



# Vi sion

**Transforming  
Total Sales  
into  
Net Profits**

**GERALD I. KENDALL, PMP**

## Chapter 7 Distribution – From Push to Pull

**“McDonalds has so many inventory turns, there is a high probability that the hamburger you are eating was mooring yesterday.”**

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The average life of a golf club is 9 months. In bowling, specialty balls have a life of less than 6 months. Many medical products, including surgical rubber gloves, have a life of less than 2 years. We are not talking about shelf life or the product physically decaying.

What we are describing is the perception created by the entry of new or replacement products, making existing products seem obsolete or not as valuable. No wonder distributors and retailers hate carrying large amounts of inventory! At the same time, retailers and distributors have the opposite paranoia – not having enough inventory and losing a customer sale.

Handled correctly, shorter product life is a golden opportunity to enhance everyone’s sales and profits. But as you will see, in distribution, the old frame of reference (local efficiency) encourages mountains of unneeded inventory in the supply chain while simultaneously perpetuating shortages.

***A distribution system managed holistically will increase Throughput of the entire supply chain in at least 6 different ways, as described in this chapter.*** Often, the potential impact on business volume and profits is greater from Throughput increases than from reductions in inventory. Thank goodness the distribution solution does not force a choice – increased turns, increased Throughput and decreased inventory occur from the same holistic approach.

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### The Current Supply Chain Frame of Reference

Driven by local optima, manufacturers push inventory into the distribution channel as soon as it is produced. Cost accounting rewards them in the short term, by reporting the inventory movement as sales and profits on their books, even though no consumer has bought.

The inventory has moved from the manufacturer's docks to the distributor's warehouse. The longer the inventory sits in the distributor's warehouse, the higher the risk of obsolescence, the greater the carrying costs for the distributor and therefore the lower that distributor's profits. For the distributor, profit is directly tied to the number of times they can turn the inventory. So the manufacturer, the distributor and each subsequent link keep pushing the inventory until it reaches the retail shops (if this link exists) and/or the end consumer level.

*In a supply chain burdened with too much inventory<sup>1</sup>, much or most of the inventory sits at the retail level, while little or no inventory is at the manufacturer's plants. At the same time, customers who visit a retail shop often cannot find the specific item they are looking for.*

Why do some retailers carry so much inventory, if it just sits in their store much of the time? Why do they tolerate costly obsolescence, high carrying costs and still have customers walk out of their shops without the desired goods in hand? To answer this question, I will link this retail behavior to manufacturer and distributor policies and practices.

Many manufacturers and distributors offer quantity discounts, on a per order basis. Also, many of these same manufacturers and distributors have freight policies and charges that penalize the retailer for smaller orders. Since most retailers compete with other shops close by selling similar goods, the retailer needs a similar cost basis to stay competitive in price and margins. Therefore, retailers place large orders with manufacturers to gain better per order discounts. As a result, retailers have much larger quantities of goods on hand than they need to cover immediate consumer demand and replenishment time. With this inventory on hand, even as consumer tastes are changing or as manufacturers replace existing products with new products, retailers are pushing *their existing* inventory on the consumer. You can see this phenomenon in the car market, in computers, cell phones, etc.

Knowing the new product is coming, the retailers rush to get rid of the old products at fire sale prices or with special deals, anxious to avoid obso-

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<sup>1</sup> This is just one form of an unhealthy supply chain. Another form was described in the last chapter on operations, where the steel manufacturer had almost a billion dollars of rusting inventory sitting in their yards, while customer demand went unfulfilled.

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lescence. By doing these mass promotions, the retailers kill the market for the new product and their profit margins. Many of the consumers who might have bought the new product are now in possession of the older one.

There is another devastating effect to a supply chain that operates this way. By pushing most of their inventory to the retailers, the manufacturers and distributors have distanced themselves from changing trends in their markets. In many cases, with several months of inventory tied up at the retail and wholesale level, it takes manufacturers and distributors several months to see consumer demand changes reflected in orders to them. The lower the number of turns at each level in the supply chain, the longer it takes for manufacturers to understand and react to trends.

There is one other very negative effect. At the same time that excess inventory abounds in the supply chain, customers come to buy a product and often don't find it. Yet many times, the very product that is short in one store is sitting in abundance on a shelf, somewhere else in the supply chain! This happens because of the practice of pushing large quantities of each SKU towards the retailers, *in a manner that does not match end consumer demand*.

In this world of local optima, manufacturers keep on producing and shipping goods to distributors, sometimes “threatening” the distributor with higher prices or loss of exclusivity if the distributor won't accept the goods. Distributors do the same with their retailers, until the supply chain is completely clogged with goods that consumers are no longer buying. By this time, significant damage has been done. There is too much inventory in the system, and the part of the supply chain that has the most inventory suffers the greatest consequences. Retailers go bankrupt. Distributors lose money. Manufacturers – well, just look at what happened to Lucent, Nortel, and so many others<sup>2</sup>.

### Applying the Five Focusing Steps

To apply Step 1 in Distribution, IDENTIFY THE SYSTEM'S CONSTRAINT, you must look throughout the distribution channels and ask yourself what, more than anything else, determines how much Throughput the channel can generate. In most cases, the answer is “the clients who come to buy the product or service”. There are not enough clients who buy.

We see distribution channels going adrift in Step 2, EXPLOIT. Before spending money to attract more clients, don't waste the ones who already

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<sup>2</sup> Of course, not all of these manufacturers' problems were because of poor distribution policies. However, these types of policies interact with and exacerbate other problems.

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come to buy from us. It is a complete waste when clients do not buy because they cannot find a product in a given location, but the same product is on the shelf in another location. In order to avoid wasting a customer, we must dramatically increase the chance of matching the right inventory in the right place, at the right time to the end consumer demand. To achieve this, we must answer the questions:

- Where is the ideal place to have most of the inventory?
- What are the correct logistics to replenish the inventory between manufacturers and distributors, and between distributors and retailers?

We will begin with the first question – where the inventory should be located. Consumer demand varies widely from one geographic location to another. In any one retail location, it shifts dramatically from day to day. There are time lags between changes in end consumer desires and the reactions of the supply chain. All of these factors make predicting demand for any product at the retail level a phenomenal challenge.

Manufacturers often try to react to the challenge by pouring millions of dollars into more sophisticated forecasting systems, only to find little, if anything, improved. After all, a forecasting system does not make the end consumer react more rationally or predictably. To exploit the constraint, the customer who wants to buy, we must move away from sophistication, into a much simpler solution.

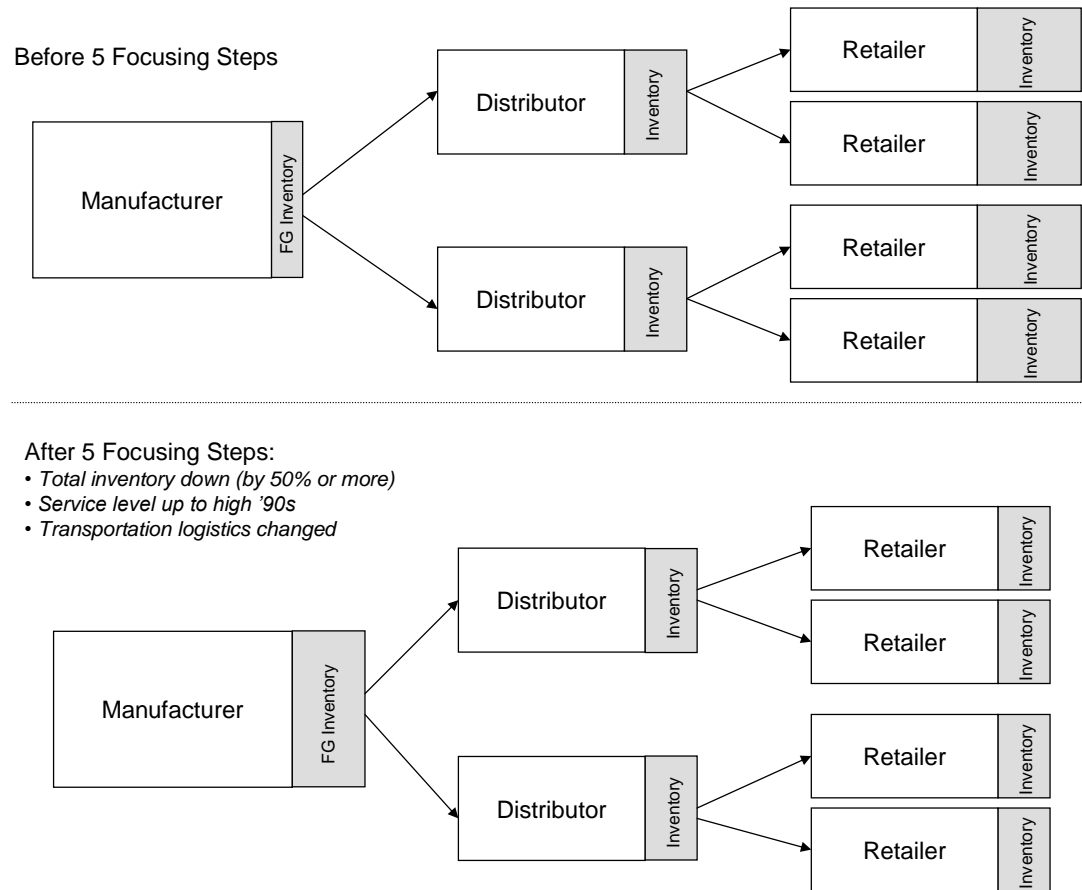
There are two steps necessary to solve service level, inventory and obsolescence nightmares permanently in a distribution environment:

- Pool the inventory where there is the greatest predictability
- Implement a pull system to replenish individual items frequently based on what was sold during a short interval

If you were the logistics manager of a large, shoe manufacturer, what is the ideal way to distribute the inventory of size 8 brown shoes across the supply chain? In one week, you couldn't say that anyone will buy even one pair of those specific shoes in any given store. But you would have much more confidence about the national numbers. ***The more macro the level you are forecasting, the greater the predictability.*** Predictability decreases as you move from national to regional and from regional to city and city to individual location.

Based on the above characteristic of predictability, the logical thing to do would be to have most of the inventory at the manufacturing plant, less at the distributors and even less at the retail level (see figure 7.1). Logically, you would also replenish with much shorter lead time. In this way, there will be

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**Figure 7.1 Exploiting and Subordinating in Distribution**

less chance of stock-outs at any given location and trends will show up much more quickly, with less waste.

For example, assume that a retail shoe store today is currently holding 3 months of inventory of each SKU. This inventory requirement is calculated based on the total replenishment lead time. The replenishment lead time is made up of:

- Transportation lead time
- Production lead time – the time it takes the manufacturer to produce the product
- Order lead time – the time between when the retailer sold the first item and the time they reorder

While the supplier controls transportation and production lead time, the retailer controls order lead time. As it turns out, Order lead time usually

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provides the biggest opportunity for improvement. In the old approach, retailers reorder when they hit a minimum quantity in stock (commonly called the min/max system, since they will order sufficient quantity to bring their stock back to a maximum level). Under the EXPLOIT step, we will implement a pull system that has the retailer order, every period (e.g., one week), exactly what they sold the previous period.

In our new system, transportation lead time stays the same. With finished goods inventory now being held by the manufacturer at the plant warehouse, production lead time is 0 – the product should be in stock in the plant warehouse. The biggest difference is usually in the order lead time. Instead of waiting 2-2.5 months for the stock level of each item to hit a minimum, and ordering a 2-3 month supply of that item, the new pull system has the retailer order only the SKUs that moved the previous week, in the exact quantities sold the previous week. The order lead time has now been reduced from months to a matter of days.

This means that the amount of inventory that the retailer needs to carry of each item to cover their replenishment lead time is much less. It also means that their chance of running out of an unexpectedly popular item for weeks at a time is almost nil. Service levels, under this new system, move much higher, while total inventory in the supply chain typically drops by two-thirds! The system reacts much more quickly to the variability and uncertainty of consumer demand. It also greatly simplifies both the distributor's and the retailer's lives. Instead of worrying about ordering a 3 months supply and debating how much and which products the consumers might demand over that long a time period, the order items and quantities are automatic based on sales.

Wearing our marketing hat, with the additional space freed up in the store by reducing the overstocks, we would have the retailer carry a greater variety of our goods! More variety means more sales.

As for transportation costs, in the real life cases where this was implemented, the configuration of each of the shipments was different, but the frequency and cost of shipping remained about the same. Instead of shipping 50 units (a 3 month supply) of 10 items, we are shipping 10 units (a 3 week supply) of 50 items.

For distribution chains that have changed logistics according to these principles, the statistics are astounding. Overall operating expenses (considering the combination of transportation costs, inter-warehouse transfers, inventory carrying costs, returns and obsolescence costs) decrease dramatically.

Successful companies do not stop at the EXPLOIT step. By focusing attention on step 3, SUBORDINATE, you substantially reduce any risk of failure.

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Even with a single company, that owns its own distribution and retail outlets, the SUBORDINATE step requires buy-in across the functional team. In cases where you have different companies in the supply chain, you must methodically overcome the resistance to change, or the solution will be stopped dead in its tracks.

SUBORDINATE means that everyone in every part of the distribution supply chain, including the manufacturers, adopts the attitude that “**AS LONG AS THE END CONSUMER HAS NOT BOUGHT, WE HAVE NOT SOLD!**” Existing measurements must change to encourage pull rather than push. This is especially important for the manufacturer, who will now be carrying a significant portion of the total finished goods for the entire supply chain in the plant warehouse<sup>3</sup>.

In the SUBORDINATE step, the company puts the pull system software and procedures in place. The minimum inventory necessary to cover fluctuations in consumer demand and transportation time during a short time period are stocked at the retail level (or level closest to the end consumer). The distributor carries the minimum inventory necessary to cover fluctuations in demand from their customers plus the transportation time from the manufacturer to replenish the inventory. The manufacturer carries a larger inventory, to cover fluctuations in distributor demand plus the cycle time for them to manufacture sufficient quantity to replenish their plant finished goods inventory. Of course, you must factor these numbers based on reliability of transportation and manufacturer into these calculations.

Under the pull system, if the manufacturer wants to introduce a new or replacement product into the market, or even if they are replacing a defect in an existing product, they need to cover only one third of the inventory that they were covering before. The lead time to replace products is much shorter, and the cost is much less.

Some of the most successful companies in the world are using such systems today – from computer manufacturing to super retail stores to luggage companies. Just look at the inventory turns of highly profitable manufacturers and distributors, and the numbers speak for themselves. They have implemented a true pull system.

What about step 4, ELEVATE? Distributors might need to elevate, for example, if they want to open up new geographic areas. But with the cash freed up from the first three focusing steps, it is much easier to add new distribution locations. Plus, the cost of setting up each new distribution location is much smaller, due to the decreased inventory.

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<sup>3</sup> For a more detailed discussion of the Distribution solution and measurements, see the TOC Insights into Distribution, at [www.tocinternational.com](http://www.tocinternational.com)



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### **Six Ways that the Holistic Distribution System Increases Throughput**

1. Having sufficient stock of each product at the right location in time to match demand increases the service level (the percentage of time the buyer finds the item in stock and therefore is able to complete a purchase)
2. With less inventory, and therefore less shelf space required per item, the distributor and retailer are able to stock a greater variety of items, thus increasing throughput from the same physical space
3. With less inventory per item, sales to get rid of excess inventory are required much less frequently. This means that both the margins and the sales revenue are increased. It also implies that sales of older products do not spoil the market for new products.
4. With less inventory per item, there is less obsolescence, leading to greater satisfaction among consumers and therefore increased sales. The products on the shelf are newer and therefore more appealing. This can have a huge impact on throughput with items that have expiry dates
5. Faster replenishment during stock out situations means that there will be much less opportunity for a buyer to have to resort to a competitor's product
6. The faster reaction to changes in consumer demand leads to fewer stock outs

### **Summary and Next Steps**

Many distributors fight hard with their manufacturers to carry smaller quantities of inventory on better terms. At the same time, the manufacturers are often trying to do the opposite – push larger amounts of inventory to distributors and retailers with more aggressive terms. Each link tries to push their inventory as quickly as possible to the next link in the supply chain. This creates huge gluts of inventory at the retail level. As retailers try to predict, months in advance, what their consumers will demand, and order accordingly, it is 100% certain that retailers will have too much of some products and shortages of others during this long time period.

The new frame of reference (T, I, OE and the Five Focusing Steps) changes this nonsense from a push system to a pull system. Inventory is kept where it makes sense (less at the retail level, more at the manufacturer's and regional warehouses). This is entirely feasible when the time to replenish goods at the retail level is significantly decreased. With these changes, total

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inventory in the supply chain decreases by two-thirds, while customer service increases.

All of the pieces that we have discussed so far to implement a Viable Vision require project management. Speeding up these projects dramatically is now vital to your improvement strategy. The next chapter on Project Management highlights one of the most exciting developments of the past 50 years. If you think that measuring people to finish their tasks on time is good, you may be very surprised by what Goldratt discovered about human behavior and managing complexity on projects.

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