

# The factory of the future

How manufacturers can boost productivity and savings with smart factory technology



verizon<sup>v</sup>

From <sup>1</sup> SmartBrief

## Industry 4.0 and the role of technology

Industry 4.0 is the next step of the industrial revolution and will connect machines, products and people into a digital ecosystem that can correct issues before they affect production – sometimes without the need for human involvement.

Technology plays a key role in creating this ecosystem, connecting, automating and monitoring all aspects of manufacturing. This allows manufacturers to boost efficiency, flag issues such as factory equipment failures before they become a significant problem and perform predictive maintenance to reduce downtime. These technologies include the 5G network and edge computing, the industrial internet of things (IIoT) and cyber-physical systems.<sup>1</sup> Industry 4.0 also relies on the use of big data and analytics to optimize production, supply chain and logistics.

These advancements address many of the challenges affecting manufacturers' productivity and bottom line, such as:

- Downtime from unexpected maintenance.
- A lack of complete visibility into supply chains.
- An expected shortage of 2.1 million skilled workers by 2030.<sup>2</sup>
- Attainment of sustainability goals.
- Inclusion of robotics on the factory floor.

Companies implementing Industry 4.0 are responding to these challenges and becoming more agile, resilient and innovative. They are also better prepared to scale once industries emerge from the uncertain economic environment and demand and production increase. The global market for smart manufacturing was worth \$259.63 billion in 2021 and is expected to grow at a compound annual growth rate of 13.4% from 2022 to 2030, according to Grand View Research.<sup>3</sup>

It's more important than ever to make this transition now amid a period of high inflation and as manufacturers continue to recover and move on from the COVID-19 pandemic.

Unfortunately, many manufacturers have been slow to take the next step in the industrial revolution. A Gartner survey found 57% of manufacturing leaders cite lack of skilled workers as an obstacle to their digitization plans.<sup>4</sup>

- 72% of manufacturers have at least partially implemented a smart factory strategy and 65% are implementing an IIoT strategy.<sup>5</sup>

As most industries are working to do more with less, warehouse operations such as picking and packing are one of the last remaining labor-intensive steps of the supply chain.

Challenges preventing adoption of Industry 4.0 innovations include a shortage in technology-skilled employees, systems that lack interconnectivity and hesitancy to invest in IIoT technologies.



**72%**

of manufacturers have at least partially implemented a smart factory strategy

**65%**

of manufacturers are implementing an IIoT strategy

## ROI on Industry 4.0

Companies that have already embraced these technologies are seeing benefits across the manufacturing environment. For example:

- Big data and analytics can reduce material waste or overuse and can be used to oversee the metrics of the entire factory.
- Predictive maintenance, simulations and digital twins can reduce unplanned downtime.
- Robots, sensors and automated processes can reduce operational risks and downtime.
- IOT and AI allow dynamic scheduling, increased capacity and lower costs.

Industry 4.0 technologies allow factory machines to flag problems in real time so the manufacturer can mitigate them before they become more costly and result in serious consequences. Meanwhile, autonomous robotics cut down on human labor and error, while dynamic scheduling and predictive quality can bring up to a 40% improvement in labor productivity and overtime.<sup>6</sup> Organizational changes, including labor strategy, can be a game-changer for manufacturers as inflationary pressures increase, as labor is one of the highest costs of manufacturing.



For employees working in the factory, new technologies can help make their jobs safer and more efficient.

- Data from sensors, edge devices and connective systems promote the safety and reliability of machinery and processes.
- Drones and intelligent video analytics can monitor operations to reduce safety incidents.
- Augmented reality (AR) and robots can reduce the need for workers in unsafe or hazardous areas.
- Prevention of quality issues in real time lessens the need for human quality inspections.

Industry 4.0 also helps manufacturers manage unexpected crises, such as ongoing supply chain problems. Supply chain shortages have had a significant impact on the manufacturing process in the past few years, causing delays in shipment of goods.

But with new technologies, manufacturers gain supply chain visibility and can better recover from shortages coming out of the pandemic. They receive advance alerts of shortages, weather events or other issues, and can program automatic ordering from alternate suppliers in the event of a problem.

Additionally, 3D printing technology can increase efficiency and flexibility while reducing manufacturing waste. Industry 4.0 technologies allow better monitoring of consumption, more efficient consumption, faster actions to address inefficiencies and faster information sharing with regulatory authorities. These improvements can bring a 15%-30% increase in labor productivity, a 10%-50% reduction in machine downtime and an 85% increase in forecasting accuracy.<sup>7</sup>

## Case study: Smart Factory @ Wichita

Deloitte's Smart Factory @ Wichita, of which Verizon is a sponsor, is a fully operational factory ecosystem that works with clients on real business problems, helping them transform manufacturing operations.<sup>8</sup>

The factory demonstrates the benefits of quality sensing and detection, energy management and a fully connected and cyberprotected tech stack.<sup>9</sup> It showcases what's possible in sustainability: The net-zero factory is powered by a renewable energy smart grid and features wind trees, solar assets and smart lighting.<sup>8</sup>

A team of solution providers, tech innovators and researchers offer applied-learning opportunities, helping organizations solve problems through smart factory use cases.<sup>10</sup>

## Future-proofing your factory

There are several steps that manufacturers should take to start the journey toward Industry 4.0. The first is investing in essential technologies that provide broad improvements to automation and visibility over the entire manufacturing operation. These include 5G, mobile edge computing, fixed wireless access, AR and virtual reality (VR), the IIoT, LTE and mobile solutions.

To assist with specific tasks in the factory, manufacturers should also leverage predictive analytics, predictive maintenance, AI, cloud computing, robotic process automation, industrial robots, autonomous factory vehicles, 3D printing, digital twins and drones.<sup>11,12</sup>

Finally, working with a partner can help manufacturers access the network, insight, technologies and infrastructure needed to operationalize Industry 4.0. The low-latency data connectivity provided by Verizon 5G Ultra Wideband and mobile edge computing solutions can power AI, AR and other technologies. Meanwhile, cloud-based solutions offer a fast, cost-effective way to connect facilities, manufacturers and suppliers.

With the right technology and the digital foundation to support it, manufacturers can boost efficiency, lower costs and prepare for demand shifts and unexpected events both on the factory floor and around the globe.



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