Demand Planning

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Introduction

Demand Planning is simply said the demand plotted in time. Due to the many versions and categories of the products, the different timeframes, and the many versions of the demand pattern, it can easily become overly complex to keep focus on what really matters. So, the challenge is to make Demand Planning not too complex and go for simplicity and clarity. If we can align the Supply Planning, in a similar simple and clear way, we have a particularly good overview of Demand&Supply and a discussion document for the management of a company to talk about the tension between Demand and Supply and able to initiate the right actions.

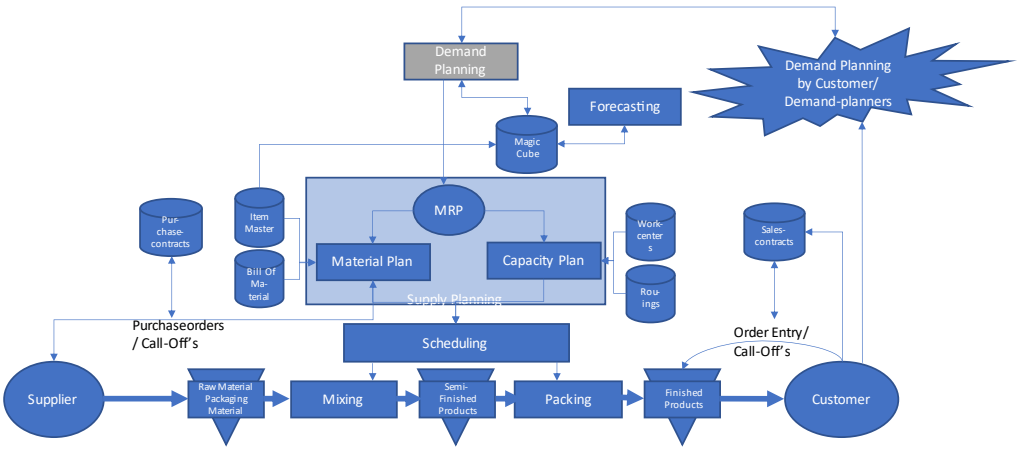
Demand planning is about operational decision-making, which will be explained later-on in this chapter, takes place foremost on the medium term. In that timeframe you can still influence supply and demand quite easy. On the short term the flexibility is almost none to zero, practically speaking most has been arranged, started, or maybe already produced. Of course, you can do some minor changes or repairs, but major changes aren't possible anymore. If you want to do big changes within the short timeframe, it will mostly mean you let a customer down in favour to deliver another one. On the longer term a lot more is possible.

In the following I will pick up the story from the Pareto analysis again to elaborate in this chapter a bit more.

Place of Demand Planning in total concept

Demand Planning starts with an overview of the actual valid demand planning and forecast proposal which has been calculated. So, the Demand Planning starts with looking at the differences between the Demand Planning and the calculated Forecast and the decision to take is: do I want to take over the forecast proposal or do I have reasons to deviate? That's the deterministic approach. You have information why you should deviate from the forecast, for instance because the customer plans a promotion, or some other future event. That is typical a talk you should have together with Sales and the Customer around the table.

‘Demand Planning’ within the total Concept



Demand Planning: customer / product axis

Demand Planning is essentially a table with on the vertical axe customer/product and on the horizontal axe time. Let’s first talk about the vertical axe, in de the following paragraph we will talk about time.

So, on the vertical axis we should define something like: customer, product, or product group. An average manufacturing company can easily have about 700 finished products, a retailer 20,000. And then you are not even talking about the specific combinations of customers and products. You need focus; therefore, you must apply the Pareto again and find what is "workable". What I usually see is: -

- A-products. These are often specific products for specific, often large customers representing 20% of the total amount of customers and taking 80% of the turnover. Typical situations are like: ca. 5 customers with on average 6 specific products, so roughly 30 combinations. Really that few? Yes! So, see that you get a ‘manageable’ number of combinations. This is your focus-area, your organisation should spend maybe something like 60% of their time at least initially to get this right. This is your lifeline, the reason you’re exist as an organisation. In most cases if there’s trust, the customer will allow you to take over control gradually in time over the supply more and more. So, it’s starting by getting Point Of Sales information and in the end, you control the inventory for them completely. So that’s what you call real partnership! There are numerous examples of these kinds of relations. Discussing the demand forecast is one of the most important subjects in these relations. It often turns out that preparing and discussing the demand itself can be done monthly and in exceptional cases you email or call. The supplier is often also responsible for the customer's stock. That is the best situation, because you are then completely "in control". The customer

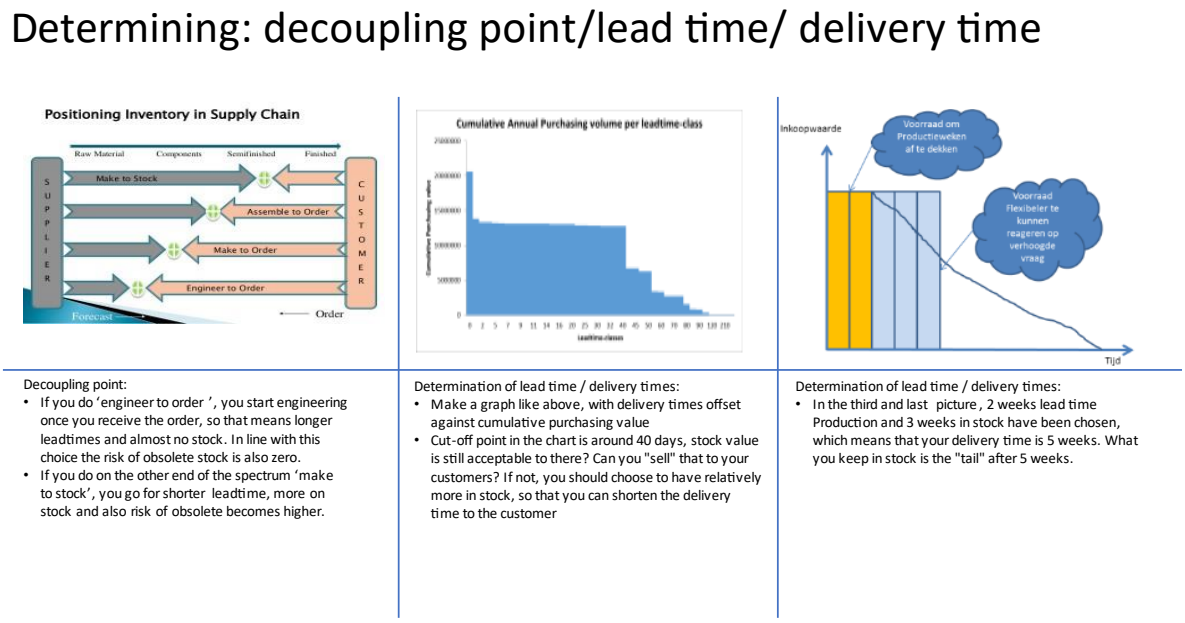
usually finds that more pleasant, you take over the responsibility for the product-availability for them. Then, they don't have to worry about it.

- C-products. These are the products that you prefer to forecast automatically. So, you are talking about those 80% articles that make up 20% of the turnover. Not unimportant, but you simply cannot give the same attention to all customers and articles. You usually keep the stock level a bit higher for this group of products but given the turnover level that is usually less of a point. Your OOS percentage will also not be 99%. These are the articles that you just let walk along and that you should pay as little attention as possible to. You usually don't follow these types of products on a customer-specific basis.
- B-articles. Is in between A and B. Sometimes it is useful to keep an intermediate class with some other parameter settings, sometimes it is better to keep only 2 classes: A and C. But I use the B-classification also very often to follow C-products which needs somewhat more attention because: they are new and potentially A-products, or just the other way around these is phase out products, ….

Decoupling point / lead time / delivery time

Before we discuss the horizontal time-axe, we need to address: decoupling point, lead time (making) and delivery time (purchasing). After all, those elements determine at what level we should plan (vertical axis) and what flexibility (horizontal axis) we can offer the customer.

Determination of the decoupling point, lead time and delivery time



Let's start with the right picture above. Assume we don't want to keep stocks at all, then the delivery time would be about 12 weeks. This means that if the customer places the order, the customer would be told that product would be delivered in

approximately 12 weeks from the moment of ordering. Dependent on the product and sector you're in, this is a problem or not. For example, I ordered a piece of furniture a while ago and in that case it's not surprising you get a delivery time of 12 weeks. You don't mind about this; you know as a consumer this is simply the reality you can't do much about it. But suppose you ordered a standard coffee machine, you want it off the shelf, right? And if that is not possible, you probably would easily switch to another brand and device that is available directly from stock.

Leadtime

In our example above, it is assumed that you face 2 weeks lead time in the factory, and you face 3 weeks delivery time for material. This would add up to a total delivery time of 2+3=5 weeks. In that case you would put the "tail" in stock, normally you calculate with inventory cost of 15% of the cost price. This cover: Interest, space, risk. How is 5 weeks come about? It isn't really a matter of pure calculation; it will be a consideration of:

1) Economical reasons. Famous in supply chain is the EOQ-formula, which is an optimum of the cost of inventory and batch size in which you produce. But also, this formula isn't that solid, it's based on a lot of assumptions which aren't true in practise.
2) Expire date. A rule of thumb is that 1/3 of the total expire date is for the supplier and 2/3 for the retailer/consumer;
3) What is the usual delivery time in that market, do you conform to the average or not?
4) ..

The point is that lead time isn't just a rational calculation a lot of assumptions and market rules play an important role in the determination of the lead time as well.

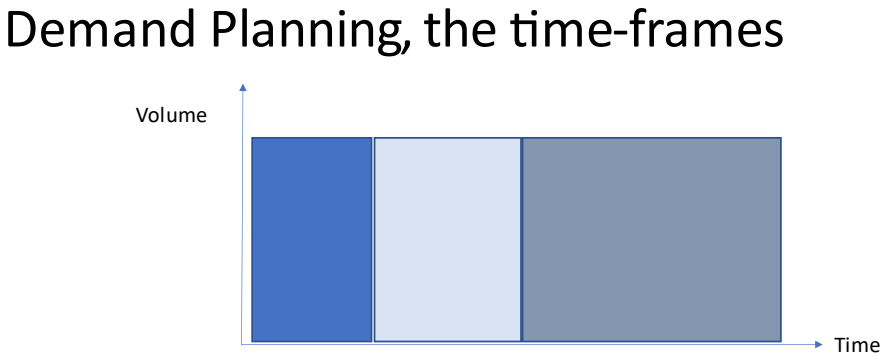
In the analysis of the total lead time, you will see that the delivery times of your suppliers take usually by far the longest duration-time at least for a lot of parts. Therefore, it's important to do the analysis of delivery times once and a while. Of course, you can ask for every purchase-item the supplier the lead time, but you should foremost focus on the longer lead times. So, see that you question the longer ones first. I must say that in practice I see very few companies that are seriously doing this. It one of the cheapest and fastest improvement you can pull through, and then we a lot more flexibility as well. I once made the middle picture above for a company in Germany that was active in the metal sector. Delivery times were up to 120 days and the bulk was around 40 days. Well, material here was not extremely expensive, but delivery times like this makes you very inflexible. Of course, you can create stocks to compensate that, but you could also question the delivery times themselves, which often are created arbitrary and far less precise determined than many people think. I would like to refer to an article I wrote about this for the Dutch magazine Logistics in 2019 under the title: "Delivery time reduction means saving money".

Move customer decoupling point.

Another option to reduce lead time is to change the decoupling point. The example of furniture above is an example of: ‘make to order’. You may have some basic parts in stock and perhaps the fabric as well, but the furniture still must be completely assembled. The production starts when the order comes in, therefore this is called: ‘make to order’. The example of the coffee machine above is available from stock as it is called and can be sold off the shelf, which is "make to stock". The manufacturer optimizes the production and produces once in while a whole batch of coffee-machines which once produced go into stock waiting until an order of a distributor is coming in, the coffee-machines are then bought by a shop where you as consumer can buy your coffee-machine. So, this way of producing is called: ‘make to stock’. I do a lot in the food industry and assemble to order is quite common there. This has to do with the fact that you often mix something in large quantities (batches), for example and fill it in big bags or tanks and then fill it in bottles, bags, etc. These bottles and bags are often customer specific. Also because of the expiring date (freshness) you can’t put too much of finished products on stock. So therefore, you see you have sufficient stock at semi-finished product level (tanks) to be filled in a customer-order specific way. In that case, the stock of semi-finished products is somewhat higher, but you avoid having customer-specific end products in stock. In the demand plan you can then calculate better with the semi-finished products than with the end products.

The timeframes

Now that we have explained at what level we should plan and how we should deal with lead times, we can talk about the timeframes in the Demand Planning.



	Short Term	Mid Term	Long term
Horizon	0-4weeks	5-12 weeks	12wk-1,5year
Timebucket	day	week	Week
Frequency	Daily/weekly	Weekly/monthly	Weekly/ monthly

Short-term

Is usually the next 3-4 weeks. Within this time-fence not much is possible anymore. Stuff is ready to produce or has been produced already. This time frame is important to have a good starting point for planning further away, and of course repair must be done where appropriate. But for the remaining your influence on this level from a planning point of view is extremely limited. In this period, you can only execute what you have previously done in terms of demand planning and forecast. This is the time frame where you should try to keep things under control with Scheduling, that's not where you should be with Demand Planning. That is the medium term.

Medium term

As just said, this is the most important period from Demand Planning perspective. You can still change the demand relatively easy without harming production or call-offs to suppliers or stuff which is already on his way to you. Capacity can still be influenced relatively easy as well. An extra shift for example you can still arrange within this timeframe. This is the period where you should talk about the forecast with your customers and see that demand planners and salespeople are all aligned. In S&OP meetings this is the period you can influence, and you should talk about.

Long-term

Like said earlier I work a lot in the food industry, where you must deal with harvests and long-term agreements. The harvest for the next season is agreed at an early stage. It is also useful if you can think in terms of quarters and years within this time frame. You can then see better when shifts are needed or not. This is also the subject of S&OP.

Connection with Forecasting

As indicated in the article / chapter on Forecasting, filling Demand Planning is not that exciting as it is often said in books and other literature (certainly scientific ones) on Demand Planning. If no Forecasting is available, you could choose to copy the entire year last year and set a growth rate for next year. If you really want to have some grip on seasonal patterns, take the average of 3 years. Forecasting can be better by using formulas and algorithms that’s for sure, but I just think it’s sometimes overrated. There are a lot of circumstances which you can’t predict and therefore a deterministic and more future-oriented approach is more valuable. And last not but not least the information which comes from you customer is the most important probably, certainly for the A-items. As indicated above, it is interesting to have a good formula for the C articles. The better, the more you can rely on it and don't have to worry about it. As said before, I think paradoxically, forecasting is interesting for the C articles and less for the A articles.

Communication, communication,…

Forecasting is basically a more technical-statistical story, demand planning, on the other hand, isn't. Forecast is used to generate a demand, which is particularly of interest for the C articles, on which you really shouldn't spend too much of your energy and time on. The demand plan for A items is ideally developed in collaboration with the customer. The knowledge of the market now and soon is more important than a very well calculated forecast based on what happened in the past. Of course, for the first time, it is good to have a proposal generated by Forecasting, but after that you should immediately see how realistic that is. It is often also good to look internally before you consult externally to see what the forecast pattern looks like, to what extent you can realize supply-technical aspects and then discuss things externally. You then really get more into the S&OP cycles, which gives structure to the internal discussion of all this. We will of course go into this in detail in the chapter on S&OP. But as far as the Demand plan part is concerned, the steps are actually: -

- Generate a proposal for a new draft-version of the Demand Plan with a forecast

- Update Demand plan by first assessing the forecast proposal and adopting what seems right

- Prepare and discuss Demand Plan in combination with: Demand Planner, Sales and Customer.

- Be sure to discuss Demand Plan about A articles and of course it is good to go through the C articles with the A customers, but these will usually be totalized over all customers so you must discuss whether there are special deviations, of such.

- In the S&OP cycle, Demand Plan is discussed in its entirety and, of course, especially its feasibility is checked.

Summary

Demand Planning is made on the basis of: 1) a statistical forecast 2) (future) deterministic knowledge inside 3) (future) deterministic knowledge from the customer. Furthermore, we made a distinction between A- and C-items. In the demand planning of A-items the deterministic knowledge internally and externally plays a major role, the demand planning of C-items should more rely on just the statistical forecasting.

To create more flexibility, we should consider where we put the decoupling point. The further this point is downstream the more flexible you're, but this is also more risky and costly (inventory). We should also discuss that we should focus on getting the longest lead times lower, so our total flexibility becomes higher.

We made clear that the medium-term is by far the most important term as it comes to Demand Planning. Within this term it's relatively easy to change quantities without big consequences and if there are consequences material- and capacity-wise you are still able to fix those relatively easy.

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