

# LEAN IS \$ NOT CHEAP

*Managing your cost to serve does not mean everything will cost less*

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All photos courtesy Schaffner





**D**rive too quickly past Solothurn, a small Swiss town near the French border, and you might just miss the midrise tower that houses Schaffner, a high-tech precision manufacturer with a global reach. In a world where GEs and Googles display their logos, you probably have never heard of this company, whose low profile emphasizes its focus on the specialized electromagnetic filters the business specializes in.

At Schaffner, brand recognition takes a back seat to the products that are embedded inside things we depend on but do not see. Think car doors, trains, meeting rooms and concert halls. This is a defining characteristic at companies that make up Europe's "hidden champions," a term coined by German author and business leader Hermann Simon. Hidden champions are small to medium-sized enterprises at or near the top of their market, but they are not well-known to the general public.

In 2009, the company's operations had achieved an enviable benchmark. Manufacturing processes had become almost perfectly lean, with lines organized in cells to maximize responsiveness, reducing both setup and throughput times. The resulting flexibility had helped the small company survive the financial crisis and global shifts in demand. However, in spite of textbook factories, both raw material and finished goods were building up without the orders to justify them. Worse, the stockpiles had come to the attention of the CEO, who decried them as "money parked on our shelves, which should be in the bank or reinvested."

Excess inventory and world-class "leanness" do not go together. However, in the drive to target this excess inventory, Schaffner's teams uncovered the revelation that lean does not necessarily mean spending less money and cutting costs to the bone.



## The blame game

Early diagnostics revealed that, upon a closer look, operations were not a picture of Swiss orderliness. Identifying all the players who had a direct or indirect impact on inventory, a research team discovered that departments with little direct contact to stock, like research and development, sales and purchasing, together with logistics and the supply chain teams, all played an unwitting part in the inventory buildup.

Each department adamantly insisted that “the problem” lay elsewhere. Accusations that “the input I get from planning is wrong” were countered by claims like “I have to produce a big batch because purchasing cannot release a smaller minimum order quantity.” Upon which purchasing complained: “I don’t even have a forecast to work with because the communication with sales is not good.” All the while, logistics was demanding bigger batches to fill their sea containers and (logically) lower the cost of air freight.

In this chorus of distress and blame, the managers started seeing that no single department was the culprit, nor was there widespread incompetence or malice. Instead, each department had pursued its own rational, economic logic: Purchasing the minimum order quantities to maintain low transaction costs, logistics pursuing the lowest freight rates, sales maximizing their time with customers instead of spending time in the office or on the shop floor. Ironically, as everyone strived to do the best possible job, when all individual decisions were put together, the company’s performance went down.

Management knew it would be pointless to “command” functional experts to act against instincts and incentives. Faced with the task of breaking down silos, the managers realized that a number of unlikely things would have to occur. The company’s teams would need to take precious time to come together instead of communicating via orders and reports. They would need to understand the logic of other job functions. They would have to reconcile any conflicting objectives between departments in order to negotiate a system optimum, and this would likely add cost to parts of their operations.

A high-cost supply chain is anathema to most managers. Common sense and lean philosophy command us to keep costs down. Yet even lean champions like Schaffner must realize that excellent processes and people do not automatically add up to great business performance.

Why? Viewed from a 10,000-foot perspective, systems tend to settle into this all-too-common scenario: A lean manufacturer working just-in-time with little inventory supplies a factory that is maximizing utilization to reduce cost per unit. They, in turn, ship to a distributor who keeps plenty of finished goods in inventory for good customer service. If each node follows its own strategy, the ascetics will be feeding the gluttons, and something has to give.

Should the distributor not get the goods on time and begin to lose customers, it reacts by over-ordering from the supplier.



These suppliers are lean, so they rush orders and pressure their own suppliers to speed things up. Uncertainty will propagate through the system, driving up inventory, backlogs and expedited shipments as the matching of demand to supply goes out of sync.

When seasons and designs change, everyone is writing off or selling off, and in the firefighting that ensues, a blame game flourishes. The irony is that individual managers are trying to do the right thing, reinforced by logical incentives, which is doubly hard to control since each reaction occurs in different locations, behind organizational walls.

Because the costs hit asynchronously, conventional backward-looking accounting tools do not easily connect the dots. Inventory-driven costs and lost sales may not even be tracked, remaining buried in the balance sheet or booked as revenue variation. Lean management encourages some cross-functional work around the material flow, but waste-hunting tools like value stream mapping do not unearth the conflicting goals of functions and companies within a given network.

## Walking in the other person’s shoes

Schaffner began with the simplest of behavioral exercises: organizing a job swap. This might involve sending a sales manager to visit the planning specialist who has to turn forecasts into operational plans. You could send the logistics manager to the shop floor to see what happens daily with his internal suppliers or the back office.

Because Schaffner’s footprint had spread across the globe, visits like these were not common practice. However, the travel expense paid off as silos began to crumble. Here is what a French manager observed at his internal supplier in the Hungarian plant:

“We saw how difficult their daily jobs were and that they weren’t behaving irrationally. I had always complained to the planning folks about our production, that they often pushed a lot of material on me, but rarely the material I was waiting for, to deliver my customer orders.

“When I went to visit that planning manager, I observed him working with external suppliers and saw with my own

eyes how dependent he was on purchasing to fill his production line, as well as on a sales forecast to predict the future. And because he needed to keep the production line running, he sometimes put in things that were not needed next week but in the following month – simply because he didn't get the raw material in time."

As normal as a lack of visibility between distant Hungarian production lines and a warehouse in France can be, the consequences for the entire organization are serious. It was no surprise to discover that the management objectives of the individual departments were oriented internally and not to a common goal. The functions in the two locations were working at cross-purposes. The next level of diagnosis would prepare the team for its solution search.

### Bringing everyone to the table

In another unusual effort, the stakeholders of Schaffner's supply chain came together physically in one location. Specialists from all organizations invested a week to prototype a redesign of their supply chain. The work was kicked off by playing the beer game: a role-playing distribution game invented in the 1950s by MIT's systems dynamics scientists. This game has such a compelling message that, decades later, Schaffner's participants exclaimed that it was "a fantastic tool."

Game players experienced the typical coordination problems of traditional supply chains, in which information sharing and collaboration are hampered by departmental, enterprise or geographical barriers. In Schaffner's case, often there was some combination of the three. In the heat of play, as inventory levels swung between overstock and back order, players questioned one another's competence and motives. During the debriefing, they learned that these feelings are universal, and that the built-in helplessness, lack of visibility and disappointments create the "bullwhip effect" of boom and bust. Shaken by the simulation, participants conceded that they "saw a lot of similarities with our own operations."

We knew that the natural conflict between departmental interests came from the breakdown of communication. One root cause was the detachment of sales from fulfillment, obscuring the details of customer requirements. The flow of information from planning to purchasing also was not timely, accurate or complete.

After debriefing the beer game, Thailand's production planning manager admitted that she knew that all forecasts she received from Sales Unit A were accurate, whereas the ones from Sales Unit B typically were exaggerated by 20 percent, and those figures from Sales Unit C undershot by 20 percent. Over the years, her experiential learning had routinely led her to adjust the inputs accordingly, without breathing a word of her interventions. Her unspoken distrust released a distorted information signal propagating uncertainty throughout the entire supply chain. Until then, nobody had understood why.



### Negotiating quickly and fairly

Long-overdue dialogue brought relief to this group. Supply chain solutions are too commonly reduced to technical fixes, when in reality they are an exercise in leadership and collaboration.

Using analytics and group-based action, Schaffner's factions negotiated the individual concessions necessary to balance their system. This especially helped those who had to "foot the bill" for the team. Operations always need assets (inventory and capacity) to make sales, so indiscriminate cost-cutting can suboptimize a system. Inventory is a form of insurance against uncertain demand, which requires statistical methods to compute how much is worth keeping, weighed against the cost of stock-outs. Because this stockpile may not always look "lean," companies must be wary of using the lean metaphor as a universal criterion.

Some best practices initially add cost to the "leanest" option, with payoffs looking very theoretical. A famous example helps illustrate this. Although the value of postponement seems obvious today, when Hewlett-Packard first replaced a printer's built-in power supply with external, localized units, the compromises were daunting. Its proud R&D department was loathe to take the power supply out of the branded casing, subtracting several cents from an already thin margin.

Manufacturing had to trust a logistics service provider to complete the final step of assembly in outside facilities, a dubious privilege that also came at a charge. Marketing executives had to live with a bulky external power supply under the user's feet, while competitors offered sleek models. Although the benefit of no longer having to forecast unit demand in every country is today the stuff of business school lectures, the early pioneers clocked lengthy negotiations to reset the local cost targets.

Schaffner launched its own negotiations by establishing a common picture of what was happening and drew the way order information flowed between departments. Traditional, sequential meetings (with their never-ending discussions) never would have gotten the stakeholders to a speedy consensus.

Instead, officials divided purchasing, research and development, production, sales, planning and stock management among five cross-functional teams and assigned each group the task of drafting one process. The R&D process team, for example, convened experts from sales, purchasing and planning to contribute to a topic that R&D normally never would address. That was done face-to-face, without handoffs or delays.

In the work sessions, a number of design and productivity tools were deployed to ensure that all team members engaged, even the “shy” ones, while minimizing time-consuming arguments. These methods included rapid prototyping, silent brainstorming, and affinity diagramming.

What they soon nicknamed “write-storming” was an alternative to the traditional brainstorming techniques, where only the extroverted and more articulate team members tend to take command. Everyone took 10 minutes to write down their ideas on Post-it notes and then stuck them on a board without a signature. In this way, all the ideas could be considered equally, grouped into common themes, and then voted on for further development.

This allowed each stakeholder to influence the outcomes, drawing on the collective intelligence in the room, both technical and organizational. Rounds of silent voting were repeated until the prototypes arrived at a solution acceptable to all. In the words of one of the participants: “This form of working was much faster and less stressful than discussing all that complexity in a group. It was remarkable how quickly we were able to arrive at a common solution, without resentment or bitterness.” Solution search and buy-in were wrapped up in one go.

## Technology is no substitute for leadership

To everyone’s surprise, the most pressing changes turned out to be behavioral. Technical improvements were not their first answer, although early expectations persisted that the new SAP system would untangle their information.

The unspoken hope that the new ERP system would solve all of the company’s problems posed a risk, since it removed pressure from individuals to reach out and talk to one another. Fortunately, the company’s chief information officer – who together with the chief operations officer, participated in the workshop – made clear that SAP only can support the ways that people already work. Technology will not reduce a colleague’s distrust of a forecast. In fact, it may actually aggravate its consequences.

In the end, the majority of their action items involved better communication between departments. For example, sales reps were encouraged to overcome their perception of fulfillment teams as unresponsive to customer needs and appreciate the importance of submitting a good forecast in time. This would help the back end finish and deliver the goods as requested.

What until then had been annoying paperwork distracting them from the “real” work of selling became the key to making revenue targets. To review the order funnel, a biweekly forecast meeting between operations, sales, planning and purchasing teams was launched. None of these departments had previously met or worked together on a regular basis.

## The hidden overspend

The stakeholders challenged another key assumption: Provide the same service level to all customers.

Because the motto “each customer is king” sounds like a commitment to excellence, the company had worked hard to provide all customers with 100 percent product availability. Once confronted with mathematical proof that inventory availability trades off asymptotically with cost, company officials realized how expensive good intentions could be, along with how easily an incautious deal could become a loss-maker and deprive more profitable orders of precious capacity.

The teams began to map sales against profitability and service levels. In an extreme case, they discovered that the safety stock levels for one of their top 10 customers was actually lower than the availability they were guaranteeing to a much smaller customer.

With new rules, the teams sought robust ways to set future inventory targets. They worked with a scientific method that computed availability as a function of the uncertainties in the system, like supplier reliability and forecast error, as shown in the equation below.

### Safety stock inventory:

$$SS = k \sqrt{\underbrace{\mu^2 * s^2}_{\text{Supplier LT variability protection}} + \underbrace{(L + R) * \sigma^2}_{\text{Forecast error protection}}}$$

Most business processes and IT systems work with average values that do not account for uncertainty (measured by standard deviations), which falsifies target levels over time. Schaffner’s teams discovered that if a supplier typically takes three days plus or minus two days to replenish a material, the company would need considerably more safety stock than if another supplier could reliably take two days every single time. Most global operations can tweak these two factors by working with suppliers and sales teams.

Schaffner’s statistical analysis (done with a spreadsheet) showed how much stock for bigger customers was justified, as well as where reallocation made sense for the business. In this way, traditional rules of thumb for stock-setting matured into the collaborative management of the company’s cost to serve.



## Keep beer flowing cheaply

Since its invention at MIT, the beer distribution game has been used in countless organizations to give participants an idea that sometimes it's the system, not the people within, that set organizations up for failure.

Each team is divided into four functions: retailer, wholesaler, distributor and brewer. Each team aims to minimize operating costs, and penalties come with excess inventory and back orders.

Both MIT's Sloan School of Management and ETH Zurich in Switzerland use the game to kick off their MBA programs. Many alumni recall that their results were a shock initiation into system dynamics. *MIT Technology Review* carried an excellent summary of a recent class initiation in its November/December 2013 issue available at <http://bit.ly/1ph358U>.



Sales and operations began to define acceptable levels of service to customers, maximizing profitability and strategic growth, then allocating the company's fulfillment resources accordingly. Initially differentiated service levels seemed to fly in the face of good sales practice, but with experience, it enabled more profitable operations in volatile markets.

In contrast, conventional balanced scorecards reflect the interests of a single entity. Since they are snapshots of arithmetic sums, they do not account for uncertainty, and the most elegant quadrants cannot manage counter-intuitive trade-offs. We should be wary of the single-minded pursuit of any 100 percent benchmark.

At Schaffner, the global logistics director emphasized that only statistical scenario analysis, over multiple nodes, will tell whether it pays off to pay more.

Take air freight, for example, which most people try to avoid at all costs. It may be leaner to ship by air than it would be by "cheap" sea freight if the quicker deliveries assure service levels for key customers. If you selectively ship by air between Asia and Europe, you may need less raw material stock in production. This causes you to manage your supplier differently, have fewer goods in transit (It is 40 days door-to-door between Asia and Schaffner's European Logistics Center.) and, finally, less finished goods in stock.

All these positive effects add up, even if the individual metrics may not look perfect.

## Lean does not mean cheap

It takes strong nerves and data to sell the local "underperformance" to the broader organization. It helped that, typical for many of Europe's hidden champions, Schaffner's CEO was a trained engineer with a firm grasp of analytics.

Under the leadership of its supply chain teams, what originally began as a project to tame rogue inventory had transformed a company that long ago had mastered the principles of lean. After a week of collaborative work, the company's global operations had established the principle that managing the company's "cost to serve" is not always about making everything cost less.

Schaffner and other organizations that take the lean journey must keep mindful of this important concept: In the end-to-end supply chain, lean does not always mean cheap. In supply chains, it is critical that you do not manage only by cutting costs at the local level. Schaffner modeled its entire system, not just one factory. You need to keep stock to serve customers in time, which inevitably costs money, and this actually can be lean without being low cost. ❖

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