Industry Watch: *Case Study*

Eli Lilly: Supporting Product Lifecycles with Supply Chain Management

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By Shoshanah Cohen and Joseph Roussel

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Eli Lilly is one of the world's leading pharmaceutical companies. With $11 billion in revenues, it markets its products in 159 countries, and has 43,000 employees. The Indianapolis-based company creates pharmaceutical products that treat a broad range of ailments, including depression, schizophrenia, cancer, and osteoporosis.

Lilly is committed to product innovation, spending about 19% of its annual revenue, or $2 billion, on research and development every year. The high risk and enormous expense of inventing, developing, and testing pharmaceutical products mean that companies in the industry often depend on just one or two flagship products for the bulk of their income. When the patent for those products expires, the financial consequences can be profound.

Lilly suffered a potentially devastating setback when a judge unexpectedly ruled in 2000 that the company's patent on Prozac, a classic blockbuster that made up over 20% of sales, would expire in 2001—three years earlier than expected. Within six months, generic competitors had siphoned off more than half of Prozac's sales.

In anticipation of this possibility, Lilly turbocharged its R&D efforts during the late 1990s. Today, the company has what is widely acknowledged as the industry's strongest pipeline, with products in every stage of development—from early-stage molecules through late-stage clinical trials. Lilly's ambitious plans for the future include launching two to four new products per year over the next several years, and doubling sales revenue.

To deal with this growth and to accommodate new manufacturing technologies, the pharmaceutical giant will nearly double the number of manufacturing locations in its supply chains. And more third-party manufacturing operations will be incorporated into the mix. Its registration strategy will have multiple manufacturing locations supplying each marketplace to enhance flexibility and reliability and manage capital investment.

Explains Ken Thomas, Director of Manufacturing Strategy and Supply Chain Projects, "With three times as many products, twice as many manufacturing sites, and far greater sourcing complexity, the real supply chain challenge for us is just managing the unbelievable complexity of the business."

Life-saving Medicines and the High Cost of Missing a Sale

Pharmaceutical companies take a different approach to supply chain management. "Too much inventory" is not a meaningful term to use when people's lives are at stake. In many industries, the cost of goods sold is high relative to price, so gross margins are relatively low. As a result, companies tend to focus on controlling supply chain costs by minimizing inventory levels and improving efficiency. Missing a few sales can be less important than managing inventory levels overall. In the

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pharmaceutical industry, it's different: People's lives and health depend on an uninterrupted supply of medicine. Disrupting patients' lives by missing a sale is simply unacceptable. Financially, missing a pharmaceutical sale is bad business. The cost of goods sold is low relative to price, so gross margins can be comparatively large—the income of the few successful research products is the only financial stream feeding the R&D engine. A new blockbuster product can generate millions of dollars in sales in just a few months, and, at peak, sales may amount to as much as $10 million of income per month. Thus, even short-lived supply problems are considered very seriously. This is why Lilly focuses its supply chain management efforts primarily on never missing a sale and only secondarily on keeping inventory levels low.

This is not to say that inventory levels don't matter. Expired products are costly. So is squandering manufacturing capacity on low-demand, low-margin products. As a result, accurate forecasting and demand management are critical to Lilly's supply chain operations. The company consequently takes a global approach to supply chain management—especially given its aggressive growth plans. Explains Stephan Bancel, Executive Director of Global Manufacturing Strategy, Global Supply Chain, and U.S. Distribution, "If we want to scale this company, we have no choice but to have common, global processes."

Standardized Global Processes

During the 1980s and 1990s, each site planned and scheduled its own operation with a focus on optimizing local results. This approach didn't recognize the additional efficiency and productivity that could be gained from a global supply chain focus—especially as the business grew larger and more complex. Consequently, in 1997, Lilly began developing global supply chain management capabilities with standardized processes, metrics, and terminology throughout the world, capturing this knowledge in its Operational Standards Supply Chain Excellence (OSSCE) program. As a part of OSSCE standards, for example, market affiliates and plants are graded on their adherence to these standards. This standardized approach means that the activities required to convert raw materials into final products that are distributed to customers are planned and scheduled in the same way around the world.

Additionally, Lilly has put in place a series of manufacturing networks—groups of plants with standard equipment and processes geared to specific product types, such as dry products, freeze-dried products, and parenteral products. As a result, development of processes prior to the launch of a new product is consistent from product to product. Each new drug being developed fits within an established "toolkit" environment. This approach saves millions of dollars each year, while boosting productivity and efficiency. It also results in greater security because redundant facilities can back each other up.

Common processes also help demand forecasting—a critical element of Lilly's never-miss-a-sale approach. The company's global demand management center is the link between sales, marketing, and manufacturing around the world. The center owns the forecasting processes and tools and ensures that the 159 marketing affiliates around the world deliver accurate forecasts to manufacturing. All plants use Manugistics' web-enabled global planning system.

> A supply chain steward acts as a liaison between the product team and the supply chain

Other companies may predict demand accurately in a particular country or region, but Lilly has established truly global precision. Overall, the company forecasts demand with 76% accuracy and in the U.S. that figure soars to 90%. What is the key to this capability? Notes Allison Leer, Manager of Global Demand Management, "We have extremely good, experienced people working in this area, who stay on the job forever." Well-documented processes, good training materials, and sound practices supplement the group's expertise. Vigilance helps, too. Forecast accuracy is measured monthly. If a market submits an errant or incomplete forecast, someone calls to find out why.

Launching New Products

Bancel led an effort over the past few years to look at the full contribution of supply chain

management to business success. As he describes it, this meant focusing on supply chain design first and operations second. By designing the supply chain during development, and not afterward, the company could support regulatory requirements. It could balance the risk of clinical failure with speed to market and enable a robust and responsive supply after launch.

Lilly spends about 19% of its annual revenue on R&D

Another major concern was supply chain optimization. Lilly decided to maximize the value of manufacturing by selecting the best product mix for its networks. It also determined to explore contract manufacturing whenever it could enhance revenue.

Lilly's supply chain management efforts start well before the launch of a new product, about four years before supply chain design is begun, according to Bancel. About one year before Lilly submits a new product to the Food and Drug Administration (FDA) for approval, a global launch leader is assigned to the case. The launch leader's job is to maximize long-term margins during the very critical early days of the launch by determining the global sequence of the release and creating an integrated launch plan for all aspects of the launch—including product flow, label approval, and sales force training.

During the same period of time, the supply chain management team starts planning for the new product, answering such questions as when and where to make the new product and how to get it to wholesalers and retailers—all with an eye toward the long-term success of the new product while optimizing manufacturing and distribution. The launch leader integrates the manufacturing and supply chain plans and aligns them with plans from the marketing, sales, clinical, and regulatory departments.

Despite these measures, there's always uncertainty around a new product launch. Lilly always prepares to accommodate the "upside forecast," but when a drug is much more popular than expected, finding extra manufacturing capacity or making other arrangements can take some creativity. For instance, when demand in Europe for Cialis—a treatment for erectile dysfunction—exceeded Lilly's upside forecast, the company delayed introducing the drug in some countries to ensure that initial supplies were adequate where launch had already been initiated.

Optimizing Capacity

Lilly has a corporate group that provides global supply chain management across the company. The group works with local sites to help optimize global capacity and inventory allocation by determining what product will be made where and for which markets. This often means making short-term sourcing changes within a framework provided by the Strategic Facilities Planning Team, which, in turn, makes long-term sourcing and capacity decisions. Since it takes somewhere between two and five years to bring on new capacity, Lilly must make the best use of the capacity it has at any given time.

Because of its standardized manufacturing processes, Lilly can optimize capacity by shifting work among plants. If the Spanish plant is making a particular product at 90% capacity, whereas the Indianapolis and U.K. factories are only at 60%, the company can distribute part of that work to other plants in the manufacturing network.

Taking work away from plants can be a concern for plant managers because they are judged in part on their production levels. However, ongoing efforts by the corporate supply chain management group are helping people to realize that such production shifts are for the greater good of the company. "We bring our manufacturing management together monthly to review and approve how some moves can benefit the organization as a whole, even though they may cause a temporary 'adverse variance in a single plant,'" explains Jon Rucker, Director of Supply Chain. "It's a consensus-driven exercise. All the plants are involved in optimizing global capacity in the two- to five-year horizon."

Organizational Change

The central supply chain management group makes business decisions as well as manufacturing decisions. For example, it may make sense from a manufacturing standpoint to discontinue an old, off-patent drug that takes up valuable capacity that could be better used for a more profitable

product. From a business standpoint, though, the legacy drug may be an integral part of a product portfolio for a therapeutic need that patients rely on. Some products are more valuable than the bottom line indicates. Gaining this degree of insight means looking beyond the manufacturing function.

During the late 1990s, Lilly set up an organizational structure of global product teams to enhance speed-to-market capabilities. Product teams are cross-functional teams of development, medical, clinical, marketing, and regulatory staff who focus on a single product. The team creates a global, integrated plan for the product over its entire lifecycle, including new indications, line extensions, and marketing programs. A supply chain steward, acting as a liaison between the product team and the supply chain, interprets and translates that plan into supply chain tactics and targets. In this way, widely dispersed manufacturing units around the world are provided with very clear objectives that align precisely with the global marketing strategy for every product.

Lilly is also making the transition to running the manufacturing organization globally instead of regionally or locally. Until recently, the company created short-term materials requirements planning (MRP) plans at each site, and attempted to reconcile the plans using supply chain models designed for single products. After experiencing a number of challenges for which this approach was clearly insufficient, Lilly realized that the only way to resolve them was to optimize networks of sites instead of individual sites, and to optimize families of products instead of single products. To this end, the company created a global sales and operations planning (GS&OP) process and model that create one long-term plan per manufacturing network. Once approved, the plan provides input to the site GS&OP process.

Each site reconciles the long-term global network view with short-term local demand and supply signals. The goal is to optimize capacity and inventory across the network of plant sites and the supply chains while ensuring an uninterrupted supply of medicine. Lilly believes the only way to do this is with GS&OP.

Of course, managing complex global operations is easier with integrated information systems. In the 1980s and 1990s, Lilly had a wide range of computer systems throughout its local and regional branches. Today, the company is in the midst of a global ERP rollout to all manufacturing sites and most of the major sales offices as well. This will allow managers to see production plans, sales forecasts, inventory levels, and capacity utilization across the enterprise. Until that rollout is complete, however, pulling together the performance data needed for global supply chain management is a major undertaking.

If the past is any indication, Lilly will continue to improve its supply chain management organization and capabilities in response to changing market conditions. The company's supply chain management structure has gone through three different organizational forms in the last four years, a continuous evolution to better align the structure with business needs. The company believes that this ongoing alignment is the key to supply chain management in the pharmaceutical industry.

Note: This profile is excerpted from *Strategic Supply Chain Management: The 5 Disciplines for Top Performance* (McGraw-Hill, August 2004), by PRTM directors Shoshanah Cohen and Joseph Roussel.

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