

## The value of shop floor data collection

by Craig L. Press

It's 9:30 a.m. Back in the pressroom a pressman completes one of six jobs waiting to be run. Before going on to the next job, he quickly scribbles some notes down on a yellow pad. Later, as he keys his notes into the shop floor data collection computer, he makes an innocent mistake and types "1500" sheets instead of "15000" sheets. This information immediately circulates throughout the company's business management system, distorting the decisions of the scheduler, customer service rep, purchaser, and other managers.

When purchasing a business management system, most companies, large and small, overlook the significance of the data collection component. *Shop floor data collection provides essential feedback to the entire system and company.* It is the catalyst to sharper estimates, smoother scheduling, quicker customer response, just-in-time inventory, increased productivity, and improved profitability. Nevertheless, owners often cut costs when purchasing these systems.

### Shop floor data collection defined

Shop floor data collection is the accumulation of production and material transactions associated with the manufacturing process. Production transactions include labor and equipment hours for equipment

set-ups, running, wash-ups, and other operations. Material transactions consist of purchases, receipts, usage, and credits.

Transactions are divided into four categories -chargeable, customer changes, non-chargeable, and errors. Chargeable transactions are typically included in the base price of a job. Customer changes are usually billable as additional charges, such as copy, color, or quantity changes requested by the customer. Non-chargeable transactions are not job-related, as in equipment maintenance and department meetings. Errors are unpredictable problems, like bad plates, mismatched ink, and paper flaws that come up when working on jobs.

### Collection methods: Low-cost to top-of-the-line

A company does not have to spend thousands of dollars on shop floor data collection. Many manual and electronic data collection methods exist, with costs ranging from virtually nothing up to \$10,000 per data collection station.

The simplest and least expensive method of data collection is job ticket notation. Plant personnel write their names, work centers, quantities they produced, and hours it took to perform their operations on the back of each job ticket. Upon completion of each job, multiply the hours

worked by the work center's cost rate and run a total to get the job's cost.

Production sheets are another inexpensive option for shop floor data collection. Plant personnel write their daily transactions on production sheets or forms. At the end of each day or the beginning of the next day (eight to 24 hours later), key the completed forms into a database. Create reports by querying the database by job, work center, date, employee, or other categories.

Alphanumeric keypads can capture production and material transactions as they occur. These devices have 50 to 150 keys that a user can easily define to represent production operations, minimizing data entry keystrokes and training. Small screens on these units prompt the user for entries and immediately verify their responses, reducing entry errors. The real-time entry of data into the management system supports the time critical requirements of scheduling, job tracking, just-in-time inventory, and other time-dependent applications. Alphanumeric keypads cost between \$250 and \$1,500, depending on size and capabilities.

Recent software enhancements make personal computers the preferred choice for shop floor data collection terminals. Unlike alphanumeric keypads, computers provide two-way communications for

collecting and distributing information between the front office and shop floor. Plant personnel can view job instructions, schedules, status, last-minute changes, and other essential information. This improves the accuracy and quality of information by providing plant employees with immediate feedback on their entries. At \$600 to \$800 per computer, this is a very affordable approach.

Barcode readers complement the assortment of shop floor data collection devices. Wands, portable scanners, and wireless radio frequency devices can be integrated into the system. A barcode system works well for tracking the receipt, movement, and usage of skid and roll stock, plates, film, ink, finished goods, and other materials. They can also be used to track proofs, samples, and customer supplied materials. The cost of a barcode wand is approximately \$150, while a basic wireless radio frequency system can run about \$8,000.

Direct machine interface (DMI) is the cream of the crop. DMI uses sensors mounted on the production equipment to *automatically* collect production hours, counts, material usage, and other data. With very little human intervention, direct machine interface on a press can automatically update the job status, revise the plant schedule, and deduct used paper from inventory. DMI costs between \$2,000 and \$10,000 per machine, depending on the number and type of add-ons.

It's easy to see that many options exist for shop floor data collection. These choices allow each business, no matter what size, to optimize cost and benefit, resulting in overall savings.

## Putting data collection to work

Management, administration, and plant personnel must commit to

successfully implementing data collection. Everyone must be willing to learn the system and preserve its integrity. Getting staff involved in the process from the beginning will add to the success of shop floor data collection by producing employee "buy-in." Organize an open forum with employees to define the project goals, objectives, and benefits. This will improve everyone's understanding, focus, and cooperation. Create a standard operating procedures manual containing detailed descriptions of cost center and operation codes, check lists, step-by-step instructions, example data collection screens and reports, and flowcharts to eliminate data entry errors and uncertainty among employees.

## Preserving information quality

Maintaining the information quality is an ongoing process. At the end of each workday, have employees approve and sign-off on their daily entries, while it is fresh in their minds. This holds employees accountable for their submissions and stops errors at the source -before they spread throughout the system.

Integrating data collection into the payroll system preserves the integrity of the data and eliminates payroll time clocks. This guarantees 100 percent of all labor hours are accounted for when analyzing productivity, non-chargeable hours, downtime, budgeted hourly rates, employee efficiency, and other labor-based research.

Additions and changes in production equipment, product mix, personnel, company goals, and other factors can easily corrupt the quality of the collection information. It is important to consistently monitor the system and make adjustments when needed. Be certain new employees have adequate system training, and the data collection equipment and

codes change with the company. Conduct periodic meetings with employees to identify and resolve new issues before they corrupt historic databases.

## The payoff

A properly implemented shop floor data collection system brings many lucrative benefits to the organization. Gathering thorough and accurate data creates estimates that reflect actual costs and improve overall competitiveness. Timely job status information Improves customer response time. Improved inventory counts minimize inventory investment by applying just-in-time practices. Supplying production managers with the latest job status and scheduling information reduces bottlenecks, smoothes workflow, and accelerates turnaround. Accurate production counts reduce job shortages and overruns. Plus, producing a true cost analysis of each job immediately upon delivery expedites the billing cycle.

## Conclusion

An integrated business management system is only as good as the data it is fed. A properly implemented shop floor data collection system provides an organization with timely and accurate data, vital to making intelligent decisions to manage its business.

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