

AUTOMATION AFTER COVID-19: PANDEMIC PRESSES FOOD MANUFACTURERS TO AUTOMATE

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Despite being essential businesses that have been allowed to remain open during the COVID-19 pandemic, some food manufacturing plants—most notably meat processing plants—were forced to close due to outbreaks of the virus among employees.

The closures brought to the forefront the vital role that automation could play in the food manufacturing industry. Specifically, automation could allow plants to continuously operate without heavy reliance on manual labor.

Automation is currently used in some areas of food manufacturing to increase productivity, maintain worker safety, and ensure quality food production. Recent improvements to robotics and sensor data, combined with data processing and the interpretive power of artificial intelligence, have led to smarter, more efficient ways of moving food through the supply chain, says Daniel Bruce, founder

and chief artificial intelligence officer at Vinsa, a West Palm Beach, Fla., company that provides computer vision solutions for food manufacturers. Processing plants and warehouses use robotics and automation to transport raw materials, reducing manual handling.

Bruce is also seeing manufacturers use computer vision to monitor and optimize the throughput of products in manufacturing lines. For example, different products require different amounts of time to freeze as they go through chillers. Because a belt's speed and a chiller's temperature are configurable, manufacturers are hoping to use the technology to automatically detect product coming through, learn optimal settings for speed and temperature, and adjust accordingly.

Furthermore, Pete Zimmerman, a software sales manager at VAI, an enterprise resource planning (ERP)

solution provider in Ronkonkoma, N.Y., that provides automation capabilities to food manufacturers and distributors, says that many food manufacturers have adopted automation practices in their daily operations for processes such as entering orders for electronic data interchange or streamlining complex manufacturing processes using programmable logic controller platforms.

For example, managing sufficient supply levels is a critical aspect for food manufacturers. With automated tools and forecasting applications, Zimmerman says manufacturers can determine precisely what goods need to be produced and how much material should be purchased based on supply and demand planning. In the food industry, automated tools in warehouse management that measure things like temperature control, alerting, and inventory levels are increasingly crucial to maintaining food safety compliance.



Automation is also prevalent in most high-volume areas where products and packaging are consistent, such as cereal in boxes or soup in cans, says Tom Steininger, market development director for Dematic, an Atlanta-based company that provides automated solutions for manufacturing, warehouses, and distribution centers. However, meat processing—due to the inconsistent product size, weight, cuts, and so forth—remains mostly manual.

Slow to Adopt

Despite its capabilities and advantages, the food manufacturing industry has not been quick to jump on the automation bandwagon. “Although the food manufacturing industry has made significant technological advancements over the years, the food supply chain has simultaneously become more complex and demanding and requires the entire supply chain to automate in order to meet demand,” Zimmerman says. In addition, food safety regulation and recalls are still a concern for manufacturers and compliance continues to be a top priority. “With better tracking and warehouse technology, however, companies can work toward eliminating recalls or instances of foodborne illnesses.”

Although food manufacturers have actively used robots for years for packaging, palletizing, cutting, dispensing, and sorting, the use of robots in other areas, such as picking, has been slower to develop. “With improvements in robotics technology, such as grippers, collaborative robots (which can accurately and uniformly pick and pack products, even fragile produce), and mobile robots, we will likely see many more applications going forward,” says Jeff Burnstein, president of the Association for Advancing Automation in Ann Arbor, Mich.

The Impact of COVID-19

The coronavirus pandemic has significantly impacted the food manufacturing industry, including upending food manufacturing operations, halting production, and slowing economic and technological progress. Simultaneously, the outbreak has highlighted serious gaps in the food supply chain. “Many of these gaps are a result of an increasingly spread out and complex supply chain, as well as high demand for faster processing and transparency, which is especially crucial in response to COVID-19,” Zimmerman says.

To address these gaps and create a transparent, fully efficient

supply chain, companies should invest in solutions that help simplify business processes and increase operational efficiency. A centralized ERP system, for example, can provide insight into the supply chain where shipments are reported by lot number and location. “This solution also provides helpful tools such as temperature regulation, in which alerts are sent to food manufacturers in real time, so they are conscious of any sudden changes,” Zimmerman says.

Manufacturers can also implement blockchain technology to track products by the unit. Information is placed on a transaction record that can’t be altered. Blockchain records the location and time of shipments, helping manufacturers to locate any issues that may arise—which helps to save time and money within the supply chain, Zimmerman says. Additionally, going forward, personnel will likely be placed in a way that includes social distancing on the shop floor. Or, robotics might replace some of them.

Along these lines, Burnstein says he expects to see the adoption of robots accelerate in food manufacturing and processing due to COVID-19. Robots can help with social distancing, reduce



human touches on items, grow food in indoor environments, and keep facilities running during a pandemic.

Biggest Benefits

All areas of food manufacturing could benefit from automation and robotics in different ways, especially now, Zimmerman says. Different food manufacturers, such as baking or meat processing, have unique operations that require different tracking capabilities. For example, technologies such as blockchain and ERP can provide complete insight into the supply chain with automated tracking, helping to avoid contamination and potential recalls.

As warehouse worker safety is currently top of mind, warehouse automation could be the key to food processors meeting food safety standards without a hands-on approach from employees. “Given required temperature levels, demanding supply chains, storage requirements, and transportation—it’s already difficult for workers to track and manage everything on their own,” Zimmerman says. “By implementing automation technology, it takes some of the burden of manually tracking product information out of the equation and keeps workers safe.”

To keep consumers and businesses safe, food manufacturers must diligently follow food safety regulations. Applying technology solutions such as blockchain and ERP can help companies remain compliant in the supply chain. These systems track important factors such as expiration dates, temperatures, and precise origins such as a crop row on a farm, which can reduce the size of a recall, thereby reducing costs. “Future regulations will likely tighten after COVID-19, giving food manufacturers an early warning to implement solutions that will help control their supply chain operations,” Zimmerman says.

Other food manufacturers, especially those impacted by seasonality, may benefit from supply and demand applications. If a manufacturer experiences issues with shipping expired products or a surplus of products in the warehouse, this solution helps to track order trends and invoice history—which keeps unused products at a minimum. Additionally, supply and demand applications have the ability to complete purchase forecasting, helping manufacturers ensure that they are stocking necessary products. This eliminates waste from warehouses and enhances supply chain operations.

New Advancements

As the food supply chain becomes more sophisticated and digital, it’s imperative that food manufacturers use automated tools to speed up processes and keep up with demand, Zimmerman says.

Sean M. Riley, senior director of media and industry communications at PMMI, The Association for Packaging and Processing Technologies, based in Herndon, Va., says that the trend toward smaller, more compact robots has expanded the potential application areas for robotics in general. Smaller robots are a less burdensome capital investment, opening up robotics to operations that previously couldn’t afford them. In addition, the precision and dexterity of smaller robots allows them to be used in industries that were previously a poor fit for robotics.

Sanitation concerns have recently been addressed, with new hygienic, wash-down compatible robots now being evaluated and added farther up in the production line. These robots can provide tangible benefits to food producers by reducing operational costs, improving food safety, and eliminating tasks that pose an injury risk to human operators. They have also drastically reduced



the maintenance costs of robots operating in harsh industrial environments. These robots claim to reduce maintenance costs on individual units by up to 60%, Riley reports.

Adoption Strategies

When looking to adopt automation into a manufacturing facility, companies should begin by having automation suppliers review the material and information flow of their operation and identify opportunities to implement equipment and software that will streamline systems. “Using data, automation companies can right-size automation appropriately to meet a business’s current requirements and those in the future,” Steinger says.

After learning more about available solutions, companies should investigate the potential for a return on their investment inside and outside of their facilities—paying special consideration to soft-cost paybacks such as employee availability, retention, training costs, work loss due to illness, product damage, and waste, Steinger continues. Finally, companies should work with a supplier with the capability and interest to be a long-term partner. Being able to count on support before, during, and after implementation will

overcome a lot of barriers.

When looking to automate, keep in mind that adopting automated capabilities is an incremental process. “It’s impossible to go from a traditional manufacturing structure to a fully-automated warehouse overnight,” Zimmerman says. “By starting with smaller projects, such as enhancing barcoding with RFID and automated order entry or automated analytics tools, food manufacturers can begin to see automation’s benefits.”

A modern ERP system can serve as a good way to start integrating automated tools and applications. “With operational insights and real-time data visibility, ERP solutions speed up capabilities and open the door for more sophisticated warehouse tracking and automated processes,” Zimmerman says.

Sean T. Riley, a senior global industry director of manufacturing and transportation at Software AG, which provides software solutions to food manufacturers, says the key to successful adoption is maximizing current automation resources and understanding the true cost of product per each production zone. “While this can be difficult with manual processes, manufacturers already

have a significant amount of data in their process histories,” he says. Advanced analytics can analyze, monitor, and predict the operational performance of production processes and the expertise of process engineers, giving food manufacturers the ability to exactly quantify the impact that advanced robotics will have on production processes.

A higher level of training is essential to cultivate the skills required to design, integrate, and maintain the advancement of robotics, he points out. Problem solvers, intuitive thinkers, and trained specialists are needed to fill the skills gap. Automation installations represent the largest improvements at food manufacturing facilities, with more than half of food manufacturers turning to automation to fill the void of diminishing worker availability.

Overcoming Challenges

To overcome barriers to automation, food manufacturers should make incremental improvements to start automating capabilities at a smaller scale. “By seeing the benefits of automation, manufacturers can build their way up to full-scale automation over time,” Zimmerman says.

Because cost is often the



No. 1 barrier to implementing automation and robotics, original equipment manufacturers and machine suppliers can benefit from collaborating with robotics providers to design more efficient packaging line configurations, Sean M. Riley says. For instance, robotic product handling to feed a flow wrapper can manage delicate and odd-shaped items like baked

goods, placing them in the proper orientation for packaging without breakage. With fully integrated sensors, a connected flow wrapper and robotic packing arm can also communicate changes in packaging counts, allowing the flow wrapper to meter the precise number of products needed per cycle to the robotic arm.

Furthermore, development teams must ensure that all departments and C-suite leaders are on board. Many times, barriers to adoption come from a lack of communication across a company. “It’s crucial to have everyone on the same page from the beginning to make sure business goals and technology goals align,” says Zimmerman.

