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# Grayway



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Top Trends  
for Equipment  
Manufacturing in  
2022

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Equipment  
Manufacturers  
Must Automate to  
Stay Competitive  
in the Global  
Economy

**Digitalization  
& Industry 4.0:  
A New Era of  
Equipment  
Manufacturing**





Welcome.



**Stephen Gray**  
President and CEO  
GRAY, INC.

If there is a silver lining to the COVID-19 pandemic, it's that it compelled manufacturers to embrace the technologies that, up until 2020, had perhaps only been considered in a casual way, with the idea of deploying them sometime in the future. But as COVID-19 shut down manufacturing and disrupted supply chains, it became very clear that digital technologies could mitigate many of these destructive impacts and keep operations running—and that there was no time to waste.

In this issue of the **Grayway**, we dive into the top trends that are driving manufacturers forward. Regardless of the status of COVID-19, manufacturers, including equipment manufacturers, will keep utilizing technologies to stay competitive in the global economy. By integrating Industry 4.0 and the Internet of Things into manufacturing operations—especially automation and robotics—companies save money and become more efficient and productive through informed decision-making. Supply chains, too, will be stronger and more transparent, in real time.



Gray practices methods which protect our environment.



# Automation & the Internet of Things Keep Manufacturers Competitive

What's on the Inside. →

## 2 Top Trends for Equipment Manufacturing in 2022

Eight trends are driving manufacturers, including equipment manufacturers, forward to be more efficient in 2022 and beyond.



## 7 Equipment Manufacturers Must Automate to Stay Competitive in the Global Economy

To increase the quality and throughput of their products and reduce costs in the process, equipment manufacturers must invest in technologies that maximize efficiencies and eliminate waste—most notably, automation and robotics.



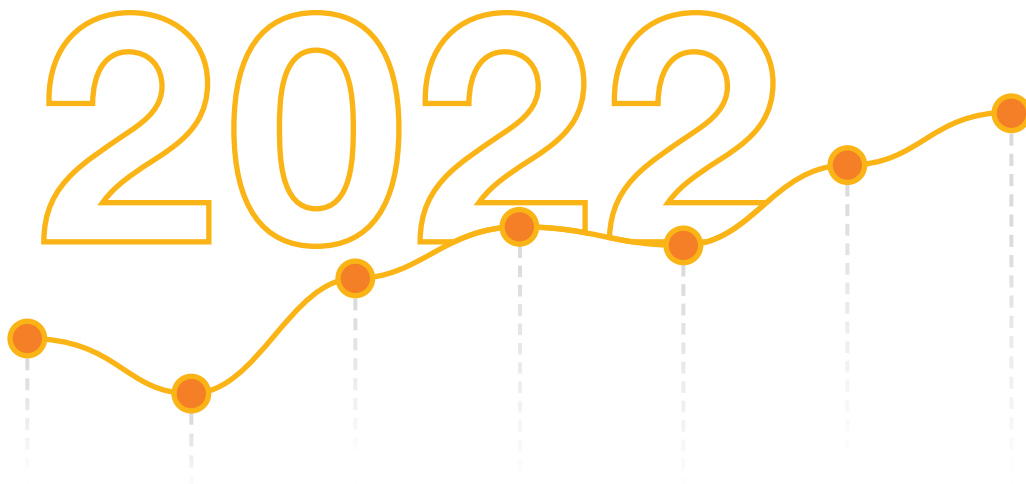
## 9 GRAY — We're Building

Food Service Specialties, based in Red Wing, MN, specializes in making custom tomato and dairy-based sauces. When it came time to upgrade their existing systems to meet production requirements, Food Service Specialties called on Gray.



# Top Trends for Equipment Manufacturing in

# 2022



**Brought on by the COVID-19 pandemic, Industry 4.0 and the Internet of Things (IoT) technologies were embraced by many manufacturers as the best way to stay competitive, deal with disrupted supply chains and fewer workers, and remain connected with customers. Manufacturers learned that these technologies could maximize quality, improve operational performance, and reduce costs.**

IoT also helped hold together wobbly and impaired supply chains, which impacted equipment manufacturers as well as food processing companies.

“Impacts from the COVID-19 pandemic include raw material shortages, extended lead times, and supply chain issues that were not a problem 18 months ago,” says Jon Nordrum, Vice President of Operations for Anderson Dahlen Inc., a Gray company, in Ramsey, Minnesota. “There were also direct impacts to our manufacturing operations, which required significant adjustments to how we managed our team members to keep everyone safe while continuing to keep products moving through welding, machining, and other work centers.”

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**Jon Nordrum**  
Vice President of Operations  
ANDERSON DAHLEN INC.  
*A Gray Company*

Robotics, vision systems, digital paperwork systems, and more advanced packaging requirements are all becoming key elements for supply chain management. “Digitizing quality and production paperwork into dedicated software systems helps drive improved knowledge and data to the plant worker, while also improving the focus on quality and productivity,” says Alex Allen, vice president of Pearson’s Candy Company, an American chocolate and confectionery manufacturer in St. Paul, MN. “Automating visual inspection is also becoming easier and more cost-effective.”

IoT enables many new ways to enhance plant and supply chain operations while also maximizing profits. Research group IDC maintains the combined added value from the improvements in operations powered by IoT is worth about \$470 billion per year.

The following are eight trends that will make manufacturing more efficient in 2022 and beyond.

## **1. Safety**

IoT can improve safety in the manufacturing environment by monitoring machine performance and identifying problems before they become dangerous. IoT-enabled sensors in personal protective equipment such as vests and hardhats can monitor a worker’s vital signs, movements, and repetitive motions to keep them safe.

## **2. Digital Twins**

A digital twin is an exact virtual model of an object, process, or system that is built from hundreds of thousands of data points generated by IoT technologies, using embedded sensors. The virtual, 3D replica or “twin” can then be viewed, monitored, or adjusted in real time to test new ideas or determine the best ways to improve production and efficiency.

## **3. VR and AR**

Digital twin data can be used to create virtual reality (VR) and augmented reality (AR) 3D models. Aspects of the models can be varied to solve manufacturing challenges, evaluate virtual prototypes, reduce costs, and increase productivity. VR and AR can also be used to determine the most efficient use of space, inventory locations, and workflow patterns. They are also effective tools for staff training and demonstrating safety protocols.

## **4. 3D Printing**

Additive manufacturing (AM) or 3D printing continues to be applied in new and creative ways in the manufacturing sector. Some companies, such as Caterpillar, design products that can only be made through additive manufacturing.

A steady stream of new materials and more sophisticated AM processes give engineers a wider range of design options. 3D printing can also be used to build replacement tools or parts for the manufacturing equipment itself.

### **5. Predictive Maintenance**

Sensors embedded in equipment track key performance indicators and alert operators in real time of operational variances that could be signs of an upcoming equipment failure—allowing technicians to fix the issue before it becomes a problem. “Advanced control features and sensors are monitoring more key indicators,” says Joe DeFrancisci, a managing partner with DEMACO, a food equipment manufacturer. “For example, not only can sensors monitor oil levels, they also monitor the percent of water in the oil.” Predictive maintenance extends the lifespan of equipment, reduces maintenance costs, and increases physical safety for workers.

### **6. Customization**

Customization is the process by which a mass-produced product can be tailored to meet the demands of smaller customer groups, without a significant increase in costly manufacturing adjustments. For example, “we are seeing a consistent push toward smaller runs with more variety of flavors, packaging size, and packaging options,” says Allen. “Competitive retailers like to be able to offer unique products, which often results in packaging or size changes.” IoT technologies such as robots and 3D printing improve the feasibility of making low-volume customized products without high costs.

### **7. Automation**

With worker shortages during the COVID-19 pandemic, many manufacturers invested in automation and robotics to maintain production. Robot cells are easy to scale up or down depending on production needs. Cobots can also be programmed to work safely beside human workers and fill in gaps along the production line, where workers are missing. Heavy lifting or risky repetitive tasks can also be assigned to robots, improving worker safety and reducing injuries.

### **8. 5G**

According to The Manufacturing Institute, “5G will usher in faster speeds, greater throughput, and lower latency. The network specifications also promise greater reliability, extended battery life for connected devices, and support for massive device connectivity [IoT].” Application areas for 5G-enabled manufacturers include supply chain, inventory, facility security, warehousing and logistics, inspection, assembling, packaging, and HR training.

### **Smart Manufacturing Gets Smarter**

IoT and data analytics have become an integral part of the manufacturing landscape. Even when COVID-19 subsides, manufacturers will continue to implement and deploy Industry 4.0 and IoT technologies to stabilize their supply chains and be competitive in the global economy. By integrating these digital technologies with each other and cloud-based analytical platforms, manufacturers will be more efficient, productive, and safer than ever before, increasing revenues and winning market share.

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**Joe DeFrancisci**  
Managing Partner  
DEMACO

# Equipment Manufacturers Must Automate to Stay Competitive in the Global Economy



**To stay competitive, U.S. equipment manufacturers must find ways to increase the quality and throughput of their products and reduce costs in the process. This requires investment in technologies that maximize efficiencies and eliminate waste—most notably, automation and robotics.**

Automation, when integrated with other Industry 4.0 technologies, can greatly increase production capacity and operational efficiency.

Robotics especially make sense for repetitive work that can be dangerous or boring to employees, freeing them up to take on more challenging tasks. For example, robots can take over quality control and auditing functions, inspection of materials and parts, and even inventory management. Drones can fly through warehouses and use radio frequency identification to count products. Data

collected through automation can also be used to make more informed business forecasts regarding production and inventory needs.

## **Benefits of Automation**

Companies that invest in automation commonly integrate robotics and vision into their manufacturing and assembly needs, including material handling. Automation benefits include:

- Reduced downtime
- Predictive maintenance
- Improve decision-making
- Real-time analytics
- Modular units or cells for scaling production
- Traceability of parts and materials

“Having real-time data can help manufacturers understand lead times and provide more accurate estimates and timelines,” says Dave Westrom, vice president of business development for



› Automated injection molding machines for plastic parts production.

MachineMetrics, a company that makes machine monitoring software. “Additionally, automated devices improve repeatability that can improve quality and reduce variability in production. Overall, automated monitoring offers a more predictable model to make business decisions from, while providing transparency for all stakeholders.”

In particular, robotics can help maintain production when the workforce is diminished. For example, during the COVID-19 pandemic, when workers were either ill or socially distanced, manufacturers realized how important robots were in maintaining operations and keeping their workers safe.

“One of the surprise benefits of automation was how far we could spread out employees on the production lines,” says Andy Ahern, plant manager for Food Service Specialties, a company that specializes in making custom tomato and dairy based sauces in Red Wing, MN. “Most of

the automation/equipment on our production lines involve machine operators monitoring and replenishing consumables. The design of the lines and layout of machines were conducive to social distancing.”

Pearson’s Candy Company, a mid-sized manufacturer in St. Paul, MN, relies on a hybrid mix of automation and manual labor, which provides it with a competitive advantage over the smaller manual manufacturers. Its automation capabilities also allow it to take on more customized orders that the larger automated manufacturers cannot handle. “We have been updating and automating several key parts of our organization to increase capabilities in order to produce current packaging standards and to expand the ability to incorporate trending flavors and ingredients,” says vice president Alex Allen. “Automated inline monitoring and recipe adjustments usually result in huge improvements for quality and consistency of production.”

### Implementing Automation and Robotics

Westrom advises that the first step should be connecting all the plant equipment through the Internet of Things (IoT) and analyzing performance data to see where automation makes the most sense. “You will then have the insight into operational performance across both your equipment and staff to automate processes and drive greater efficiency across the shop floor,” he says.

Automation in equipment manufacturing is often applied in strategic areas such as welding, material handling, pick and place, and other repetitive tasks. “Typically, companies use a combination of robotic arms, sensors, conveyance, guided vehicles, artificial intelligence, and machine learning to improve quality, traceability, efficiency, and throughput,” states JR Automation, a provider of automation solutions for the manufacturing and distribution industries.

However, robotics and automation are not without their challenges.

“It is much easier to train humans on new styles or shapes, with much greater flexibility for creativity,” Allen points out. “Robotic machines can create limitations on the breadth of options, as well as create an inherent minimum economic order size, for tooling or programming adjustments.”

In fact, robots are just as vulnerable to supply chain disruptions as other equipment.

“COVID-19 has highlighted the need to be very diligent regarding reliability and maintenance supply chains for robotic systems,” Allen adds. “Most robotic systems have broad international part

sourcing, and we have seen random, sometimes critical components, suddenly become unavailable. Can the supplier truly send you any part overnight? Can technical support be sent immediately?”

Robotics are coming down in price, making them more affordable to small and mid-sized manufacturers allowing for a more even playing field. However, they are still an expensive investment.

“As you research your business case for purchasing, consider all the costs, including installation and configuration,” advises Mark Stevens, a principal with Wipfli LLP’s manufacturing and consulting practice. “Evaluate whether your robot can be easily modified if you need to alter operations in the future. Industrial robots also need sophisticated operation, maintenance, and programming—consider the personnel investment you will need to make to bring in that expertise or re-tool your existing staff to take on the tasks. In addition, you will want to consider the costs to keep your robot and any related IoT-connected devices protected from cyberthreats.”

Manufacturers who turned to automation and robotics to help them get through the COVID-19 pandemic have seen how these and other Industry 4.0 technologies improved the efficiency and productivity of their operations. More automation will also be used in the supply chain, orders and delivery fulfillment, and sensing and communication technologies. Companies that choose not to invest in these technologies will find it challenging to stay competitive with other manufacturers that transition to digital systems of operation that boost quality, profits, and speed to market.



## Food Service Specialties

RED WING / MINNESOTA

**Food Service Specialties, based in Red Wing, MN, specializes in making custom tomato and dairy-based sauces. The company worked with Anderson Dahlen Inc., a Gray company, on food & beverage specialty equipment needs.**

Recently, they needed a way to fulfill the increasing orders from their downstream restaurant, frozen food, and retail grocer partners to keep up with increased demand.

Anderson Dahlen Inc. supplied and installed two 4-piston pump bin evacuation systems with electronic PLCs. To further enhance the process, Spec Engineering, a Gray company, installed an additional I/O panel to tie

into the Graco BES control station. This allowed for reduced unloading times and seamless integration into the Clean-In-Place (CIP) system.

Food Service Specialties was able to cut evacuation time by more than half, meaning 2,900 pounds of tomato products could be loaded in less than 10 minutes, while doubling their daily production to 100,000 pounds.

GRAY — WE'RE BUILDING



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