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Shrink Your Inventory Costs

And Make Your Staff Happier

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Shire's process development department recently overhauled its inventory system. The result was a projected five-year net benefit of over US$1.5 million and an immediate increase in its scientists' productivity and satisfaction.

Hiding in Plain Sight

We asked one of our scientists why he kept 12 cases of gloves on his laboratory bench. "I use a lot of them," he told us. "I don't want to run out." When asked how long his supply would last, he replied, "I don't know. But when I get to 11 cases, I'll reorder." As a chemical engineer, he develops and scales up bioprocesses for transfer to manufacturing. That was his focus, not his gloves. So he ensured that he always had enough of them.

Understanding and respecting that scientist's viewpoint gave us insight into how to solve our inventory problem. It was a problem that would be exacerbated when the process development department moved in 2012 from the company's facility in Cambridge, MA, to a newly built facility in Lexington, MA. Indeed, when we arrived at the new structure, the stockpiles of supplies we brought with us — from pipettes to chemicals to bags — hardly fit into the building.

The Root of the Problem: In Cambridge, our laboratories had been physically isolated and managed independently. More than 100 scientists ordered their own materials. There were no economies of scale, and there was little to no tracking or sharing of stock. We did not realize the size of the problem until we arrived at the new facility with our collective mountain of stock. The new building featured a progressive, open structure with glass facades, and its layout was designed for just-in-time (JIT) inventory with limited storage space.

Our state-of-the-art building required a state-of-the-art infrastructure for managing laboratory operations. We launched an initiative to completely restructure our inventory system to save space and money, and enable our scientists to focus on their work — not on their "stuff."

A Project Management Approach

We took a comprehensive project management approach. For each laboratory, we launched a thorough

Product Focus: All biologics

Who Should Read: Chief executives, chief operating officers

Keywords: Inventory, facility planning, laboratory design

Level: Intermediate

Do You Need to Retool Your Inventory System?

Here are starter questions to help you adjudicate your inventory system:

What stock do you have now?

What stock are you using now?

Who uses the stock?

What are the current storage locations of the stock?

What are the current usage locations of the stock?

How much do you generally order at a time and why?

What is the lead time on each inventory item?

What is the burn rate for each inventory item?

What is the process you use to order stock, and how long does it take you?

evaluation of its stocking and replenishment requirements. That was followed by data-driven analysis of how best to meet those requirements.

Business Goals and Project Components: Our goal was to decrease spending while increasing productivity. Specifically, that meant that our organization had to

- reduce annual inventory costs
- reduce time and resources needed to manage inventory
- increase inventory visibility to enable better control.

We focused on three components:

- common consumables and chemicals (e.g., gloves, paper towels, pH buffers, conical tubes, pipette tips, and sodium chloride), which our labs typically use in day-to-day operations
- bulk consumables (e.g., disposable bags and cell culture media), which are generally high-priced, long-lead items that take up much warehouse space
- an enhanced inventory management program.

Preliminary Fact Finding

Before making changes, we first needed to know our starting point. How did our staff actually order, store, and use materials? What stock did they buy and from which vendors? How much time did employees spend ordering, retrieving, and managing supplies?

Because each laboratory had not been systematically tracking its own inventory, the information we gleaned was incomplete but invaluable:

- Altogether, our labs were buying chemicals from more than 100 different vendors.
- Collectively, our scientists spent over 2,400 hours per year placing orders and managing inventory, which surpasses a full-time equivalent (FTE) in combined working hours.
- We were "donating" an average of $100,000 per year in expired or excess supplies, which cost both money and valuable warehouse space.

Pilot Program

We aimed to create an inventory replenishment system based in stand-alone stockrooms to free up laboratory space. But first, we needed to look more deeply into the needs of individual scientists. We interviewed laboratory personnel and captured their response data on spreadsheets. Sample questions included the following: What materials do you want managed through an inventory replenishment program? How much do you want available on hand? What is the reorder quantity below which you never want to drop?

We then launched a Kanban-style manual inventory replenishment system for about 15 commonly used consumables (e.g., gloves and pipettes) as a pilot program. An in-house laboratory service group regularly checked nine storage areas that had been built into three floors of the new facility. When they saw a shelf that someone had flagged for restocking, they replaced the supplies.

The program was a success. Our company researchers were happy not to have to order items themselves but be able to pick them up as needed.

Scalability: The inventory system worked well for 15 items, but it was not scalable. Our staff used more than 1,000 different supplies, and they needed them closer to their laboratories for quick retrieval and optimal productivity. For the supply of chemicals, a physical inventory check was a snapshot in time that changed as soon as it was done. That had implications for regulatory compliance.

Our solution to the problem was to eliminate manual inventory management. We needed a computer-automated system.

Choosing a Vendor-Managed Inventory System

When we explored managing inventory in house, we confirmed our hypothesis that enterprise resource planning applications would be too expensive, would require more overhead than we could obtain at the time, and would take too many resources (personnel and financial) to implement and sustain. So that was not a viable option for our team. We needed to outsource.

Selecting a vendor-managed inventory (VMI) provider was a strategic initiative. We sought to partner with a company that could provide the services we needed as well as deliver cost management opportunities. The VMI provider we ultimately chose fulfilled our defined requirements based on an initial investigation and the outcome of our pilot program. Our primary requirements are described below.

Full-Spectrum Inventory Management: A VMI vendor should be able to take over every aspect of inventory management. Capabilities needed to include not only tracking and replenishing, but also

- ordering supplies
- selecting and consolidating vendors
- negotiating best pricing
- managing chemical stocks
- assessing stockroom layout and locations to best meet scientists' needs
- acting as staff point of contact for "everything inventory"
- solving everyday problems
- continually analyzing metrics to enable continuous improvement in JIT performance.

Barcode Tracking: Barcoding would enable us to track inventory in real time. That would improve budget control and strengthen regulatory compliance through up-to-the-minute accuracy of chemical stocks.

External Storage of Bulk Consumables: Our facility did not have the square footage to store large

volumes of consumables such as custom disposable bags, which are usually delivered in three or four pallets of material stocked four to six feet high. We needed a vendor that could receive such long-lead bulk consumables at its own site, store them in an environmentally controlled warehouse to preserve quality over the short or long term, and deliver them within a day to our facility upon request.

Just-in-Time Replenishment: Our scientists needed assurance of immediate access to all supplies (common consumables, chemicals, and custom bags). Unavailable supplies translated to delays, which in turn meant loss of productivity in time, effort, resources, and money. An automated replenishment program would establish baseline inventory levels for each item, track the rate of consumption, and provide recommendations on the basis of use rates and stocking levels. Such capabilities would enable just-in-time replenishment.

Program Implementation

Once we were ready to launch the program, the VMI vendor provided two onsite, full-time VMI specialists to order supplies, offloadng this task from our researchers. We also made retrieving supplies far more efficient. We began with seven stockrooms. After an analysis of individual laboratory requirements, we placed more than 20 additional stocking locations strategically throughout the facility, stocked with materials that met the specific needs of each laboratory. Although those two factors alone improved our inventory management, barcoding has played an essential role.

Benefits of Barcoding: Barcoding has been key to reducing costs and increasing efficiency. Materials are scanned at the receiving dock. That information is uploaded immediately to the vendor's requisition inventory management system and fed to the warehouse, which starts the supply chain. As more usage data are generated over time (what moves and how quickly), we can further refine our purchasing pattern. Those data also serve as a demand forecast for our many suppliers, which keeps the replenishment cycle running smoothly.

On the stockroom level, more than 1,300 items are now managed by the VMI program. The vendor's laboratory services team rotates through each stocking area and scans supplies. If they fall under a minimum number designated for each shelf, then they're replenished. The process is quick, easy, clear, and fully documented.

Barcoding also has strengthened our chemical management. Each chemical is scanned into and out of the building. That improves our ability to maintain compliance with federal and local regulations and enables on-demand reporting during internal and external audits.

Results: $1.5 Million in Net Benefit

The combination of a rigorous project management approach with a VMI vendor that met our requirements yielded a big win. We estimate a >30% reduction in excess inventory in our stockrooms and laboratories, while increasing productivity by more than 40% by eliminating staff time spent ordering, retrieving, and managing supplies. Operations are more efficient, both in our facility and along the supply chain. All this adds up, conservatively, to $400,000 in annual savings, with more than $1.5 million in net benefit over the first five years and project payback within the first year.

The Valuable Intangibles

Just as important but far less tangible is employee morale. Our staff couldn't be happier, including our scientist with the 12 cases of gloves. He doesn't keep gloves stacked up in his closet anymore, and he doesn't give them a second thought. They are replenished automatically, as soon as they run low. Now he uses his time — and his shelf space — for his experimental work.

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