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The Sweet Spot

Striking a balance between happy customers and optimal inventory levels

The traditional challenge for most distributors is to have the right amount of inventory for each product they stock. Too much inventory ensures all orders will be filled, but carrying that inventory is cost-prohibitive. Conversely, not enough inventory keeps the investment low, but customer orders go unfilled.

When it comes to addressing this problem, supply chain management usually gets most of the attention. While this is perfectly understandable, the approach only addresses one dimension of the situation. There's another problem that is generally overlooked: Customer demand is subject to unpredictable extremes – and these extremes are the single greatest source of inefficiency in inventory management.

Most inventory managers are reluctant to deal with this problem because they think there's nothing they can do about it. Plus, the demand side of operations often is viewed as untouchable. The accepted wisdom is, while supply can be managed, demand is off limits and can't be questioned or controlled. Following that logic, extreme orders are handled in two steps.

First, accept large orders; fill them on a first come, first served basis; and deal with the inevitable backorders later.

Then, send out a flurry of expedited purchase orders to suppliers in a desperate attempt to replenish stock levels.

Unfortunately, this strategy is reactive and does little to resolve the problem.

The baker's dilemma

Demand can and must be managed. When demand management principles are applied intelligently, scientifically, and analytically, the results are higher fill rates, more satisfied customers, and far fewer headaches for inventory managers. Additionally, when combined with rigorous supply management, target and contractual service levels are more profitable and lower inventory levels are achieved than even current industry best practices.

To explain the most effective approach to demand management, consider the following fictitious situation. Fred is the proud owner-operator of a one-man bakery specializing in doughnuts. He has a solid base of loyal customers, who come in with their orders on a predictable schedule. Fred makes only one batch of doughnuts each day, but he knows his customers so well that he's able, most of the time, to bake an optimum amount – in other words, enough to fill every regular customer's order with a minimal number of unsold doughnuts scrapped at day's end.

Early one morning, a new customer comes in and places a large order for half of Fred's doughnuts. "What an opportunity!" thinks Fred, "a chance to fill half my day's orders with one sale!"

He fills the order, while savoring the idea of this new, important customer and a wonderful profit opportunity. But reality intrudes later that morning when the bulk of Fred's regular customers come in and are turned

away empty-handed and very irritated. Fred vows this won't happen again, and the next day, he begins baking enough doughnuts to fill everyone's order, including Mr. Big's.

Unfortunately, Mr. Big doesn't come in the next day, or the next. Fred ends up throwing away dozens of doughnuts, a profit-eroding practice he can ill afford. After several days and still no Mr. Big, Fred scales back to his normal doughnut production levels. Predictably enough, the next morning, Mr. Big appears with his oversized order. "Now what do I do?" wonders Fred, as he assesses his situation.

Every inventory manager has customers who, like Mr. Big, place unexpectedly large and unpredictable orders. When filled, these orders endanger the remaining orders. Traditionally, inventory managers have dealt with extreme orders by focusing on the supply side. Fred did that by baking extra doughnuts (until it threatened to drive him out of business).

Although he wants Mr. Big's business, winning it means accepting one of two equally untenable options:

- Fill the extreme order and turn away many regular customers empty-handed.
- Stock extra doughnuts on the slim chance Mr. Big will come in, incurring inflated inventory and increased scrap.

The baker's epiphany

Fred is on the verge of a business-transforming insight. He suddenly realizes there is a third option. He could partially fill Mr. Big's order, leaving just enough doughnuts on the shelves to keep his regular customers happy. Thus, he figures out how many doughnuts he can sell to Mr. Big without creating problems for the other customers.

And the answer, indeed, comes to Fred in a brilliant flash: Every customer will get something, but nobody will get everything. Without knowing it, Fred has embraced one of the primary principles of demand management.

Fred immediately moves into "allocation" mode. He takes a quick doughnut count, projects remaining demand for the day, and then partially fills Mr. Big's order, which allows most of his regular customers to receive their orders complete. By closing, everybody had received some doughnuts, and no one left the store empty-handed, headed for the competitor's bakery. Yes, there was one dissatisfied customer, but Fred's regular clientele walked out of the bakery content.

Although Mr. Big's extreme order had threatened the entire doughnut business, Fred's intelligent rationing had solved the problem in an optimal way.

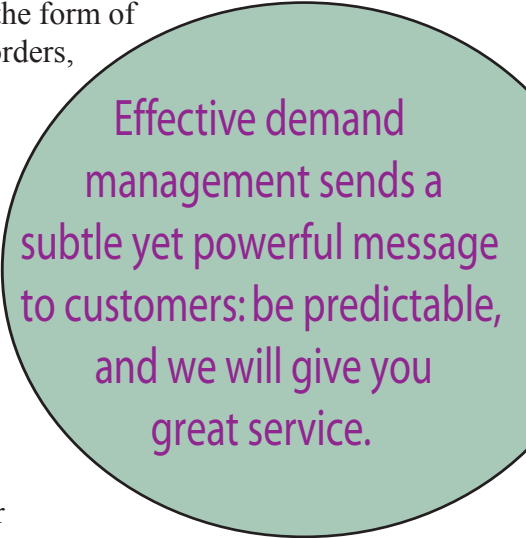
Everyone has to deal with extreme customer demand in the form of unexpected bulk orders, one-time out-of-the-blue customers with large orders, or a regular customer wanting to buy an item once a quarter instead of monthly. Shortages are caused by other issues too, including supplier problems.

The point is, whenever there is unpredictable demand or a disruption in the supply chain, future orders are at risk. And here, risk simply means that the probability of backorders has increased beyond an acceptable level during the current order cycle.

Demand management calls for the distribution manager to respond by intelligently rationing each order as long as the item is at risk. This is done in a number of ways, such as restricting large orders, partially filling others, and limited backordering. The rationing process is guided by basic business rules: Extreme orders may be fully or partially backordered based on supply and demand projections that exist at the moment the order is received. Then, rationing is determined mathematically, by projecting remaining historic customer demand for that item against a supplier's remaining lead time.

Old attitude, new perspective

Many inventory managers will read about demand management and feel threatened. That's understandable. The new principles and methods involved fly in the face of some deep-seated, core beliefs; for example, not filling a complete order when there's enough stock on the shelf to do so. How can a warehouse manager be expected to do that? To answer this question, simply recall the dire alternatives faced by Fred (before his epiphany): overstock for "just in case," and tie up valuable resources in excessive inventory; or fill orders on the basis of first come, first served, and chronically infuriate regular customers. Managing demand provides a scientific way to sidestep those undesirable alternatives by maximizing customer satisfaction in an innovative way.



Effective demand management sends a subtle yet powerful message to customers: be predictable, and we will give you great service.

When inventory is at risk, even average orders – if not handled according to demand management principles – will add volatility to an already bad situation. At this point, inventory managers run the risk of becoming extreme suppliers, worsening a vicious cycle that started when unpredictable customer demand was met with equally unpredictable and erratic service and fill levels. Customers can begin to anticipate such a scenario, and demand becomes even more volatile. As a result, operating costs and customer dissatisfaction increase, and profitability suffers. Effective demand management sends a subtle, yet powerful message to customers: Be predictable, and we will give you great service.

Successful inventory management

Advanced buying rules have been created for distributors so they can achieve their desired service level at the lowest possible inventory cost. These have been incorporated into Windows-based software customized on a distributor-by-distributor basis. It provides a calculator for order quantity, notes the timing of the purchase, and treats each product as a unique inventory situation.

The evaluation of each stock-keeping unit is based on popularity, usage pattern, purchasing lead-time, product value, size and cubic volume, freight costs, and volatility of product demand. The program determines optimal processes without adversely affecting service to customers and keeping inventory low.

Using this new approach, very sophisticated algorithms are employed to continuously monitor inventory and demand. When an order pushes an inventory item into a risk category, it's flagged and the following demand management rationing protocols kick in:

- The degree of risk is first determined from a probabilistic projection of demand over the supplier's remaining lead time, using actual histories.
- A comparison is made between probable demand and current stock levels.

- Based on the aforementioned comparison, "safe" allocations of inventory are quantified for each order that arrives.

Unlike traditional inventory management strategies, demand management is not an all-or-nothing approach. Its protocols are flexible, adjusting by degree and intensity to changing stock and demand realities. Rationing measures are minimal for items mildly at risk, becoming more aggressive as the stocking situation worsens. Select items may be exempted from demand management protocols, as necessary.

The days when distributors could manage inventory by rules of thumb are over. But decades-old, established inventory management attitudes and operations will not change easily. The assertion that customer demand can and should be controlled will take time to gain acceptance. However, when inventory managers and their senior executives see the results obtained from a customized, intelligent, and scientific method of inventory management, their doubts will disappear.

There is a way to triumph over the problem of fluctuating demand levels without inflated inventory levels or angry customers left without product. This new approach to inventory management ensures every customer gets something and nobody experiences production interruption, the ultimate aim of every distribution manager. It is an effective way for businesses to earn the trust of their customers, consistently, intelligently, and profitably.

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