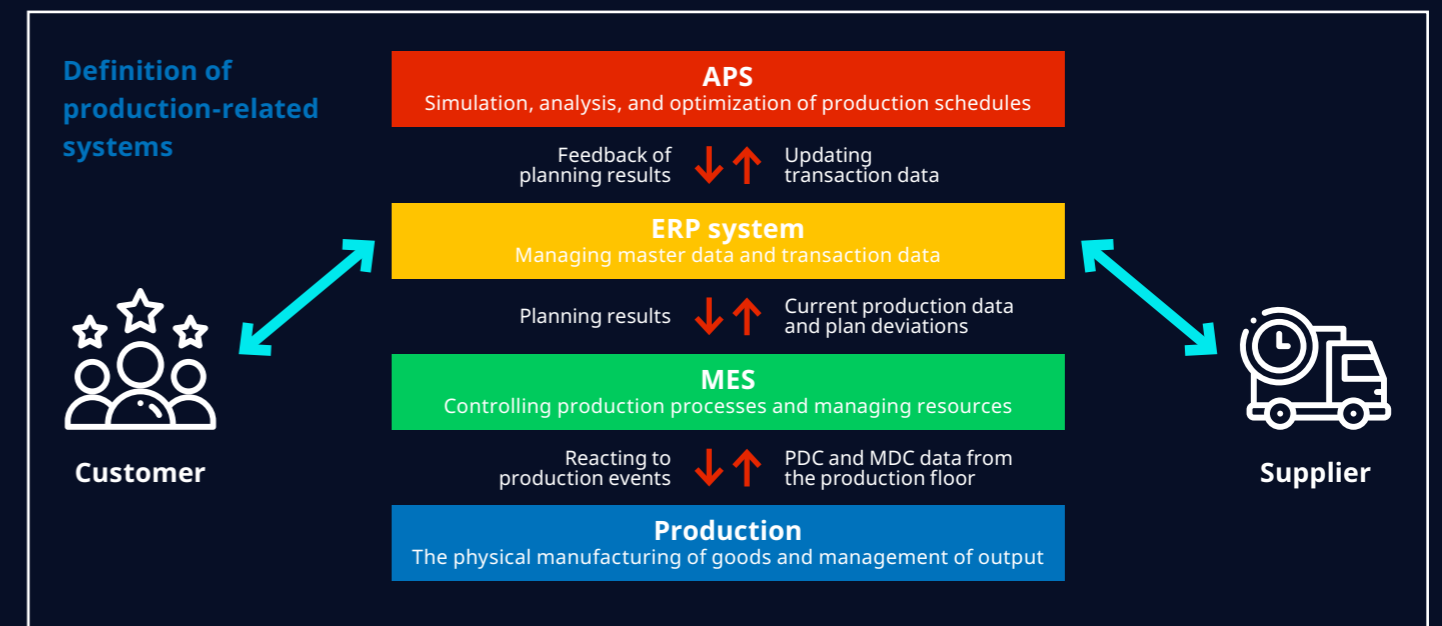
The challenges in the manufacturing industry share a common thread: key solutions depend on the vertical and horizontal integration of business processes. Particularly on the shop floor, a modern MES is essential to optimize production capacity and enhance flexibility.

This reduces the impact of negative external factors on a company's competitiveness. Concepts like Industry 4.0, Smart Factory, and Smart Manufacturing are widely discussed, but let's break down the practical aspects, focusing on three critical areas: production execution, evaluation, and resource planning.

In an ideal manufacturing environment, the company would achieve complete vertical integration through the MES. This allows real-time planning, control, and adjustments to production processes. On the horizontal level, suppliers and customers would also be fully integrated, ensuring that preliminary products arrive at the right time and in the correct variant. Customer demand would be accurately met because their data flows seamlessly into the company's MES and ERP system.

However, the reality is often far from this ideal. Production management frequently has to operate multiple specialized machines and systems, each with its own MES, which often lack SAP integration. This fragmentation creates blind spots in production control, evaluation, and planning, as there is no holistic overview or connection with the administrative and commercial data in the ERP system. Furthermore, comparing performance across multiple production sites becomes nearly impossible.

In this scenario, resource orchestration primarily relies on the experience of local production managers and workers. Many small and medium-sized companies don't use an MES at all, relying instead on printed orders and Excel spreadsheets to manage production operations. When failures occur, whether due to staff, materials, or machinery, overall system efficiency drops, defect rates rise, and delivery deadlines are missed.



3. Scalable MES from the cloud

Modern MES offer flexible production planning, high machine availability, and improved delivery reliability, which are critical success factors for any business.

A cloud-based MES can be especially beneficial for smaller sites with only a few machines due to its inherent scalability. The cloud connection, coupled with various subscription models, makes these systems easy to implement at relatively low cost.

The SAP Digital Manufacturing Cloud (SAP DMC), a comprehensive MES with advanced planning and analytics capabilities, has been available

since 2019. It provides the typical advantages of cloud-based solutions: scalability, cross-company use, and an operational expenditure (opex) model, which reduces the need for capital expenditure (capex). SAP DMC requires minimal effort from internal IT teams for implementation and maintenance, as SAP manages system updates. New releases are automatically installed every three months.

SAP DMC is also ideal for companies that already use an MES. It allows specific tasks to be performed in the cloud, reducing the strain on on-premises infrastructure. Additionally, businesses can supplement their existing MES by integrating specialized functions that are not covered by their primary system.

Key Functions of SAP DMC

Execution: SAP DMC includes all the essential functions of an MES, like those found in the on-premises SAP Manufacturing Execution (SAP ME) system. This includes worker interaction and management, machine connectivity, and direct integration with warehouse logistics and quality management.

Insights: The cloud solution provides real-time, in-depth production analyses, offering a comprehensive view of production key performance indicators (KPIs). These insights drive continuous optimization and allow businesses to track and compare performance across different areas. Companies can also configure custom KPIs using the integrated self-service modeling environment.

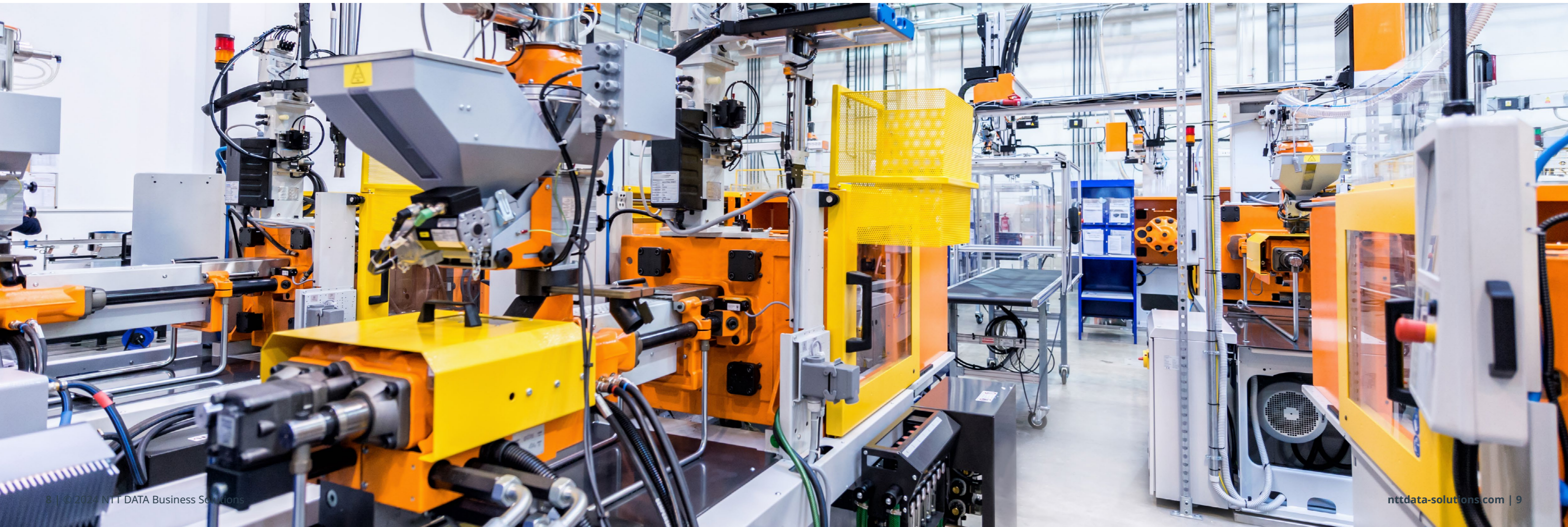
Resource Orchestration: This planning tool enables production control teams to plan, monitor, and manage shop floor activities in real time.

Production Process Designer: This feature allows users to design and distribute production processes, while also monitoring and tracking execution in real time.

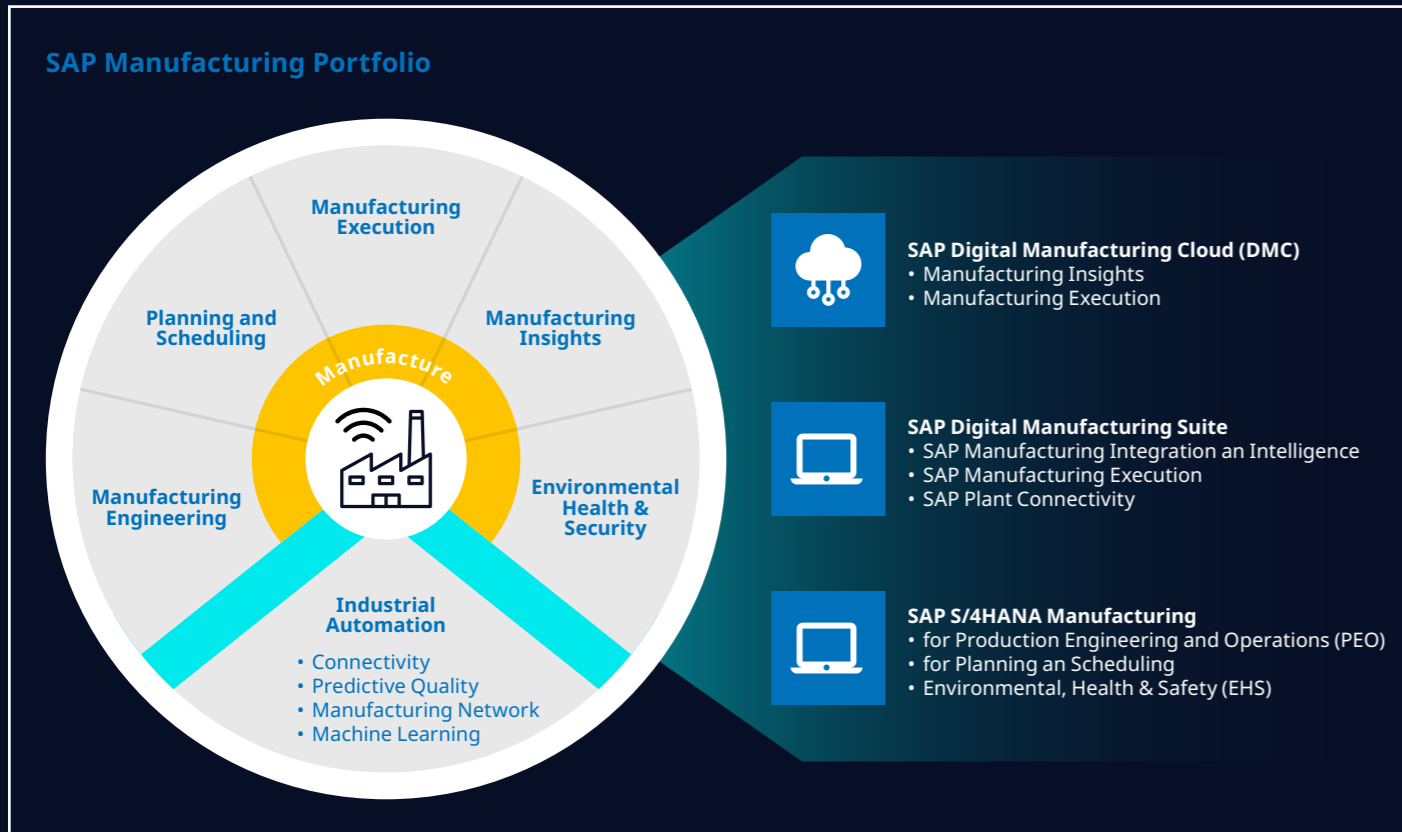
AI/ML Scenarios: SAP DMC allows users to develop AI and machine learning scenarios to accelerate production processes and improve quality. For instance, cameras can be used to inspect workpieces and ensure they meet quality standards.

SAP Manufacturing Network: This feature connects suppliers, customers, and the company's purchasing department, ensuring faster and error-free access to commercial and technical documents.

APIs/Interfaces: Data from different systems, such as warehouse management, logistics, inventory, material lists, and personnel planning, converge through standardized interfaces, ensuring seamless integration.



4. The Digital Manufacturing Cloud: What makes it so special?



The SAP DMC is a comprehensive MES available as a Software-as-a-Service (SaaS) model. It encompasses key areas such as Execution, Insights, and the Manufacturing Network. For instance, planning tasks like order sequencing can be handled through Resource Orchestration, while Labor Management enables production staff to organize personnel deployment efficiently. This results in a new level of real-time transparency and improved production efficiency. Additionally, SAP DMC can seamlessly supplement and expand existing on-premises solutions, bridging the gap between traditional production systems and the cloud.

One of SAP DMC's standout features is its intuitive usability. Take reports and analyses as an example: they are not only more user-friendly but also more comprehensive than in comparable SAP solutions. Shop floor users benefit directly from this, as the reports allow them to quickly identify the root causes of discrepancies in the production process. Additionally, these reports can be easily shared with customers and suppliers via the cloud. Creating custom KPIs is straightforward and doesn't require any development expertise. The system offers a modular modeling environment and a harmonized data model, enabling users to set up their own KPIs or use industry-standard ones right out of the box.

Digitalization is changing everything, and it's happening fast.

Everything that can be digitized will be. But how do you ensure it works effectively? What are the real benefits? If digitization is the solution, what challenge was it meant to solve?

At NTT DATA Business Solutions AG, we believe that digitalization should never be pursued for its own sake. However, to remain competitive in the long term, digital transformation is essential. We recognize that this journey is not a one-size-fits-all solution. It requires a close, collaborative partnership with you. Our goal is to work together to create a smart, connected manufacturing enterprise that is tailored to your unique needs.

By combining SAP's cutting-edge technologies with our deep local market knowledge, we deliver solutions that give you a competitive edge. With over 35 years of experience, we not only anticipate our customers' needs, but also stay at the forefront of industry trends. Our mission is to give you a competitive edge by seamlessly integrating innovative technologies with customized processes.

Digital transformation unlocks your company's full potential, provided the technology is designed to serve the people who use it. At NTT DATA Business Solutions, we plan, implement, manage, and continuously develop SAP solutions with your employees in mind.

With services in more than 30 countries, we've helped thousands of companies improve efficiency and productivity over the past three decades. Our global team of 10,000 experts is ready to help you on your journey to becoming an Intelligent Enterprise. No matter where you start, we are here to support you.

We transform. SAP® solutions into Value





About NTT DATA Business Solutions

We Transform. SAP® Solutions into Value

We understand the business of our clients and know what it takes to transform it into the future. At NTT DATA Business Solutions, we drive innovation - from advisory and implementation, to managed services and beyond, we continuously improve SAP solutions and technology to make them work for companies – and for their people.

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