Time standards yield more accurate estimating, higher productivity gains.

Estimating Labor with Averages Not Sufficient

by Todd Drummond

I was first exposed to the art of estimating labor costs for a truss plant in the early 1990s. The company I was with was installing new design software, and the labor estimation part of the program needed to be set up. I had no idea how to approach that task, so I observed a senior salesman who was doing the setup. He assigned various time values to elements such as board footage, lineal footage and numerous other factors. He would then adjust the computed figure based on his feel for the job. He was satisfied with his results, because on "average" it worked out.

After some exposure to time standards in the industry, I began to question whether having an average labor figure is sufficient.

Most truss shops use one of the following factors for estimating labor:

- Board Footage
- Linear Footage
- Material Cost
- Sales Dollars

These figures are easily derived from the truss design software, so they provide a relatively easy way to figure labor costs, which on average may work out. The problem is they usually bear little connection to the actual time, or man-hours, required for an individual job, and your labor costs are actually based on man-hours.

For instance, there could be a significant discrepancy in man-hours between a pole barn and a hip roof system, both of which use the same board footage. With linear footage the difference between a common truss and a customized profile with multiple pitch breaks skews the calculation enormously. Basing labor on material cost ignores cost fluctuations based on market conditions, and using sales dollars as a metric fails to consider discounts (lowering the price does not get trusses built faster).

We all try to make adjustments based on the complexity of each order, but can we say with honesty that we are consistent? In fact, it makes labor estimation more of an art than a science. But the panacea is that it works out on an average, so it is acceptable. What is even worse is we try to measure individual groups on a daily basis, and that does not relate well to an average.

The average really has nothing to do with the individual labor estimation of a single order, or even a single truss. Does it matter that you know how long it should take to do individual activities such as cutting and assembling? In a word YES!

Time Standards & Labor Estimation

Measuring the length of time it takes for the various cutting and building activities results in something called Time Standards. The use of time standards in all sorts of manufacturing has been around since Benjamin Franklin. More recently Toyota developed a system of time standards that have come to be called lean manufacturing, and was the basis for what also became known as the Japanese system. In the truss industry, it is often referred to as the Houlihan Method.

at a glance

- ❑ Most truss shops use one of four factors that work "on average" to estimate labor.
- ❑ Labor estimates based on averages do not take into account complex jobs.
- ❑ In the truss industry, the Houlihan Method is one example of lean manufacturing.
- ❑ Employing proper time standards provides a solution to estimating labor.

John Houlihan was an industrial engineer who applied time and motion studies to truss manufacturing. (For more information on Houlihan, read "Houlihan: Recipe for Production Success" from the December 2004 issue of ***SBC***). Proper time standards are not derived from knowing what has been done, but knowing what should be done to achieve lean manufacturing.

In my opinion, clear time standards meet each of the following conditions:

- They are measurable time elements (I use man-minutes, but Reasonable Expectancy or Scheduled Units—each representing 1/100th of an hour—also work).
- They can be measured consistently.
- They are broken down to the lowest common denominator so when added over the various groups, the total time remains true.

The time standards should have a reference to real world variables. For instance, the 100% standard could equal what is expected by an experienced individual (e.g., with three years of experience). You might expect an inexperienced individual to perform to 50 or 60 percent of the standard.

So Why Are Time Standards So Important?

Industrial engineers are taught the following statistics:

For Most Manufacturing Shops:
Gains Expected from Clear Time Standards[1]

No Time Standards = 60% performance

With Proper Time Standards = 85% performance

Proper Time Standards and an Effective Incentive Program = 120% performance

(normal; deviation of +/- 10%)

This is the secret of the Houlihan system. Industrial engineers understand the gains manufacturers would obtain in their facility if they employed proper time standards. On the average most manufacturers gain a 42 percent increase in productivity simply by employing time standards. (85%-60% divided by 60 = 41.7% gain)

I believe anyone can achieve these results by following five basic principles:

- Goal setting (setting time standards)
- Comparison of actual performance with goals
- Tracking results
- Reporting variances larger than acceptable limits

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[1]Studies by industrial engineering consultants Mitch Fein and Fred Myers published in Motion and Time Study for Lean Manufacturing 2001. Their studies have remained consistent in many studies and are considered statistically valid.

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- Taking corrective action to eliminate causes of poor performance

What manufacturer would not like a 42 percent gain in productivity? And this is only considering the application of time standards; accurate labor forecasting can bring additional benefits to job scheduling and costing.

There are some other things to note about establishing time standards. First, if you are not thoroughly versed in lean manufacturing principles you should get some help from somebody who is. A poorly implemented application of time standards is of little help. You should also be prepared to examine how you do things with a fresh eye, and avoid the pitfall of thinking you "already have that solved."

In the end, the important thing is to have a better grasp on your labor costs than the "averages" generated by the traditional methods of measurement. With accurate time standards, you will know exactly what the labor cost is of each job that you do, and you will know just how much discounting a job in a tough market will actually cost you. SBC

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