COSCO leverages supply chain insights to keep its distribution center network in balance

Overview

The Need
Shipping giant COSCO needed a way to optimize the deployment of its sprawling distribution center resources, while maintaining high service levels.

The Solution
COSCO engaged IBM Global Business Services to help it optimize the number and placement of facilities in its distribution network, thus enabling more efficient and sustainable logistics processes.

What Makes it Smarter
Business insights uncovered through advanced algorithms guided COSCO's efforts to realign its worldwide distribution network, resulting in leaner inventory management, more efficient loading practices and optimized route planning.

The Result
"We see the work we've done with IBM to optimize our supply chain as a 'win-win' proposition."

– Dalei Huang, chief technology officer, COSCO e-Logistics

In the international transportation business, China Ocean Shipping Company (COSCO) is a conglomerate in the truest sense of the word, with operations that span nearly every sector of the transport value chain. In the global shipping boom that marked the last decade, COSCO (www.cosco.com.cn) was one of the industry's big winners, becoming China's largest and the world's second largest shipping company in terms of capacity. In addition to growth, COSCO's story is also one of evolution, with the company expanding its focus from core shipping activities into higher value logistics services, such as warehousing, supply chain management and port services.

COSCO saw its transformation into a comprehensive logistics company as a way to strengthen its global competitiveness. At the same time, COSCO realized that its increased focus on logistics services requires the company to conform to a more complex set of operational demands. Like the shipping business, the profitability of logistics services is driven fundamentally by efficiency and service-level performance. What distinguishes logistics services from shipping, however, is the sheer number and complexity of the operational parameters that ultimately drive efficiency. At their most basic, COSCO's logistics services manage the flow of goods from suppliers, through its network of distribution centers, to market end-points such as retailers. Within this network, optimal efficiency is achieved by configuring distribution centers and shipping routes in a way that minimizes supply chain costs while still meeting customer service expectations. In short, it is about striking a delicate balance. For COSCO, this represented a major challenge.

Restoring balance

To augment the growth of its logistics business and expand its customer base, COSCO had acquired other logistics service providers. While these acquisitions strengthened its market position, they also resulted in COSCO inheriting a number of redundant facilities and shipping routes, thus disrupting the balance of COSCO's logistics network and directly affecting the bottom line. Key performance indicators most affected by this imbalance were inventory costs,

Business Benefits

- Reduction in distribution centers from 100 to 40 with no impact on service quality
- 23 percent reduction in logistics costs through leaner inventory management, more efficient loading practices and optimized route planning
- 15 percent reduction in CO_2 emissions
- Increased competitive differentiation through carbon footprint visibility
- Adherence to COSCO's strong corporate social responsibility standards

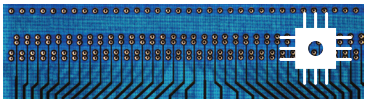
transportation costs and truckload rates. COSCO realized that to sustain both growth and profitability, it needed to bring its logistics network back into balance by rationalizing it and thus lowering its supply chain costs.

In addition to the business case for change, COSCO was also strongly motivated by concerns for corporate social responsibility. As a member of the United Nations Global Compact, COSCO has long put its support for sustainable and socially responsible policies into practice, most markedly by improving the fuel efficiency of its vessels. COSCO saw the optimization of its logistics network as a way to not only strengthen its business, but also put in place the most environmentally sustainable practices. To advance this initiative, COSCO judged IBM as uniquely capable of bringing together the proven tools, expertise and methodologies to optimize the supply chain on both levels.

COSCO saw the most compelling value proposition as the IBM Supply Chain Network Optimization Workbench (SNOW) solution, an analytical framework developed by IBM Research China that uses advanced algorithms to provide data-driven guidance on all facets of supply-chain strategy. Used by IBM within its own integrated supply chain and delivered by IBM Global Business Services as a consulting service, SNOW combines advanced business modeling techniques with real data input from across the supply chain. Conceptually, SNOW represents the supply chain as a series of nodes, or activity points, connected by links, which represent business process or logistical dependencies.

To best understand how COSCO leveraged SNOW, picture a cluster of distribution centers in the middle of the supply chain, with suppliers sending product upstream and customers receiving product downstream. COSCO's fundamental business problem—and the goal of its optimization effort—is figuring out how many distribution centers it needs to have and where they need to be located. Getting to this

Smarter Logistics: Supply chain insights lead to optimized distribution



Instrumented

SNOW combines advanced business modeling techniques with real data input from across the supply chain.

Interconnected

SNOW integrates data from COSCO's entire distribution network.

Intelligent

SNOW employs advanced algorithms to determine the location and customer alignment of its distribution centers.

Solution Components

Software
- IBM Supply Chain Network Optimization Workbench (SNOW)

Services
- IBM Global Business Services

IBM Research
- IBM Supply Chain Network Optimization Workbench (SNOW)

knowledge requires COSCO to factor in business intelligence from both upstream and downstream sources simultaneously, and do so at a highly granular level. This means, for example, taking into account not only the location of raw materials and component suppliers in the chain, but also the details of their production plans. It means factoring in the processing capacity of each distribution center, as well as demand-side forecasts from customers. Finally, the SNOW methodology also takes into account the distances between each point in the supply chain and the associated costs (such as fuel) for different modes of transport (ocean shipping, air or trucking).

SNOW also reflects the fact that in supply-chain optimization, customer expectations of service performance are arguably the most important variable to factor in. As such, the inherent goal of SNOW is to provide the highest possible service levels, while maximizing the underlying cost and energy efficiency of the supply chain. To achieve this maximum service level, SNOW's algorithms also determine which customers should be served by each distribution center. This process, known as service territory alignment, also factors in both transportation costs and underlying carbon emissions.

As a result of the three-month engagement, IBM Global Business Services helped COSCO formulate a plan to consolidate its distribution centers from 100 to 40—without impacting service quality. Acting on the recommendations of the IBM SNOW engagement, COSCO was able to lower its logistics costs by 23 percent, the result of leaner inventory management, more efficient loading practices and optimized route planning. Just as important, COSCO's supply-chain realignment reduced the company's CO_2 emissions by 15 percent, largely as a result of reduced fuel consumption. That translates into 100,000 tons of CO_2 emissions annually that don't get released into the atmosphere. Going forward, COSCO can use the "what if" capabilities of SNOW to determine the cost and CO_2 implications of future decisions related to network expansion.

"IBM is unique in its ability to combine the delivery capabilities of IBM Global Business Services with the solution development capabilities of IBM Research. We saw IBM's use of [SNOW] in its own supply chain as a strong vote of confidence."

– Dalei Huang

Making the footprint transparent

COSCO expects the competitive impact of its SNOW initiative to extend beyond its lower supply chain costs. That's because more and more customers are demanding that their suppliers—and logistics providers—document their carbon footprint as a condition for earning their business. The fact that COSCO has this visibility represents a competitive advantage that the company expects to grow over time. Dalei Huang, chief technology officer of COSCO e-Logistics, sees the company's SNOW initiative as an expression of its corporate values, its commitment to high-quality service and its desire to stay ahead of the competition. "We see the work we've done with IBM to optimize our supply chain as a 'win-win' proposition," says Mr. Huang. "We are now stronger competitively and even better able to meet our goal of corporate social responsibility as we grow as a business."

For more information

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