# MANUFACTURERS SHOULD WATCH FOR THESE FIVE TRENDS

Artificial Intelligence Technology







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In the early 1980's, robotics in assembly plants were in the early stages of massive growth. GE Appliance in Columbia, Tennessee may have been in the wrong place at the wrong time. Yet this economic experiment of the 1980s in which the sprawling manufacturing facility was to serve as the industrial cornerstone of a planned community, spawned innovation in automation. Though the social part of the experiment failed, the innovations of robotic technology and automated assembly made the facility a pioneer in what are today's smart factories.

During the same time, the transition away from the rear-wheel-drive cars to front wheel drive unibodies was well underway by most auto manufacturers. Robotics and factory automation were in full gear at the advanced assembly Ford Motor plant in Oakville, Ontario. The trending models Mercury Lynx and Topaz, and Ford Escort and Tempo were rolling off the line at record numbers. Much of the advancement in assembly began in the design phase, where the "unibody" of the vehicle was developed to serve as the frame, supporting the weight of the vehicle and holding the suspension and wheels. As the name implies, the unibody is all one piece, held together with thousands of spot welds applied by some of automotive's earliest in-process assembly techniques using robotics.

Over the last several years, trends have constantly emerged and evolved in manufacturing, realizing significant advancements from machine-reliant assembly lines to highly automated factories. As we look ahead, there are several key trends to watch.

### **Smart Factory Adoption**

The trend towards smart factories has been gaining momentum in recent years, as more and more manufacturers realize the benefits of automating their facilities. Smart factories are characterized by their use of advanced technologies such as data analytics, machine learning, and artificial intelligence to optimize operations and increase efficiency. By leveraging these technologies, manufacturers can reduce costs, improve quality control, and streamline processes, ultimately leading to greater profitability and competitiveness.

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To transition to a smart factory, companies must invest in a range of technologies and capabilities. Cloudpowered smart capabilities, for instance, are essential for storing and processing the vast amounts of data generated by smart equipment. Global template-based manufacturing execution systems (MES) enable manufacturers to manage and optimize production processes across multiple sites, while the Industrial Internet of Things (IIoT) provides the connectivity needed for smart devices and equipment to communicate and share data.

Achieving a truly smart factory also requires the integration of operational technology (OT) and information technology (IT), as well as robust security measures to protect against cyber threats. By connecting these systems, manufacturers can create a seamless flow of data between equipment, machines, and human operators, enabling real-time decision-making and process optimization.

The benefits of a smart factory are many, including improved efficiency, increased quality control, and reduced labor costs. With the adoption of smart technologies, manufacturers can achieve predictable inventory requirements, minimize process variability, and optimize performance across their operations. In addition, the use of automation and self-configuring operations can help to minimize the need for manual labor, further reducing costs and improving efficiency. As we move further into 2023, it is likely that we will see even more manufacturers adopting smart technologies and optimizing their operations for greater efficiency and profitability.

### **Sustainability and Carbon Neutrality**

Sustainability has become a major focus for the manufacturing industry in recent years, as more and more companies seek to reduce their carbon footprint and become more environmentally responsible. In addition to regulatory requirements, many customers are now demanding sustainable processes and products from their suppliers.



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However, there is still some confusion and disagreement around measuring and reporting ESG data, which includes environmental, social, and governance issues. Currently, there are no universal standards or consistent methodologies for collecting and analyzing this data. This can make it difficult for companies to accurately measure their own performance, and for customers to evaluate the sustainability of their suppliers.

Efforts are underway to address this issue, with the International Sustainability Standards Board working to align ESG ratings and establish a global standard for ESG disclosures. This should create greater consistency and transparency in reporting ESG data, making it easier for companies to assess their own performance and for customers to make informed decisions about their suppliers. As these standards become more widely adopted, sustainability is likely to become an even more important factor in the manufacturing industry.

### **Supply Chain Reassessment**

Manufacturers are still grappling with persistent bottlenecks in transportation, raw materials, and production. These challenges have made it difficult for supply chain leaders to plan and execute their operations effectively, as they must contend with unreliable transportation, part and product shortages, uncertain customer demand, and logistical challenges in designing and planning new supply chain models.

To address these issues, supply chain reassessment will continue to be a prominent trend in the manufacturing industry. Facilities are looking for ways to add flexibility and reliability to their operations while retaining value. While data-driven inventory management is an effective way to identify previously unknown supply chain deficiencies, disruption and uncertainty will still be prevalent as organizations work to improve their logistics and supply networks.



Digital solutions are crucial to ensuring that product availability and customer experience are intact. As a result, there will be significant technological investments in supply chain technologies and logistics jobs in the coming year. However, not all operations can be entirely digitized, especially within smaller organizations. While the risk of supply chain disruptions can be reduced through technology, small businesses can optimize their supply chain by accurately forecasting demand, finding alternative and secondary suppliers to deepen their vendor base, and outsourcing logistics to a 3PL provider (third-party logistics).

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In summary, the manufacturing industry faces ongoing challenges related to transportation, raw materials, and production. However, by reassessing their supply chain strategies and investing in digital solutions, organizations can increase flexibility, reliability, and value while reducing the risk of disruption. Small businesses can optimize their supply chain by implementing effective forecasting techniques, expanding their vendor base, and working with trusted logistics partners.

### Safety and Health Measures

Employee safety and health remain a top priority for manufacturers today. Companies are implementing various measures to monitor and maintain the health of their employees. The Occupational Safety and Health Administration (OSHA) is expected to increase inspections and enforcement activities this year. With a 3.3% increase in their budget from last year, companies should plan to be compliant with worker safety regulations and anticipate potential inspections. Failure to comply with these regulations can result in heavy fines and plant shutdowns in extreme cases.

In 2022, OSHA expanded its Severe Violator Enforcement Program, which prioritizes employers based on the severity of their safety records, increasing the number of companies that will be closely scrutinized. As a result, manufacturers must prioritize employee safety and compliance with regulatory standards, investing in safety measures, employee training programs, and staying up to date with the latest regulations and guidelines.

Non-compliance with regulatory standards can have severe consequences, including costly fines and reputational damage. By prioritizing employee safety and compliance, manufacturers can not only protect their workers but also avoid the risk of legal penalties and business disruptions.

### **Dark Factory Adoption**

The manufacturing industry has seen significant advances in recent years, driven in large part by the growing adoption of virtual processes and technologies. Digital twins, machine learning, artificial intelligence, augmented reality, and virtual reality are just a few examples of the powerful tools that are transforming the industry. In 2023, we can expect to see these technologies become even more prominent, enabling manufacturers to remotely monitor and operate equipment, optimize production processes, and enhance overall efficiency. This trend is paving the way for the development of "dark factories," facilities that can function with minimal human intervention, and even in complete darkness.

Dark factories are no longer a futuristic concept; they are becoming increasingly common in modern manufacturing. With the help of advanced digital solutions, machines can now operate autonomously, with minimal human input. This not only increases efficiency and productivity but also reduces a factory's carbon footprint, as the technology used in these facilities can help minimize resource consumption and produce more output with the same energy. While heavy industries such as steel mills and forge companies may still require some manual labor, many other manufacturing processes can now be fully automated.

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### CONCLUSION

In today's fast-paced world, the manufacturing industry is constantly evolving to meet the demands of consumers and businesses alike. Technological advancements, changes in consumer behavior, and global economic shifts all play a role in shaping the industry's landscape. To stay competitive and relevant, manufacturers must stay on top of these trends and adapt to changing market conditions. Whether it's investing in new equipment, adopting more sustainable practices, or exploring new markets, manufacturers who stay ahead of the curve are more likely to achieve continued success in the years to come. However, this requires a commitment to ongoing learning and innovation, as well as a willingness to take calculated risks and embrace change. By doing so, manufacturers can position

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### SOURCES:

<u>Forbes</u> Barnes & Thornburg <u>PR Newswire</u> J<u>D Supra</u> <u>Manufacturing.net</u>

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