Kastor Optimises Orders with Integrated Production Tool

Transparent order situation, manageable quick turnarounds, optimised processes, answerable what-ifs...

Plan orders optimally

The task in hand

Modern production processes have to meet stringent demands in terms of speed, flexibility and safety.
On a given system, speed can often be attained by optimising the processes. Flexibility can be achieved by an order planning system with which various what-if scenarios can be quickly and easily analysed. Such a system allows conclusions to be made regarding, for example, whether an order calling for quick turnaround can be scheduled in without any problems or whether this would only be at the expense of other orders.

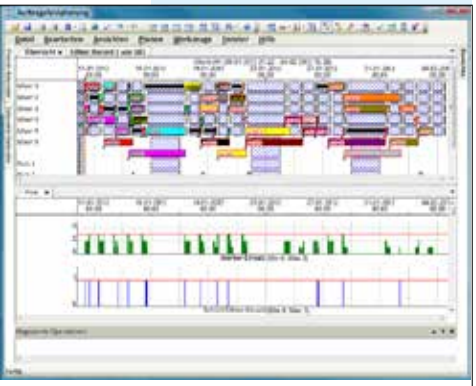
The completion date for all scheduled orders is clearly stated; delayed orders due to e.g. resource bottlenecks are marked by colour as late. If all planned orders can be scheduled within their latest delivery date, an optimum delivery reliability is achieved. If this is not possible due to the order situation, resource utilisation or other schedule constraints, the orders can be shifted on the planning board so in the end, only the orders for which the resulting disadvantages are the most minimal will be delayed.

Customer benefits

The advantages of a detailed scheduling system are immediately evident:

- Thanks to the Gantt display, the order situation is clearly organised and transparent.
- Possible bottlenecks are easily identifiable.
- Enquiries regarding delivery dates can be directly answered.
- Resource shortfalls can be responded to with a swift rescheduling.
- The current production status can be blended in live within the planning.

THE INNOVATION



Simultaneous display of processes and secondary restrictions.

The solution

Kastor systems can be operated with or without detailed scheduling. Orders are typically accepted by an ERP system and with the rough planning date given therein, added to the Kastor order list. If the Kastor solution contains the detailed scheduling tool, the further order planning, i.e. determination of the order sequence optimised according to the various criteria as well as selection of the machine or line most suitable for each order under consideration of their specific capabilities and their current production status, can be carried out within the order list.
The results of the detailed scheduling can be explicitly transferred to the ERP rough planning manually as well as automatically. Through the seamless interplay of the production program and detailed scheduling tool, permanent feedback of the degree of production processing reached up to the present or of currently approaching resource shortfalls is possible in the reverse direction as well. On the one hand, this allows the detailed scheduling to display the planning target and actual statuses at the same time. On the other, the online data can also be used to adapt the planning status to the actual situation over and over again.

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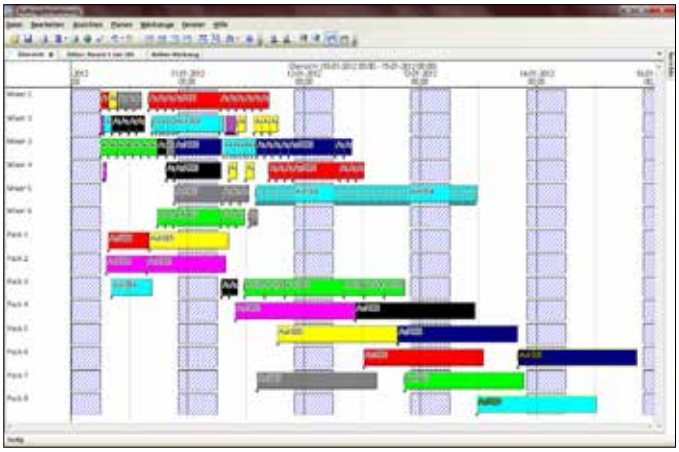
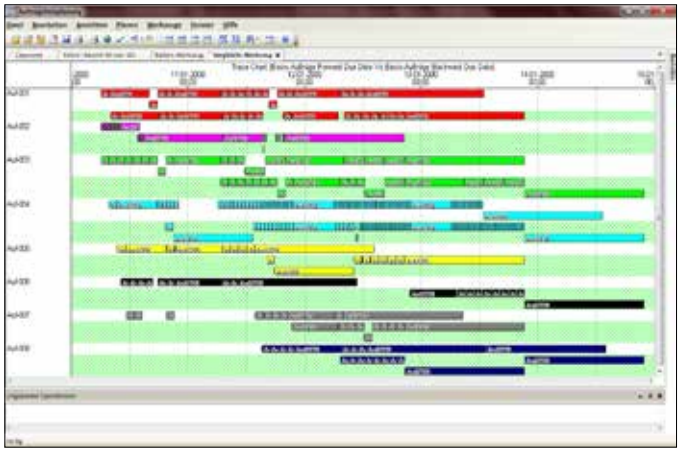
Detailed scheduling function

FCS algorithms - Planning rules taking restricted capacities into account (Finite Capacity Scheduling).
These include both the rules for forwards and backwards planning as well as those for bidirectional scheduling. In the planning results, the planner can make changes manually by drag-and-drop of the Gantt column and run through various what-if scenarios.

APS algorithms - Planning rules with expert functionality (Advanced Planning and Scheduling).
This category includes event-controlled algorithms which are frequently programmed in to extend the basic configuration in accordance with special customer requirements. Default and customer-specific optimisation rules such as cleaning and set-up time optimisation, throughput optimisation, inventory minimisation, cost optimisation etc. also fall under this category.

One further APS functionality is the integrated material control. It ensures that orders are only planned on a line when the required material is available at the various sites. This may be raw materials or packing materials, or even intermediate products from upstream lines or machines.
In addition to the primary restrictions which machines are generally subject to (output, machine calendar, capacity, supported functionality etc.), the so-called secondary characteristics are also characteristic for planning rules. These include e.g. consideration of required tools or operators; where required, including their differing expertise. Through the so-called plots, the availability of such secondary resources can be graphically displayed in parallel to the Gantt display of the orders.
In addition to availability of the secondary resources display through plots, additional advanced graphic displays facilitate further evaluations regarding special problem formulations.
In the illustration on the left below, as opposed to the conventional Gantt diagram, the bars for each machine are arranged directly next to each other without maintenance or set-up times. This makes local system overloads or bottlenecks visible at a single glance. After an additional planning run under changed conditions which should alleviate the bottleneck situation, a comparison with the previous bottleneck result can be made in this machine utilisation display.
In contrast, the illustration on the right below shows a comparison of two individually ascertained and saved planning results, separately displayed within one graphic.





Market studies

Market studies regarding the advantages a detailed scheduling tool can bring have been conducted. The following averages are specified:

- 15 - 20%
Improvement in productivity.

- 40 - 50%
Reduction of raw material stocks.

- 40 - 50%
Reduction of manufacturing duration; reduction of WIP stocks.

- 50 - 90%
Improved delivery reliability.

These advantages lead to a quick Return-on-Investment.
Due to improvements in productivity and savings of sizable raw material and buffer stocks, the ROI can be partially realised in a matter of weeks or months.

Conclusion

Connection of the detailed scheduling tool with the order planning from Kastor brings considerable advantages. In addition to the benefits stated in the marketing studies, which contribute to a quick ROI, the tool also assists daily production planning. Where previously orders had to be manually entered in the optimal sequence and distributed over diverse machines and lines based on intuition, now a swift tool working according to matured rules and to a great extent fully automatically supports the optimum scheduling of material and resources during the daily processing of orders.

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