



The smart factory

Responsive, adaptive, connected manufacturing

A Deloitte series on Industry 4.0, digital manufacturing enterprises, and digital supply networks

Deloitte Consulting LLP's Supply Chain and Manufacturing Operations practice helps companies understand and address opportunities to apply Industry 4.0 technologies in pursuit of their business objectives. Our insights into additive manufacturing, the Internet of Things, and analytics enable us to help organizations reassess their people, processes, and technologies in light of advanced manufacturing practices that are evolving every day.

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The new frontier of manufacturing systems

CONNECTIVITY within the manufacturing process is not new. Yet recent trends such as the rise of the fourth industrial revolution, Industry 4.0,¹ and the convergence of the digital and physical worlds—including information technology (IT) and operations technology (OT)—have made the transformation of the supply chain increasingly possible. Shifting from linear, sequential supply chain operations to an interconnected, open system of supply operations—known as the *digital supply network*—could lay the foundation for how companies compete in the future. To fully realize the digital supply network, however, manufacturers likely need to unlock several capabilities: horizontal integration through the myriad operational systems that power the organization; vertical integration through connected manufacturing systems; and end-to-end, holistic integration through the entire value chain.²

In this paper, we explore how these capabilities integrate to enable the act of production. This integration is colloquially known as the *smart factory*, and signifies the opportunity to drive greater value both

within the four walls of the factory and across the supply network.

The smart factory represents a leap forward from more traditional automation to a fully connected and flexible system.

The smart factory represents a leap forward from more traditional automation to a fully connected and flexible system—one that can use a constant stream of data from connected operations and production systems to learn and adapt to new demands.³ A true smart factory can integrate data from system-wide physical, operational, and human assets to drive

manufacturing, maintenance, inventory tracking, digitization of operations through the digital twin, and other types of activities across the entire manufacturing network. The result can be a more efficient and agile system, less production downtime, and a



greater ability to predict and adjust to changes in the facility or broader network, possibly leading to better positioning in the competitive marketplace.

Many manufacturers are already leveraging components of a smart factory in such areas as advanced planning and scheduling using real-time production and inventory data, or augmented reality for maintenance. But a true smart factory is a more holistic endeavor, moving beyond the shop floor toward influencing the enterprise and broader ecosystem. The smart factory is integral to the broader digital supply network and has multiple facets that manufacturers can leverage to adapt to the changing marketplace more effectively.

The concept of adopting and implementing a smart factory solution can feel complicated, even insurmountable. However, rapid technology changes and trends have made the shift toward a more flexible,

adaptive production system almost an imperative for manufacturers who wish to either remain competitive or disrupt their competition. By *thinking big* and considering the possibilities, starting small with manageable components, and *scaling quickly* to grow the operations, the promise and benefits of the smart factory can be realized. In this paper, we define and describe the concept of the smart factory:

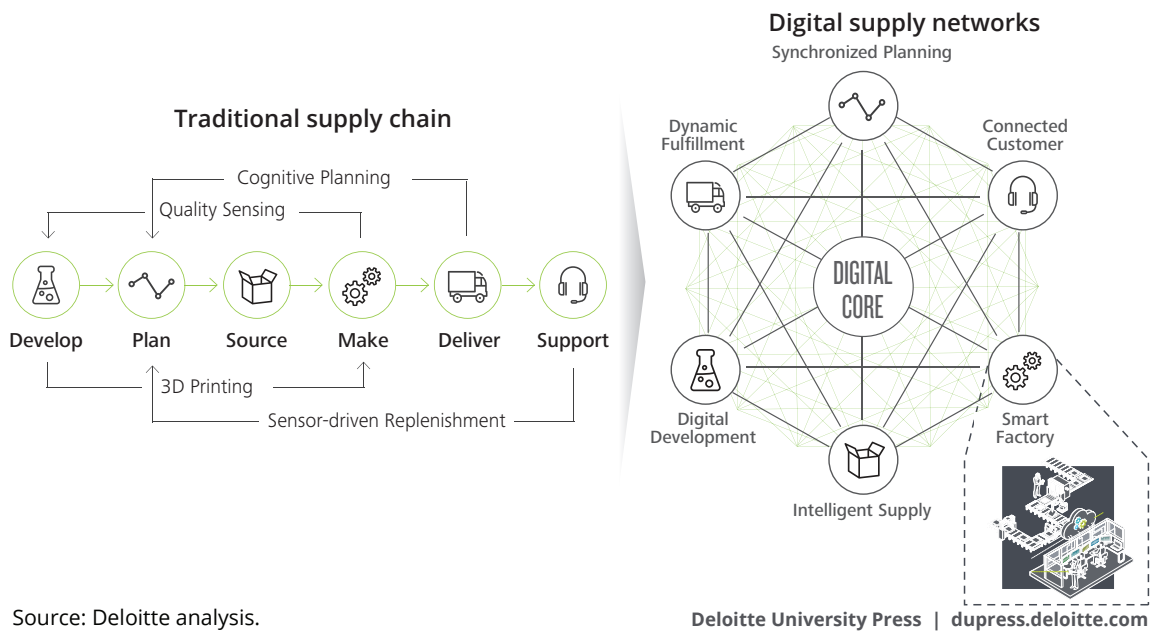
- What it is, its key features, and the trends that have contributed to its rise
- The components and technologies that comprise the smart factory, and how it fits within the digital supply network
- How the smart factory can drive value and its other benefits
- Ways organizations can begin building and enacting a true, holistic smart factory

A BRIEF LOOK AT THE DIGITAL SUPPLY NETWORK

In Deloitte's first publication of this series, *The rise of the digital supply network*,⁴ we examined how supply chains traditionally are linear in nature, with a discrete progression of design, plan, source, make, and deliver. Today, however, many supply chains are transforming from a static sequence to a dynamic, interconnected system—the digital supply network—that can more readily incorporate ecosystem partners and evolve to a more optimal state over time. Digital supply networks integrate information from many different sources and locations to drive the physical act of production and distribution.⁵

In figure 1, the interconnected lattice of the new digital supply network model is visible, with digital at the core. There is potential for interactions from each node to every other point of the network, allowing for greater connectivity among areas that previously did not exist. In this model, communications are multidirectional, creating connectivity among traditionally unconnected links in the supply chain.

Figure 1. Shift from traditional supply chain to digital supply network



Defining the smart factory

AUTOMATION has always been a part of the factory to some degree, and even high levels of automation are nothing new. However, the term “automation” suggests the performance of a single, discrete task or process. Historically, situations in which machines have made “decisions” have been automation based and linear, such as opening a valve or turning a pump on and off based on a defined set of rules. Through the application of artificial intelligence (AI) and increasing sophistication of cyberphysical systems that can combine physical machines and business processes, automation increasingly includes complex optimization decisions that humans typically make.⁶ Finally—and perhaps most crucially—the term “smart factory” also suggests an integration of shop floor decisions and insights with the rest of the supply chain and broader enterprise through an interconnected IT/OT landscape. This can fundamentally change production processes and enhance relationships with suppliers and customers.

Through this description, it becomes clear that smart factories go beyond simple automation. The smart factory is a flexible system that can self-optimize performance across a broader network, self-adapt to and learn from new conditions in real or near-real time, and autonomously run entire production processes.⁷ Smart factories can operate within the four walls of the factory, but they can also connect to a global network of similar production systems, and even to the digital supply network more broadly.

It is important to note, however, that the smart factory as defined and described in this paper should not be considered the “end state,” given the rapid pace of technological development. Rather, it represents an ongoing evolution, a continuous journey toward building and maintaining a flexible learning system—rather than the “one and done” factory modernization approach of the past.

The smart factory is a flexible system that can self-optimize performance across a broader network, self-adapt to and learn from new conditions in real or near-real time, and autonomously run entire production processes.

The true power of the smart factory lies in its ability to evolve and grow along with the changing needs of the organization—whether they be shifting customer demand, expansion into new markets, development of new products or services, more predictive and responsive approaches to operations and maintenance, incorporation of new processes or technologies, or near-real-time changes to production. Because of more powerful computing and analytical capabilities—along with broader ecosystems of smart, connected assets—smart factories can enable organizations to adapt to changes in ways that would have been difficult, if not impossible, to do so before.

Features of the smart factory: What makes it different?

As many manufacturers grapple with the myriad organizational and ecosystem-wide changes exerting pressure on their operations (see the sidebar “The smart factory: Why now?”), the smart factory offers

The smart factory

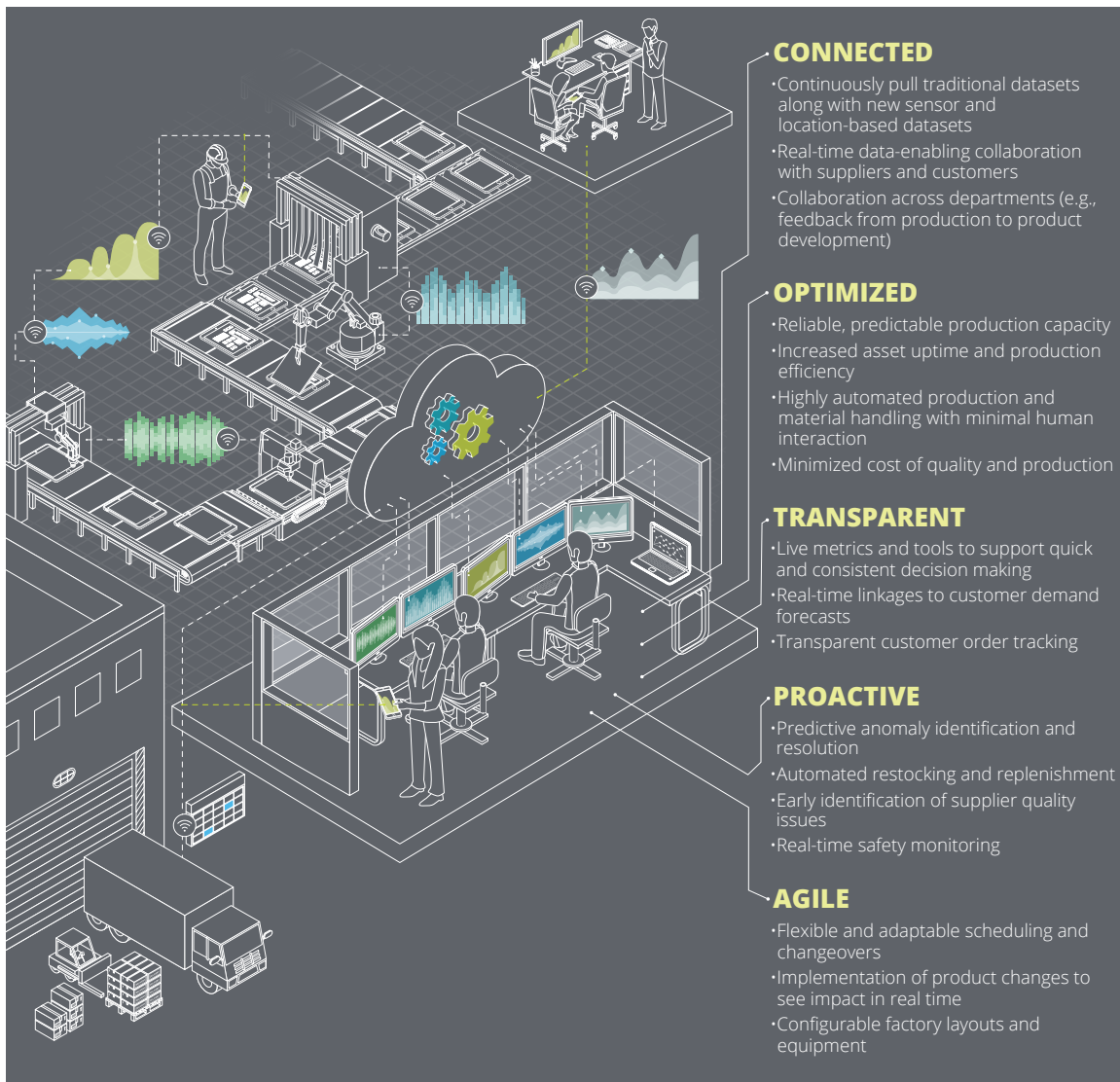
ways that can successfully address some of those issues. The ability to adjust to and learn from data in real time can make the smart factory more responsive, proactive, and predictive, and enables the organization to avoid operational downtime and other productivity challenges.

As part of its efforts to implement a smart factory while producing air conditioners, a leading electronics company used a fully automated production system, three-dimensional scanners, Internet of Things (IoT) technologies, and integrated machine control. The benefits of this automation included

lower lead times for customers and lower overall costs, along with production capacity improvement of 25 percent and 50 percent fewer defective products.⁸

Figure 2 depicts the smart factory and some of its major features: connectivity, optimization, transparency, proactivity, and agility. Each of these features can play a role in enabling more informed decisions and can help organizations improve the production process. It is important to note that no two smart factories will likely look the same, and

Figure 2. Five key characteristics of a smart factory



Source: Deloitte analysis.

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manufacturers can prioritize the various areas and features most relevant to their specific needs.

Perhaps the most important feature of the smart factory, its **connected** nature, is also one of its most crucial sources of value. Smart factories require the underlying processes and materials to be connected to generate the data necessary to make real-time decisions. In a truly smart factory, assets are fitted with smart sensors so systems can continuously pull data sets from both new and traditional sources, ensuring data are constantly updated and reflect current conditions. Integration of data from operations and business systems, as well as from suppliers and customers, enables a holistic view of upstream and downstream supply chain processes, driving greater overall supply network efficiency.

An **optimized** smart factory allows operations to be executed with minimal manual intervention and high reliability. The automated workflows, synchronization of assets, improved tracking and scheduling, and optimized energy consumption inherent in the smart factory can increase yield, uptime, and quality, as well as reduce costs and waste.

In the smart factory, the data captured are **transparent**: Real-time data visualizations can transform data captured from processes and fielded or still-in-production products and convert them into actionable insights, either for humans or autonomous decision making. A transparent network can enable greater visibility across the facility and ensure that the organization can make more accurate decisions by providing tools such as role-based views, real-time alerts and notifications, and real-time tracking and monitoring.

In a **proactive** system, employees and systems can anticipate and act before issues or challenges arise, rather than simply reacting to them after they occur. This feature can include identifying anomalies, restocking and replenishing inventory, identifying and predictively addressing quality issues,⁹ and monitoring safety and maintenance concerns. The ability of the smart factory to predict future outcomes

based on historical and real-time data can improve uptime, yield, and quality, and prevent safety issues. Within the smart factory, manufacturers can enact processes such as the digital twin, enabling them to digitize an operation and move beyond automation and integration into predictive capabilities.¹⁰

Agile flexibility allows the smart factory to adapt to schedule and product changes with minimal intervention. Advanced smart factories can also self-configure the equipment and material flows depending on the product being built and schedule changes, and then see the impact of those changes in real time. Additionally, agility can increase factory uptime and yield by minimizing changeovers due to scheduling or product changes and enable flexible scheduling.

These features afford manufacturers greater visibility across their assets and systems, and allow them to navigate some of the challenges faced by more traditional factory structures, ultimately leading to improved productivity and greater responsiveness to fluctuations in supplier and customer conditions. For example, an apparel, accessories, and shoe company is exploring ways to address some of the challenges manufacturers typically face, including global fragmentation of production and rapidly shifting demand (see the sidebar “The smart factory: Why now?”), by building one new smart factory each in Europe and North America. Traditional factories and supply chains can face challenges in keeping up with ever-shifting fashions. Located close to the point of customer demand, the new smart factories can better adapt to new trends and allow shoes to reach customers faster—an estimation of less than a week, compared with two to three months with traditional factories. Both smart factories will leverage multiple digital and physical technologies, including a digital twin, digital design, additive manufacturing machines, and autonomous robots. The company plans to use lessons learned from the two initial smart factories as it scales to more facilities in other regions, such as Asia.¹¹

THE SMART FACTORY: WHY NOW?

While automation and controls have existed for decades, the fully smart factory has only recently gained traction as a viable pursuit for manufacturers. Five overarching trends seem to be accelerating the drive toward smart factories:

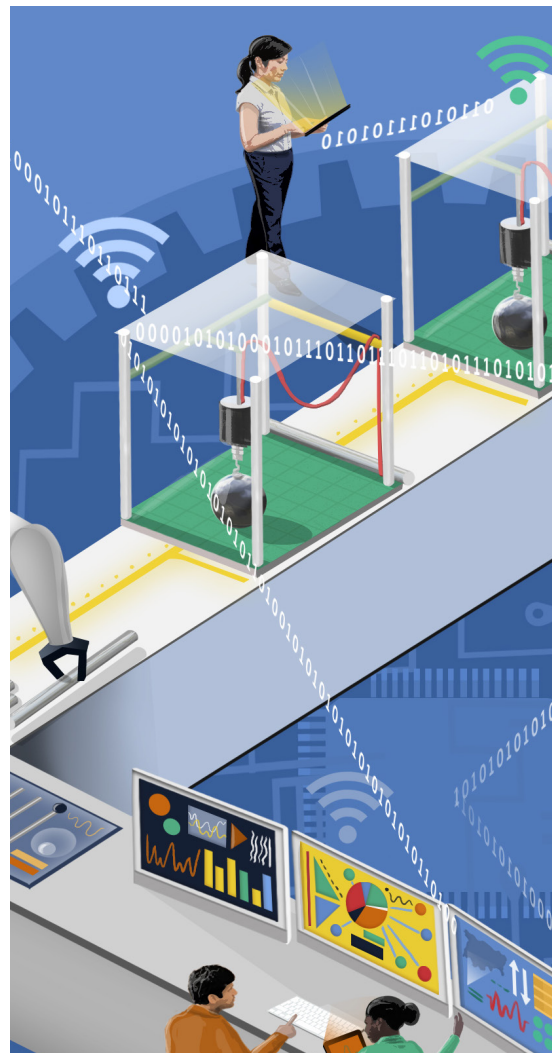
- Rapidly evolving technological capabilities
- Increased supply chain complexity and global fragmentation of production and demand
- Growing competitive pressures from unexpected sources
- Organizational realignments resulting from the marriage of IT and OT
- Ongoing talent challenges, as described below

Rapidly evolving technological capabilities

Until recently, the realization of the smart factory remained elusive due to limitations in digital technology capabilities, as well as prohibitive computing, storage, and bandwidth costs. Such obstacles, however, have diminished dramatically in recent years, making it possible to do more with less cost across a broader network.¹² Further, the capabilities of technologies themselves have grown more sophisticated: AI, cognitive computing, and machine learning have enabled systems to interpret, adjust to, and learn from the data gathered from connected machines.¹³ This ability to evolve and adapt, coupled with powerful data processing and storage capabilities, allows manufacturers to move beyond task automation toward more complex, connected processes.

Increased supply chain complexity and global fragmentation of production and demand

As manufacturing has grown increasingly global, production has fragmented, with stages of production spread among multiple facilities and suppliers across multiple geographies.¹⁴ These shifts, coupled with the increased demand for regional, local, and even individual customization; strong demand fluctuation; and increasingly scarce resources, among other shifts, have made supply chains more complex.¹⁵ Due to these changes, many manufacturers have found it important to be agile, connected, and proactive to address ever-shifting priorities.



Growing competitive pressures from unexpected sources

The rise of smart digital technologies has ushered in the threat of entirely new competitors who can leverage digitization and lower costs of entry to gain a foothold in new markets or industries in which they previously had no presence, sidestepping the legacy of aging assets and dependence on manual labor encumbering their more established competitors.

Organizational realignments resulting from the marriage of IT and OT

Factory automation decisions typically occur at the business unit or plant level, often resulting in a patchwork of disparate technologies and capability levels across the manufacturing network. As connected enterprises increasingly push beyond the four walls of the factory to the network beyond, they are beginning to have greater visibility into these disparities. The increasing marriage of IT and OT has made it possible for organizations to move many formerly plant-level decisions to the business-unit or enterprise level.¹⁶ This can illuminate where inefficiencies exist or where changes in one plant have resulted in complications in other facilities. It has also made the notion of the smart factory more of a reality than an abstract goal. While connectivity within the factory is not new, many manufacturers have long been stymied about what to do with the data they gather—in other words, how to turn information into insight, and insight into action.

The shift toward the connected digital and physical technologies inherent in Industry 4.0 portends solutions to this challenge: the ability to not only gather data, but to now analyze and act upon them in the physical world.¹⁷



Ongoing talent challenges

Multiple talent-related challenges—including an aging workforce, an increasingly competitive job market, and a dearth of younger workers interested in or trained for manufacturing roles—mean that many traditional manufacturers have found themselves struggling to find both skilled and unskilled labor to keep their operations running.¹⁸ Deloitte has estimated that the US manufacturing industry could face a 2 million worker shortage over the next decade.¹⁹ Many companies are making investments in smart factory capabilities to mitigate the risk associated with this possibly pervasive labor shortage.²⁰ However, this move can create a new set of talent-related consequences, as automated assets typically require highly skilled personnel to operate and maintain;²¹ even the location of manufacturing facilities would need to take into account factors such as this.

Benefits of the smart factory

THE decision on how to embark on or expand a smart factory initiative should align with the specific needs of an organization. The reasons that companies embark or expand on the smart factory journey are often varied and cannot be easily generalized. However, undertaking a smart factory journey generally addresses such broad categories as asset efficiency, quality, costs, safety, and sustainability. These categories, among others, may yield benefits that ultimately result in increased speed to market; improved ability to capture market share; and better profitability, product quality, and labor force stability. Regardless of the business drivers, the ability to demonstrate how the investment in a smart factory provides value is important to the adoption and incremental investment required to sustain the smart factory journey.

Asset efficiency

Every aspect of the smart factory generates reams of data that, through continuous analysis, reveal asset performance issues that can require some kind of corrective optimization. Indeed, such self-correction is what distinguishes the smart factory from traditional automation, which can yield greater overall asset efficiency, one of the most salient benefits of a smart factory. Asset efficiency should translate into lower asset downtime, optimized capacity, and reduced changeover time, among other potential benefits.²²

Quality

The self-optimization that is characteristic of the smart factory can predict and detect quality defect trends sooner and can help to identify discrete human, machine, or environmental causes of poor

quality. This could lower scrap rates and lead times, and increase fill rates and yield. A more optimized quality process could lead to a better-quality product with fewer defects and recalls.²³

Lower cost

Optimized processes traditionally lead to more cost-efficient processes—those with more predictable inventory requirements, more effective hiring and staffing decisions, as well as reduced process and operations variability. A better-quality process could also mean an integrated view of the supply network with rapid, no-latency responses to sourcing needs—thus lowering costs further. And because a better-quality process also may mean a better-quality product, it could also mean lowered warranty and maintenance costs.²⁴

Safety and sustainability

The smart factory can also impart real benefits around labor wellness and environmental sustainability. The types of operational efficiencies that a smart factory can provide may result in a smaller environmental footprint than a conventional manufacturing process, with greater environmental sustainability overall.²⁵ Greater process autonomy may provide for less potential for human error, including industrial accidents that cause injury.²⁶ The smart factory's relative self-sufficiency will likely replace certain roles that require repetitive and fatiguing activities. However, the role of the human worker in a smart factory environment may take on greater levels of judgment and on-the-spot discretion, which can lead to greater job satisfaction and a reduction in turnover.²⁷

Impacts of the smart factory on manufacturing processes

Manufacturers can implement the smart factory in many different ways—both inside and outside the four walls of the factory—and reconfigure it to adjust as existing priorities change or new ones emerge.²⁸ In fact, one of the most important features of the smart factory—agility—also presents manufacturers with multiple options to leverage digital and physical technologies depending on their specific needs.

The specific impacts of the smart factory on manufacturing processes will likely be different for each organization. Deloitte has identified a set of advanced technologies that typically facilitate the flows of information and movement between the physical and digital worlds.²⁹ These technologies power the digital supply network and, by extension, the smart factory—creating new opportunities to digitize production processes. Table 1 depicts a series of core smart factory production processes along with a series of sample opportunities for digitization enabled by various digital and physical technologies.

Table 1. Processes within a smart factory

Process	Sample digitization opportunities
Manufacturing operations	<ul style="list-style-type: none"> • Additive manufacturing to produce rapid prototypes or low-volume spare parts • Advanced planning and scheduling using real-time production and inventory data to minimize waste and cycle time • Cognitive bots and autonomous robots to effectively execute routine processes at minimal cost with high accuracy • Digital twin to digitize an operation and move beyond automation and integration to predictive analyses
Warehouse operations	<ul style="list-style-type: none"> • Augmented reality to assist personnel with pick-and-place tasks • Autonomous robots to execute warehouse operations
Inventory tracking	<ul style="list-style-type: none"> • Sensors to track real-time movements and locations of raw materials, work-in-progress and finished goods, and high-value tooling • Analytics to optimize inventory on hand and automatically signal for replenishment
Quality	<ul style="list-style-type: none"> • In-line quality testing using optical-based analytics • Real-time equipment monitoring to predict potential quality issues
Maintenance	<ul style="list-style-type: none"> • Augmented reality to assist maintenance personnel in maintaining and repairing equipment • Sensors on equipment to drive predictive and cognitive maintenance analytics
Environmental, health, and safety	<ul style="list-style-type: none"> • Sensors to geofence dangerous equipment from operating in close proximity to personnel • Sensors on personnel to monitor environmental conditions, lack of movement, or other potential threats

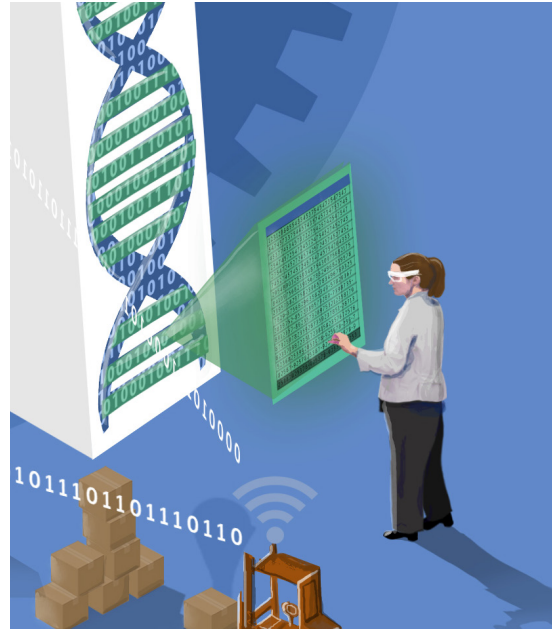
Source: Deloitte Analysis.

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It is important to note that these opportunities are not mutually exclusive. Organizations can—and likely will—pursue multiple digitization opportunities within each production process. They may also phase capabilities in and out as needed, in keeping with the flexible and reconfigurable nature of the smart factory.

It is important for manufacturers to understand how they intend to compete and align their digitization and smart factory investments accordingly. For example, some manufacturers could decide to compete via speed, quality, and cost, and may invest in smart factory capabilities to bring new products (and product changes) to market faster, increase quality, and reduce per-unit costs. Others may choose to focus on “lot size of one” product customization and fulfillment models, and invest in other technologies to fulfill those goals.



Making the transition to the smart factory: Areas for consideration

JUST as there is no single smart factory configuration, there is likely no single path to successfully achieving a smart factory solution. Every smart factory could look different due to variations in line layouts, products, automation equipment, and other factors. However, at the same time, for all the potential differences across the facilities themselves, the components needed to enable a successful smart factory are largely universal, and each one is important: data, technology, process, people, and security. Manufacturers can consider which to prioritize for investment based on their own specific objectives.

Data and algorithms

Data are the lifeblood of the smart factory. Through the power of algorithmic analyses, data drive all processes, detect operational errors, provide user feedback, and, when gathered in enough scale and scope, can be used to predict operational and asset inefficiencies or fluctuations in sourcing and demand.³⁰ Data can take many forms and serve many purposes within the smart factory environment, such as discrete information about environmental conditions including humidity, temperature, or contaminants. How data are combined and processed, and the resulting actions, are what make them valuable.³¹ To power the smart factory, manufacturers should have the means to create and collect ongoing streams of data, manage and store the massive loads of information generated, and analyze and act upon them in varied, potentially sophisticated ways.

In order to move to higher levels of smart factory maturity, the data sets collected will likely expand over time to capture more and more processes. For

example, implementing a single use case might require the capture and analysis of a single data set. Implementing further use cases or scaling an operation to an industrial level will typically require expanding the capture and analysis of greater and different data sets and types (structured vs. unstructured), leading to considerations around analytical, storage, and management capabilities.³²

Data might also represent a digital twin, a feature of an especially sophisticated smart factory configuration. At a high level, a digital twin provides a digital representation of the past and current behavior of an object or process. The digital twin requires cumulative, real-world data measurements across an array of dimensions, including production, environmental, and product performance. The powerful processing capabilities of the digital twin may uncover insights on product or system performance that could suggest design and process changes in the physical world.³³

Technology

For a smart factory to function, assets—defined as plant equipment such as material handling systems, tooling, pumps, and valves—should be able to communicate with each other and with a central control system. These types of control systems can take the form of a manufacturing execution system or a digital supply network stack. The latter is an integrated, layered hub that functions as a single point of entry for data from across the smart factory and the broader digital supply network, aggregating and combining information to drive decisions.³⁴ However, organizations will need to consider other

technologies as well, including transaction and enterprise resource planning systems, IoT and analytics platforms, and requirements for edge processing and cloud storage, among others. This could require implementing the various digital and physical technologies inherent in Industry 4.0—including analytics, additive manufacturing, robotics, high-performance computing, AI and cognitive technologies, advanced materials, and augmented reality—to connect assets and facilities, make sense of data, and digitize business operations.³⁵

Process and governance

One of the most valuable features of the smart factory—its ability to self-optimize, self-adapt, and autonomously run production processes—can fundamentally alter traditional processes and governance models. An autonomous system can make and execute many decisions without human intervention, shifting decision-making responsibilities from human to machine in many cases, or concentrating decisions in the hands of fewer individuals. Additionally, the connectivity of the smart factory may extend beyond its four walls to include increased integration with suppliers, customers, and other factories.³⁶ This type of collaboration may raise new questions about processes and new governance models. With a deeper, more holistic view across the factory and the broader production and supply network, manufacturers could face new and different questions. Organizations may want to consider—and perhaps redesign—their decision-making processes to account for these shifts.

People

A smart factory does not necessarily translate into a “dark” factory. People are expected to still be key to operations. However, the smart factory can cause profound changes in the operations and IT/OT organizations, resulting in a realignment of roles to support new processes and capabilities.³⁷ As mentioned

A smart factory does not necessarily translate into a “dark” factory. People are expected to still be key to operations.

earlier, some roles may no longer be necessary as they may be replaced by robotics (physical and logical), process automation, and AI. Other roles might be augmented with new capabilities such as virtual/augmented reality and data visualization. New, unfamiliar roles will likely emerge. Managing changes to people and processes will require an agile, adaptive change management plan.³⁸ Organizational change management could play an important role in the adoption of any smart factory solution. The successful smart factory journey will require a motivated workforce that embraces the greater impact of their roles, innovative recruiting approaches, and an emphasis on cross-functional roles.³⁹

Cybersecurity

By its nature, the smart factory is connected. Thus cybersecurity risk presents a greater concern in the smart factory than in the traditional manufacturing facility and should be addressed as part of the overall smart factory architecture. In a fully connected environment, cyberattacks can have a more widespread impact and may be more difficult to protect against, given the multitude of connection points. Cybersecurity risk seems to only grow more pronounced as the smart factory scales and potentially moves beyond the four walls of the factory to include suppliers, customers, and other manufacturing facilities. Manufacturers should make cybersecurity a priority in their smart factory strategy from the outset.⁴⁰

Getting started: Taking steps toward the smart factory

THE challenge to begin may seem daunting. The nearly limitless configurations of smart factory solutions provide a number of pathways to proceed on the journey that need to be defined, planned, and executed at a pace suitable to the organization and the challenge—or opportunity. As manufacturers consider how to build their smart factory, they can begin with the following steps:

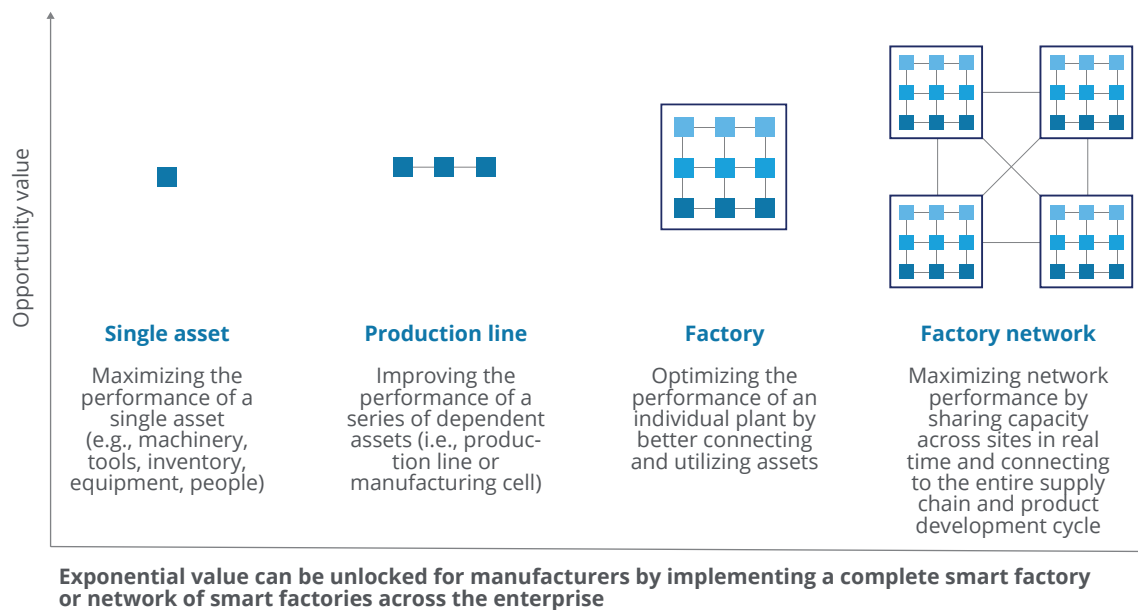
Think big, start small, and scale fast . . .

Smart factory investments often start with a focus on specific opportunities. Once identified,

digitization and insight generation fuel actions that can drive new value. Building and scaling the smart factory, however, can be as agile and flexible as the concept itself. Manufacturers can get started down the path to a true smart factory at any level of their network—value creation can begin with and scale from a single asset, and use an agile approach to iterate and grow.

In fact, it can be more effective to start small, test out concepts in a manageable environment, and then scale once lessons have been learned. Once a “win” is achieved, the solution can scale to additional assets, production lines, and factories, thus creating a potentially exponential value creation opportunity (figure 3).

Figure 3. Starting small and scaling to unlock value



Source: Deloitte analysis.

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... but stay grounded in the specific needs of the factory

A company's manufacturing strategy and environment will determine which specific issues to address and the way to unlock value through smart factory solutions. Customizing the approach to each scenario and situation can help ensure the resulting smart factory meets the needs of the manufacturer.

Don't just begin and end with the technologies

The smart factory journey requires more than just a set of connected assets. Manufacturers would need a way to store, manage, make sense of, and act upon the data gathered. Moreover, companies would need the right talent to drive the journey and the right processes in place. Each smart factory journey would require transformation support across solution design, technology, and change management dimensions.

Think outside the four walls

As mentioned earlier, the smart factory solution is a holistic solution, joining what happens within the four walls with what happens across the entire digital supply network. Therefore, in order to achieve a

Far from being an “end state,” the smart factory is an evolving solution—one that taps into multiple features such as agility, connectedness, and transparency.

truly successful outcome, any organization embarking on the smart factory journey should consider the full array of supply chain partners and customers from the start. Actions in one node, or for one stakeholder, can impact the others.

Far from being an “end state,” the smart factory is an evolving solution—one that taps into multiple features such as agility, connectedness, and transparency. At a high level, the dynamic nature of the smart factory speaks to an unending call for creative thinking: imagining the possibilities of the nearly endless configurations that a smart factory solution makes plausible. Investing in a smart factory capability can enable manufacturers to differentiate themselves and function more effectively and efficiently in an ever-more complex and rapidly shifting ecosystem.

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