

Chatou, November 19, 2004

INVENTORY POLICY FOR THE SUPPLY CHAIN: HOW MUCH TO HAVE?

Inventory reduction is certainly the most frequent reason given to justify the implementation of Supply Chain Management or Lean Production or even new computer software. But **the arrival of Supply Chain Management has made classical inventory calculations obsolete**. It's no longer necessary to put into inventory a quantity equivalent to 1.65 standard deviations or 2.06 Mean Absolute Deviations (MAD's) to obtain 95% protection against stockouts.

(That policy was never very good anyway, because it placed the bulk of investment on items with the highest demand variation: typically the Class « C » items! You ended up with lots of Class « C » while the Class « A » items, the best sellers, were out of stock!)

Supply Chain Management teaches us to **distinguish among various demand flows**. Inventory policy should be defined by demand flow: **to each demand flow should have its own inventory policy**.



For example, demand for windshield wipers for an automobile assembly line is different from the after-sales demand for the same product. The customers are different, la quantity demanded par period is different, the distribution channel is different, and the inventory policy is different.

Below are **three demand flows** that we encounter commonly in our education and consulting work in companies, and **their associated inventory policy**:

Demand Flow	Statement of Demand	Inventory Policy	Where Stocked
1. Major customer or OEM customer	Supplier Schedule	produce 1 or 2 weeks in advance	On or near customer site
2. Class A product or Best Seller	Forecast by item	1 or 2 replenishment cycles	At distribution point with reserve stock in central
3. Class C product or slow Movers	Total forecast for capacity	No safety stock (left-over lot sizes only)	Centrally

Pharmacies have another inventory policy. If Class "A" products like aspirin or Vitamin C are stocked in order not to have shortages, these products represent only 2% of the 6000 or more items in a typical pharmacy. The vast majority of products belong to Class "C", which are stocked with just one box or package. By chance should two customers in a row ask for the same item, the druggist will say, "Come back this afternoon".

A distributor of plastic gutters and tubing in the U.S. applies a policy of « 1 of each » to all items stocked in its Distribution Centers, whether they are Class A, B or C. The complete product catalogue is there, but only one package of it: a case, a pallet or a box.

Like the pharmacy, everything the distributor sells during the day is replenished very quickly. Any product sold from inventory is replaced. All of the items are stocked "in depth" at the central distribution point of the supply chain to replenish the inventories "in breadth" in the DC's closer to the customer. The bulk of investment is in the Class A items.

The products involved in these two examples belong to the same demand flow: mass-consumption. No OEM demand, no large customers. For the mass-consumption demand, there are a multitude of small customers. Whether one individual customer makes a purchase or not, has no influence on overall demand. It's a perfect example of "independent demand", estimated by a forecast, and for which safety stock is necessary to cover the uncertainty of the forecast.

It's also an exception. In a supply chain, almost all demand is 'dependent', and depends on the replenishment requirements of the downstream node. This type of demand should be calculated. The downstream customer should calculate it and send the results of his calculated demand to the supplier in the upstream node via a Supplier Schedule (see our Newsletter No. 19).

For a 'dependent' demand flow, a safety stock is not required to cover forecast error...because there's no forecast! The best policy in this case was mentioned above: produce one or two weeks in advance the quantities on the customer's Supplier Schedule, and to stock the products near the customer. This protects the customer who was sensible enough to give us information on his future purchases from us.

If the customer doesn't want to give a Supplier Schedule of his 'dependent' demand, the supplier should try to obtain from him the information required to calculate a Supplier Schedule in the place of the customer. The required info is: the average weekly consumption of the product at the customer's site, the actual inventory level at the customer's, the safety stock that he wants to maintain, and the last shipment received. This approach is always better than making statistical forecasts, for both parties involved.

In a future Technical Newsletter, we'll look more closely at the impact of Lean on inventory policy in the supply chain.

