

Managing the inventory levels: the key problem for any distribution chains

A TOC perspective by Eli Schragenheim

How big is the problem?

Distribution chains provide a necessary link between the producers and the shops/stores. Practically every consumer good requires a distributor in order to be sold to a user. Many products for businesses also require a distributor as an interface between suppliers and clients. One might look at the growing sales through the internet as an alternative for the traditional distribution, but still the vast majority of the sales are done through shops, which are assisted by a distribution chains.

So, the service provided by the distributors is quite necessary for the goods to reach the potential buyers. What are the problems of the distributors in managing their business?

The key challenge of any distribution chain is to face the uncertainty in both the demand side and the supply. The most obvious difficulty is to decide well ahead of time what is going to be sold and what not, because the distributor has to purchase the items from the supplier.

There is another aspect that makes the purchasing of items by the distributor a critical managerial decision. The limiting factor for most distributors is cash. Usually the distributor has enough space and logistical means to move the merchandise around. What limits the distributors from holding and eventually selling more items is **the available cash or liquidity**. This means that the time between the money spent and money received has more impact for the distributors than for many other types of business. Due to this aspect distributors are typically pressed to “get rid” of inventory that seems a little slow to be sold. Thus, selling in very significant price reduction is very common in the distribution chains line of business.

The decision how much to hold from a specific item is so critical because buying too much of an item is on the expense of buying other items and if the whole quantity is not sold fast enough pressure to reduce the price in order to get rid of that item would be quickly raised.

On the other hand, buying too little might generate a shortage of an item with good demand. The financial damage of a shortage is not straight-forward to calculate, but is definitely significant.

But the overwhelming difficulty is caused by the **huge quantity** of different items stored at different locations. For each item/location there is a need to make a decision, and every such decision has to be checked quite frequently. More, in order to meet the cash limitation the **sum of all the purchasing orders need to be under full continuous control!**

Forecasting: A weak spot of the current common practices

Forecasting is a common central tool to support the critical decisions on how much to purchase from each item. This mathematical-statistical tool is widely used to forecast the future demand of individual items or the future demand of a family of products. However, the way decision-making is based on the forecast is truly distorted. It is not true to claim that “forecasts are always wrong” as forecasts are not intended to tell you how many units would be sold. A forecast just tells you what **reasonably could be** the sales. Forecasting generates **partial information** and in order to deal with it the decision maker has to consider not just the one number issued by the forecasting algorithm, but also the reasonable possible deviations, sometimes referred to as “forecasting error”. However, the forecasting error estimation very is seldom used.

The TOC Way to handle the stock levels in the distribution chain

The intent of the coming paragraphs is only to note some of the critical insights that are at the basis of the TOC solution for managing stocks.

A critical insight is to recognize that the required stock of an item is impacted by the combination of two major influences: the demand and the supply. This simple fact has very significant ramifications especially as the distributor is able to affect the supply time in a more effective way than it can affect the demand. This understanding changes the focus of the resulting process.

The above insight also points to the fact that the behavior of the on-hand stock reflects the actual **combination of demand and supply**, and thus it is a key in deciding whether the current stock level needs to be increased or decreased.

The resulting process puts an emphasis on generating a **clear priority system** for the purchasing and the transportation of items from the suppliers and between the different locations of the distribution chain.

At the same time the existing stock levels are kept constant unless a clear signal is received pointing to a required change in the stock level of certain items. This understanding creates a quick replenishment process that is quite straight-forward to follow. One of the benefits of this method is that the cash investment can be easily monitored and controlled.

Managing the stocks leads to significantly lower stock levels than most chains are holding, while having far superior availability of the items at their target locations.

More advanced understanding on where the main bulk of the stock should reside bring even more opportunities to reduce stocks while keeping better availability.

Two recent books on the TOC methods describe the thinking and the method itself:

1. Isn't it Obvious, by Dr. Eliyahu M. Goldratt, Ilan Eshkoli and Joe Browleer. This is a fiction story about a retail chain and their logistical problems.
2. Supply Chain Management at Warp Speed, by Eli Schragenheim, William H. Dettmer and Wayne Patterson. This book covers the whole supply chain: the producers and the distributors together.