Improve your labor yield

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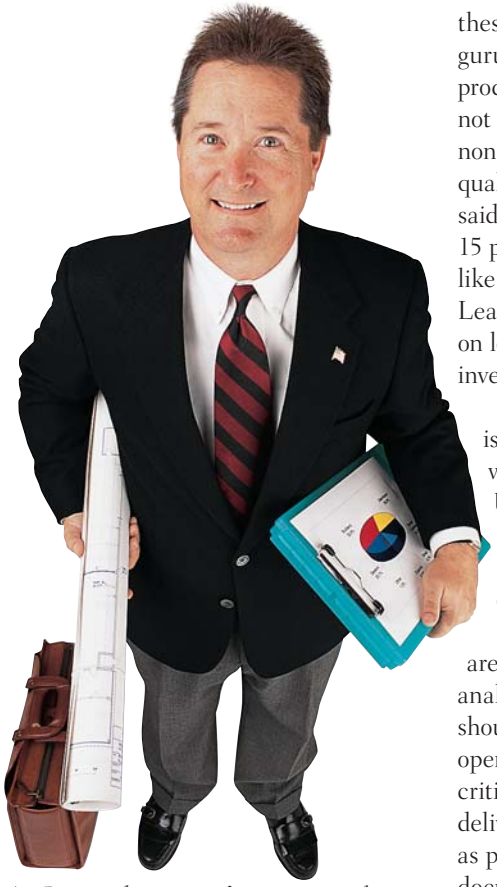

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Beginning in the mid-1970s, the world for U.S. manufacturers became truly global. The first wave of automobiles, electronics and other products made by foreign companies who benefit from low-cost labor hit our shores. To defend against these attacks, many management gurus and academicians argued that production plants should concentrate not on cost but rather on achieving nonfinancial measures such as high quality and fast delivery. Labor, it was said, need not be a concern – it's only 15 percent of total cost. Philosophies like Total Quality Management and Lean Manufacturing that focus on lowering defect rates, reducing inventories and the like were born.

While noncost performance is important, let's face it, cost is where the rubber meets the road. Ultimately, the market, not you, sets prices. To make a suitable profit, you had better control your costs.

Cost control opportunities are found through sound process analysis. To make improvements, you should start with a look at your present operations. Are you achieving your critical process objectives like fast delivery? Is your process as frictionless as possible? Observing, measuring and documenting your process will answer those key questions. One valuable tool for that purpose is work sampling.

Work sampling allows you to examine how your front line workers are spending your time. The key to low labor cost is sound labor utilization. Good manufacturers monitor their material utilization, the yield of saleable lumber or panels they achieve. Maximizing that yield lowers cost. Likewise, maximizing labor yield by ensuring that your workers are adding value will reduce your costs.

> *Cost is where the rubber meets the road.*

Labor yield affects not only your cost but also your other objectives. If your process results in excessive material handling, machine set-ups and other wasted efforts, you will most likely suffer less-than-optimal cycle times, build surplus inventories and use excess space. Even if your primary objective is fast delivery, you must also attend to your labor utilization.

Collecting and analyzing data

Work sampling involves documenting your workers' activities and analyzing their value-adding performance. This task is relatively simple:

List the types of activities the sample worker group typically experiences. Examples are machine operation, machine set-up, machine breakdown, delays due to material handling, delays due to scheduling problems, etc.

Develop a data collection

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form to observe and record the activities occurring at each listed workstation. Place the relevant code for the situation you observe. For statistical accuracy, collect about 100 observations randomly over a period of one week.

Next, compute the activities as a percentage of the total number of observations on a spreadsheet like the table shown on page 25. For example, to calculate the material handling delays at the panel saw, divide the three observed delays of this type by the 20 total observations. Insert the resulting 15 percent under D4 on line 1 of the table.

The key to low labor cost is sound labor utilization.

To analyze the efficiency of a machine or workstation, compile the activity types into three basic categories:

Operating – When the machine is actually working, i.e., creating value.

Downtime – The sum of all delay types, i.e., when the machine is generating excess cost.

Unstaffed – When the machine is not required.

Drawing conclusions

A quick glance at these numbers reveals areas for potential improvement. Look at the CNC drill that has a downtime ratio of 40 percent. Drilling down into the individual delay types shows that the culprit is the 35 percent lost time due to maintenance. Likewise, the single edgebander is suffering from 25 percent lost time due to the lack of materials. Management in this plant should be assessing the need for a major overhaul or replacement of the CNC drill and the reasons timely delivery of materials to the edgebander is not occurring.

The numbers for the horizontal drill require some interpretation. While the 20 percent delay for set-up may be excessive for this machine, this operation is only employed 35 percent of the typical day.

Work Sampling Analysis

Work Sampling Analysis	Utilization								Summary		
	W	D1	D2	D3	D4	P	NW	Total	Operating	Unstaffed	Downtime
Panel Saw	80.0%	0.0%	5.0%	0.0%	15.0%	0.0%	0.0%	100.0%	80.0%	0.0%	20.0%
CNC Drill	60.0%	0.0%	35.0%	5.0%	0.0%	0.0%	0.0%	100.0%	60.0%	0.0%	40.0%
Horizontal Drill	35.0%	0.0%	0.0%	20.0%	0.0%	0.0%	45.0%	100.0%	35.0%	45.0%	20.0%
Sgl. Edge Bander	60.0%	25.0%	0.0%	5.0%	5.0%	0.0%	5.0%	100.0%	60.0%	5.0%	35.0%

Legend

W = Working
D1 = Delay for Lack of Materials
D2 = Delay for Equipment Maintenance
D3 = Delay for Station Set-Up
D4 = Delay for Material Handling
P = Personal Delay
NW = Not Working/Idle

Compute the activities as a percentage of the total number of observations. For example, to calculate the material handling delays at the panel saw, divide the three observed delays of this type by the 20 total observations. Insert the resulting 15 percent under D4 on line 1 of the table.

Like most analysis, you should concentrate on the important elements of your process. Start with your bottlenecks – those key machines and workstations that control the pace and throughput of your process. Improving the value-adding performance of these operations can create huge process efficiencies.

One other point: Accountants worry about so-called direct and indirect labor. Direct workers operate machines, assemble products, etc. Indirect workers perform support functions. In reality, direct workers handle many indirect activities such as set-up and material handling. All labor is a cost. Don't forget the utilization of your material handlers, quality inspectors, maintenance and administrative staff. You can often find valuable cost-reduction opportunities in these supposed indirect areas.

Armed with this data, you can attack areas of your process that add little, if any, value. Most wasted activities are controllable, as shown on the accompanying list, and include machine set-up, assembly or finish line stoppages, scheduling delays, use of new scheduling tools and machine breakdowns.

Work sampling helps you to set priorities for improving labor yield.

Intelligent use of work sampling data will also enable you to determine the gap between today's

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labor performance and the ideal with those value-wasting activities reduced. Smart manufacturers employ performance measures such as revenue per employee to monitor their operations. (See the ***FDM*** April 2003 Raymond's View for more on performance measurement.)

A key part of such measure is the target level of performance. In this case, what should the revenue per employee be? With a few simple calculations based on your work sampling data, you can set a realistic, achievable target.

The root purpose of work sampling is to enable the reduction of waste. By doing so, you simplify your operation and remove the friction that adds cost. Typically, eliminating wasted activities increases the repetition of value-adding activities. Simplicity and repetition breed competence. Your workers will move higher up the learning curve and stay there. The most successful companies make it easy for their workers to excel.

Bottom line: Don't take your eye off the ball. Labor utilization is critical to your success. Make the investment in regular work sampling in your operation. Find out what your plant does and does not do well. Then make the necessary improvements. ▲

Five controllable wasted activities

- ☑ **Machine set-up. How much time can be saved through faster set-up techniques, the use of dedicated machines for specific jobs or the purchase of a new machine?**
- ☑ **Assembly or finish line stoppages. If this problem is serious, collect more data to identify the specific causes.**
- ☑ **Scheduling delays. How often does poor scheduling impact process efficiency?**
- ☑ **Would a new scheduling tool result in significant performance improvement?**
- ☑ **Machine breakdowns. How much productive time is lost due to machine failures? Would reduction of this loss justify the purchase of a replacement machine?**