

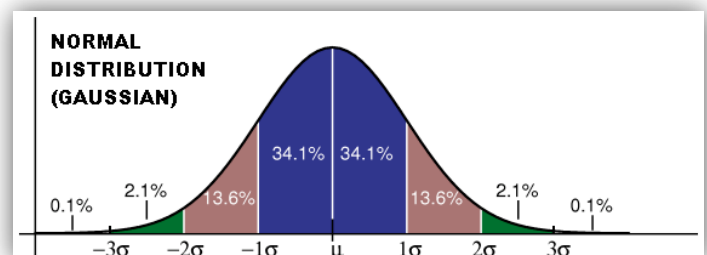
Efrat's Nuggets

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Efrat's nugget -2: Stray elephant

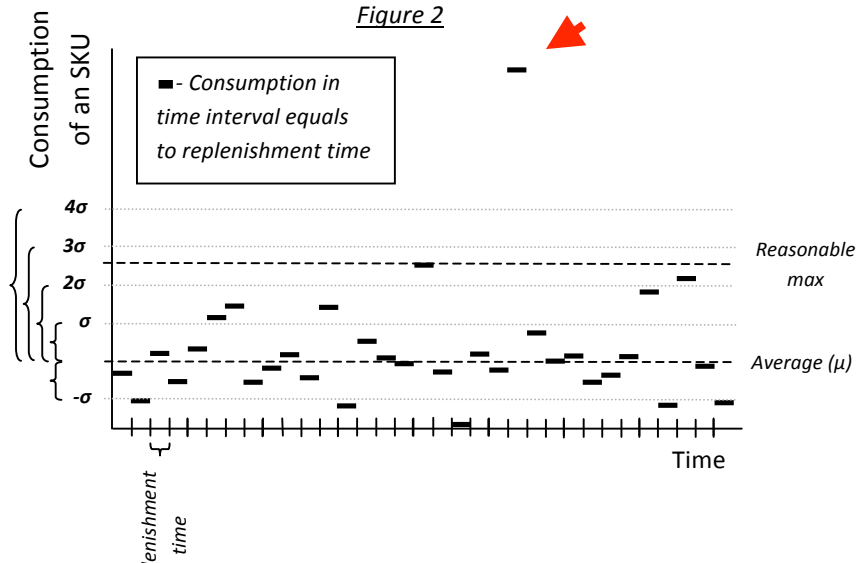
(MTA; Production)

Figure 1



Stray elephant: When initially determining the proper buffer target, we need to determine the maximum consumption within replenishment time. That is done by looking back at the consumption during past time-intervals (intervals that are equal in length to replenishment time) and choosing amongst them the max value – or actually, the reasonable max. What does a “reasonable max” means? Well, statistically, the consumption behaves, roughly, as a normal (Gaussian) distribution. Figure 1 shows the Normal distribution and figure 2 shows a typical picture of the consumption over time. However, in reality, for some SKUs there are also sporadic large orders (like the one highlighted by the red arrow).

Figure 2



The 'reasonable max' is the max value taken without regarding those extreme large orders.

To better understand why we omit those exceptional consumption segments when determining the inventory target, let's examine what would have happened otherwise. Determining the inventory target according to a large sporadic order would have led to a high inventory target, so high that the consumption within a replenishment time is likely to be less than one third of this target. Since most of the time we handle normal-sized orders rather than huge ones, the consumption within the following time interval(s) is likely to leave the inventory at the green. This would result in cutting the inventory target (probably more than once) until it fits the Normal consumption. In other words, considering sporadic large orders will cause us to invest in creating a pile of inventory only to lower it shortly afterwards.

But, for some SKUs such extreme orders, rare as they might be, do exist. These orders are larger than the inventory target. What will happen if we try to satisfy them from the available inventory? The inventory will not suffice for such huge order. The inventory will drop to zero and therefore the corresponding production order will be launched with a red priority disrupting the flow of all other production orders. Moreover, since the production order is very large, its process time will be long and the buffer will stay red for a long time, and so the mechanism for enlarging the inventory target will be activated only to cause an unnecessary oscillation in the target.

What can be done to prevent the described undesirable disruption? The answer is very simple. On those rare occasions of getting an order above the inventory target, do not supply it from inventory – do not accept it as an order for MTA, but rather refer it to MTO, notifying the client that such big orders are not supplied from stock. Accepting such order is like letting a stray elephant to enter a china shop.

