
The Productivity Paradox

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American manufacturers' near-heroic efforts to regain a competitive edge through productivity improvements have been disappointing. Worse, the results of these efforts have been paradoxical. The harder these companies pursue productivity, the more elusive it becomes.

In the late 1970s, after facing a severe loss of market share in dozens of industries, U.S. producers aggressively mounted programs to revitalize their manufacturing functions. This effort to restore the productivity gains that had regularly been achieved for over 75 years has been extraordinary. (Productivity is defined by the Bureau of Labor Statistics as the value of goods manufactured divided by the amount of labor input. In this article "productivity" is used in the same sense, that is, as a measure of manufacturing employees' performance.) Few companies have failed to measure and analyze productivity or to set about to raise output/input ratios. But the results overall have been dismal.

From 1978 through 1982 U.S. manufacturing productivity was essentially flat. Although results during the past three years of business upturn have been better, they ran 25% lower than productivity improvements during earlier, postwar upturns.

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Consider, for example, the XYZ Corporation, which I visited recently. The company operates a large manufacturing plant, where a well-organized productivity program, marshaling its best manufacturing talent, has been under way for three years. Its objective was to boost productivity so as to remove a 30% competitive cost disadvantage.

The program has included: appointing a corporate productivity manager; establishing departmental productivity committees; raising the number of industrial engineering professionals by 50%; carrying out operation-by-operation analyses to improve efficiency levels, avoid waste, and simplify jobs; retraining employees to work "smarter not harder"; streamlining work flow and materials movement; replacing out-of-date equipment; retooling operations to cut operator time; tightening standards; installing a computerized production control system; training foremen in work simplification; emphasizing good housekeeping and cleanliness; and installing a computer-based, measured-day work plan, which allows for daily performance reports on every operation, worker, and department.

For all this effort—and all the boost it gave to production managers' morale—little good has come of the program. Productivity has crept up by about 7% over three years, but profits remain negligible and market share continues to fall. As one executive said, "It's been great finally getting management support and the resources needed to get this plant cleaned up and efficient. But it is extremely discouraging to have

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worked so hard and, after three years, to be in worse competitive shape than when we started. I don't know how long we can keep trying harder when it doesn't seem to be getting us anywhere."

Unfortunately, XYZ's frustration with a full-out effort that achieves only insignificant competitive results is typical of what has been going on in much of American industry. Why so little competitive return—even a negative return—on so much effort? Is it the high value of the dollar, which cheapens imports? Is the cost gap just too great for us to overcome? Or are we going at the problems in the wrong way? What is going wrong? Why this apparent paradox?

The Wrong Approach

With these questions in mind, I have visited some 25 manufacturing companies during the last two years. Never have I seen so much energetic attention to productivity starting from the top and ricocheting all the way through organizations. This is American hustle and determination at its best. Productivity committees, productivity czars, productivity seminars, and productivity campaigns abound.

But the harder these companies work to improve productivity, the less they sharpen the competitive edge that *should* be improved by better productivity. Elusive gains and vanishing market share point not to a lack of effort but to a central flaw in how that effort is conceived. The very way managers define productivity improvement and the tools they use to achieve it push their goal further out of reach.

Resolutely chipping away at waste and inefficiency—the heart of most productivity programs—is not enough to restore competitive health. Indeed, a focus on cost reductions (that is, on raising labor output while holding the amount of labor constant or, better, reducing it) is proving harmful.

Let me repeat: not only is the productivity approach to manufacturing management not enough (companies cannot cut costs deeply enough to restore competitive vitality); it actually hurts as much as it helps. It is an instinctive response that absorbs managers' minds and diverts them from more effective manufacturing approaches.

Chipping away at productivity . . .

. . . is mostly concerned with direct labor efficiency, although direct labor costs exceed 10% of sales in only a few industries. Thus even an immense jump in productivity—say 20%—would not reverse the fortunes of import-damaged industries like autos, consumer electronics, textile machinery, shoes, or textiles.

. . . focuses excessively on the efficiency of factory workers. By trying to squeeze out better efficiency

from improved attitudes and tighter discipline on a person-by-person and department-by-department basis, the approach detracts attention from the structure of the production system itself.

Production experience regularly observes a "40 40 20" rule. Roughly 40% of any manufacturing-based competitive advantage derives from long-term changes in manufacturing structure (decisions, for example, concerning the number, size, location, and capacity of facilities) and basic approaches in materials and work force management. Another 40% comes from major changes in equipment and process technology. The final 20%—no more—rests on conventional approaches to productivity improvement.

What this rule says is that the least powerful way to bolster competitive advantage is to focus on conventional productivity and cost-cutting approaches. Far more powerful are changes in manufacturing structure and technology. The rule does not, of course, say "Don't try to improve productivity." These well-known tools are easy to use and do help to remove unnecessary fat. But they quickly reach the limits of what they can contribute. Productivity is the wrong tree to bark up.

. . . ignores other ways to compete that use manufacturing as a strategic resource. Quality, reliable delivery, short lead times, customer service, rapid product introduction, flexible capacity, and efficient capital deployment—these, not cost reduction, are the primary operational sources of advantage in today's competitive environment.

. . . fails to provide or support a coherent manufacturing strategy. By assuming that manufacturing's essential task is to make a company the low-cost producer in its industry, this approach rashly rules out other strategies.

Most of the productivity-focused programs I have seen blithely assume that competitive position lost on grounds of higher cost is best recovered by installing cost-reduction programs. This logic is tempting but wrong. These programs cannot succeed. They have the wrong targets and misconstrue the nature of the competitive challenge they are supposed to address. Worse, they incur huge opportunity costs. By tying managers at all levels to short-term considerations, they short-circuit the development of an aggressive manufacturing strategy.

But they also do harm. These programs can, for example, hinder innovation. As William Abernathy's study of auto manufacturers has shown, an industry can easily become the prisoner of its own massive investments in low-cost production and in the organizational systems that support it.¹ When process

1. William J. Abernathy and Kenneth Wayne, "Limits of the Learning Curve," HBR September–October 1974, p. 109.

costs and constraints drive both product and corporate strategy, flexibility gets lost, as does the ability to rapidly introduce product changes or develop new products.

Even more is at stake than getting locked into the wrong equipment. Managers under relentless pressure to maximize productivity resist innovation. Preoccupied as they are with this week's cost performance, they know well that changes in processes or systems will wreak havoc with the results on which they are measured. Consequently, innovations that lead to, say, better service or shorter lead times for product changeovers are certain to suffer.

Innovation is not, however, all that suffers. A full-out concentration on productivity frequently creates an environment that alienates the work force. Pressure for output and efficiency are the staples of factory life as hourly workers experience it. Engineers and supervisors tell them what to do, how to do it, and how long they may take. There is an often unhappy, quota-measured culture—and has been for more than 150 years. In such an environment, even the most reasonable requests are resented.

Recent admirers of the Japanese argue that low cost and high quality can go hand in hand. Indeed, in the right setting managers need not trade one for the other. But in an efficiency-driven operation, this logic can be a trap. When low cost is the goal, quality often gets lost. But when quality is the goal, lower costs do usually follow.

The will to make large investments in radically new process technology gets lost too. The slow adoption of such manufacturing technologies as CAD/CAM, robotics, and flexible machining centers reflects managers' wise assumptions that these investments would initially drive productivity down.

Fears that several years of debugging and learning to use the new gear would hurt productivity have already cost many companies valuable time in mastering these process technologies. Even more troubling, the companies have failed to acquire a strategic resource that could help them restore their competitive position. A productivity focus inevitably forces managers into a short-term, operational mind-set. When productivity is driving, experimentation takes a backseat.

The emphasis on direct costs, which attends the productivity focus, leads a company to use management controls that focus on the wrong targets. Inevitably, these controls key on direct labor: overhead is allocated by direct labor; variances from standards are calculated from direct labor. Performance in customer service, delivery, lead times, quality, and asset turns are secondary. The reward system

based on such controls drives behavior toward simplistic goals that represent only a small fraction of total costs while the real costs lie in overhead and purchased materials.

Why has this gone on year after year even as the cost mix has steadily moved away from direct labor? By now our accounting and control systems are pathetically old-fashioned and ineffective. But nothing changes. Our continuing obsession with productivity as the be-all measure of factory performance is to blame, not the stubbornness of accountants.

When managers grow up in this atmosphere, their skills and vision never fully develop. They instinctively seize on inefficiencies and waste while missing broad opportunities to compete through manufacturing. The harsh fact is that generations of production managers have been stunted by this efficiency-driven mentality. There is the oldest management function, yet today it is often the most backward. Unable to join finance, marketing, and general management in thinking strategically about their businesses, they are cut off from corporate leadership. As my recent study of 66 "comers" in production management shows, 10 or 15 years' immersion in a productivity-directed organization creates severe limitations of vision.² These limitations, in time, form a long-term mind-set that only a few can shake. Today the production function is seldom the place to find managers who can design competitive manufacturing structures.

Indeed, ever since Fredrick Winslow Taylor, our obsession with productivity and efficiency has spoiled the atmosphere of the factory. "Factory" is a bad word. Production managers first came into existence not as architects of competitive systems but as custodians of large, capital-intensive assets. Their job was to control and coordinate all factors of production so as to minimize costs and maximize output. This single dimension of performance is deeply ingrained in the profession and until recently has sufficed as a basis of evaluation.

Not surprisingly, it created a negative, penny-pinching, mechanistic culture in most factories—a culture that has driven out and kept away creative people at all levels. Who among our young today wishes to work in an environment where one is told what to do, how to do it, when to do it, is measured in minutes and sometimes seconds, is supervised closely to prevent any inefficiencies, and is paced by assembly lines or machines to produce at a rapid and relentless pace?

2. Wickham Skinner, "The Taming of Lions: How Manufacturing Leadership Evolved, 1780–1984," in *The Uneasy Alliance*, ed. Kim B. Clark, Robert H. Hayes, and Christopher Lorenz (Boston: Harvard Business School Press, 1985), p. 63.

Today's problems in making the factory into a more attractive place to work are not new. They are the direct outcome of the 150-year history of an institution based on productivity. As long as cost and efficiency are the primary measurements of factory success, the manufacturing plant will continue to repel many able, creative people.

Breaking Out

Faced with this paradox—efforts to improve productivity driving competitive success further out of reach—a number of companies have broken out of the bind with extraordinary success. Their experience suggests, however, that breaking loose from so long-established a mind-set is not easy. It requires a change in culture, habits, instincts, and ways of thinking and reasoning. And it means modifying a set of values that current reward systems and day-to-day operational demands reinforce. This is a tall order.

Every company I know that has freed itself from the paradox has done so, in part, by:

Recognizing that its approach to productivity was not working well enough to make the company cost competitive. This recognition allowed managers to seek strategic objectives for manufacturing other than those determined primarily by cost.

About 12 years ago, a key division of American Standard adopted a "become the low-cost producer" strategy. Its productivity-driven focus did little to reduce costs but had an immediate negative effect on quality, delivery, and market share. What Standard needed was a totally new manufacturing strategy—

one that allowed different areas of the factory to specialize in different markets and quality levels. When this approach replaced the low-cost strategy, the division regained its strong competitive position within three years.

Accepting the fact that its manufacturing was in trouble and needed to be run differently. In the mid-1970s officers of the Copeland Corporation, a large producer of refrigeration compressors, decided that their industry was fast becoming mature. An analysis of their nearly obsolete production facilities and equipment made it clear that manufacturing had become a corporate millstone. Without a major change in the number, size, location, and focus of these facilities, long-term survival would be impossible. Copeland made these changes. The results (described later) were remarkable.

Developing and implementing a manufacturing strategy (see the insert). When production managers actively seek to understand (and, in some cases, to help develop) the competitive strategy of relevant business units, they are better able to work out the objectives for their own function that will turn it into a competitive weapon. The requirements of such a manufacturing strategy will then determine needed changes in the manufacturing system's structure and infrastructure.

At Copeland, this approach led to order-of-magnitude improvements in quality, shortened delivery cycles, lower inventory investments, and much greater flexibility in product and volume changes.

Adopting new process technology. Changes in equipment and process technology are powerful engines of change. Bringing such technology on line helps force adjustments in work flow, key skills, and

Manufacturing Strategy

A manufacturing strategy describes the competitive leverage required of—and made possible by—the production function. It analyzes the entire manufacturing function relative to its ability to provide such leverage, on which task it then focuses each element of manufacturing structure. It also allows the *structure* to be managed, not just the short-term, operational details of cost, quality, and delivery. And it spells out an internally consistent set of structural decisions designed to forge manufacturing into a strategic weapon. These structural decisions include:

- What to make and what to buy.
- The capacity levels to be provided.
- The number and sizes of plants.
- The location of plants.
- Choices of equipment and process technology.
- The production and inventory control systems.
- The quality control system.
- The cost and other information systems.
- Work force management policies.
- Organizational structure.

Labor Intensive

That people love their work, who work a drill
Or run a lathe, sounds alien to some
Who see in them "the robots they've become":
Automatons bent to assembly's will.

And some are that, who welcome programmed steel,
Greet automation heralded as Change—
But others feel an intimate exchange,
The tiniest components but a field

As varied as a single breed of snail,
With textures, contours hidden from all eyes

Save those communing daily half their lives
With parts they know like totems. They have nailed

That one philosophy, have made the grade
Who seen in work heir lives, and love their trade.

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information systems as well as in systems for inventory control, materials management, and human resource management. There are few more effective means of loosening up old ways of organizing production.

General Electric and Deere & Company have made wholesale process changes at their dishwasher and locomotive (GE) and tractor (Deere) plants—changes that boosted product quality and reliability. Timken and Cooper Industries have each made large investments in radical new technologies that speeded up their ability to deliver new products and customer specials.

Making major changes in the selection, development, assignments, and reward systems for manufacturing managers. The successful companies I looked at decided they needed a new breed of production leader—managers able to focus on a wider set of objectives than efficiency and cost. It was, however, no simple matter to find or train this new breed.

Some, in fact, turned up in unexpected places: marketing, sales, engineering, research, general management. As a group, they were good team builders and

problem solvers and had broad enough experience to hold their own in top corporate councils. Their companies considered them among the most promising, high-potential "comers" for future leadership at the highest levels.

Only when manufacturers were willing to try such novel approaches to the competitive challenges facing them have they broken loose from the productivity paradox and transformed their production function into a strategic weapon. There is hope for manufacturing in America, but it rests on a different way of managing in this oldest of managerial professions.

As we have seen, our pursuit of productivity is paradoxical: the more we pursue it, the more elusive it becomes. An obsession with cost reduction produces a narrowness of vision and an organizational backlash that work against its underlying purpose. To boost productivity in its fullest sense—that is to unleash a powerful team of people supported by the right technology—we must first let go of old-fashioned productivity as a primary goal. In its place we must set a new, simple but powerful objective for manufacturing: to be competitive.