Shop-Floor Automation Is a 'Win-Win' for General Sportwear

Founded in 1927, General Sportwear may be venerable, but it's not old-fashioned. This family-owned manufacturer of private-label woven bottoms uses cutting-edge technology to run all aspects of its operations. As Jeff Rosenstock, the company's president, says, "We're always looking at ways to leverage technology to do things more efficiently, faster, and with better quality."

General Sportwear owns and operates production facilities in Nicaragua, where its products are cut and sewn, and in Honduras, where they are washed and finished; it also outsources production to several partners in China. Product lifecycle management software automates the development process from design through sampling. The company-owned factories in Central America are highly automated, with automatic back pocket setters, label setters, and welt pocket, belt loop, and hemming machines. The washing machines are programmable washer/extractors that automatically inject chemicals as they are needed. The company also uses an ERP system for real-time inventory management, order processing, accounts receivable, materials planning and handling, and more.

Five years ago, in its company-owned North Carolina distribution center, General Sportwear implemented RF scan packing, which Rosenstock calls a "tremendous game changer." It not only doubled pickers' output but nearly eliminated packing chargebacks. "That was an eye-opener about how valuable real-time

Real-time data collection on the shop floor yields efficiencies for the manufacturer — and gives operators an opportunity to earn higher wages.

information is," Rosenstock says. The company started to look for other processes where real-time information could have a similar impact; one of these was control of the sewing operation at Sincotex, the company's 110,000-square-foot facility in Tipitapa, Nicaragua.

From batch to real time

Like most other factories where operators are paid on a piecework basis, Sincotex used an end-of-day batch processing system, in which each of the 800-plus sewing operators would collect bundles of tickets, paste a ticket onto a gumsheet for each bundle they sewed and turn the sheets in to be scanned when their shifts were over. The batch system helped the factory process the payroll, but it was cumbersome and error-prone, and it added extra tasks for operators. Most important, it didn't give real-time information. "We didn't know what an operator did until the end of the day," Rosenstock explains. "We couldn't calculate payroll in real time or track the bundles throughout the day." ▶

At General Sportwear's Sincotex factory in Nicaragua, an operator uses a CGS BlueCherry terminal and a sewing machine with an automated back pocket setter.

systems at a glance

Product Life Cycle Management: Gerber Technology YuniquePLM

Enterprise Resource Management and Supply Chain Management : CGS

Warehouse Management System: Manhattan Associates PkMS

Shop Floor Automation: CGS BlueCherry Shop Floor Control

VENDOR VIEWPOINT

Paul Magel, President, Business Applications and Technology Outsourcing Division, CGS
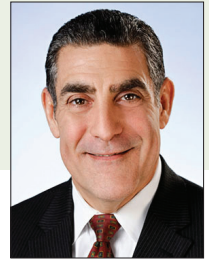
Apparel: Any supply chain is only as strong as its weakest link, and sometimes the breakdown comes on the manufacturing floor, where companies can lose visibility into the process, and where there can be a variety of problems due to the labor-intensive nature of apparel manufacturing. Where do the blind spots and bottlenecks tend to occur most frequently, and how can apparel businesses address these challenges?

MAGEL: a) Production shortages and bottlenecks often develop silently and then snowball until they become obvious. They can arise from many different sources, such as:

- A workload that has an unusually high labor content
- A workload that over utilizes some limited equipment
- Fabrics or styles that are just difficult to handle
- Poor cutting, or any other quality breakdown
- Operator productivity
- Absenteeism
- Equipment breakdowns

The key to addressing production and bottleneck challenges is proper planning. For instance, if low operator productivity can be identified 15 minutes into the workday, bottlenecks can be identified early and capacity can be adjusted inexpensively. If roving quality checks are performed regularly at sewing operator workstations, quality problems can be detected and resolved before they cause disruptions downstream.

b) Capacity planning

Production planning often views the factory as a monolithic black box with a fixed production capacity. The factory may be capable of 1,500 units per day, or 2,500 SAHs (standard hours). At best this capacity is broken down by production line or product type.

But there are often equipment constraints that limit capacity to specific styles or fabrics or even trim items or labeling. For instance, a shoe lasting machine may be configured for a particular style, and it can produce a limited number of units of that style in a day.

And planning systems are generally not aware of the SAH content of different styles of the same product. A dress line with 50 operators can make 225 'average' dresses per day, but if the day's schedule consists of styles that require 20 percent more labor, the unit production will be closer to 190.

Good production planning reflects these constraints and schedules the right blend of work to ship orders on time while enabling the factory to run efficiently.

Apparel: When it comes to speed to market and today's consumer, apparel companies are challenged to shorten cycle times while also often shifting direction on a dime in response to changes in consumer demand. What improvements are you seeing in how the manufacturing process can be monitored that are allowing companies to better respond to demand in real time?

MAGEL: We are seeing several changes.

First, reductions in work-in-process levels in the factory allow orders to move through the process faster. But WIP acts as a buffer against problems, so reductions in WIP require much better management of the production process. Modern companies running with lean inventories must monitor production, inventory, operator productivity and quality very closely to detect and address problems quickly. First-line production managers must have real-time, actionable intelligence at their fingertips.

Some factories implement teams or modules to turn orders around very quickly when necessary. But this tends to drive up production costs because the operators cannot achieve the efficiencies that are possible on high volume work. The fast-response lines require the most highly skilled operators, but they need to be compensated in a way that motivates them to achieve the necessary production and quality in a fast-changing environment. Creative incentive pay schemes are often devised to reflect production, quality, and attendance. A good production control system monitors these metrics, displays the information where the team (and management) can see it continuously, and rolls it up into an incentive pay calculation.

As discussed in the previous question, having better visibility into the equipment, resource and other constraints and how they relate to the type of product produced is critical. If these constraints and levers are made available and considered upstream where demand is bounced against supply (inventory/WIP/production), better and more profitable decisions can be made.

Apparel: Today's consumer, particularly the Millennial shopper, is increasingly focused on not only the end product but also on how it was made, workers' conditions and also the product's impact on the environment. What role is technology playing to bring visibility to these concerns and how does visibility in turn also benefit both the employees and employers themselves?

MAGEL: This area has gained importance over the years and falls into several compliance categories such as vendor, product, environmental and regulatory. And the responsibility to comply lies with both vendors and buyers. Technology can play a major role in this area by allowing both buyers and vendors to easily capture very detailed information frequently in an integrated manner, consolidate the information and be able to report and trigger alerts in case there are deviations or non-compliance. For example, product quality testing, CPSIA compliance, environmental audit reporting, WIP spot checks, minimum age by country, labor rates by region, maximum hours of work allowed as well as other industry-defined benchmarks and scorecards can be monitored. Once such information is available centrally and easily, vendors can be evaluated for past performance, corrective actions can be put in place for improved compliance or vendors can be switched for continual non-performance. Let's take one example of wages. There are factories operating in very poor regions of the world, paying people very low wages, and achieving poor efficiencies. But in these same regions, incentive pay schemes can make a huge improvement in the sewing operator's standard of living while increasing production, reducing costs and improving quality.

A real-time system with flexible incentive pay calculations can make this work. Operators can be motivated by seeing their earnings in real-time: bundle by bundle, minute by minute. The impact on productivity and earnings is immediate and profound. As earnings improve, absenteeism and turnover improve. As factories retain experienced and skilled operators, quality and flexibility also improve.

This is particularly important where there are multiple factories competing for a limited pool of skilled labor.

General Sportwear's warehouse in Zebulon, N.C., is equipped with RF scan packing equipment.


The company identified a real-time shop floor control system — CGS BlueCherry, known at that time as Leadtec — and adopted it in 2012. The implementation, which Rosenstock calls one of the smoothest he's ever experienced, took about six months. With the help of the CGS team, the managers set up, learned and tested the system; by the time it went live, it was trouble-free. Operators were able to become adept at it in about a week. "It actually makes their jobs easier," Rosenstock says. Operators clock in and out at their own terminals rather than at a central checkpoint, and they can't misplace tickets because they scan them as they complete each bundle.

The system's most immediate impact was that it dramatically increased the amount of information available to everyone. Operators can see their own production levels at any time and know exactly what they are earning. Supervisors, who used to spend two to three hours per day walking around the shop floor and counting up production, can now view real-time production totals on any of the terminals throughout the floor. If there is a slowdown anywhere, they can respond to it immediately instead of waiting for the next day to make adjustments. They can also see immediately if any workers haven't clocked in on time, and they can transfer personnel from another line, if necessary, to keep the work flowing. Balancing the lines throughout the day has helped reduce the amount of overtime.

Increasing efficiency and speed to market

The system gives operators a much more accurate picture of their efficiency and helps them increase their efficiency so they can earn more. Rosenstock explains, "Operators can challenge themselves by entering their own efficiency goals into their terminals, so the system can pace them as to how long it should take to complete each bundle to help them achieve their goals. … Many operators take advantage of that. We were an efficient factory to begin with, but our standard efficiency went up about 10 percent."

General Sportwear's customers all conduct yearly labor compliance audits, and both factories in Central America are Worldwide Responsible Accredited Production (WRAP) certified. The shop floor control system simplifies compliance with these standards, and workers are also satisfied that the system is fair. "There's no better tool for complete transparency," Rosenstock says. "There are no question marks anymore." If an operator tries to scan a ticket that has already been paid, the system automatically rejects it, so it is always clear who should be paid for any particular piece of work. If an operator scans a bundle at 5:00 p.m., overtime is automatically applied. If a machine is faulty or work is backed up, an operator can take herself off standard time and immediately get credit for the downtime.
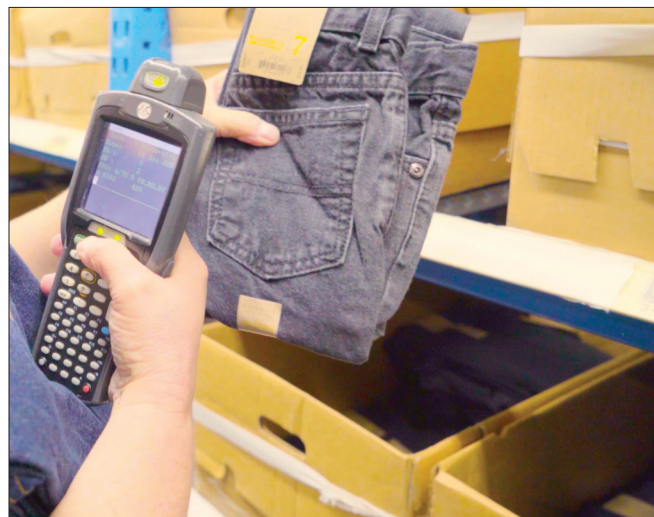
Speed to market is another goal that General Sportwear strives for, and it too has improved as a result of the system. Work in process was reduced from about 1.5 weeks to one week, largely because of confidence in the shop floor control software. Before the system was installed, Rosenstock says, they would cut further ahead to make sure there would always be enough work for the lines. Now, production is better balanced and cutting can be done as needed rather than ahead of time.

Reducing defects

After the first six months, General Sportwear added the quality control module to the system. QC auditors perform in-line audits and enter information about defects directly into the system. "We know in real time where we're having problems — which operators, which operation," Rosenstock says. "Four times a day, the supervisors and quality control staff look at the quality issues. They're going to the operators, finding out what the problem is, and correcting it in the moment rather than seeing daily or weekly reports." Defects can have many causes, from sewing errors to cutting errors to machine malfunctions, and catching them in real time makes it easier for supervisors to find the root causes and prevent any further problems. Repairs have gone down by about 20 percent now that quality inspectors are catching problems "at the needle," Rosenstock says.

In summary, Rosenstock adds, "The system is a tool to help the operator make more money and help us become more efficient. Having transparent information in real time allows our supervisors and management to react to production and quality issues as they occur, which allows us to reduce our lead time and lower our overall costs." ■

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