Performance and Strategy – Group 7

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Introduction

The Performance and Strategy (P&S) subsystem is in charge of basically set and manage production (order and delivery) times. Moreover, this subsystem define a business strategy to ensure that production is as efficient and stable as possible. According to experience (old factory) the strategy was set, and the subsystem will ensure provide the information to the subsystem as rules to follow. This poster will present the strategy, the requirements, some important interfaces, after this, the final optimized production schedule will be presented considering the defined strategy compared to the old case to visualize the changes made in a better way with a respective explanation. To finalize the poster some conclusion will be presented

Requirements

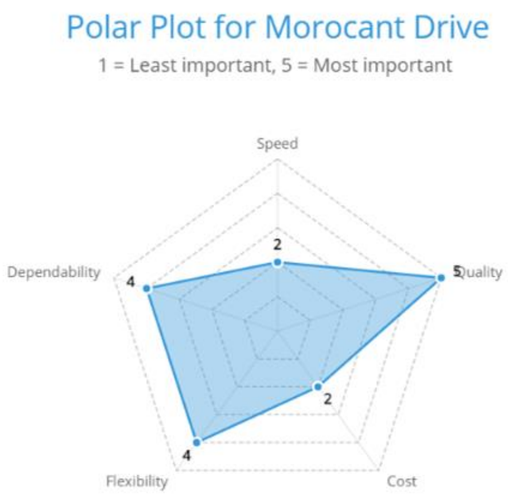
- Ensure that the products will be delivered according to the settled dates in the planning.
- Consider and respect 2 shifts/day, 48 weeks/year (112 hours a month).
- Satisfy current order pattern plus room for future growth
- Optimize the scheduling to accomplish production every 4 months, consider “Due Date” as a sequencing rule to minimize lateness.
- Satisfy current order pattern with 90% capacity.
- Attract more customers in order to increase the production and increase the needed flexibility for future improvements.
- Ensure that dependability is not affected by demand increase.
- Reduce the importance of cost as a performance indicator in the Polar plot and do not modify the values of speed and quality of the old factory polar plot

Interfaces

To get the best performance out of factory, a good communication between interfaces is crucial. Here, the most important interfaces will be explained. Due to given production patterns and order patterns it was defined that Flow Control (FC) will consider the production order process to define production families and make up a layout. From this layout, information about its efficiency will be analyzed and optimized by P&S. To get the schedule, P&S will check the number of machines given by Production Control (PC) and make a comparison to define the number of machines needed to accomplish the production and deliveries of 4 months. In addition to this, the final schedule will be sent to Finance and Logistics (F&L), so they have information about when raw material is required from suppliers and when orders are ready to be transported. The final schedule will be sent to (PC), so they communicate final decisions to FL.

Polar diagram and Strategy

Strategic decisions will be focused on the business objectives of the company in the near future. It is clear that as a company it is desired to have the highest output with the least input, that is, the goal is to increase sales and obtain more income with the least possible investment. Two of the strengths of the current company that were identified are that quality plays an important role in the production and that it has a JIT inventory system which means, for example, preventing overproduction, minimizing waiting times and costs of transport. For this reason, as a first strategic decision, preserving these strengths will be paramount. As for the company's weaknesses, currently, the main weakness has to do with its growth capacity. It is not desirable that the company needs more space each time more products are required from customers.



This weakness brings us to the opportunities for improvement which are focused on increasing the mix flexibility (mix of products it produces at any one time) and volume flexibility (volume of products produced) and more importantly, consider room for future growth expected by the flexibility increase. In other words, the second strategic decision is to focus on the capability the company will have to offer any product within the fields that it already works now and the possibility to expand to fields such as maritime products, without this directly meaning changing to a larger space. For this reason, a new and more efficient production layout is required so the new products can be included in the production flow easily. Finally, it must be considered that these changes could present some threats. Dependability could be affected. By producing more and different products, suppliers could play a bigger role, leading to situations that cannot be controlled, such as delays. In addition, the speed of delivery could also be adversely affected. For a better visualization check the polar diagram in Figure above.

Machines Optimization

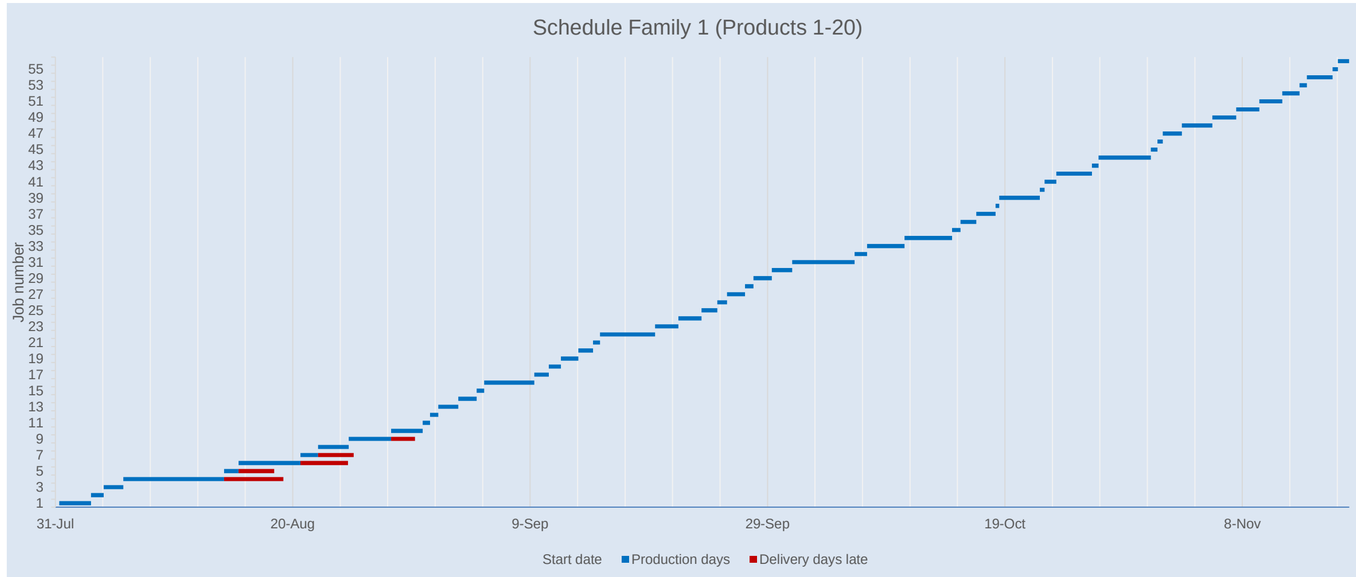
This section shows a comparison between the PC and P&S results for the number of machines needed. There is a difference in this number and the reason lies on the different approach. PC assume that each process (e.g., sawing, turning) has an available time of 4 months, with this assumption the delays in deliveries were unsustainable. Therefore, P&S approach was to assume that the whole process for each product should be done within 4 months respecting shifts and weekend days. With this approach and optimization, the number of machines needed increased, but the delivery dates were kept to an acceptable range. In the table, also the number of current available machines and final number of machines needed can be observed.

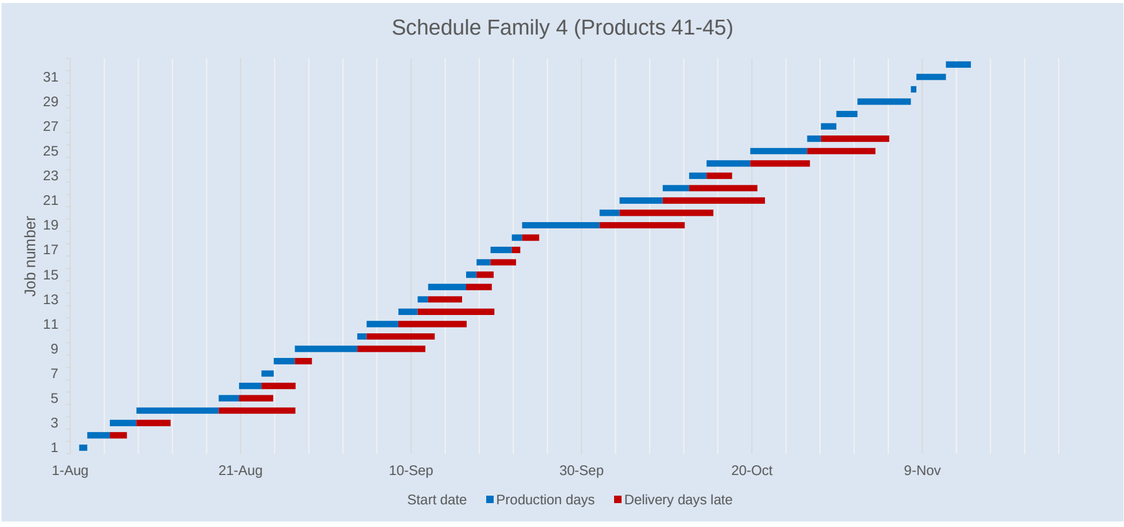
	# Machines P&S	# Machines PC	# Machines P&S - PC	# Available machines	Final # Machines needed
SM	11	6	5	5	6
TM	10	5	5	4	6
MM	15	9	6	5	10
GM	14	8	6	4	10
CMM	12	4	8	4	8
MC	8	6	2	5	3
DM	6	5	1	2	4
A	10	5	5	2	8

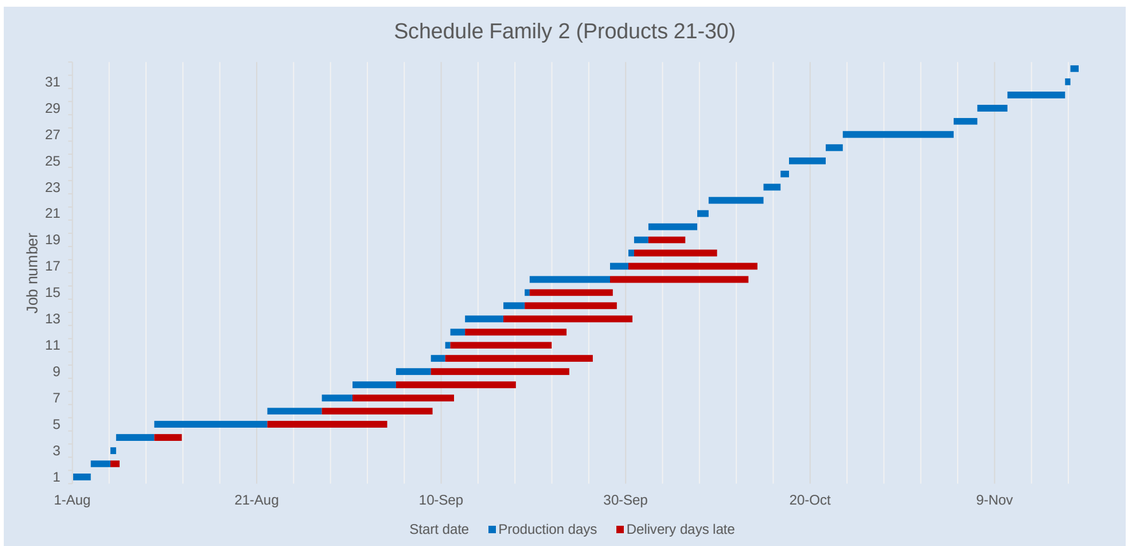
Production Schedule

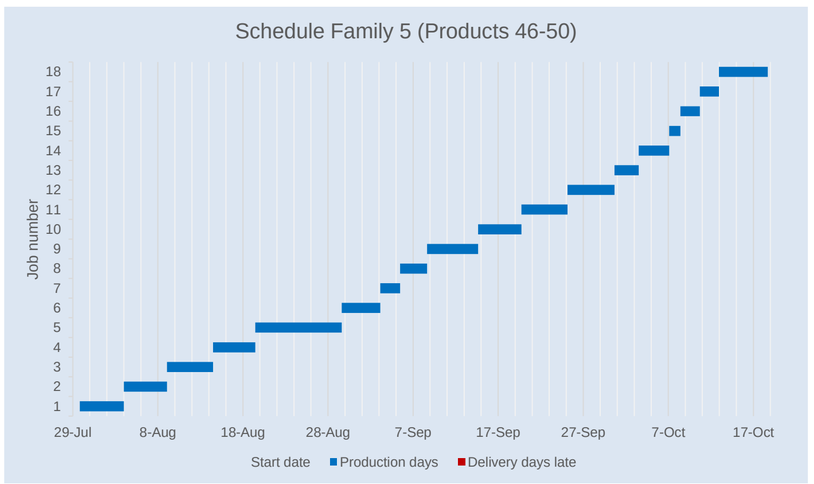
In this section, a table showing important details regarding the sequencing rule applied (“Due Date”). Due to the link between dependability and lateness, reduction on total lateness was the focus of the optimization. In this way delays are reduced, and due dates are similar to the old factory pattern. Speed of the factory is linked to the total time in process. In addition to this, the production capacity was calculated per family and in total, to proof if the requirement concerning growth capability is met. Below, the detailed production schedules for the 7 different families provided by FC are graphically presented.

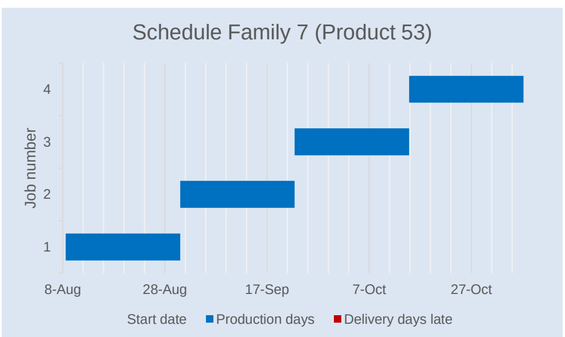
	# Jobs	Time in process (days)	Lateness (days)	Production capacity (%)
Family 1	56	3420,2	17,0	97,0
Family 2	32	1832,1	181,0	97,3
Family 3	40	2501,4	79,0	97,8
Family 4	32	53,6	140,0	93,4
Family 5	18	849,7	0,0	72,2
Family 6	16	46,5	0,0	76,7
Family 7	4	224,1	0,0	80,0
Total	198	8927,5	417,0	87,8

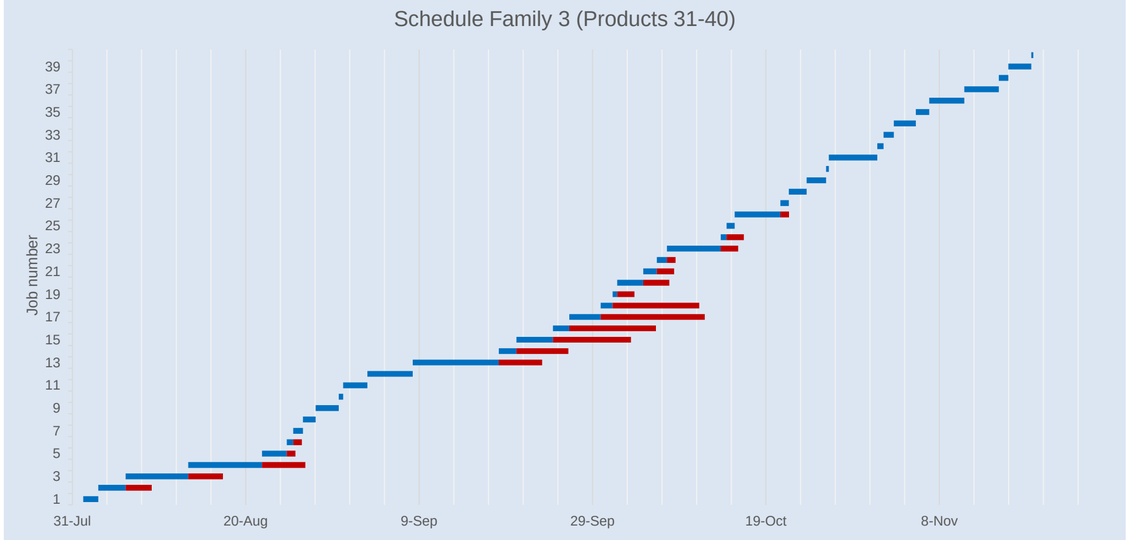


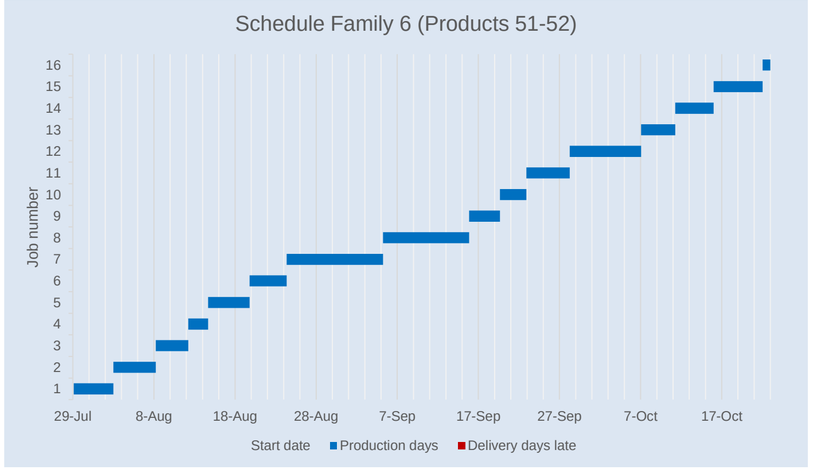












Conclusion

To conclude, requirements were checked. All requirements are met, and it can be said that the strategy is successfully implement. Requirements such as reducing the effects of supplier dependability and customer attraction is a cooperative work between F&L and P&S that would have to be evaluated in a future stage. The schedule for each family is presented in the Grantt charts above. From these, it can be observed that families 2 and 4 could be further optimized as orders are unevenly distributed over the 4 months of production. On the other hand, families 5,6 and 7 are the ones which provide the factory with growth room. The factory works at around 88% which means that new products could be inserted into the production flow. The total lateness should be analyzed, as it may be negative for the factory interests even though this number is distributed all over the 4 months for all products.

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