

Waste not, want not

Converts to the creed of lean manufacturing are discovering that less is more. Simon Caulkin on a corporate strategy that pays dividends - and helps the planet

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Sunday September 8, 2002
The Observer

After Kyoto and Johannesburg, only an idiot would say it was easy to save the planet, wouldn't they? But the dizzying irony is that it is. All the posturing at political level ignores a prosaic truth. Every company in the world would directly benefit - in lower costs and higher profits - by doing its bit for the earth. And it would cost nothing except the energy to shift office furniture or a few machines around the factory floor.

This sounds fantastical. But the most fantastical thing of all is that there is no catch. All it takes is for managers to start tackling the waste in which their companies wallow.

Companies are almost inconceivably wasteful. Most obviously, they directly waste raw materials and energy. Many industrial processes achieve at best 10 per cent efficiency. They also waste vast amounts of time - in most workplaces items of work spend at least 90 per cent of their time waiting or in transit from one work station to the next, and an infinitesimal period being worked on. Naturally, they waste a lot of human effort, too.

But less obviously, all companies actively generate waste - masses of it. One form of self-generated waste is rework - correcting errors that should not have been made in the first place. Another is making things that people don't want to buy - often a function of time wasted upstream in manufacturing so that when products get to market tastes have changed or are out of date. Half of all the books printed in the US are pulped unread. At the same time, many books that people do want to read are out of print and unavailable - yet another kind of waste.

But even less obviously and worse still, all of these conspire to create a nightmare spiral of yet more waste, endlessly feeding on itself - more space, heat, light, people, forklift trucks, conveyors, paperwork and computers to track it, all to deal with stuff that would be better off not being done at all.

Putting this together, at least a quarter, perhaps a half, of all world GDP is wasted. It's uneconomic growth - activity that adds no value and profits no one except perhaps the economists who add it up. And the more that is wasted, the more effort has to go into managing its byproducts and pushing harder against the friction on the flywheel.

Hence the bitching and wrangling over costs and responsibilities at Johannesburg - still more waste that ignores the practical benefit in simply doing existing things better.

Waste on this scale is not a preordained condition of productive activity. It is the treacherous legacy of mass-production techniques and thinking that have long outlived their usefulness.

Ever since Adam Smith and his famous pin-makers, manufacturers have been in thrall to the twin notions of specialisation and economies of scale. They have assumed that the only efficient way to make and process things is by 'batch-and-queue': laying out factories so that parts and assemblies queue up to be processed in high-volume batches on one specialised machine, then queue again to pass on to the next.

Most industrial processes are slaves to this model. So are offices. A routine mortgage approval takes only half an hour of work by three or four people, each crunching a different number - but waiting between the stages adds three weeks. Likewise security screening of schoolteachers. A book takes

months to go from practically instant composition (from disk) through laborious batch printing, binding and distribution before it reaches the bookshop.

Batch production is fine for products that use a few simple processes and parts, and for very long runs of high-volume products - cans of Coke or household goods. But the effort and expense of tracking, managing and moving many parts through more complex systems multiply exponentially. Shorter product lifetimes and changing tastes add to the pressures.

The conventional response has been to fight complexity with complexity - tracking materials with enormous computer systems and processing them on automated multipurpose machines. But the expense is colossal and the results mediocre. The machines are often temperamental and need to run flat out if they are to be economic, while much of the vast computing power used by the world's companies adds nothing whatever to the final product - just huge cost.

But there is an alternative. Suppose instead of batch-and-queue, products can be made to flow continuously one by one from one workstation to the next, without stopping, right through the production process. In that case, two things magically happen. First, since there are no batches, you don't need warehouses to store piles of work-in-progress between each stage, computers to track it, expeditors to ferret for lost parts or orders, or storemen to manhandle stuff around.

Second, and critically, since you're now building the products much faster, you can make them to real customer order, not guesswork. So no wasted production, either.

Better yet, the process is dynamic. Companies adopting these principles discover that just as waste is a vicious circle, eliminating it is joyously self-reinforcing. Because the main change is attitudinal, it is also low-cost - initial changes are often a matter of straightening out the production flow on the shop floor.

And the results are extraordinary. In Lean Thinking, Dan Jones and James Womack suggest that if for a given activity you haven't cut effort and space by half and work-in-progress and production lead times by 90 per cent within a week, you're doing something wrong.

Less is more - and more. Porsche, a near basket case as an old-style manufacturer a decade ago, has driven this route to become one of the most profitable (that is, least wasteful) car manufacturers in the world. Nearer home, of plants shortlisted for Management Today's 2002 manufacturing awards, to be presented in November, all use these principles to a greater or lesser degree.

One factory is so economical and flexible that it can produce dozens of different car wing mirror variants every day in as small or large quantities as required, with little automation or computery. Another cuts the time needed to make a complex electronic product from six weeks to three days. And to repeat, each of these waste savings feeds into others. Another plant will have cut its emissions of greenhouse gases by 60 per cent in two years.

Of course, when companies start stripping out waste, they usually discover that some jobs are surplus, too. But that's not a problem. With a lower cost base and improved responsiveness, they usually find they can cost-effectively manufacture a much wider range of products than they did before, often using the space vacated by non-productive storage.

And remember, in this context, that offices are, if anything, even more wasteful than factories. Bureaucracy is the defining monument to non-value-adding cost.

This means that truly stupendous potential for improving public services lies in removing the entire cost-inflating apparatus of audit, inspection, regulation, rule-devising and target-setting, and instead redeploying people into activities that the public actually wants and can now afford.

In the long term, lean manufacturing needs supplementing with other measures, of course - above all with a radically changed accounting system that prevents companies from externalising their costs

and treating natural inputs as free. Emission-trading mechanisms are a precedent-setting step in that direction, and more will surely follow.

Meanwhile, frugal manufacturing (and management) is self-evidently better than the profligate kind. It buys time, it's available to everyone, and it's free. How hard is that as a decision? Just this once there really is a free lunch. So eat it.

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