



Krones Integrates Upstream Sales and Engineering with Operations and Downstream Services

In engineer-to-order industries, complexity is inevitable. Every order is custom-built and must be managed as a discrete project, with a unique bill of materials to meet specific customer requirements. In this environment, precise supply chain planning is essential—but often difficult to achieve. Like many companies in its industry, Krones suffered from poor due-date performance and resource overloads that made order fulfilment a monumental exercise that, in turn, had a negative impact on customer satisfaction and revenues. However, following the implementation of supply chain planning tools from i2, the company is well on its way to improving order fulfilment performance and is delivering improved customer service, while cutting costs.

Founded more than 55 years ago in Germany, Krones is a well-established engineer-to-order company that produces automated equipment for use in the beverages industry. Its products range from machines for labelling and bottling to appliances for pasteurising liquids and moulding plastics.

Each machine that Krones produces is unique to its customer's requirements, and the complexity of its products varies enormously. If a customer is setting up a new bottling plant, it may require multiple machines for inspection, rinsing, filling, labelling, and packing, all linked by conveyor belt. Alternatively, a customer might simply require an upgrade to a single machine. Every year, Krones undertakes around 1,500 new build projects and 6,000 product upgrade projects, each taking from four weeks to 12 months to complete.

Krones' Challenges

At the time, the company computed its due dates primarily based on critical path method dates without fully taking into account its current workload, capacity, or material availability. Consequently, it frequently found that it could not deliver on time, and this led to low customer satisfaction. To try to compensate for this problem, the



Challenges

- Increase the efficiency of resource and material planning to cut costs
- Improve due date performance
- Reduce lead times

Solutions

- Implement i2 Factory Planner and i2 Enterprise Project Planner
- Create a centralised, integrated multi-project planning system
- Carry out structured change management, to ensure that processes and people are aligned with the new technology

Results

- Increased throughput by more than 20% without any increase in headcount
- Reduced lead times, resulting in improved customer satisfaction
- Improved operational efficiency, leading to an anticipated increase in revenues

Company Description

Founded in Neutraubling, Germany, in 1951, **Krones** is a leading manufacturer of specialist equipment for the beverages industry. It operates five factories and employs more than 9,100 people worldwide and has a revenue of about €1.9 billion.

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***— Markus Tischer
SVP Life Cycle Services
Krones***



company frequently experienced busy periods, because projects were scheduled without regard for capacity. During these times of high activity, Krones often had to bring in extra temporary labour or pay staff overtime. This helped to keep projects on schedule, but lowered margins. There was also an impact on staff morale, as employees got tired and stressed.

In addition, Krones tended to “pad out” the duration of jobs (a standard technique used in all project-based enterprises) when providing estimates to customers. As a result, the company’s predicted lead times for projects were unnecessarily long, which contributed to some lost business opportunities.

The company’s material procurement was typically always based on the project plans developed at the start of projects. When delays — or indeed advancements — of projects occurred, procurement plans were often not updated. Consequently, the company frequently found that it procured parts either too early and locked in capital or too late and created delays in the schedule.

The company realised that all of these business issues stemmed from the lack of visibility into project load, resource capacity, and material availability.

Why i2?

Krones had already implemented an enterprise resource planning (ERP) system, which provided it with functionality for human resource management, materials management, product scheduling, and production planning. However, this solution did not give the company integrated visibility into projects and their associated resources and materials. As a result, planners and schedulers within the company found it hard to manually coordinate changes when projects or materials were delayed or dates moved, which happened frequently.

To overcome this problem, Krones selected two solutions from i2: i2 Enterprise Project Planner™ and i2 Factory Planner™. It selected

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IBM to implement the solutions. i2 Enterprise Project Planner (EPP) is a planning and scheduling tool designed specifically for engineer-to-order companies. It is ideally suited to helping companies plan, communicate, and manage the execution of multiple projects in a dynamic and complex environment. i2 Factory Planner enables companies to simultaneously consider material and resource constraints to optimise factory schedules.

By implementing these two i2 solutions, Krones aimed to create an integrated planning system, combining project, material, and resource information. Through i2 EPP, Krones has been able to create a workflow wherein projects are created and managed from initiation by sales, through engineering. Planners in operations had visibility into future orders and were able to manage it through the services delivery to the customer. All employees use one central system to input new orders (sales), plan on it, and execute on it (individual employees). The system would be used by all employees—from the sales team to procurement managers and factory planners—and would close the gap between long-term strategic planning and near-term execution.

i2's Contribution

Using i2 solutions, Krones is now able to plan capacity two years ahead and view materials requirements six to nine months in advance. Planners in various divisions now have a powerful decision-support tool in i2 EPP that allows them to react to changes from strategic plans as well as perturbations to the plan due to

execution being different from the plans. When events occur that cause projects to be delayed (or advanced), planners are now able to use i2 EPP's powerful “what-if” and problem-solving capabilities to automatically assess the impact not only on the individual project, but also on the entire division and company level. i2 EPP allows planners from engineering, manufacturing, and services to collaborate with each other effectively, a capability that they never had before but sorely needed. They can effectively respond to the changes in requirements and scope that are almost inevitable in engineer-to-order projects. Most importantly, planners can keep customers informed about any delays and provide actual delivery dates.

As part of the implementation process, Krones established new processes: top-down planning and bottom-up escalation. Top-down planning is now used to create strategic plans in the long term that drive operational plans in the mid term, and execution schedules in the near term, all of which are synchronized and respect all constraints. Bottom-up escalation gives the individual performing the execution the ability to communicate exceptions and deviations upstream so that adjustments can be made and the impact of the delay can be minimized. Between the two workflows, everyone in the company now has end-to-end visibility into the status of the project and the needed transparency to communicate. These two processes helped Krones close the loop from strategic planning to execution scheduling and have laid a strong foundation for new-generation supply chain management.

Krones, with the help of i2, also defined new roles and responsibilities for employees including the creation of planners for various divisions to manage the trade-off between project due dates and resource capacities. The company undertook a comprehensive education program to explain the importance of integrated planning, and incentives were offered to encourage employees to use the system correctly.

“By aligning people, processes and IT, we have been able to effect real change and realise great success,” said Dr. Michael Kranz, SVP Information Management, Krones.

Krones' Results

The use of i2 solutions has completely transformed the way in which Krones plans and manages its projects. For the first time, the company can control the entire life cycle of orders—from the issue of the quote to the delivery of the completed equipment—in one centralised, integrated system. The due dates calculated are realistic and achievable, and the number of on-time deliveries is steadily increasing.

Krones is using i2 solutions as its main planning tools to handle: Euro 7,5 mio order intake per day, 6.000 concurrent projects, 30.000 concurrent work orders, and 175.000 jobs planned daily.

In the two years since Krones has implemented i2 solutions, primarily i2 EPP, in production, they have achieved over 20% increase in throughput without practically any increase in headcount. Improved enterprise-wide visibility into projects has also led to more timely procurement and reduced resource overload, overtime, and weekend shifts. Krones is fully expecting all of this to lead to cost savings and to have a direct impact on the profitability of the company.

Krones has already realised significant improvements in operational efficiency, and more are planned right across the enterprise. They believe that operational efficiency is a continuous journey wherein processes and technology are in synch. Technology is an enabler, but without good processes, they tend to fall short of expectations. The efficiency gains are coupled with anticipated improvements in customer satisfaction, as customers start to receive their orders more quickly and on time.

While delighted with its achievements so far, Krones does not plan to stop here. The company has established a process management group that is constantly reviewing system performance and assessing new opportunities for improvement. For example, in the future, Krones plans to take advantage of some of the advanced features of i2 EPP, including the automatic calculation of buffer durations, to reduce lead times of orders. They believe that if they can reduce order lead times then that could put them in a very competitive positioning in the market and help increase market share.

A recognized visionary in the industry, Krones, finds in i2, a true and trusted partner in their journey to realize operational efficiency through supply chain management.

“Our supply chain is now a competitive weapon,” said Markus Tischer, SVP Life Cycle Services, Krones. “Through our use of i2 solutions, we have embarked on a journey to make ongoing improvements to operational efficiency that will strengthen our position in the market.”



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