

## INVENTORY IN THE SUPPLY CHAIN: WHERE TO PLACE IT?

by Bill BELT

Technical Newsletter No. 25 talked about *how much* to stock; let's talk now about *where* to place this inventory in the supply chain.

### \*\*\* Case No. 1: Purchased Parts \*\*\*

Recently a Supply Chain Manager said to me, "We deliver to a large manufacturer of cables. The customer has no inventory in his factory but wants us to put 15 days of inventory on a logistic platform beside his factory...at our cost, of course."

That's a financially clever solution: the customer has the inventory on his site or almost, but doesn't pay for it. In fact, who pays? The supplier? The banks? The government? The International Monetary Fund?

Of course the customer ends up paying! If the supplier can't make up the additional cost, his margins will drop; and the customer could wake up one day to discover that he has to deal with a giant new supplier has bought up all the smaller suppliers in financial difficulty. The new giant doesn't want to hear about any arrangements wherein he finances consignment stock. The power in the supply chain has shifted in his favor.

However, Lean does recommend placing inventory not in a faraway stockroom but in small quantities at the point of use. So the supplier should place his components at the customer site...as long as their requirements are repetitive. Obviously if the requirements are not repetitive, it doesn't make sense to put component stocks at their point of use...they'll just sit there a long time!

What can be done for components with non-repetitive requirements? Ideally, the supplier would make them, or at least *finish* them according to the firm customer order on the manufacturer.



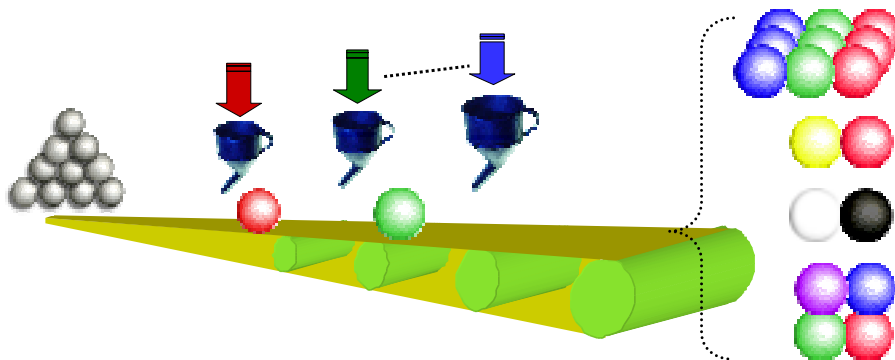
Whether the components are standard or specific, the customer and the supplier both gain from working together to find the best inventory point which will create financial gain to be shared by both parties. Standardization and postponement with Lean play important roles here. If the supplier can move a standardized component up to a point of differentiation near the end of his process, say with 2 days remaining to customize the product and 2 days to deliver it to the manufacturer, who can then make his finished product in 5 days and deliver it, final customers can order with 10 days' lead time.

But if the manufacturer takes 15 days and the supplier 10, either the final customer orders 25 days ahead of time or the purchased components, even the non-repetitive ones, will have to be stocked at the manufacturer.

### \*\*\* Case No. 2: Production \*\*\*

In the ideal Lean Production flow, inventory is placed at the least advanced point in the factory or the supply chain which still permits finishing the product within the lead time imposed by the market or the customer. Ten years ago, a manufacturer of electronics products stocked subassemblies and assembled the finished product to order. Today, he stocks components and makes the subassembly AND the final assembly to order. Note that for his automobile customers, he still holds a few days of finished goods inventory, a near-universal practice among automobile suppliers.

The general rule for production is to keep inventory either at the end of the process, if customer delivery lead time has to be immediate, or better yet the start of the process, where inventory is the cheapest and the least customized and most flexible, but not between the two. Intermediate stocks and work-in-process just add to lead time to go through the process



Here too, postponement (mass customization with Lean) modifies the general rule. If a large number of different items can be assembled or painted or labelled or boxed or otherwise customized from a set of standardized components, it would better to keep the inventory not at the finished-goods level but at the standardized-component level. See our Technical Newsletter No. 28.

### \*\*\* Case No. 3: Distribution \*\*\*

What about a large mix of products which all have to be delivered immediately, which implies finished-goods inventory which in addition should be placed at the point of use, in the far extremities of the supply chain?

A manufacturer and distributor of electrical accessories in the U.S. tells his affiliates and wholesalers: keep a "wide" inventory of one of everything, we'll stock "deep" in central. The final customer finds the entire range of products available at the nearby distributor, including items with weak and erratic demand. The forecast error on these products is very large at the extremities of the supply chain, but much less at the central location. It's the same for the typical pharmacy, with its broad but shallow inventory backed up by a rapid-delivery regional distributor with deep inventory.

The next step for the electrical-accessory company is to redesign the class B and C items with weak demand so that they can be made at the same time as class A products with strong demand, using the technique of postponement if possible.

