

Virtuous Connections

by Richard Verity and Chris McNally

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A fine-tuned supply chain is more than the sum of its parts. Ideally, each link improves the next.

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When Roy West (not his real name) was offered the job of European supply chain manager of the lacquer division of a major multinational chemical company (call it Chem One Lacquers), he was hesitant to accept the position. As a veteran manager in that company, he knew well that the division's supply chain, taken as a whole, was far from desirable. In fact, there were three separate supply chains, each serving a distinct business line, feeding more than 30,000 products to 10,000 customers. These included massive automotive plants in Germany's Ruhr region at one end of the scale and family-run consumer outlets at the other. There were two main manufacturing plants, both in northern Europe, and at least half a dozen smaller facilities scattered throughout the continent. As many as 70 warehouses or points of distribution were on line, employing 700 people.

With such a complex and unwieldy system, it was little surprise that Chem One's supply chain costs had risen 12 percent annually between 2005 and 2007. During that same period, inventory days had climbed by more than 50 percent and the company had consistently failed to meet delivery deadlines. Customers regularly complained of poor service, and industry benchmarks indicated that they

were right.

Certainly, there had been well-intentioned attempts to fix the supply chain. Some had even delivered a modicum of improvement. For example, one patch had standardized the dimensions of pallets throughout the company's European operations, making it possible to load trucks fully and relatively efficiently, and minimizing freight rates per ton. But this initiative, like a few others put into practice, was so focused on a narrow aspect of the supply chain that it failed to alter overall performance.

Another potential solution had been broader in scope. Around 2005, Chem One had installed a system-wide network to track supply chain activities. But management had miscalculated the number and range of the company's manufacturing and logistics channels, and the network proved incapable of coping with the volume of incoming orders. Consequently, inventory built up, trucks regularly formed in long queues, and customers often wondered when they would receive their product. To take pressure off the system, the company decided to outsource warehousing to a third party — but the network's software could not communicate with the programs in the warehouses. The result: in one case, shipments of single containers of lacquer, each shrink-wrapped to a full-size pallet.

Examining the minimal impact

of these past efforts on overall supply chain performance, West came to a radical realization, something that he had never considered fully before. Every supply chain is composed of a set of virtuous or vicious circles; deficiencies in one area cause or reinforce weaknesses in other parts of the chain. This notion, that a supply chain will fail to demonstrate significant and sustainable system-wide improvements from staggered initiatives, offered a new way of looking at a supply chain — as an integrated whole, not as a set of individualized and independent processes. To put it another way, a supply chain is deftly calibrated only to the extent that each part of the chain triggers a virtuous circle in the next.

West began to implement this unorthodox concept by tackling Chem One's customer segmentation problem. At that time, the

then became “rush” orders themselves, perpetuating planning instability and suboptimal manufacturing. Service levels declined, and costs increased.

To mitigate this situation, West and his team dug deep into Chem One's sales records, analyzing each customer by its size, needs (for example, did it have a just-in-time system?), and strategic importance to Chem One, along with a few other variables. After this assessment and discussions with salespeople in the field, the team gave each customer a priority code. This code, in turn, dictated how its Chem One customer service representative would respond to its requests for rushed or changed orders. Immediately, unplanned deliveries were reduced significantly and customers were given a more realistic picture of product availability and shipment schedules.

eries and product shortages. These processes had overridden the automatic system, wreaking havoc with Chem One's manufacturing schedules. By eliminating these rogue systems, West was able to shift special ordering questions back to customer sales representatives, who could use their new segmentation programs to make smart decisions.

After cleaning up sales and ordering procedures in the supply chain, West had a relatively uncluttered pathway for improving production scheduling. Typically, manufacturing timetables had been based not on the capacity of the factory but on demand forecasts by salespeople. That had led to unrealistic schedules that did not take into account the time, resources, and plant space needed to make more complex items. To alter this inefficient approach, West implemented a system that included risk constraints — for example, the number of batches of lacquer that could be manufactured in a week was determined by whether the order contained one, 10, or 20 viscosity types. If the risk constraint was reached, the factory could not be scheduled to manufacture any more product unless management added another shift of workers. By adding this improvement to the other supply chain fixes already under way, Chem One could offer a higher level of shipment predictability. In turn, Chem One's customers became more confident in the company's ability to deliver on time and stopped making unreasonable demands, relaxing the supply chain still further.

This was just the beginning — in large part because Chem One's supply chain is an extremely wide-ranging and intricate network. West

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company didn't prioritize its customers. Good customers, bad customers — large, small, loyal, or intermittent — all were equally important. If any of them asked for a product with rush delivery, Chem One's service representatives would simply agree to it, without first considering the cost or the value to their own company. These rush orders upset the planning schedule and required manufacturing to shorten its production runs. The orders that had been delayed as a result of these sudden changes

That small fix led to another that was also related to orders and shipments. Chem One had always been proud of its automatic inventory system, which refilled warehouse shelves in an orderly fashion as product levels declined, ensuring that there was always more than enough — rather than just enough — product on hand to move out quickly as customers needed it. But in some warehouses, sales teams had developed rogue stock replenishment processes, hoping to protect their customers from delayed deliv-

went on to attack several long-running and seemingly intractable problems, orchestrating a set of solutions that ultimately simplified Chem One's product line, reorganized its ordering procedures, and introduced a series of lean manufacturing procedures into the factories. The payback from these efforts was substantial, by all the most critical measures: Inventory on hand is down by 20 percent, to its lowest level in three years; shipment costs per ton are stable, even in a period of rising fuel prices; and stockouts have fallen by 50 percent.

Perhaps the most intriguing outcome of Chem One's holistic supply chain initiative is that the resulting improvements and cost savings were far above the initial expectations. Although West and his team implicitly understood the potential influence of the virtuous circle concept on supply chain performance, they nonetheless forecast gains based on expected, discrete improvements in each individual aspect of the supply chain and ignored their carryover impact on subsequent links. In fact, the gains were exponential. And those gains demonstrated clearly that connecting the silos within an organization — particularly within a sprawling structure like a multinational's supply chain — can produce tipping points that drive efficiency and generate cost savings in parts of the network that at first appear to have little direct bearing on one another.

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