Supply Planning

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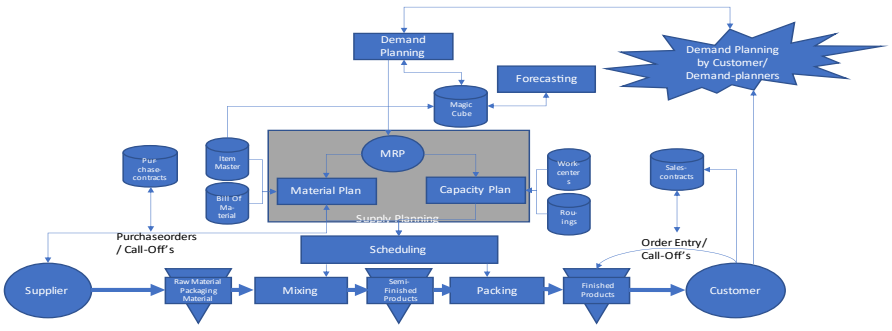
Introduction

The essence of Supply Planning is in the end that it should be clear if Demand Planning can be met. It should be indicated what the 'tension' is, between what is desired (Demand Planning) and what could be realized (Supply Planning). In that sense this is also the main topic of S&OP. To be able to really judge the tension the Supply Planning should be presented in the same units of measure as the Demand Planning. Often a somewhat different presentation from a different angle is than desired, for example per machine or machine group if you want to talk about the capacity: how much do you want to make?; how much can you make per shift? Supply Planning is the result of MRP (Manufacturing Resource Planning), the 'engine' of ERP.

Place of Supply Planning in total concept

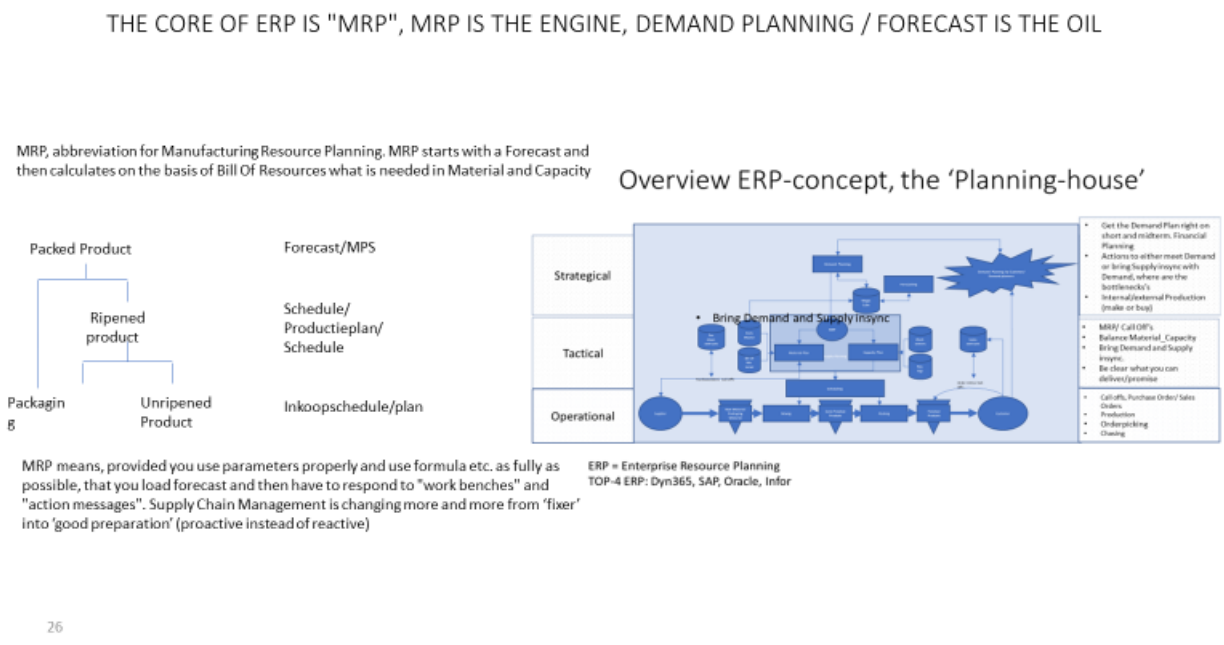
The supply plan that we use in response to the demand plan within the S&OP cycle is the result of the MRP-calculation and should be a realistic estimation and rectification of the Material and Capacity requirement. So, first Demand Plan will ensure that in a first version of the Supply Planning, a tension arises in terms of material and capacity requirements. The great thing about ERP systems is that if you set the parameters correctly, you as a Supply Chain Officer have just to respond to the action messages. Action messages are of the nature: 'advance material A to make production order X on time to be able to deliver customer order Y on time'. As Supply Chain Officer you walk through the action messages and try to bring in realism into them and eventually a Supply plan is created that is also realistic. Of course, a Supply plan may contain a bit ambition to deliver things on time. That is the tension that you should also bring into an S&OP meeting.

'Supply Planning' within the total Concept



Wat is MRP?

I don't think I should try to handle MRP in detail here, but we should touch it at least so we get a better understanding of Supply Planning. What I notice in practice is that many companies don’t use MRP properly. And that is a shame, because MRP is the heart of ERP. Don't try to modify this, stick to the default. MRP picks up the demand from Demand Planning and calculates through the Bill Of Material (bill of materials) the material- and capacity requirement. The same logic can be used only in reversed way to calculate the cost prices of end items, which is called with a nice word: Cost Roll Up. So, you start from the bottom of the BOM with the purchase-price and you add costs to it while creeping to the top of the BOM. And still, you can do more if you walk the path of the BOM, for instance lot tracking and tracing is making use of the same logic. So, you can determine a lot more with MRP than just material requirement, which was originally the first MRP-engines could do. Therefore the abbreviation changed in time from Material Requirements Planning (MRPI) to Manufacturing Resource Planning (MRPII). Most modern ERP-systems have this logic build in, in their software, so use it, it’s immensely powerful.

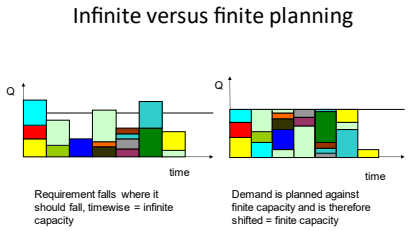


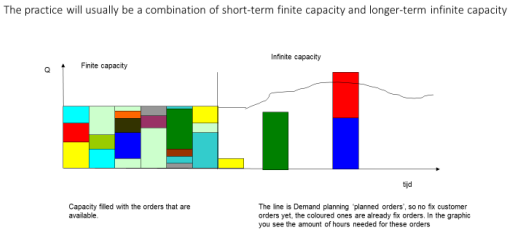
Let’s stick here to the Supply Planning in relation to Demand Planning. Demand plan is usually read as Forecast into ERP. First thing MRP does is to deduct the final stock from the Forecast. That is not always desirable, for that reason you see that newer versions of ERP software can convert the Demand Plan directly into ‘planned’ orders, in fact a 1 to 1 translation from Demand plan to planned orders, without deduction of the stocks. Planned orders are of the "planned" type, which means that every time you run MRP, the old planned orders are discarded and replaced by new ones based on the newly created situation in terms of forecast, stocks, production order status, etc. You can convert planned orders directly into Production orders, Transfer orders or Purchase orders or convert them to the type "firm planned", these are orders that are not discarded when a new MRP is run.

You can easily change numbers and dates; the BOM is not yet final yet. In fact, firm-planned is like planned order with the only difference that it is kept in the system regardless MRP-runs and planned order aren't. More and more you now see that you can set a flag that an order is "confirmed". This is often used to turn the demand plan 1 to 1 into final production orders.

Supply plan

Back to the Supply plan. In the introduction it has already been indicated that you should try to make the units of measure of the Supply plan equal to those of the Demand plan, so you can compare Supply plan with Demand plan and vice versa. You should try to make those units a bit like each other. I will try to explain that with an example: - Suppose you have two machines (A and B). Those are the "bottlenecks" in the organization, so planning should be done around them first before you plan the other machines. Presenting the required hours compared with the supplied hours per machine sounds the most logical. Then you must make sure that you make a connection in the file (Demand plan) between product X and machine A in hours, and for product Y and machine B in hours. If your Supply Plan has the supply in hours, you can show in an overview per machine whether Demand and Supply match in a certain period.





Manufacturing Execution

To complete the planning house, Scheduling is usually used for the Manufacturing Execution. Scheduling is software that can indicate the sequence of production orders against finite capacity per machine. ERP is standard against infinite scheduling. You use scheduling to put production orders in sequence per production-line. You usually use this type of software for the period 0-2 weeks. In contrast to ERP, this software often offers the possibility to work in smaller time units than 1 day. A day is the smallest unit of time in ERP.

Planning hierarchy

Basically, we can distinguish 3 planning levels:

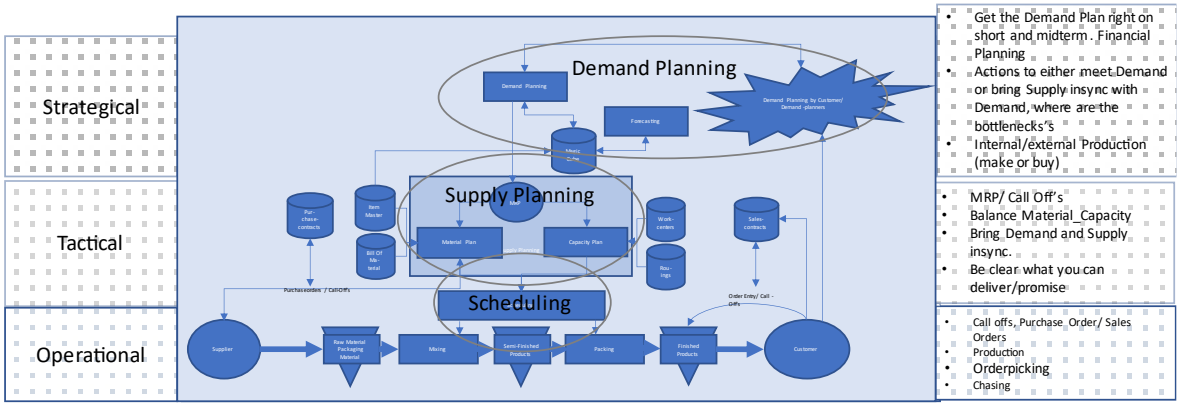
1. Demand Planning. Statistical forecast is used to create a first version of a Demand Plan. Subsequently, the Demand Planning process takes place, which, as explained earlier, has a

deterministic character, and is mainly based on information and communication between Sales, Demand Planner and Customer.

2. Supply Planning. This is the calculation of the Demand Plan using MRP as explained above. In the end we get a realistic Supply plan per machine or machine group

3. Scheduling. Is sequencing of production orders per machine against finite capacity on the short term. Often this planning level is not distinguished separately. I think this level should be considered separately. This is a short-term plan, say about the next 2 weeks. The degrees of freedom are limited here. So, if you have done Supply and Demand work well, this is the execution and it should go smoothly, it is in fact executing what you have thought through earlier and planned for. So, sell what you have forecasted before.

Planninglevels within the planninghouse



ERP = Enterprise Resource Planning
TOP-4 ERP: Dyn365, SAP, Oracle, Infor

ERP = Backbone

In practice, I see ERP suppliers saying they can cover everything, but they can't of course, so the result is that companies make all kinds of software-modifications to get the software running well for them. Really see ERP as the backbone of your IT landscape. It is good to look for MPS / MRP / CRP and such programs to cover these in an ERP system. But as soon as you get into surroundings of such programs and those areas are part of the 'core' business, try to find specific software solutions for those areas. Typical examples of specific software which are normally quite good connectable to ERP-systems are: forecasting-solutions, a grower portal, a scheduling package. These softwarepackages are very often owned by smaller independent companies which fully focus on certain specific needs and solutions. If necessary, build it yourself, there are a lot of socalled low-level code programms on the market, but make sure you leave ERP standard as much as possible. Only then, you know that your IT landscape can easily last for the next 10-15 years. And if you do need to replace parts, it is not such a problem if you use standard software. Make sure you keep modifications to a bare minimum, not so much to save costs (which you do of course), but

you remain more flexible and transparent, you can follow updates easier. And in the end you make your business-live easier at least as it concerns software supporting your business.

Summary

Supply Planning is the calculation based on MRP of material and capacity requirements. Based on the possibilities, you draw up a realistic Supply Plan, which can be mirrored with the Demand Plan. Between Demand and Supply there needs to be a bit of tension and ambition, after all, you want to grow, get better. This is reflected in great KPIs such as: delivery reliability, forecast accuracy and bias, balanced stocks, efficiency.

Furthermore, some information is given about MRP and scheduling. The distinction between plans against infinite and finite capacity is explained. Finally, we talked about the Planning hierarchy.

Now we are sufficiently prepared to talk about the S&OP steps.

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