Masterclass QRM

Subject:	Masterclass at PNPPK
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Preliminary

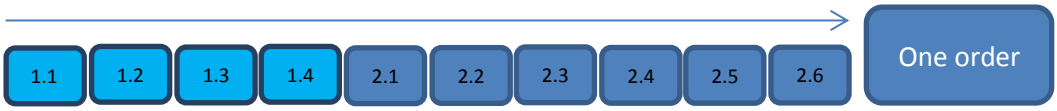
This document contains the questions and answers that have been discussed during the masterclass. The following questions are asked:

The questions will be answered below.

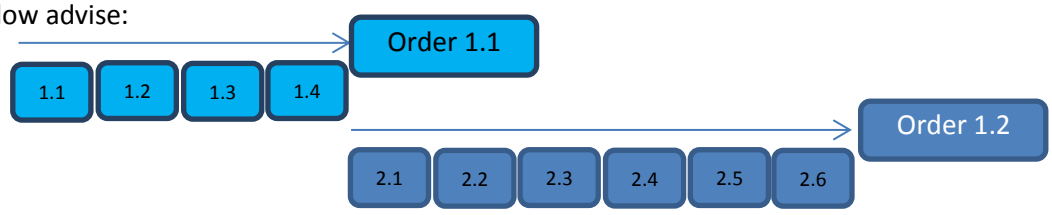
Answer question 3: Who is responsible for the flow between the cells?

When an order is produced by successive cells, the order must be split up in multiple sub-orders as shown in the figure below.

Current flow:



Flow advise:



When the order is finished in cell 1, than cell 1 will bring the product to cell 2. Cell 2 will only plan the order after it has been received from cell 1. In this way each cell is responsible for its own throughput time. Cell 1 is responsible for bringing the product to cell 2 after they have finished their sub-order.

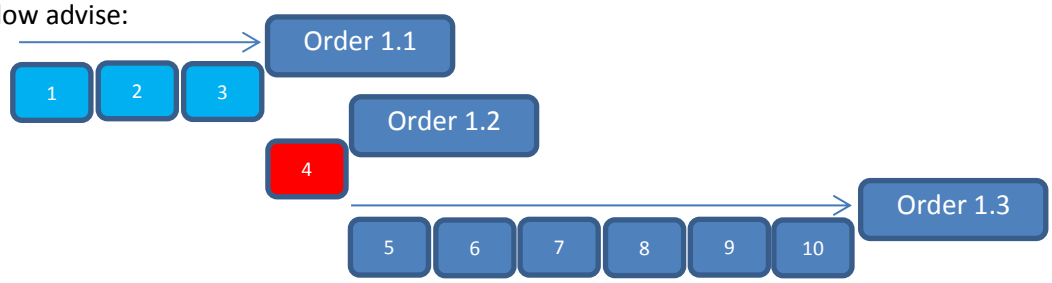
On top of this the planners of the cells will discuss on forehand the available capacity of the critical resources.

Answer question 2: A process step is executed outside the cell. This is an external activity. Why is the cell responsible for the lead time of the external order?

When an order step (step 4) is executed outside of the cell, than the order must be split up into sub-orders as shown in the figure below:

Current flow:

Flow advise:



The time between sending the product to the outside facility (Cell 2) and receiving it back must be measured. An agreement must be made with the outside party (cell 2).
When the agreement about the throughput time is measured, the outside party can be made responsible. The cell purchasing is responsible for the outside facility.

Answer question 1: Only one machine is available for 3 cells.

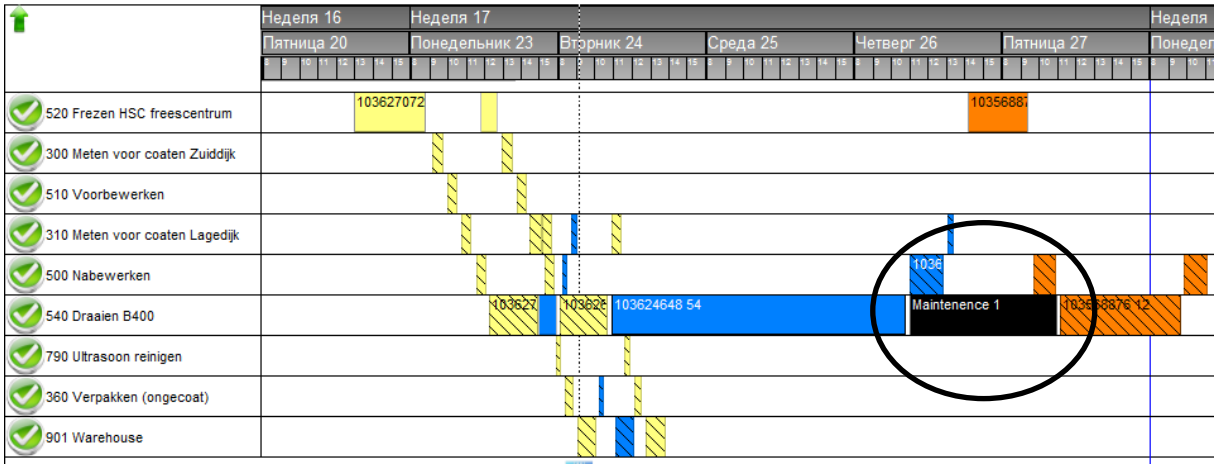
Solution 1:
Make a separate cell for the machine and treat the machine as an outside supplier. The orders must be split up into sub-orders as explain in the previous solutions.

On top of this the planners of the cells will discuss on forehand the available capacity of the critical resources.

Solution 2:
All cells are subject to one planning. One planner plans the 3 cells. On the shop floor, the operators see only their own resources plus the resource of the machine.

Answer question 5: Maintenance, conflict of execution time. How to solve this?

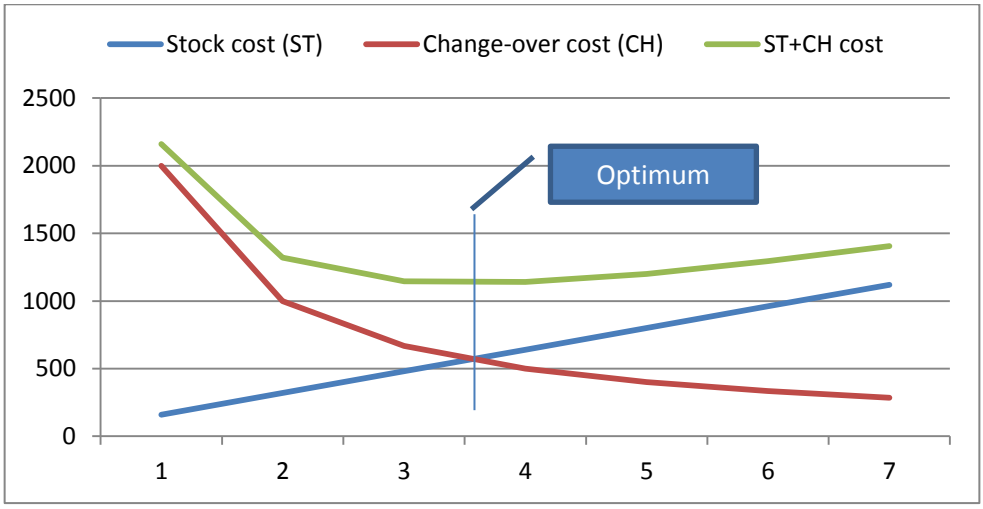
A maintenance order is planned well in advance in the same way as a production order. See the black box in the figure below. Production has to respect the time that is given to maintenance, even if, at the time of execution, there is a lack of production time. Maintenance may have ordered engineers from outside to perform the job. On the other hand maintenance has to execute the job in the planned time, even if they have other priorities at that time.



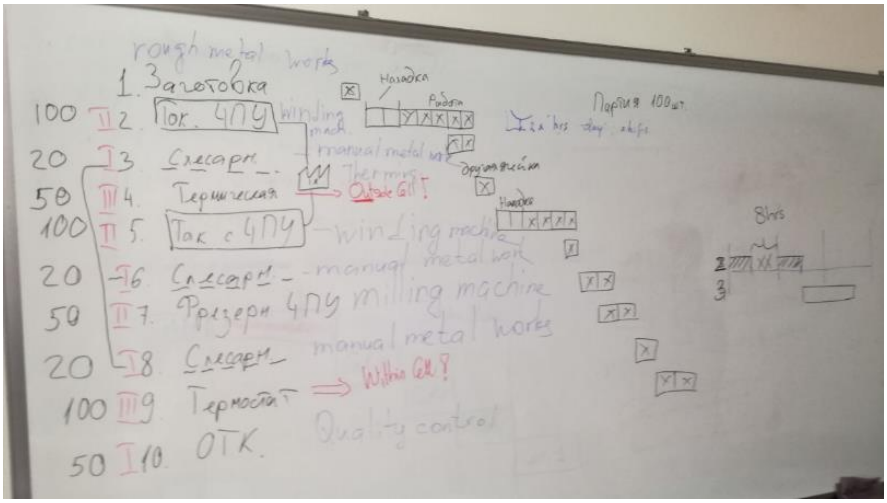
Exercise: Draw the flow of an article; Determine the bottle neck; Determine for each process step the batch size; Determine the batch size of the article.

The exercise is made to show that each article is different and each article may have a different lot size. It is possible to create lot sizes per article when one customer orders is transferred into one unique production order and when orders are added together on the Shop Floor.

The optimal lot size of each article can be calculated. When the optimal lot size is reduced to half, than the cost will rise approximately 10% (see the figure below). In practice we see that the hidden cost will also drop by approximately 10%. So to reduce the lot size (and the throughput time) the lot size can be reduced to half the optimal lot size. Of course when the customer order is bigger than the lot size, the quantity of the customer order has to be produced. When the customer orders are smaller than the lot-size, than the planner must add together the orders in the shop floor planning.



Because of the limited time that was available in the master class, we could only discuss one article. The flow of the article is shown below.



The chosen article appeared to be an article with a very difficult set up and a very long set up time of 16 hours. The optimal lot size is not calculated, but is can be expected that the optimal lot size is much bigger than the current 1 month production volume.

It is much more practical and sensible to first pay attention to those articles that have short or no setup times. When the customer order volume of the individual customer orders can be produced, this will give a direct result.