New Technology and Connectivity Software

New software can assist challegens in food manufacturing

BY **CODY P. BANN**

Manufacturing is being squeezed by labor and skills shortages. The numbers of people older than 55 in the technical workforce in the U.S. are increasing, signifying that not enough young employees are not replacing older ones. Meanwhile, technical demands for manufacturing have grown, making it difficult to hire the right workers. These companies need workers with the same skills as the workers who are currently retiring. For the most part, these are highly skilled people who have gained their expertise over 25 to 30 years.

The latest report released by Deloitte and the Manufacturing Institute predicts that as many as 2.1 million manufacturing jobs could be unfilled through 2030. The report warns that the worker shortage will hurt revenue and production, and could ultimately cost the US economy up to $1 trillion by 2030.

With these looming statistics, manufacturers face enormous pressures to stay competitive. But it's not all doom and gloom: To combat these labor challenges, manufacturers are increasingly looking to technology and connectivity to expand productivity, decrease labor costs, increase uptime, and slash error rates.

Increased Plant Automation
Automation helps manufacturers reduce errors and costs while increasing productivity, quality and safety standards.

With the increased data coming from the production line, it's now much easier to determine ways to improve efficiency and productivity and reduce error rates. Through an increased use of sensors and the Industrial Internet of Things (IIoT), machines can talk to each other and seamlessly react to any problems that arise. If a machine spots an issue, it can quickly alert other machines and employees, allowing the issue to be addressed in real time.

Using smart machines that can communicate with each other means that full traceability and transparency are possible across the entire food manufacturing value chain. That capability, in turn, reinforces food safety and helps a business meet regulatory needs in the most efficient manner.

Sensors and SCADA
Adding technology such as sensors that monitor whether a machine is working properly instead of having someone check out a problem is an ideal solution for areas with worker shortages.

Sensors pick up on performance aberrations that simply can't be detected through manual spot checks and personnel monitoring. By detecting the underpinnings of potential issues in real time, sensors can alert maintenance teams of the need to investigate and prevent a machine failure before it happens.

Supervisory control and data acquisition (SCADA) is a system of hardware and software elements used to control processes both locally and remotely. Such sys-

Case Study: Night Hawk Frozen Foods

Austin, Texas-based Night Hawk Frozen Foods quickly adapted to meet the growing frozen food consumption during the pandemic. The company implemented a full-scale expansion, which included a new engine room with added compressors to support the increased production.

Night Hawk has a state-of-the art refrigeration system with a large cooler and freezer rooms that keep products at precise temperatures. To help reduce maintenance expenses and ensure minimal unplanned equipment downtime, the refrigeration maintenance crew uses Wonderware InTouch software to oversee and manage their control systems hardware. Integrated with this SCADA system is remote alarm notification software to continuously monitor the alarms and provide important security updates on the entire refrigeration system. This configuration allows a maintenance technician or engineer to easily see the refrigeration equipment inflows and outflows status via remote view from the main office computers

to closely watch temperatures, ammonium levels, and other critical metrics.

When a monitored change occurs, an alarm notification immediately comes through, notifying the crew through email and SMS. Having this information available at a moment's notice is key. Subtle changes can have serious impacts on inventory or crew safety if left unattended. Having access to remote alarm notifications enables the company's refrigeration crew to respond faster to maintenance requirements and keep the supply line set at optimal levels. The longer it takes plant personnel to respond and repair equipment, the more damaging the interruption will be.

Night Hawk successfully increased overall production by 50% percent using their current control systems and advanced supply chain practices. The remote alarm notification software played an important role in empowering the company to effectively scale up along with consumer and operational demands, while reducing unplanned downtime.

tems are crucial for organizations as they help maintain efficiency, process data for more well-informed decisions and communicate system issues to help mitigate loss and downtime. SCADA systems perform data acquisition and communication, information and data presentation, and monitoring and control.

These functions are performed by sensors, controllers, and a communication network. The sensors collect and send the information to the controller, which displays the status of the system. The operator can then give commands to the components of the system, depending on the status. SCADA systems allow communication between the operator and the connected devices. Real-time systems have thousands of components and sensors; each gathers data and helps ensure that every part of a facility is running effectively. The real-time applications can also be controlled remotely. Access to real-time information allows entities to make data-driven decisions about how to improve processes. Without SCADA, it would be difficult to gather sufficient data for consistently well-informed decisions.

Remote Monitoring

Another way to reduce unplanned downtime is with remote alarm notification software, which allows fewer employees to monitor many more assets using devices that people already have, such as smartphones and tablets. Uninterrupted remote availability is essential to ensuring systems can be continuously monitored, even without staff onsite or with fewer people working at the facility.

Remote monitoring of critical plant systems has been extended beyond email, texts, and phone calls to include apps that feature time-saving tools like real-time alarm acknowledgements, team chats to troubleshoot and resolve plant problems, and detailed reporting for preventing future incidents. Not only does this mean fewer emergency shutdowns, but it also means fewer resources are spent on overtime and maintenance.

A mobile alarm notification app is software that seamlessly integrates with the SCADA or HMI software of an industrial operation, allowing an employee to monitor, receive and acknowledge plant and machine alarms on their smartphone or tablet, freeing them up to work from home or any other remote location. Hardware and software are available that can constantly monitor equipment and, by applying machine learning to historical data, warn when a breakdown or other problem is imminent. Bolstered by wireless technology and IIoT, these customizable systems have the potential to bring predictive maintenance to a new level.

The benefits of using a remote monitoring and notification software system via a mobile app include:

- **Streamlining decision making**. Push notifications let users quickly see what is wrong, send an acknowledgment, and monitor alarm condition changes in real-time, right from smartphones.
- **Promoting team problem solving**. Chat helps the entire team converse, brainstorm, and share solutions on the fly, from anywhere—whether in the plant, at home, or on the road.
- **Working more efficiently**. Team visibility shows who has seen an alarm as well as who has acknowledged it, reducing guesswork and redundant responses.
- **Providing multiple communication channel support**. Ensures resiliency through voice notification and SMS messaging in the event of internet connectivity issues.

Remaining Competitive

Rapid globalization, technological advancements, changing consumer preferences, and evolving government policies are reshaping the manufacturing industry. Trying to meet these challenges with manually intensive processes and outdated technology is difficult; however, by seamlessly integrating advanced technology such as remote alarm notification software, manufacturers can increase productivity and efficiency, and reduce maintenance costs. ∎

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Cybersecurity in the Food Industry

high-traffic and chaotic environment, where hundreds of people can influence production. Floor staff, but also visitors and vendors, may—knowingly or unknowingly—bring malware in when they connect to your equipment. Trying to outsmart the bad guys is futile: They have enough time, resources, and motivation to find the vulnerability. What we see companies do is try to detect attacks, while what they should really do is prevent and protect and realize that cyberattacks can come from any direction."

If attacks can come from anywhere, the best defense, says Witucki, "is a layered structure, with firewalls in front of the legacy devices, network monitoring, and regular backups, so if somebody exploits a vulnerability to attack your system, you could get back up to speed relatively quickly. Also, you should have an incident response plan specific to ICS, so you would know what to during an emergency."

When responding to an attack, it's also important to address all possible legal implications: "You should immediately check the contracts and purchase orders with your customers to see if you are under obligation to report the incident to them and if you have any liability. The next step is to check if you have any insurance coverage," says Delaney.

For Demoranville, the change to increased security must come from the top: "The executive level and the board need to agree that cybersecurity is a priority," she says. "If that doesn't happen, anything that gets done will be disbanded quickly. More companies should set up a strong change management board where representatives from all departments, including production and quality, meet once a week to discuss what's happening in their environment. Ultimately, you can save lives and money if you do that properly."

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