

SMART FACTORIES: CONNECTING THE SHOP FLOOR WITH THE DIGITAL SUPPLY CHAIN



The Industrial Internet of Things (IIoT), which is also known as Industry 4.0 when applied to the manufacturing industry, is a concept of integrating smart manufacturing machinery, artificial intelligence (AI)-powered automation, and advanced analytics to help make every worker and factory more efficient.

The marriage of advanced manufacturing techniques with information technology, data, and analytics is driving another industrial revolution—one that enables manufacturing leaders to combine information technology and operations technology to create value in new and different ways.

What is the “smart factory?”

The smart factory can help manufacturers improve performance in a dynamic, digital world. The smart factory is an environment in which cyber-physical systems monitor the physical processes of the factory, provide analysis, and automate or support the controls and decision-making. This improves manufacturing efficiency and effectiveness.

Interest in smart factory applications continues to grow because of the significant operational benefits and competitive advantage it can generate for the manufacturers. These include:

- Real-time, on-demand visibility into performance across the production chain

- Information and technologies to improve physical process control
- Flexible, adaptive, and proactive production
- End-to-end integration with suppliers and customers

Industry 4.0—accelerating innovation, automation, and driving operational excellence

As the beating heart of your business, the shop floor is central to your smart factory journey. Industry 4.0 is unleashing new technologies that accelerate automation, connect data, and drive operational excellence on the shop floor, to unlock the true mastery of your makers. The following technologies are major disruptors that will shape the next revolution for Industry 4.0:

- Big data and data analytics
- Geotagging and geographical information systems (GIS)
- AI
- Cloud computing and everything as a service (XaaS)
- Robotic process automation (RPA)
- Blockchain
- Remote sensors and Internet of Things (IoT)
- Drones and unmanned aircraft systems (UAS)

The benefits of smart factory technology

By implementing smart factory technology, organizations can yield many benefits, such as:

- Better, faster, cost-effective production of goods
- On-demand availability, including small-batch production
- Customized designs, materials, and delivery
- Complete traceability of all parts, ingredients, and materials
- The opportunity to develop services and experiences, not just products
- Sustainable models that reuse, repair, and repurpose—moving from linear production to a circular economy
- Becoming a trusted partner in your digital supply chain by implementing cybersecurity as a key quality characteristic of your production process and the goods you produce

Fueled by technology and the Autonomous Digital Enterprise

Disruptive, digital technologies have accelerated and changed dramatically in recent years, driven largely by three key developments: lower computing costs and cheaper storage and bandwidth. Data is at the heart of today's business, and as more manufacturing organizations face an increase in its sources, volume, and complexity, they will need to learn to leverage it by implementing digital enterprise applications that span on-premises, cloud, and hybrid infrastructures.

Smarter strategies and new, centralized, and scalable AI-enabled operations (AIOps) systems will ascend, replacing conventional IT operations (ITOps) approaches to modern management. By harnessing new operational models and technology to drive agility, customer centricity, and actionable insights, companies can achieve the innovation required to succeed, and evolve to become an [Autonomous Digital Enterprise](#), a future business state driven by automation that works

with—not instead of—humans.

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