



Finding the PUSH- PULL Balance

By Lisa Arnseth



During difficult economic times, many organizations have had to make tough choices regarding inventory management. A pull strategy is one option many companies are considering as the economy slowly recovers.

In the same family as lean manufacturing processes, a pull strategy is characterized by customer demand “pulling” a product or service through the supply chain, while a push strategy has companies “pushing” a product or service out to the customer base (see chart on page 25). Many companies currently operate with a mix of these strategies. With today’s volatile customer markets, organizations are planning against the frequent changes by adding demand-driven aspects to their supply chains. While there are benefits to a pull strategy, it’s not an inventory management strategy without challenges.

“The advantages of having a demand pull supply chain strategy are indisputable,” says Keith McNeil, an associate principal with Proactive Human Capital in Melbourne, Australia. “The closer you can reach a situation where the supply chain is activated by an individual customer order, the closer you get to having zero inventory, zero risk of obsolescence and markdowns in price. Your business will also be more abreast of changing customer preferences and so on.” These supply chains are likely to have minimum waste and shorter cycle times, and McNeil points out that the Gartner Group’s latest *Supply Chain Top 25* list of demand-driven supply chains always includes successful companies such as Apple, Dell, Amazon and Wal-Mart. “It is reasonable to say that the evidence is there that being demand-driven also translates into increased profitability and brand value.”

Using a pull strategy in the supply chain to respond to customer demand comes with several challenges, but a combination of pull and push strategies can be highly effective.

Finding the PUSH- PULL Balance

Determine the Best Strategy

Of course, a pull strategy cannot work for everyone. If the business model, the market and the customer's order frequency don't match the mechanics of working with demand-driven inventory, a company shouldn't consider it. However, this doesn't prevent some companies from implementing a pull strategy. Ian Johnson, a longtime supply management consultant and author of *Drive Your Success* (www.driveyoursuccess.com), has experienced this firsthand. "One of the biggest issues I see with clients occurs when companies go with an inventory management strategy such as JIT or a mixture of push and pull simply because they've read it works for other companies in other industries. In

director of the supply and logistics management program at Portland State University in Portland, Oregon. In reality, he says, manufacturing lead times mean that there is always a boundary between push and pull because some materials must be stocked ahead of time.

"For example, it may be possible for a company to make a steel case for a customer that is a computer manufacturer only on demand (in other words, on a pull basis), but it takes far longer to manufacture the steel, so it must be inventoried somewhere in the supply chain," explains Buddress. "While, in theory, a pull system may not always require forecasting, in reality, a very good forecast, shared with supply chain partners, is key to minimizing the push inventory."

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Know Your Inventory Cost Drivers

Pull strategies may also not work well for organizations with cyclical or seasonal demand, according to Johnson. In his experience, he's seen companies encounter two inventory cost drivers when they attempt to make pull strategies work. One of these is high inventory holding costs, which is "when they have high inventory counts or levels, and low sales volumes," he says. The other is lost sales as a cost of inventory, which happens when a company has high customer demand, but little inventory to close sales. Johnson says the following conditions are ineffective for a pull strategy environment:

- Cyclical, infrequent and seasonal demand
- Small volumes
- Low purchasing power and low economies of scale (small fish in a big pond)
- When the organization is not the supplier's top priority, as the supplier may be less able or willing to be flexible or help during unexpected demand periods, such as a natural disaster or sudden demand from a new market
- Not having contractual agreements to support inventory requirements for supply
- When suppliers are located too far away to consistently provide short lead times on parts and materials.

most cases, they ignore the basic principle of inventory management — match inventory management and strategy to the business model."

Why would a company attempt an integration of pull system strategies, even if the business model might not sync up? It could be that popular lean manufacturing concepts lend themselves to demand-driven inventory strategies. As companies adopt lean to minimize inventories, the pull process itself may seem like a natural progression. "Incorporated within the lean concept is the notion of a pull process, but that is founded on the assumption that the internal and supply chain processes have sufficiently short lead times to allow products to flow through the system and reach customers within an acceptable time frame," says Lee Buddress, Ph.D., C.P.M., professor and

When companies — large or small — are considering changing their inventory approach, Johnson recommends that supply management compile and analyze all inventory costs. Not having inventory on hand can be a risky proposition. “You must know the costs of inventory obsolescence, inventory damage, ruined inventory, inventory financing costs and per-unit freight costs on incoming and outgoing parts and materials. This also includes the costs to warehouse the inventory, and the cost of electricity and any other utilities at the warehouse, as well as the impact of lost sales as a result of not having inventory,” says Johnson. “Once you have outlined these costs, then you can move forward with matching an inventory approach to your business model.”

Buddess also points out that organizations should not be focused solely on improving the bottom line when considering these inventory strategies. “It’s crucial not to ignore potential supply chain interruptions and the impacts of those events on costs. If they are ignored, supply management professionals could find themselves in the same position as so many did after the 2011 Japan earthquake,” he says, referring to companies that faced deep supply chain disruptions following the disaster.

“While the JIT strategy that is at the heart of a pull process may reduce inventories and costs, the concept needs to be tempered with a little just-in-case inventory. Consider how much it might cost for a manufacturing process to be shut down for lack of parts,” notes Buddess. “For example, at one auto manufacturer, the cost for this type of shutdown is approximately US\$23,000 per minute.”

Make Push-Pull Strategies Work

One of the most well-known examples of a push-pull supply chain strategy is that of Dell. The company is able to deliver customized computer systems with relatively short turnaround time by building the majority of the computer components on a more standardized level, and then adding features and specifications according to each particular order. This premanufacturing method works for Dell because the

company has significant purchasing power, economies of scale spread across a robust product line and other factors based on the company’s market share and clout among its suppliers, according to Johnson.

But can this push-pull strategy work for smaller enterprises that might not have the volumes of companies such as Dell? Johnson says it is indeed possible for smaller-scale businesses to adopt some of these approaches to supply chain strategy.

“Premanufacturing is key to this approach. For example, if a small manufacturer were to have its products

approach, Johnson notes that these costs are low in comparison with high freight costs when companies attempt to operate as JIT and run into issues with rush shipments, late customer shipments and other expenses.

In cases when demand is difficult to predict, companies operating a pull supply chain face certain risks, such as being out of stock. Several best practices help reduce that risk, says McNeil, such as collaborative forecasting with key suppliers, striving for accurate point-of-sale data to manage replenishments and

Characteristics of Push-Pull Strategies

CHARACTERISTIC	PUSH	PULL
Objective	Minimize Cost	Maximize Service Level
Complexity	High	Low
Focus	Resource Allocation	Responsiveness
Lead Time	Long	Short
Processes	Supply Chain Planning	Order Fulfillment

Source: Table 3.1 in *Operations Rules: Delivering Customer Value through Flexible Operations*, by David Simchi-Levi, MIT Press, October 2010.

ready in a 70 percent completed state, then the remaining 30 percent would fall under that customizable option,” he says. “It doesn’t have to mean the small manufacturer has to rush in parts and materials only in the times they are needed, as is usually the case in JIT. Instead, they can run a min/max system — which advises procurement when stock levels are coming close to the minimum level, and to hold off on ordering additional parts when stock levels are approaching the maximum level — and retain inventory of those parts needed to complete the remaining 30 percent of the product.”

Although there are inventory holding costs inherent in the min/max

applying the principle of postponement to its production, for instance.

Overall, McNeil says push is not necessarily better than pull, or vice versa. In fact, he doesn’t believe that “push versus pull” is the most effective way to differentiate supply chains. “Pull tends to imply customer-centric and push tends to imply supply-centric, but good businesses in either camp do not lose sight of either customers or the suppliers,” he says. “Today, many companies and industries have supply chains that have elements of both push and pull.” **ISM**

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