Getting more juice from a lemon

Retrofitting helps companies squeeze better performance out of their overcrowded DCs.

by Lisa H. Harrington

Smaller orders, higher volumes, shorter delivery cycles, added services, changing supplier networks and shifting markets. These realities–which are so common in today's business environmen–can easily exhaust the capabilities of distribution centers (DCs) that at one time worked just fine.

Take dock space, for example. "People come to me all the time and tell me they are out of dock space," says Mark Wulfraat, managing partner with Montreal-based consulting firm *KOM International Inc.*

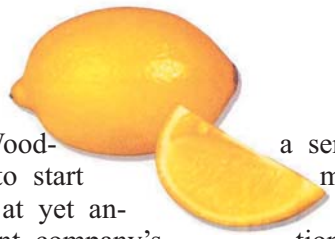
"They say they are working with half the space they need," Wulfraat observes. "This creates all kinds of problems in a DC. If you have a 20 ft.-deep dock and you need 50 feet, the aisles get clogged up with overflow. It's 2 p.m., *UPS* arrives at 4, and the order pickers can't access product because the aisles are jammed. The DC turns into Manhattan at evening rush hour."

While abandoning the old facility for a spanking new one may seem appealing, doing so may not be the most sound business option. In fact, given the current state of the economy, it may not be an option at all. Companies are gun-shy about sinking significant capital into new distribution facilities at the moment. Nor are they up for tackling the risks and disruptions that relocation generates.

"For these reasons," Wulfraat says, "many of our clients today choose retrofitting when they outgrow the capacities or capabilities of their warehouse infrastructures. In fact, a lot of our business which was predicated on designing new facilities has shifted toward 'getting more juice from the lemon,'" he observes.

"The goal in any retrofit is to optimize labor, space, material handling equipment and technology to fulfill customer needs and support the company's mission," explains Drew Hale of *The Progress Group*, a consulting firm in Atlanta. "With a successful retrofit, you can extend the effective life of the facility by years."

Optimization projects don't come cheap, however. In recent experience, for example, The Progress Group has worked on retrofits ranging from $3 million to $ 10 million. Generally, Hale says, retrofits should show a payback of identifiable savings and investment recovery within three years.



Once the decision to optimize a facility is made, where do you begin? Start by gathering massive amounts of information about the current facility and its operation. Consultants and companies, however, differ somewhat on exactly where they begin this research.

Measure the facility. KOM, for instance, starts by measuring every physical aspect of the building, the yard around the building, the yard around the dock doors, columns, material handling equipment, and anything else that goes into the building, noting clearance heights and obstructions (e.g., fans, ceiling air conditioner units, lighting). These details get fed into an **AutoCAD** system to plot the current facility design, and figure out "how much stuff you can hold in your DC given the facility's cube," Wulfraat explains. "We learn that about 25% of building cube is product and the rest is aisles, dock space and air. It's remarkable how little you can actually fit in a building."

Measure the product. The Progress Group launches a retrofit project by measuring the product. "We determine how well the product fits in its packaging," says David Stollard, a consultant with the firm. "There's a fair amount of air in most packaging. Remarkably, companies can gain as much as 20% to 30% space savings in the total footprint of their building by taking a good look at their packaging."

Next, Stollard looks at the pallets and cartons, to assess how well the latter fits on the pallets. He looks at how well the pallets fit in the racking. "Often people put full pallets away, and then use some of the product on that pallet," he notes. "So you have a fair amount of partial pallets occupying the same space as full pallets."

Assess end-customer needs. Bob Silverman, president of *Gross & Associates* of Woodbridge, N.J., likes to start the retrofit process at yet another point–the client company's end customer. "We look at the building as if it were a blank sheet of paper," he says. "We look at it as if it was empty and we want to create the optimal layout. To do that, you have to work backwards from the customer. What's best for the customer? How should product be loaded onto the trucks, staged to make loading possible, packed to facilitate that staging, picked and staged for packing the order, and so on? We go step by step through the process to design optimal flow."

The next Step is to analyze the data collected and develop alternatives. The Progress Group looks at transaction data to assess inventory movement from an **activity-based costing** (ABC) analysis perspective, i.e., which items are fast movers, and which are slow movers. "The ABC analysis tells us whether a company's inventory is logical when compared against the popularity of its items," notes Stollard.

"Most companies know their fast movers," says Silverman, "but they often look at their movement in terms of units and dollars, not how often each item is accessed. Looking at sales volume doesn't tell me about the physical nature of their business. How often you go to a location of course feeds travel distance."

Silverman loads inventory movement data into software tools that analyze inventory item by item to track movement and profile each item by customer orders. He then summarizes the client's business from a physical standpoint and suggests what he thinks the facility can handle in terms of physical throughput.

Wulfraat likes to look at 52 weeks of order flow history to get a sense of inventory item movement over time. He captures information on sales of units, pieces, cases and pallets in order to identify the volume and item peaks and valleys. "This tells us what kind of pressures a building experiences during the year," he explains.

In addition to order history, KOM looks at the company's individual customer order files to see whether orders typically comprise one line item, 100 line items or 1000 line items. Most warehouses are a hybrid of two order types–large and small. "You attack them differently," Wulfraat says. "Large orders get picked conventionally; smaller items might be picked to totes."

Order picking, says Silverman, is one of the most important activities to optimize in a retrofit design. "Order picking is the most labor intensive activity that goes on in a DC," he points out. "It's where you have the greatest opportunity for bottlenecks and pickpack slowdowns."

By re-slotting your inventory –locating stock items to reduce travel time and increase velocity– you can go a long way toward improving facility efficiency. "Pickers spend 70% to 80% of their time traveling, and 20% doing actual picking," Silverman explains.

Efficient slotting can reduce travel time tremendously. If 20% of your high volume items are slotted well, you can cut walking time by 30%. If you compare an efficiently slotted warehouse with an inefficient one, you could see a 25% to 30% difference in labor productivity."

Many companies find the prospect of re-slotting daunting. It doesn't have to be arduous, Silverman suggests. "You don't need to take on the whole operation at one time. Look at your top 20 movers to

make sure those items are in the optimal picking position."

To do this, he advises printing out a fist of the top 20 movers, and comparing the appropriateness of their movement to how "prime" their pick positions are. Assign each item a score based on popularity, and do the same with the pick position. Subtract the velocity of the product from the velocity the pick position supports, then sort that list to determine which items should be relocated.

"Just keep attacking the wrong 50 items each week," Silverman says. "Look for those items that cause pain."

Finally, based on information provided by the client, the consultants assess future demands on the facility. "We need to know what you think your product variety will be, as well as your sales growth and order profile," Hale says. "Most firms plan five years out at the maximum. So we factor those growth rates into the design."

"In all of this," cautions Wulfraat, we have to keep track of one very important factor–flexibility. The more automation you install, the less flexible the facility becomes. Companies must weigh the benefits of automation against this element.

The Output of all this research and analysis is a retrofit plan. This plan should run the gamut from re-slotting the facility all the way to re-designing the flow, tearing out existing material handling equipment and installing new dock doors, or adding a mezzanine, and so on. It's not uncommon for a company to consider several re-fit designs at once, and evaluate what makes the most sense economically and operationally.

"Each plan we present will have very different characteristics in how they're operated, how they address labor productivity, and what kind of capital investment is required," says Wulfraat. "Each will offer a different ROI."

A company needs to consider certain intangible factors when reviewing a retrofit plan. Some projects are riskier, being more difficult to execute. This level of difficulty affects ROI.

Implementing a DC retrofit or re-set is no small task. Making the changes, while continuing to ship orders without interrupting service levels, requires a changeover plan. The purpose of the plan is to think through where the domino effect of changes can be executed so that events and people can be scheduled without oversight.

How do you accomplish a retrofit while at the same time continuing to ship? "Break the project into smaller and smaller problems until you can get your arms around it," Silverman recommends. "When you do this, you come up with a 50 to 100-step implementation plan. You create a detailed project plan, assign resources to each step, and determine the linkages and interdependencies between steps. The rule of thumb is that it takes 2.5 to 3 times longer to implement a new design in an existing building than it does to build a new building. So a project that would have been a three to four-month implementation in a new building could take a year in an existing facility. Almost no one has the luxury of shutting down completely for six weeks."

In a significant optimization project, Wulfraat recommends assigning a full-time project manager. "Not dedicating a full-time human being to the project is a big mistake," he says. "You can spot a reset without a full-time manager when you go into a facility and see everyone running around frantically with walkie-talkies while the PA system is blaring out names. People are fire-fighting, and they don't have time to sit down, talk and plan. It's these kinds of projects where we see the most failures."

Be sure to advise your customers up front that you are undertaking this project, Silverman stresses. "In any re-optimization, the over-riding constraint is to continue to serve customers and make sure the implementation is invisible to them."

No matter how well you plan, however, problems invariably arise. By advising customers up front, you enable them to plan for potential hiccups.

Resources

Gross &Associates
www.grossassociates.com

KOM International Inc.
www.komintl.com

The Progress Group
www.theprogressgroup.com

Facility redesigns take a lot of work. However, the payback for these efforts can be staggering –from as low as 10% to as high as 300% on capital invested.

"If I have a client with 500 people in its warehouse, and a re-set can save them 10% in labor costs, that's 50 people," says Wulfraat. "Or, if I can go from 30% capacity to 50%, I just avoided a major capital investment for five years. Clearly, you can save millions of dollars."

Companies must determine the alternative that offers the best ROI vs. the one that offers qualitative advantages. "Look at how difficult a retrofit is to implement," Hale recommends. "It may offer a better payback on paper, but it also may involve more risk." **T&D**

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