

MHM

Material Handling Management

From Common to Custom: The case for make-to-order

By **Tom Andel**, *chief editor*

A widget's a widget. Whether that perception is reality in the case of your company's products, it's fair to say that commoditization is now common. The last frontier of product differentiation is service, and that's becoming the new specialty of warehousing and distribution. Mass customization is the perfect case in point.

The ability to offer customized products with short lead times is getting to be a huge area of competitive differentiation among suppliers to both the industrial and retail worlds. Retail soft goods provided some of the earliest examples of mass customization, or postponement. In the 1980s, Benetton was one of those pioneers. Rather than knitting sweaters in different colors and storing separate SKUs, they would knit sweaters in neutral colors and dye the completed garment to meet current market demand. When coupled with a real-time reporting system from retailers, response to color demand could be instantaneous and obsolete inventory could be reduced.

Today, suppliers of commodities are able to look across supply chains to coordinate inventory buffers among several enterprises worldwide. They can then provide these commodities to markets in unique ways. Packaging is an affordable way to customize commodities to market needs. However, it requires a dedicated supply chain manager who is responsible for coordinating the efforts of manufacturing, distribution, marketing and sales. Those functions must meet regularly to do forecast-based inventory planning.

Custom packaging

Imation is a good example of mass customization at the retail level, where it supplies floppy disks and CDs. It has differentiated itself by providing many different packaging options for retail customers like Wal-Mart and Office Depot. These options might include five-packs, 10-packs, red disks, blue disks and any number of combinations of these. However, this created a huge expansion of the stock keeping units this company had to keep, and thus created an inventory problem.

Imation looked to postponement as a solution. It uses a contract manufacturer in Asia to mold its CDs. This added long lead times to the SKU proliferation problem — as well as more risk.

By investing in a postponement and packaging center in North America, Imation now reacts quicker to changes in customer demand, putting final differentiation of the packaged product days away from the customer as opposed to weeks. The challenge was to deliver higher levels of service at lower levels of cost.

"In 2000 we worked with some supply chain experts on a supply chain investment strategy project," says Dana Smith, project



There are various strategies for customizing products and services. Learn the supply chain implications before deciding if mass customization is made for you.

manager at Imation. “That effort identified postponement as a key strategy for us to pursue. The *how* didn’t come out of that, however. We realized we could plug postponement into a lot of different places in our supply chain. Another question was: Do we do it for some or for all of our retail based product lines?”

The next step was selecting a tool to sort through the various scenarios.

“We happened upon Optiant and some other companies that do supply chain modeling. Their optimization tool looks at the supply chain from one end to the other and takes into account variability in demand and supply as well as accounting for freight costs and lead times,” Smith continues. “That’s all boiled down to total delivered cost.”

Imation has always put a lot of effort into forecasting. Its sales and operations planning processes use Manugistics software to help predict demand. Still, demand for Imation products is spiky, some of it related to actual end-user demand changes, and another piece coming from retailers changing their marketing strategies. That could mean going from five-packs to 10-packs at a moment’s notice.

“Those are the things that blind-side us,” Smith adds. “And it happens all the time. On one hand we’re trying to drive improvements in the way we forecast to make our demand more predictable, on the other hand we’re trying to become more flexible. So we’re covering it from two directions. If one doesn’t work the other will.”

Imation used Optiant’s PowerChain suite to determine if these operations could be carried out in one central location or if it would have to spread operations over a broader area. As a result of this analysis, the postponement operation is now run for Imation by Menlo Logistics at a facility in Kansas City, Kansas.

“Our software offers the ability to view your supply chain end-to-end and figure where you should be doing postponement,” explains Mike Braatz, co-founder and vice president of business development for Optiant. “It also helps you draw the line between flexible inventory and specific inventory.”

The Kansas City facility gets products in bulk from overseas and finishes the packaging, making 1-, 3-, 5-, 10- and 20-packs, and adding labeling to finish the product. This means exploding a few raw material SKUs into many product options.

“We’re in the first phase of our postponement implementation now,” Smith concludes. “Our emphasis has been to improve service without raising inventory levels. We’ll provide a very significant 20 percent increase in service on postponed products at the same total delivered cost as before.”

Also, by fulfilling orders out of one operation rather than establishing multiple locations, Imation expects to reduce total inventory investment by 20 percent. Where it used to carry as much as eight weeks of inventory, it will soon be down to two.

Keeping up with marketing

Consumer demand and retailer promotions: Which drives which? It’s hard to say for some products. Many consumer goods companies are faced with volatile demand for their products as well as frequent promotions at the retail level. With postponement, they can decide to delay product differentiation to forecast total product demand rather than on an SKU-by-SKU basis. Delaying differentiation enables CPGs to better respond to retailer customers’ seasonal and promotional demands.

Gillette and Hewlett-Packard are on the list of customers that outsource to global packaging supplier Sonoco to operate their packaging postponement facilities.

“Our customers develop a production schedule and they feed that to us,” explains Steve Lyles, process improvement manager, packaging services, Sonoco. “All they have to focus on is basic factory planning and manufacturing of their core product. Sonoco is responsible for the packaging material requirement planning, specification management, ordering the material and packaging the product. The packaging equipment in the pack centers is operated with our people. We package the products and send them directly to their distribution. By postponing and focusing on the packaging and customization, the order fulfillment time has been drastically reduced. Our customers can now be more responsive to their customers and increase their customer service levels.”

Another reason for separating manufacturing and packaging lines is better use of resources.

“What makes this work is that our customers ship us their products in bulk, so there are a lot of opportunities on the handling and logistics side,” Lyles continues. “You may be 30 percent to 40 percent denser in your trucking because it’s in bulk. If the packaging lines were coupled to manufacturing, you’d have to run your packaging line the same speed as the manufacturing line. By de-coupling the packaging from manufacturing, we have seen situations where packaging line production can be reduced by as much as a shift. Some companies will have 20 to 30 base products with 300 SKUs of packaging. A lot of facilities aren’t designed to handle that kind of SKU proliferation, especially promotions, so they’re having to do things that are abnormal in their automated and dedicated processes. That leads to a lot of inefficiencies.”

He adds that if your planning periods are six to eight weeks out and you try to schedule packaging production to that, especially in promotions, you’ll make material that won’t sell.

“Being able to bring that down to one week or less, you can react better to what you’re seeing in the market,” Lyles concludes.

Process or product?

Mass customization is more involved than simply postponing

the final characteristics of a packaged product until the last moment at some point in the distribution network. As Bruce Strahan sees it, you have a choice to make: delay the customization process or build a very flexible production process. As general manager of the supply chain practice of The Progress Group, he tells clients that their choice depends on the value of their product. If you have a high-value product that can pay for fast transportation, then making and distributing it upstream isn't a bad way to go. But if it's a low-value, large-cube item, it's harder to do that because you can't afford to be shipping small parcel and LTL for something that doesn't pay for itself. That's why a good logistics execution system (LES) is essential to any mass customization strategy.

"If you configure a product in the distribution center you can make it look like a customer order, but there are differences," he observes. "You need bill of material information that might have resided only in the assembly facility and now you have to figure out how to do that in a warehouse management system [WMS] environment. If postponement is pure assembly operations, that's critical."

Part of the complexity is that some of a product's components used in manufacturing or assembly may also be sold as finished goods into the service market.

"Typically, in a manufacturing plant, a bill of material covers kitting and would also have to feed the postponement assembly line in the DC," Strahan explains. "You're also doing procurement functions to support that final assembly."

Some of the leaders who use postponement in assembly are computer manufacturers like IBM and H-P. Both developed concepts of procuring and distributing components to assembly centers throughout the world — closer to the customer. But as the automotive industry is learning, it's important to make distribution decisions back in the product design stage. Those decisions will affect the process machinery and material handling equipment needed to make your mass customization strategy work. That's all part of the customer relationship management (CRM) strategy automotive OEMs are exploring.

The road to CRM

CRM inside automotive used to be the domain of the aftermarket, according to Gary Flum, general manager, automotive business unit, QAD, makers of collaborative commerce software. Now the automakers are looking at closing the gap between them and the drivers of their cars.

"How I can have the customer relationship management needed to do prototype development, to understand what my



Imation, a supplier of computer media like floppy disks and CDs, offers retailers like Wal-Mart and Office Depot a wide variety of packaging options. By postponing final packaging, Imation minimizes the stock keeping units it must inventory.

rapid engineering.

"For example, one of the most complex things you can put into a car is an electrical harness. For every little bell and whistle, including mirror controls, there are four pieces of wire going through connectors to let you do that. What happens if engineering moves that mirror six inches or they come up with new options, putting defoggers on the mirrors? The engineering changes you see in automotive manufacturing are incredible. These people are trying to manufacture those individual circuits that go into the assembly of a harness and stay ahead of the game without having to eat inventory as these changes come through two or three a week. Linking of product data management [PDM] systems and enterprise resource planning [ERP] is absolutely essential to maintain margins."

In short, mass customization requires mass communication, from design to distribution. You need to address decisions that affect material handling and distribution early in a product's life cycle. The Internet is a good means to that end.

On-line tools

More than two-thirds (68 percent) of industrial buyers have experienced an increased need for customized products or components over the past three years, according to a survey by Thomas Register.

"Many suppliers have begun to address this need on-line," says Ruth Hurd, Thomas Register publisher. "The Internet, particularly when used as an outlet for CAD drawings, is becoming an invaluable tool for streamlining the custom sourcing process."

The Internet is only a medium, however. Content needs to be custom packaged for users all along a network.

"Operations people don't understand how to look at a CAD diagram," says Paul Strzelec, vice president, marketing, NewView Technologies Inc. "So I have to take that structured document, and make it relevant to the operational level. I need an attribute-oriented model for the way we describe things. The challenge is cramming a CAD drawing's attributes into a 12-digit part number. That doesn't work because you haven't dealt with the nuances of the complex material and you haven't supported all the

timing for 'Available to Quote' is going to be, and what I need in place to have supplier certification — that's automotive CRM," Flum explains. "I've been involved in automotive for 25 years and have seen a lot of attempts to do this, but it's the integration of engineering, industrial engineering and procurement into a package that gives you the sequencing and quality issues that have to be dealt with. We're not going to take engineering cycle time down to the magnitude we need to maintain gross margin; we have to do it with the up-front development costs, prototype development,

attributes that affect all the operational dialogs. An operational spec is an attribute-oriented definition that serves all the processes that allow for mass customization.”

Art St. Onge, president of St. Onge Company, logistics consultants, says mass customization is made possible by a company's evolution out of a craft industry to mass production. Processes are transformed from being innately part of the trade to being more of a procedure that's stable and well documented. Mass customization is the next step, introducing modularization.

“Modularity plays into postponement,” St. Onge explains. “Another element is a configurator that allows a customer to specify the product, generally on-line. Then there's the linkage element, which allows modules to fit together in unique configurations. Think of Legos.”

Once you arrive at that level of customization, it won't be long before you can think about customizing services.

“A company called Symetrx developed a software product using autonomous agent technology to allow collaboration to occur among different companies that have disparate ERP systems,” St. Onge explains. “The autonomous agents can negotiate to create an end product. Herman Miller, the commercial furniture manufacturer, has done some work in this area. The idea is to give the distributor of commercial furniture the ability not just to meet a

specification a client might come out with, but rather to meet the express performance needs of a client.

“For example, if a company wanted to set up a branch office and outfit 15,000 square feet, it could describe generally what it wanted in terms of configuration and budget. It could then be linked to various combinations of vendors and service providers that could complete the facility within the set parameters.

“This is business-to-business right now, but the same kind of thinking, once proven, could be used in business-to-consumer,” St. Onge concludes.

According to Forrester Research, Global 3,500 companies (firms with revenues of \$1 billion or more) extracting value from a CRM investment is an evolutionary process, from channel integration through process redesign and eventually arriving at continuous optimization. Firms that reach phase three will view their business as a constantly updated portfolio of products and customers. Smart companies will continuously tune their channel and customer mix by adjusting products and services, “driving micro-segmentation with analytics, and adjusting customer interactions based on lifetime value.”

If you're nowhere near that stage, take step one, toward channel integration. Even if that step doesn't take you to mass customization, you and your customers will benefit from tighter supply chain ties. **MHM**

Newview

www.newview.com
1.877.447.8335
212.527.9997