Engineers — the missing link

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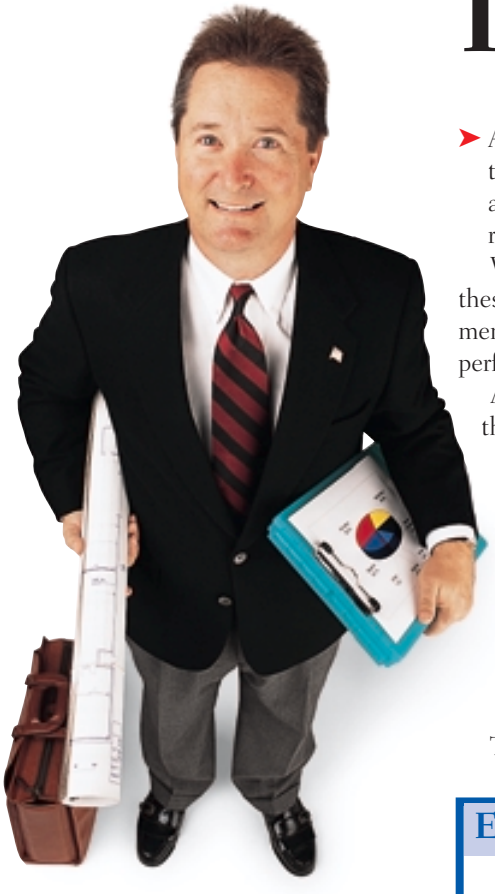

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It seems like a perfect match...

- An industry like furniture manufacturing, with low labor productivity, high material waste, slow delivery and other inefficiencies.
- A toolbox full of solutions, like continuous improvement, kaizen, JIT and lean manufacturing that offer remedies for those inefficiencies.

What's the problem? Why haven't these tools been successfully implemented in furniture and other poorly performing industries?

At least part of the blame lies with the absence of people skilled in process improvement on the payrolls of these businesses. Call these people manufacturing engineers, process engineers, product engineers, industrial engineers or simply engineers — the term used in this column. These people figure out how to do things better.

The household furniture industry employed only 633 industrial engineers and other process-minded staffers. That's only one engineer per $43 million in annual volume.

Producers of millwork, cabinets and plywood employed 1,119 engineers, or one for every $30 million in annual shipments.

Compare these numbers with the two other industries shown in Table 1. And look closely at the shipments per employee, a rough measure of labor productivity. More engineers clearly equal higher performance.

An engineer's job

Engineers are educated to improve productivity and quality — doing more, better and faster with less. Let's look at two functions where engineers can be profitably used:

- **Smarter product engineering** — Product design and execution predetermine your ability to make a product

Engineers in Industry

Industry	Engineers Employed	% of Total Industry Employment	Shipment $ per Engineer (in millions)	Shipment $ per Employee
Home Furniture	633	0.22%	$43.2	$96,916
Millwork, Plywood & Cabinets	1,119	0.36%	$30.7	$111,620
Household Appliances	3,442	2.95%	$6.2	$183,329
Communications Equipment	39,423	14.00%	$2.1	$294,220

Source: U.S. Census Bureau and U.S. Bureau of Labor Statistics

efficiently. A prerequisite for effective manufacturing is a product line that contains as few parts as possible with many of these parts standard, i.e., used on a number of SKUs. Plus the fabrication of these parts must be within the plant's capability. In the guise of a customer-centric strategy, many wood products plants are burdened with building a myriad of dissimilar products. Product engineering is often done under the gun rather than in a well-conceived process. Every new product is truly new right down to the least critical interior parts. If product design is considered strategically important, then why not optimize the process of product development and engineering? Why not design for manufacturability? To do so takes people skilled in that task.

➤ Systematic processing — All factories have production procedures and methods developed over the years. But few have put these assets into an integrated "system" that ensures smooth operation. Such a system consists of three critical elements: 1. well-selected machinery; 2. well-trained front line workers and 3. great information. Creation of the optimal system does not happen by chance. It takes people skilled in designing process flow, standardizing procedures, reducing setup times, improving ergonomics, minimizing waste, developing key information — all aimed at achieving their employer's targets for profits and customer satisfaction.

Justifying engineers

Many question the value of engineers or their affordability. If you don't believe engineers add value, look at these numbers. Take a plant producing $24 million a year with 260 workers using 6 million board feet of lumber. What if two engineers could improve productivity by only 5 percent and yield from 50 percent to 52 percent? At an average cost of $25,000 per worker, the headcount reduction of 12 generates annual savings of $300,000. Lumber saving totals about 240,000 board feet or about $192,000 at $800 per MBf. If your engineering team costs $160,000 a year, you pay for that resource in less than four months. And the next year your engineers will aim for another 5 percent gain in labor productivity.

The savings targets in this example are achievable. But you won't get them by chance. You must hire skilled engineers and then manage them intelligently.

Getting started

How do you manage an engineer?

First, explain to him/her your company's key factors for success. Real benefits are achieved only by doing the right things better.

Second, make him/her part of your team. When new company objectives are set, your engineer may need new marching orders.

Third, keep him/her on the plant floor. Engineers must work with front line workers, not in the vacuum of their offices.

Next, measure his/her impact. Metrics for labor productivity, delivery performance, material yield, and other key process objectives can be easily developed in most plants. Such measures become a report card on your engineers' achievements.

And finally, keep him/her focused on improving your processes. Only then can you leverage his/her education and experience into change for the better.

Bottom line

You can't optimize your company's performance alone. If you don't staff your company with engineers — people educated to save you money and improve customer satisfaction — don't complain when competitors take your markets. ▲

Availability of engineers

Finding talented engineering staff is not easy. The graduation rate for college-educated engineers fell from more than 77,000 in 1985 to below 61,000 in 1998. And many engineering graduates leave the profession in a few years for line management and sales jobs.

Once you begin to value what engineers can do for your company, what can you do to ensure an adequate supply of these skills?

1. Support meaningful curricula change at your local university

Only one-third to one-half of freshman engineering students actually graduate. A common reason given by students for dropping out of engineering programs is the heavy dose of math and science theory in the first two years. Get behind innovations that expose first- and second-year students to courses with real world content.

2. Hire engineering interns

Another way to bring relevance to an engineering education is work experience. Many engineering programs incorporate a few semesters of actual employment with time in class. Not only is the use of these interns good for their education but also for your recruiting process.

3. Encourage pre-engineering programs at your local high schools

Project Lead The Way, a non-profit group promoting pre-college engineering studies, has set up curriculum in over 100 high schools in the United States. Their program partners with local engineering firms and manufacturers to defray costs, provide plant tours and supply guest lecturers. More about this innovative program can be found at www.pltw.org. And don't forget WoodLINKS, a non-profit organization specializing in developing front-line workers for the wood products industry (www.woodlinks.com).

Don't depend on others to do this. The job is yours.