

## **Move Your Operations to China? Do some lean math first. – January 2003**

I recently got a phone call from a reporter for The Wall Street Journal with a simple but provocative question: "If you are a manufacturer in a high-wage country such as the U.S., can you ever be lean enough that you don't need to relocate your operations to China?"

The reporter's reasoning was that China has an enormous labour pool in its coastal development zones, with 300 million additional migrants to these areas expected in the next ten years. So labour costs may stay at their current low levels for decades.

He further reasoned that a large fraction of the cost of manufactured goods is ultimately wages (for touch labour plus support staff, managers, and engineers, and the workers designing and making process machinery and extracting and processing raw materials.) He then concluded that no matter how much cost an American or Japanese or German firm removes by getting lean, costs in China (or, if you prefer, India), based on cheap labour, will always be much lower. Hence, "Won't you need to relocate?"

My answer to this simple question was also simple: "Do some math before you move and make sure it's lean math." Here are the items you need to include in your calculation:

Start with the piece part cost for an item where you are.

Compare this with the piece part cost for the same item in China or India (or Vietnam or Poland or...) (It will almost always be much lower.)

Add the cost of slow freight to get it to your customer.

Note that you have now done all the math that many purchasing departments seem to perform. Let's call this mass production math. To get to lean math you need to add some additional costs to piece-part plus slow-freight cost to make the calculation more realistic:

- The overhead costs allocated to production in the high-wage location, which usually don't disappear when production is transferred. Instead they are re-allocated to remaining products, raising their apparent cost.
- The cost of the additional inventory of goods in transit over long distances from the low-wage location to the customer.
- The cost of additional safety stocks to ensure uninterrupted supply.
- The cost of expensive expedited shipments. (You'll need to be careful here because the plan for the part in question typically assumes that there aren't any expediting costs, when a bit of casual empiricism will show that there always are.)
- The cost of warranty claims if the new facility or supplier has a long learning curve.
- The cost of engineer visits or resident engineers to get the process right so the product is made to the correct specification with acceptable quality.

- The cost of senior executive visits to set up the operation or to straighten out relationships with managers and suppliers operating in a different business environment. (Note this may include all manner of payments and considerations, depending on local business practices.)
- The cost of out-of-stocks and lost sales caused by long lead times to obtain the part.
- The cost of remaindered goods or of scrapped stocks, ordered to a long-range forecast and never actually needed.
- The potential cost, if you are using a contract manufacturer in the low-cost location, of your supplier soon becoming your competitor.

This is becoming quite a list - and note that these additional costs are hardly ever visible to the folks in senior management or purchasing who relocate production of an item in a low-wage country based simply on piece-part price plus slow freight. However, lean math requires adding three more costs to be complete:

- Currency risks - which can strike quite suddenly when the currency of either the supplying or receiving country shifts.
- Country risks - which can also emerge very suddenly when the shipping country encounters political instabilities or when there is a political reaction in the receiving country as trade deficits and unemployment emerge as political issues.
- Connectivity costs of many sorts in managing product hand-offs and information flows in highly complex supply chains across long distances in countries with different business practices.

These latter costs are harder to estimate but are sometimes very large. The only thing a manager can know for sure is that they are very low or zero if products are sourced close to the customer rather than across the globe.

If you do the lean math, will it always mean that you don't need to relocate? Absolutely not. For example, if you are planning to sell within high-growth, low-wage markets like China or India you will almost certainly need to locate most or all of your production for those markets within those markets. This is simply because lean math works in the opposite direction as well. Transport, inventory and connectivity costs and country and currency risks are much lower if you produce within the market of sale.

However, in my experience a hard look at the true cost situation will suggest that relocation is not the first line of defence for producers in high-wage countries. Rather it's to get truly serious about a lean transformation through the entire value stream for the product in question.

If you find that you do need to relocate, even after doing lean math and applying the full complement of lean methods, my experience is that moving all of the steps in the value stream for a product to an adjacent location in a low-wage country within the region of sale - Mexico for the U.S., Poland for Germany, and, yes, China for Japan - is likely to provide the lowest total cost.

I'd love to hear your own thoughts and experiences with this question, which has emerged as the largest single issue many managers are wrestling with in high-wage

countries. If you've got some better (leaner!) math please let me know and I will pass it along to the entire Lean Community.

Best regards,

Jim

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