

# SUPPLY CHAIN TECHNOLOGY NEWS

SOLUTIONS FOR THE EXTENDED ENTERPRISE

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## Custom-made supply chains

Blame it on Benetton. Back in the 1980s, apparel manufacturer *Benetton Group* was a pioneer of **mass customization**, or **postponement**. Rather than knitting sweaters in different colors and storing separate stock-keeping units (SKUs), Benetton 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.

The ability to offer **customized products with short lead times** has since become a huge area of competitive differentiation among suppliers to both the industrial and retail worlds. 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.



The last frontier of product differentiation is service, leading companies to adopt mass customization strategies to stay out in front.

by Tom Andel

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.

Floppy disk and compact disk manufacturer *Imation Corp.* has differentiated itself by providing many different packaging options for retail customers like *Wal-Mart Stores Inc.* and *Office Depot Inc.* These options might include five-packs, 10-packs, red disks, blue disks and any number of combinations of these. Problem was, the company found itself with an ever-expanding number of SKUs, which led to a [significant inventory problem](#).

Imation 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.

The company then looked to postponement as a solution. By investing in a postponement and packaging center in North America, Imation now is able to react more quickly to changes in customer demand, reducing time of delivery of the finished packaged product from weeks to days.

The company still faced a daunting challenge, though: how 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,” remembers Dana Smith, project 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. The question was: Do we do it for some or for all of our retail based product lines?”

The next step for Imation was to adopt an inventory optimization tool from *Optiant Inc.* to sort through the various scenarios.

“The 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 explains. “It’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 software from *Manugistics Group Inc.* 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 points out, “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.

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% 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%. Where it used to carry as much as eight weeks of inventory, it will soon be down to two.

**Consumer demand** and retailer promotions: Which drives which? It’s hard to say for some products. Many consumer packaged goods (CPG) 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 CPG manufacturers to better respond to their retail customers’ seasonal and promotional demands.

*The Gillette Co.* and *Hewlett-Packard Co.* are two manufacturers who outsource to global packaging supplier *Sonoco Products Co.* 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 materials requirement planning, specification management, ordering the material and packaging the product, Lyles says. “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. “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, 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,” he concludes.

**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 consulting firm *The Progress Group*, Strahan believes the choice depends on the value of a company’s product. If you have a high value product that can cover the costs of 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 less-than-truckload for something that

## Buzzword alert: Supply chain design

Known variously as *inventory optimization* or even more specifically as *optimized tactical inventory planning*, two new **supply chain design** applications from *Optiant Inc.* and *SmartOps* utilize cutting-edge technology developed at, respectively, *MIT* and *Carnegie Mellon University* to tackle inventory deployment issues.

"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."

According to *AMR Research Inc.*'s Larry Lapide, these applications represent an emerging market because they "formally incorporate optimized inventory and service-level target setting. [These] products are designed to support, not supplant, a customer's ERP or supply chain planning systems, since inventory targets generated by Optiant's and SmartOps' applications are input to these systems."

doesn't pay for itself. That's why a good supply chain execution system 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," Strahan 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."

Adding to 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 distribution center," Strahan explains. "You're also doing procurement functions to support that final assembly."

**The high-tech industry** is at the forefront in using postponement in the assembly process. Computer manufacturers *IBM Corp.* and Hewlett-Packard, for instance, 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. It's become a crucial part of the customer relationship management (CRM) strategy automotive OEMs are exploring.

For the automotive industry, CRM used to be the domain of the aftermarket, according to Gary Flum, general manager, automotive business unit for solution provider *QAD Inc.* Today, however, the automakers are looking at closing the gap between them and the drivers of

their cars.

"How can I have the CRM needed to do prototype development, to understand what my 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. "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 and rapid engineering."

One of the most complex things inside a car is an electrical harness, Flum notes. "For every little bell and whistle — including mirror controls — there are four pieces of wire going through connectors. What happens if engineering moves that mirror six inches or they come up with new options, like putting defoggers on the mirrors? The engineering changes you see in automotive manufacturing are incredible. People are trying to manufacture the 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 times a week. Linking up product data management (PDM) systems and enterprise resource planning (ERP) systems is absolutely essential to maintain margins."

In short, [mass customization requires mass communication](#) — from design to distribution.

"Operations people don't understand how to look at a CAD diagram," points out Paul Strzelec, vice president, marketing with solution provider *NewView Technologies Inc.* That structured document needs to be made relevant to the operational level, which requires an attribute-oriented model for the way a company describes things.

"The challenge is cramming a CAD drawing's attributes into a 12-digit part number," Strzelec says. "That doesn't work because you haven't dealt with the nuances of the complex material and you haven't supported all of the attributes that affect all of the operational dialogs. An operational spec is an attribute-oriented definition that serves all the processes that allow for mass customization."

According to analyst firm *Forrester Research Inc.*, companies with revenues of \$1 billion or more are extracting value from a CRM investment through an [evolutionary process](#) — from channel integration through process redesign and eventually arriving at continuous optimization. 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 your company is nowhere near that stage, it's a good idea to take the first step toward channel integration. Even if you don't ultimately arrive at mass customization, you and your customers will benefit from tighter supply chain ties. ◀

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