

Next-Generation Data Capture

This case study on an OEM and a supplier reveals how next-generation technology is transforming common one-way shopfloor data collection systems into two-way information channels.

By Steve Campbell



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The global automotive industry faces significant structural challenges, including declining prices, increased demand for higher-quality products and the need to reduce excess on-hand inventory. All these factors are exerting tremendous pressure on manufacturers and their suppliers to continually reduce costs while improving customer satisfaction and service. For most, part of the answer has been adopting the principles of lean manufacturing.

The concept of lean manufacturing is not new. It was launched in 1979 by James Womack, Daniel Jones, Daniel Roos and

others at MIT through the International Motor Vehicle Program (IMVP), an initial five-year, \$5 million research project directed at identifying production factors leading to success in the global automobile manufacturing industry.

The IMVP led to the publication of *The Machine That Changed The World: The Story of Lean Production*, authored by the above researchers in 1990. Today, the IMVP is in the middle of the fourth phase (2000–2004) of its research, focusing on how the auto industry will navigate the “next economy,” including extending the supply chain,

improving collaboration and going green.

One way auto manufacturers have delivered cost reductions within the lean manufacturing framework is by using bar codes, Radio Frequency Identification (RFID) and other proven automatic identification data collection (AIDC) technologies to eliminate the labor-intensive and costly paper-pushing that typically permeate shop floor processes.

“Given the challenges facing the global automotive industries, the application of data collection techniques assists manufacturers to reduce costs and eliminate non-value-added tasks as much as possible,” notes Greg

Watkin, vice president of marketing for Epic Data. “Automated shop floor data capture and auto ID supports lean manufacturing in automotive and other industries.”

Cutting Shop Floor Paperwork and Forms

Watkin notes that data capture within lean manufacturing is comprised of two aspects. First, it helps an organization to understand its production weaknesses by quantifying the inefficiencies and waste in each business process or transaction by pinpointing where wasteful processes might be bundled or eliminated. Second, by applying data capture technologies within the process, these technologies wring out the non-value-added paper shuffling that adds an extra expense layer to production costs. The result is the reduction of unnecessary work, allowing employees to complete higher-value tasks and develop a more efficient production line. In short, it helps the organization to focus its attention on producing value and cutting excess cost.

Data capture is any kind of information-gathering—time and attendance, tool tracking, inventory, receiving, materials, vendors, the supply chain—needed to manage the value-production process. In older outmoded systems, this was done via handwritten notes and paper forms that were later entered into the ERP system manually. The cost, delays and errors involved in this type of manual data entry work can be significant. The goal of automation is to narrow the margin for error as much as possible.

The rationale for instituting a data capture system is quite simple: automating the capture and transmission of information reduces the cost of acquiring and moving that information around. The result is that more and better kinds of intelligence can be transmitted up from the shop floor.

AIDC technologies can be used to identify, track and control essentially anything—parts, inventory pieces, employee work, tools, workstation access, processes and suppliers. It also includes the development of software to manage this information and

make it accessible to decision-makers at various levels of the company, by connecting it directly to the ERP system.

Handheld (wireless) units or fixed-wired stations that scan the bar codes comprise the system’s hardware. If the system is wireless and allows the employee to roam about the factory floor with handheld scanners, RFID antennae are stationed throughout the plant to acquire the signals from the portable units. The fixed stations can be PCs, modified PCs, or fixed-mount data capture terminals designed specifically for shop floor applications.

“These systems improve the speed of a wide variety of warehouse and manufacturing transactions—receiving, picking, materials transfer, replenishment, tool tracking, warehouse management and vendors/supply chain management,” said Watkin. “They also make it much easier for accounting and enable the financial analysts to track time and attendance, control project costs and make budget forecasts. The result is information savings

throughout the company that can help keep costs down.”

Time and Attendance Tracking Vital for Volvo Truck

Data capture systems are well established with larger manufacturers. For example, such systems have been in use at the Volvo Truck Company’s factory in Goteborg, Sweden since the mid-1980s. There, the data capture system uses fixed-mount terminals on the shop floor to track time and attendance for all employees. Staff members simply swipe their cards through the terminal as they enter or leave work or a particular workstation. The information is automatically sent to the ERP system for tabulation. Aside from cost control, this enables the company to manage projects and evaluate its cost structure for future budget planning.

Going even further, the next-generation technology is transforming today’s one-way shop floor data collection technologies into two-way information channels. For example, Volvo recently started an upgrade to a new shop floor terminal. The new system has a full-color 10 by 6 inch VGA screen with added room to present corporate knowledge—everything from graphical work procedures to CAD drawings—to employees on the shop floor when they request it.

The new terminal technology also enables customer-selected applications like quick shop floor access via a corporate intranet to company policies and procedures, safety rules, e-mail, directories and other valuable information.

Honda Supplier Upgrades Data Capture

A second example of how advanced data capture is paying off can be seen in the operations of Honda supplier Listowel Technology of Listowel, Ontario. Listowel’s upgraded shop floor data capture system delivers improved, real-time accuracy in a highly complex work process and even made 12 clerical positions redundant. The system includes 40 PC terminals and 40 Intermec scanners and printers.

With 450 employees (called “associates”) working three shifts per day, Listowel produces plastic injection moldings (glove



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boxes, dashboards, center consoles, kicker panels, etc.) for the Honda manufacturing assembly plant located two hours down the road in Alliston. The Alliston plant produces the Acura MDX, as well as the Honda Civic, Odyssey and Pilot.

At least 20 trucks per day are used to deliver these parts from Listowel. The company completes some 1.5 million transactions annually. With 125 different styles and colors at Honda’s Plant 1 and 250 at Plant 2, and more than 1,400 labels produced each day, the work process is complex and fast. In all the activity, it can be difficult to tell which part should receive which label. Mistakes can be made—putting the wrong label on a part, for example—and this costs money to rectify.

“We were mislabeling 40 internal parts shipments per month and also had significant inventory-management issues that we had to allocate staff to deal with,” notes Chris Poland, Listowel’s IS manager. “It was time to upgrade to a data capture system that would address these and some other challenges we were having.”

What is Auto ID?

Automatic identification and data capture (AIDC) is an industry term for the identification and/or direct collection of data into a micro-processor controlled device such as a computer system or a programmable logic controller (PLC), without the use of a keyboard. At their core, all AIDC technologies aim to eliminate errors associated with identification and/or data collection and to accelerate the through-put process.

As an industry family, AIDC covers six distinct groups of technologies and services. These include card technologies, data communications technologies, bar code technologies, radio frequency identification technologies, emerging technologies, and the support and supplies that serve the industry.

The objective of the Listowel IS team was to upgrade the firm's data capture system to fit their new needs and eliminate the human-error factor from routine parts tracking and inventory management. These requirements included reducing the number of missing labels, improving inventory accuracy, enabling staff to review production schedules on-screen, distributing quality alerts, providing an online help desk and enabling staff to access photos of the parts they were shipping to eliminate errors in part labeling.

Now, Listowel's new system offers an open standards structure that fits the company's unique business processes, instead of the other way around. Another benefit is that the organization can unify its various standalone systems.

Inventory Updates in Real Time

Inventory accuracy was a key consideration at Listowel. The accuracy rate was at 78 percent, with monthly adjustment counts requiring 150 employees and costing \$20,000 per month. The company's goal was to move it up to 93 percent and schedule inventory checks every three months. The savings just in changing from monthly to quarterly checks could add up to \$160,000 annually. It would also eliminate four label-verification positions.

"Previously, our inventory was reported manually, with the accompanying errors that occur when you have 1.5 million transactions per year," notes Poland. "Now, all inventory changes are recorded automatically in real time as the staff performs functions of producing parts. It's automatic and included in our business processes; no one has to think about it."

In addition, the internal label errors are moving down from 40 per month to zero with the new system. This was achieved by setting up the system so that labels can't be printed and removed from the computer screen until the staff member verifies the accuracy through scanning the part's bar code against the work order. The new system also prevents the pre-printing of labels to be certain that double-checking occurs.

In Conclusion

Commenting on the positions Listowel was able to eliminate, Watkin says, "These

were all non-value-added work that is not part of the value chain for Listowel. The new system allows the company to reduce costs or re-assign people to more valuable tasks."

Of course, the value of shop floor data capture runs deeper than eliminating positions. Providing employees with real-time access to more and better information empowers them to develop more efficient and logical ways of doing things. Ultimately, that means an even leaner operation. Given

the cost pressures facing today's automotive industry, this is an advantage that can't be overlooked.

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