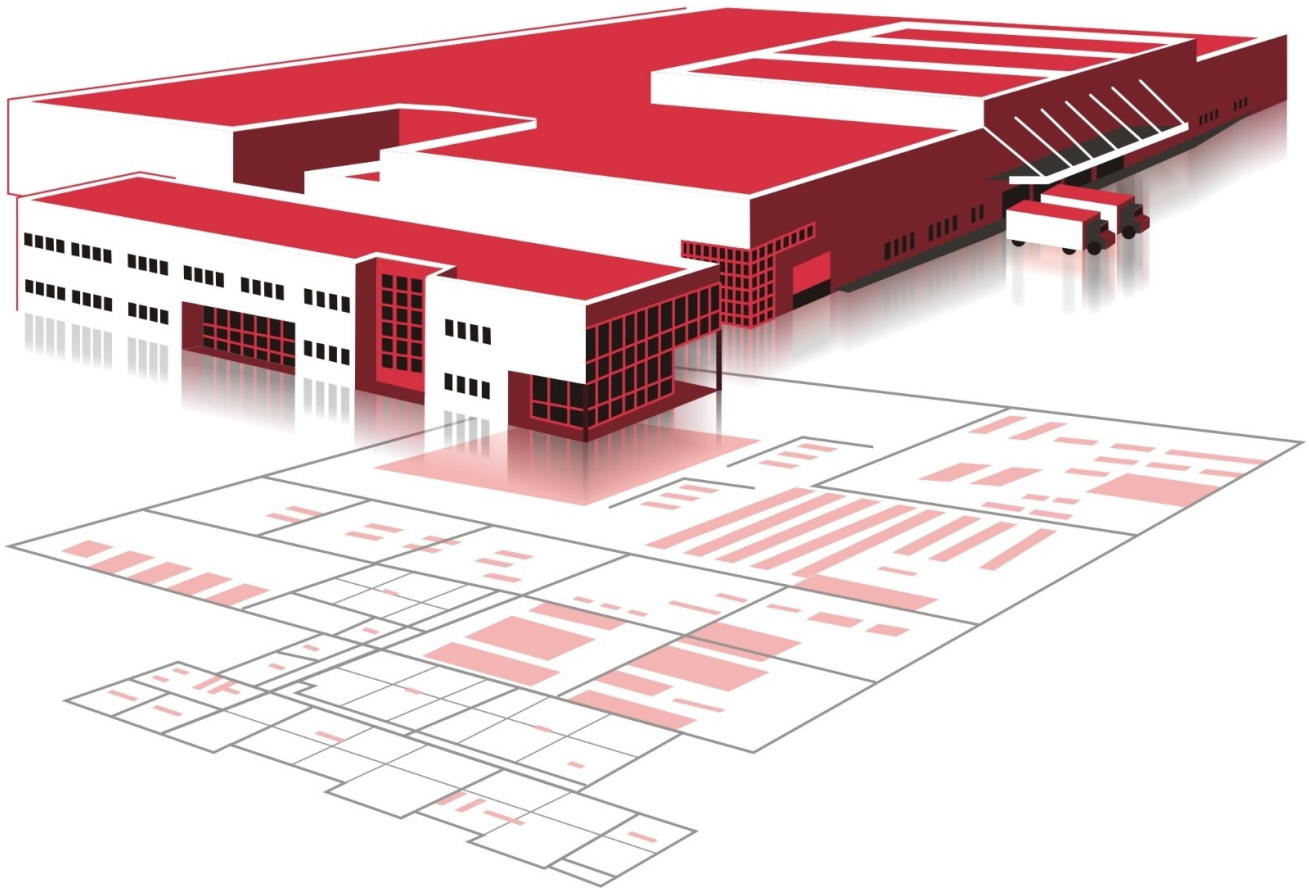
SOLUTION

4APS

APS software for real-time detailed scheduling



SOLUTION BROCHURE 4APS

APS software for real-time detailed scheduling

This brochure presents the product 4APS, four related research projects and selected customer references with 4APS. 4APS is the interactive planning and optimisation tool by software4production for real-time production planning with an interactive planning board, what-if simulation and AI-supported optimisation – scalable and integrable into any ERP/PPS landscape.

On the following pages you will find the 4APS solution, four selected AI and planning research projects (FAIRPLAN, ProSki, PePPS, SynErgie) and one page per customer with initial situation, challenge, solution and results.

Contents

01. 4APS
02. FAIRPLAN – AI-supported shift and operating th...
03. ProSki – Resilient PPC through artificial intelligen...
04. PePPS – Energy-oriented production planning an...
05. SynErgie – Synchronised and energy-adaptive p...
06. Liebherr-Components Deggendorf GmbH
07. Brembo SGL Carbon Ceramic Brakes GmbH
08. ANDREAS STIHL AG & Co. KG
09. KSB SE & Co. KGaA
10. Fraunhofer IGCV – Additive Manufacturing
11. Gaugler & Lutz GmbH & Co. KG
12. Kinkele GmbH & Co. KG
13. Bühler Heidenreichstein MKE GmbH
14. UTS Maschinenbau GmbH & Co. KG
15. Rollstar AG
16. Goldammer Wasserfuhr Stahl GmbH
17. Lochanstalt Ahammer GmbH
18. INTERPRECISE Donath GmbH
19. Fraunhofer IGCV – Learning Factory for Digitalisa...
20. ABC Service & Produktion GmbH
21. Furtak & Salvenmoser GmbH
22. Pauli + Sohn GmbH
23. Winning CoFo – Räuchle GmbH
24. Ulmer Maschinenteile GmbH
25. Carl Nolte Technik GmbH
26. Lorenz GmbH & Co. KG
27. MEV Möbel-Elemente-Vertriebs GmbH
28. Burgsmüller GmbH
29. DRAENERT STUDIO GmbH
30. GDS Präzisionszerspanungs GmbH
31. BÜHLER CNC-TECHNIK
32. Großewinkelmann GmbH & Co. KG
33. Inoyad GmbH
34. Eagleyard Photonics GmbH
35. Timmer GmbH

4APS

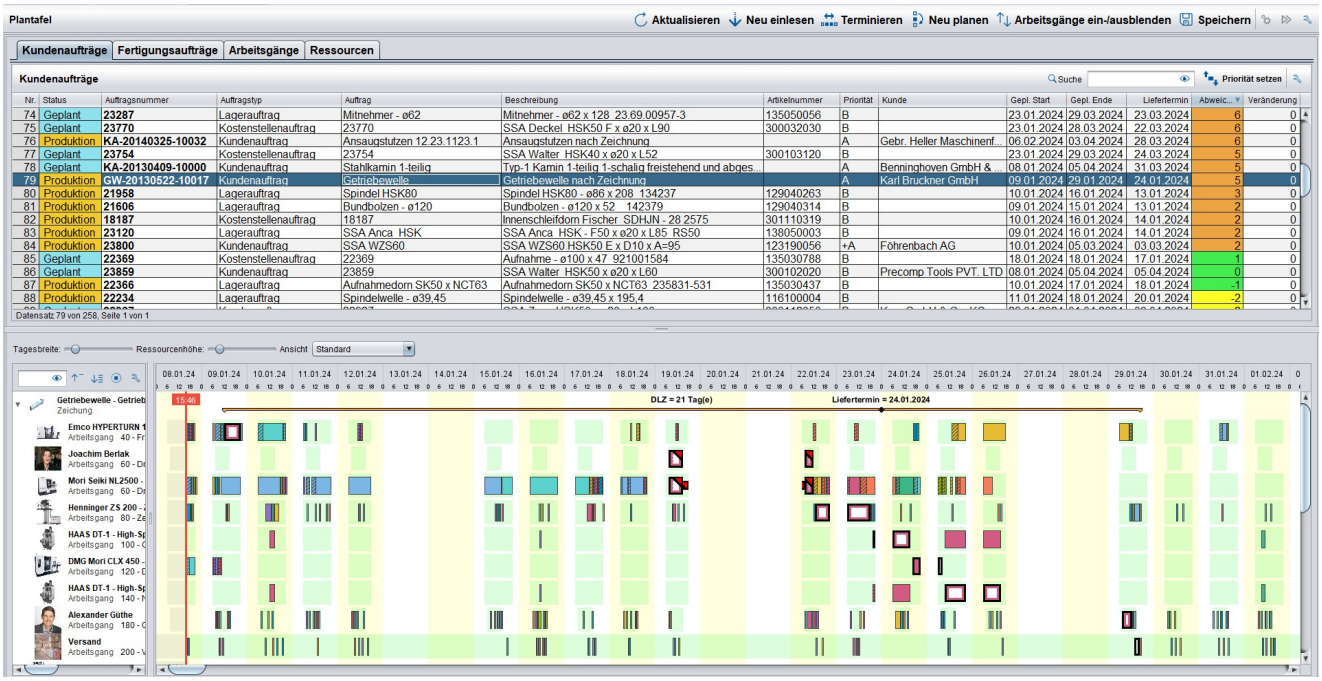
Solution ↗

APS software for real-time detailed scheduling

Interactive planning board · Production control centre · Advanced Planning and Scheduling

Scalable from planning board via control centre to multi-resource scheduling

Integrable with any ERP/PPS system



Initial situation

With 4APS, software4production offers an interactive planning and optimisation tool that stands out for its clarity and ease of use. Whether small or medium-sized company or corporate group: production planning depends on accuracy and precision from the very start. The days of manual planning are over – more and more companies rely on modern software solutions for detailed production scheduling that deliver clear transparency and improve logistical target figures.

Challenge

Unwanted downtimes and disruptions occur again and again in production. Machines fail, deliveries arrive late, employees fall ill – yet customers still expect reliable delivery dates. Classic ERP/PPS systems often plan with infinite capacity and into the past. In addition, consistent scheduling and capacity planning requires the simultaneous consideration of machines, workstations, employees, tools and material – including the qualification matrix.

Solution

4APS consists of an interactive assistance system for real-time production planning and control with what-if simulation. An interactive planning board shows the current status of all orders at a glance and allows online rescheduling with impact simulation. Intelligent algorithms ensure holistic detailed scheduling with finite capacities and optimise lead times, delivery reliability, costs and utilisation (nesting, set-up optimisation, order networks, planning areas). Backlog-free forward/backward scheduling is performed against actually available capacities; feedback from production updates the plan in real time. Multi-resource scheduling simultaneously schedules machines, workstations, people, tools and material with their qualification matrix.

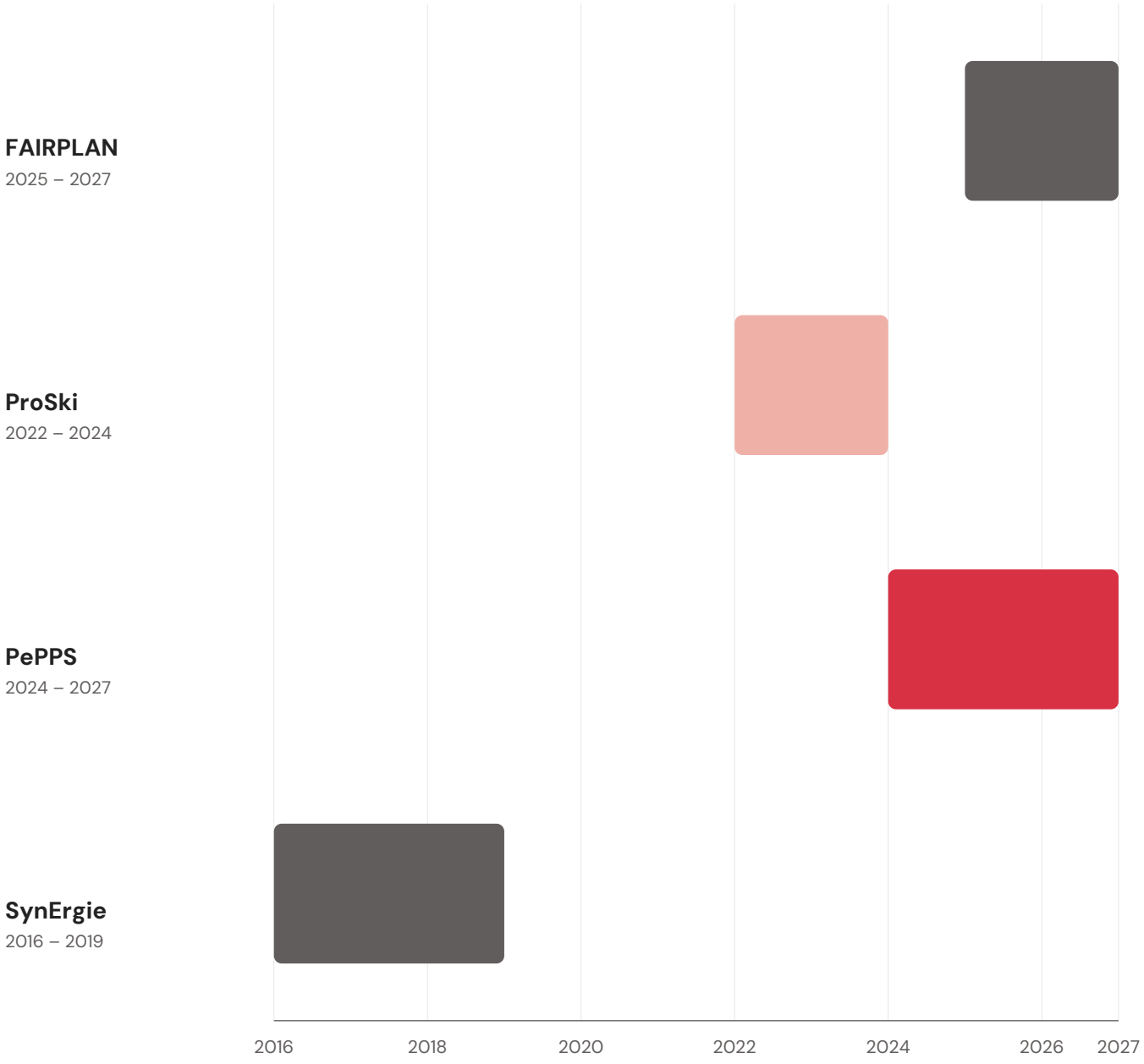
Results and benefits

With 4APS, companies benefit from reliable, data-based production planning: productivity, flexibility, delivery reliability and transparency increase, while lead times and planning effort decrease. 4APS closes the loop between planning and execution in real time, thereby resolving key weaknesses of classic ERP/PPS systems. The software integrates seamlessly into any existing IT landscape and can be adapted to individual requirements.

Research projects

Four joint projects related to 4APS – from AI assistance to energy flexibility.

Project timelines



FAIRPLAN – AI-supported shift and operating theatre… Research project ↗

Project duration: 01.01.2025 – 31.12.2027

Funded by: Bavarian State Ministry of Economic Affairs, Regional Development and Energy

Partners: TUM (Chair fml, Klinikum Rechts der Isar, research group MITI), Emporias Management Consulting, proba…

Relation to 4APS: AI methods for resource and shift planning



Initial situation

Hospitals face a central pain point of the healthcare industry: shortage of skilled workers and overload due to rigid shift planning. At the same time, operating theatres as the most valuable resource are often not optimally utilised, individual wishes of employees are hardly taken into account in planning and there is no transparent, fair distribution of working hours.

Challenge

Modern shift and operating theatre planning must put the needs of employees at the centre while taking business conditions such as operating theatre utilisation, availability and qualifications into account. What is needed is a data-based planning system that combines historical shift data, preferences and performance profiles in a consistent model.

Solution

The research project FAIRPLAN develops an AI-based planning solution that makes shift and operating theatre plans in hospitals fairer and more efficient. The AI combines historical shift data, employee availability and business conditions, analyses attendance histories, preferences and performance profiles and creates optimal shift plans from them. In parallel, the utilisation of the operating theatres is optimised – unproductive idle times are reduced, bottlenecks are identified early and resources are allocated as needed.

Results and benefits

FAIRPLAN makes hospital operations more flexible and economical – without compromising employee satisfaction. Automating shift planning significantly reduces the administrative effort. For 4APS, the project builds expertise in AI-based planning and data processing that flows into S4P products for MES, APS and WMS and strengthens S4P's position as a pioneer of AI-supported enterprise software.

ProSki – Resilient PPC through artificial intelligence

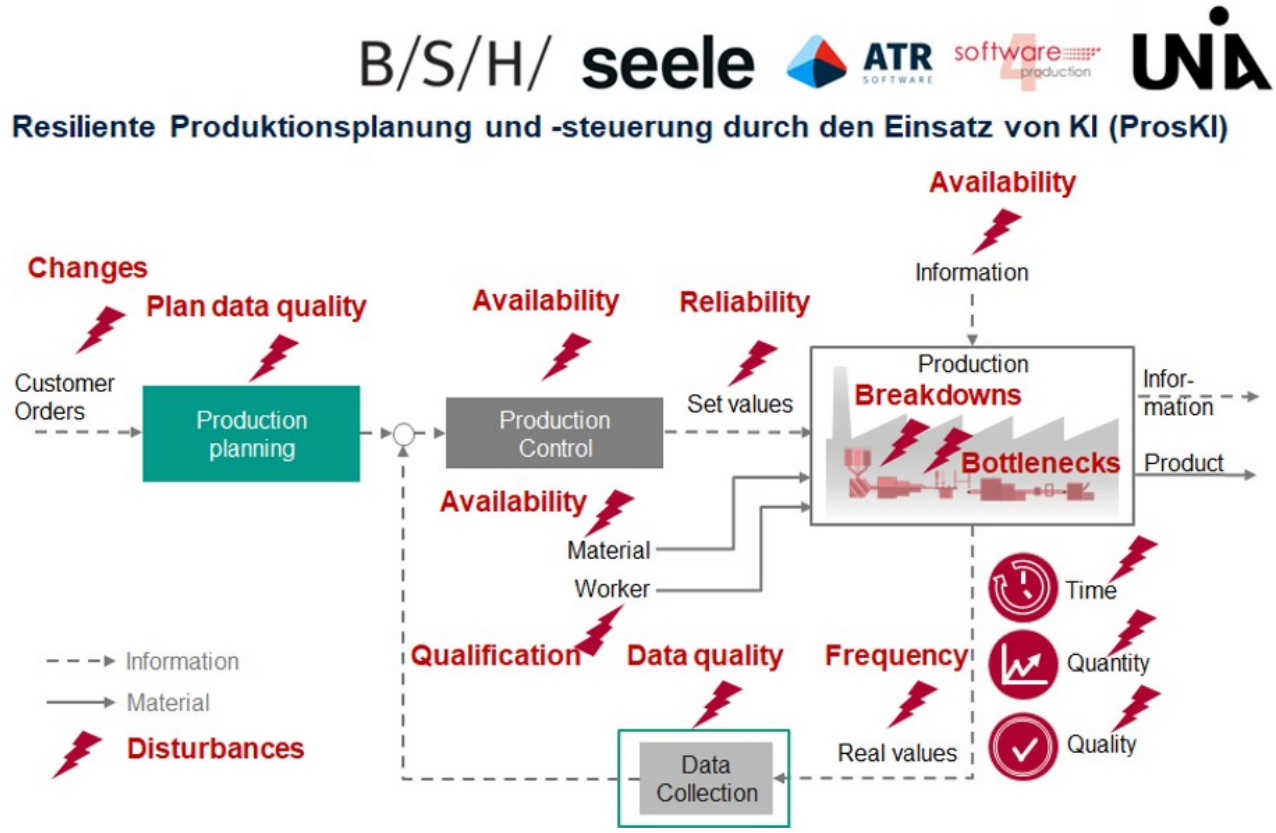
Research project ↗

Project duration: 01.01.2022 – 31.12.2024

Funded by: publicly funded joint project

Partners: University of Augsburg (Chair of Production Informatics, Chair of Organic Computing), ATR Software, BSH, seele

Relation to 4APS: AI assistance for rescheduling in case of disruption



Initial situation

Large amounts of process data are generated in production every day, which in theory enable detailed process knowledge and a digital twin for monitoring production. Today, however, this potential is hardly used. Plant failures, maintenance intervals and forecast disruptions are entered manually by production planners for future planning processes and are based on their experience.

Challenge

Disruptions lead to machine utilisation falling well short of the required level. The complex control processes and the derivation of recommendations for ongoing and future production processes are very time-consuming – rescheduling in case of failure as well as selecting a suitable strategy to resolve it. In addition, due to the insufficient depth of information in today's PPC systems, employees lack acceptance of automated solutions, which is why the production programme is often overridden manually.

Solution

The ProSki project develops an AI assistance system for PPC in case of failures or disruptions. The solution uses AI to support the planner in finding a suitable solution strategy, thereby reducing the effort required to identify disruptions. By analysing production data with machine learning methods, forecasts of future disruptions are derived and integrated into production programme planning. The derived conditions for rescheduling are provided transparently and at a suitable level of detail via easily interpretable models.

Results and benefits

Analytically supported decision-making leads to shorter reaction times and more robust production control. Stability and flexibility in the face of expected disruptions increase, and acceptance of automated PPC solutions grows. The findings from ProSki flow directly into the further development of 4APS and strengthen its AI-supported planning functions.

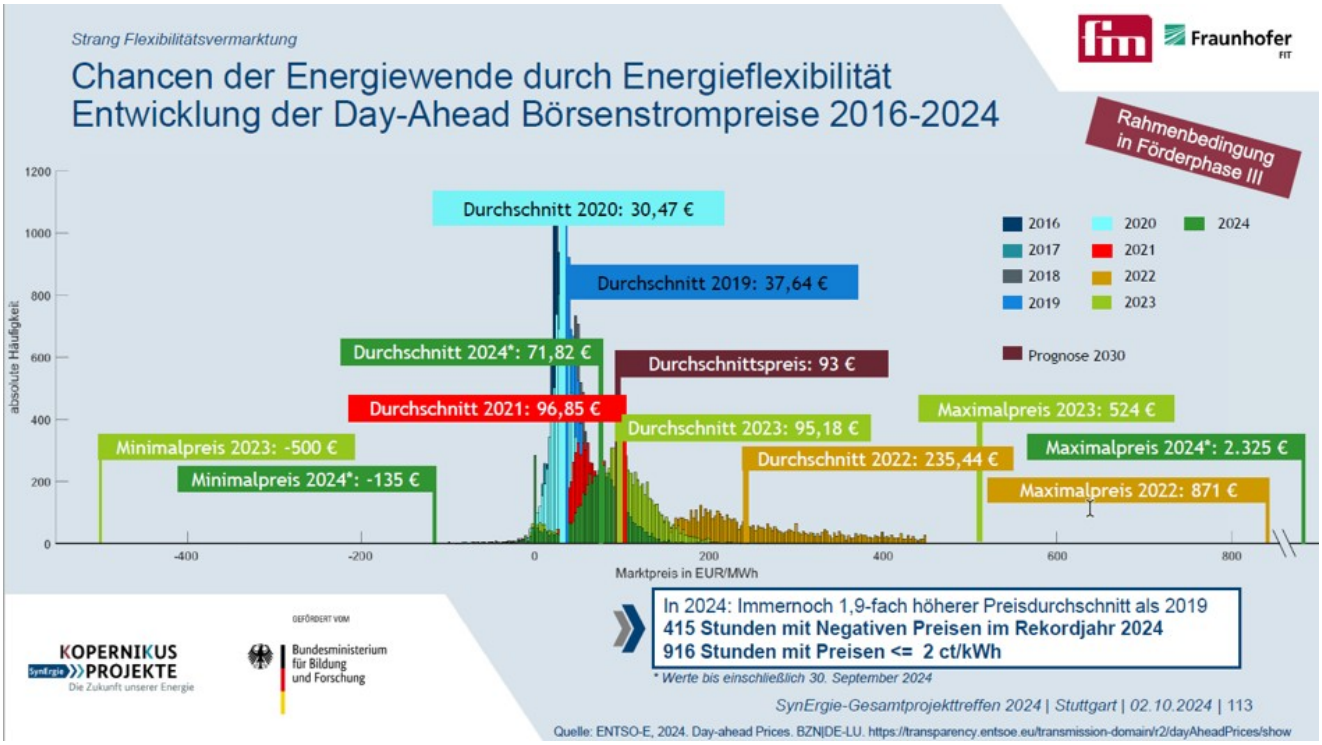
PePPS – Energy-oriented production planning and co… Research project ↗

Project duration: 01.08.2024 – 30.01.2027

Funded by: Bavarian State Ministry of Economic Affairs, Regional Development and Energy

Partners: Fraunhofer IGCV, IFA Leibniz University Hannover, GFaI

Relation to 4APS: energy as a planning dimension alongside throughput and delivery reliability



Initial situation

Energy costs are a growing cost factor for many small and medium-sized enterprises – while at the same time there is pressure to decarbonise. The importance of energy flexibility in production is increasing, but its adoption among SMEs is still low.

Challenge

So far, there has been no practical tool for systematically evaluating energy flexibility in the context of production planning and control. SMEs need a user-friendly approach that allows energy flexibility measures (EFM) to be identified with little effort and their effects to be quantified ex ante – before implementation.

Solution

The research project PePPS develops a method for assessing the potential of energy-oriented production planning and control. It combines the logistical modelling of production processes with energy and cost modelling and holistically evaluates the effects on logistical performance figures as well as on energy costs and consumption. A user-friendly demonstrator allows SMEs to test various energy flexibility measures virtually and to analyse their economic and operational consequences in advance.

Results and benefits

With PePPS, SMEs make well-founded decisions on load shifting, shutdown times and restart times without jeopardising production targets. Savings potential in electricity purchasing costs is realised, the CO□ balance is improved and production becomes more resilient to price fluctuations on the energy market. The results flow directly into the further development of 4APS and make energy criteria an equal planning dimension alongside throughput and delivery reliability.

SynErgie – Synchronised and energy-adaptive produ…

Research project ↗

Project duration: 01.09.2016 – 30.08.2019 and 01.11.2019 – 31.10.2022

Funded by: Federal Ministry of Education and Research (BMBF)

Partners: more than 80 consortium partners; in the sub-project energy-based PPC Fraunhofer IGCV and AEP Solutions

Relation to 4APS: energy-adaptive detailed scheduling in multi-resource scheduling



Initial situation

German industry is one of the largest energy consumers in Europe and faces the challenge of integrating its production into an increasingly volatile energy system with a growing share of renewable energies. SynErgie is one of the four Kopernikus projects for the energy transition funded by the BMBF and the only one focusing on industry. Led by TU Darmstadt and the University of Stuttgart, more than 80 consortium partners from science, industry and civil society work together across disciplines over two funding phases (2016–2019 and 2019–2022) to adapt energy-intensive industrial processes in time and space to the electricity supply.

Challenge

A holistic, synergetic solution requires close integration of production and process engineering, energy economics, business informatics as well as social, legal and economic sciences – existing PPC/MES systems largely plan orders without reference to electricity prices, grid load or CO□ intensity. Energy flexibility must become measurable, plannable and controllable during operation without jeopardising the logistical targets of delivery reliability, lead time and utilisation. In the energy-flexible model region of Augsburg, this approach is tested on a real industrial scale to ensure economic efficiency, technical feasibility and social balance at the same time.

Solution

SynErgie develops methods, models and software modules that enable industrial processes to respond flexibly to the power grid: load shifting, load increase/reduction and demand-side management become plannable functions of production. The energy flexibility potential of entire plants, sites and industries is evaluated; this results in reference architectures for energy-adaptive PPC and MES systems as well as concrete key figures, interfaces and market models. Already today, around 60 % of the positive and about 2 % of the negative balancing power can be covered exclusively by industrial DSM measures; SynErgie shows how industry's energy supply costs can be reduced by more than €10 billion and CO□ emissions significantly lowered.

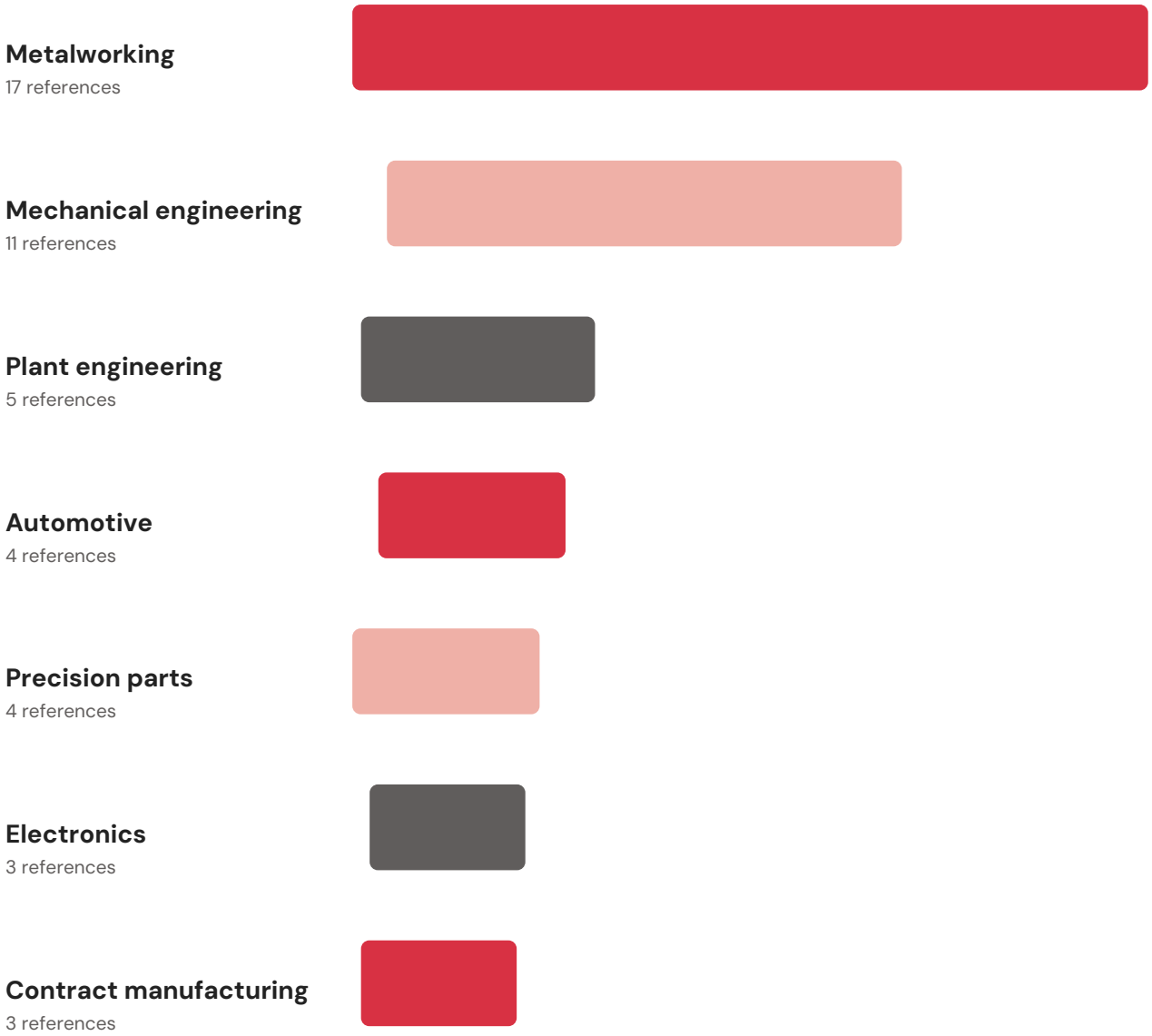
Results and benefits

Estimates assume a potential of 6.9 GW of positive and 4.0 GW of negative balancing power for particularly energy-intensive industrial processes – so far largely unused in Germany. For 4APS, SynErgie provides the foundations of energy-adaptive detailed scheduling: electricity price and grid signals are integrated directly into multi-resource scheduling, orders are moved to favourable energy windows, and the planning board shows energy costs and CO□ balance in addition to dates and capacity. This turns 4APS into a strategic tool for the energy transition in manufacturing – with measurable savings in energy and grid costs and an active contribution to climate-neutral industry.

Customer references with 4APS

Selected practical examples with 4APS for digital production planning

Industry distribution of the 4APS references (sorted by number)



Liebherr-Components Deggendorf GmbH

Homepage ↗

94469 Deggendorf, Germany

Industry: Automotive, precision parts, injection systems, component manufacturing, metalworking

Products: Diesel and gas injectors, injection systems, micro-precision parts, automotive components

S4P solutions: 4APS, 4BDE, 4MDE, 4SPC, 4PRO



Initial situation

The climate-controlled production at Liebherr-Components Deggendorf is characterised by highest precision, cleanroom assembly, complex processes and demanding manufacturing conditions. In this environment, the need for continuous real-time information from production grows in order to assess statuses, progress and deviations quickly and reliably.

Challenge

After the company was founded in 2015, growth in 2018 led to the following situation: despite the ERP system Infor:LN and a Forcam MES, the lack of transparency in production and machine data made it increasingly difficult to monitor manufacturing processes reliably, detect faults early and take well-founded decisions on the shop floor and in production control. In this complex production environment with high quality requirements a digital link between planning, production and data acquisition was needed. In a lengthy and intensive system selection process with competitor benchmarks, reference visits and a proof of concept, the final decision was taken in 2019 to introduce the MES/APS solutions from S4P and Inform from Aachen, who have been an OEM partner of S4P since 2012 and market the complete S4P portfolio under the name FELIOS|MES.

Solution

Together with Inform, S4P introduced the following solutions in dedicated sub-projects: bidirectional interfaces to the Infor:LN ERP, FELIOS|APS for day-accurate multi-resource planning, FELIOS|SPE for shift planning, FELIOS|FLS for real-time multi-resource planning, FELIOS|BDE for shop-floor data collection, FELIOS|SPC for statistical process control and claim tables, FELIOS|MDE for manual machine data acquisition, FELIOS|PRO for warehouse management (WMS) and logistics control, plus the integration of e-labels, handhelds, RTLS object tracking and Liebherr applications. Together these modules provide production feedback, machine states and relevant manufacturing information within a fully integrated digital environment.

Results and benefits

Better availability and usability of production data enable processes to be steered and evaluated with greater transparency. This supports faster reactions to deviations, improves the information basis for shop-floor management and creates an important foundation for more efficient workflows, higher process reliability and data-driven production improvement.

Brembo SGL Carbon Ceramic Brakes GmbH

Homepage ↗

86405 Meitingen, Germany

Industry: Automotive, carbon-ceramic brakes, series production

Products: Carbon-ceramic brake discs, high-performance brakes, brake system components for sports and premium ve...

S4P solutions: 4APS, 4BDE, 4MDE, 4SPC, 4PRO



Initial situation

The production of carbon-ceramic brake discs is characterized by long, multi-stage process chains. From the production of raw parts to thermal treatments, machining and coating processes to final testing and approval steps, the components go through numerous work steps and quality tests. Production is organized on the basis of batch and serial numbers at the same time to ensure complete traceability.

Challenge

BSCCB manufactures in 3-shift operation in a complex production system that includes both batch-guided and serial number-based processes. As part of the strategic development, this production system will be transformed into an increasingly automated, cyber-physical production system. Industry 4.0 approaches, digital twins and a close coupling of physical production facilities with digital factory models play a central role in this.
Against this background, the focus in 2024/2025 was on the following requirements in particular:

- Realistic detailed planning of complex production steps at APS/MES level below SAP
- Detailed, timely production data acquisition (PDA) for orders, operations, times, quantities and status information
- Reliable machine data acquisition (MDE) for machine utilization, conditions, faults, key figures and technical process data
- End-to-end statistical process control (SPC) to ensure high quality requirements and to detect deviations at an early stage
- Ensuring seamless traceability over decades in the interaction of SAP, MES, BDE/MDE, SPC and QMS (Siemens Quality / Siemens Quality Management System)

Solution

Since 2024/2025, BSCCB has been using almost all of software4production's core solutions along the entire value chain. This creates an end-to-end digital factory platform that closely interlinks planning, control, recording and quality assurance:

- 4APS for real-time digital production planning
- 4BDE for production data acquisition
- 4MDE for Machine Data Acquisition
- 4SPC for statistical process control
- 4PRO for process and production control

The solutions integrate into the existing SAP environment and create a consistent database from planning to execution.

Results and benefits

With the combination of 4APS, 4BDE,4MDE, 4SPC and 4PRO from software4production, BSCCB has implemented an end-to-end, modularly scalable MES/APS architecture under SAP. The solution supports:

- Industry 4.0-capable, cyber-physical production systems
- Realistic detailed planning of the complex carbon-ceramic process chains
- Transparent operating and machine data acquisition in real time
- Robust statistical process control and seamless traceability over 30 years
- Seamless integration of SAP, Siemens Quality and S4P solutions

BSCCB is thus ideally positioned to support growth, capacity expansions and the highest quality requirements in the high-performance and premium automotive segment with a modern, digital factory platform.

ANDREAS STIHL AG & Co. KG

Homepage ↗

71336 Waiblingen, Germany

Industry: Power tools, garden technology, metalworking, electronics, additive manufacturing, series production

Products: Chainsaws and motorized garden tools

S4P solutions: 4AVO, 4APS, 4BDE



Initial situation

ANDREAS STIHL AG & Co. KG, headquartered in Waiblingen, Germany, develops and manufactures chainsaws and motorized garden tools with around 1,000 employees within prototyping department. In a demanding environment of additive manufacturing, metalworking and electronics, transparency, reliable production data and stable production control are decisive for quality, delivery reliability and operational efficiency. Development and prototype production at STIHL is characterized by complex processes, short innovation cycles and demanding requirements in metal processing (including magnesium machining), additive manufacturing and electronics (including battery cells). In addition to a high level of in-house production, the company has over 300 suppliers for components and entire assemblies. In this environment, the need for continuous real-time data from order processing is growing in order to be able to assess conditions, progress and deviations quickly and reliably.

Challenge

Without sufficient transparency in order processing due to many isolated solutions, it becomes much more difficult to reliably monitor development and prototype construction processes, to detect malfunctions at an early stage and to make well-founded make-or-buy decisions. In a complex production environment where "time = money" and there are high quality requirements, this requires a digital transformation of the entire order processing process in close connection to the existing SAP ERP.

Solution

Together with Stihl, S4P implemented a web-based customer order cockpit for the approximately 600 designers, connected to PTC Creo. Here, designers can very easily define and monitor their requirements for prototype parts. At Stihl, eight order managers make the respective make-or-buy decision in prototype construction, where any customer-order-related mix is possible. In the event of a buy decision, the specified suppliers automatically receive an e-mail notification with access to the SharePoint and access to all necessary data, such as CAD drawings. An offer must be submitted as a PDF in an order-related structure so that a detailed cost breakdown in terms of supply chain management is possible. After comparing offers in S4P, the decision and creation of a purchase repurchase agreement are made via SAP or Ariba with corresponding order processing until goods are received by Stihl. In in-house production, the master craftsman areas from mechanical production to additive manufacturing to SMD production are mapped directly in terms of system technology from work process planning, detailed planning to the structured recording of production data. As a result, the complete control loop from development, prototype construction and procurement to in-house production is mapped in one system and interlinked with the surrounding IT systems.

Results and benefits

Better availability and usability of data in order processing make it possible to plan, control and evaluate all supply chain processes with greater transparency. This supports faster reactions to deviations, improves the database for detailed planning and creates an important basis for Stihl's innovation and competitiveness in the future.

KSB SE & Co. KGaA

Homepage ↗

67227 Frankenthal, Germany

Industry: Pumps, valves, mechanical engineering, plant engineering, water technology, industrial technology

Products: Pumps, valves, shut-off and control technology, service and automation solutions for water, energy and indust…

S4P solutions: FELIOS|FLS powered by 4APS



Initial situation

KSB SE & Co. KGaA is building a new factory and logistics centre for ETAP pumps to make manufacturing faster and more productive. Across many of its plants, KSB already uses FELIOS|APS for day-accurate multi-resource planning of complex order networks. The new ETA factory is shaped by one-piece flow, highly variant-rich processes and demanding quality requirements in pump manufacturing. Based on SAP ERP as the central data platform, planning and capacity control were to be more tightly integrated and transparency in manufacturing increased further.

Challenge

Given the scale and strategic importance of the new ETA factory within the KSB group, an intensive selection process for the fine planning system lasted over a year, including a comprehensive proof of concept. The factory design incorporates one-piece flow, FIFO buffers, Industry 4.0 principles and automation with automated guided vehicles (AGVs) — all of which must be coordinated and validated in real time before the facility goes live. Planning mistakes detected only during operation carry significantly higher correction costs than those identified during the design phase, making pre-commissioning simulation a critical success factor.

Solution

Following the intensive proof of concept, FELIOS|FLS powered by 4APS was selected as the fine planning system. Before the actual commissioning of the new factory, KSB decided to build a digital twin of the ETA factory with S4P during the planning and construction phase. SIMPLAN realised a discrete-event emulation of the ETA factory using Plant Simulation, coupled to FELIOS|FLS via REST web services. Master data are generated by KSB in MS Excel and read directly into both FELIOS|FLS and Plant Simulation. The emulation model retrieves movement data dynamically from FLS via REST — with FLS operating as a service. This enables arbitrary planning scenarios to be simulated over extended time horizons, with findings flowing directly into the factory design.

Results and benefits

Beyond the established benefits of FELIOS|FLS powered by 4APS for improving logistical key figures such as on-time delivery, lead times, WIP inventories and costs, the digital twin approach directly addresses the ‘Rule of 10’ — the quality management principle that correction costs increase tenfold with each subsequent lifecycle phase. By simulating the new factory digitally before commissioning, planning errors are identified and resolved early, the factory build is underpinned by solid planning and simulation evidence, and the ramp-up risk is substantially reduced. KSB secures its investment in the EUR 70 million facility with a validated, data-driven planning foundation.

Fraunhofer IGCV – Additive Manufacturing

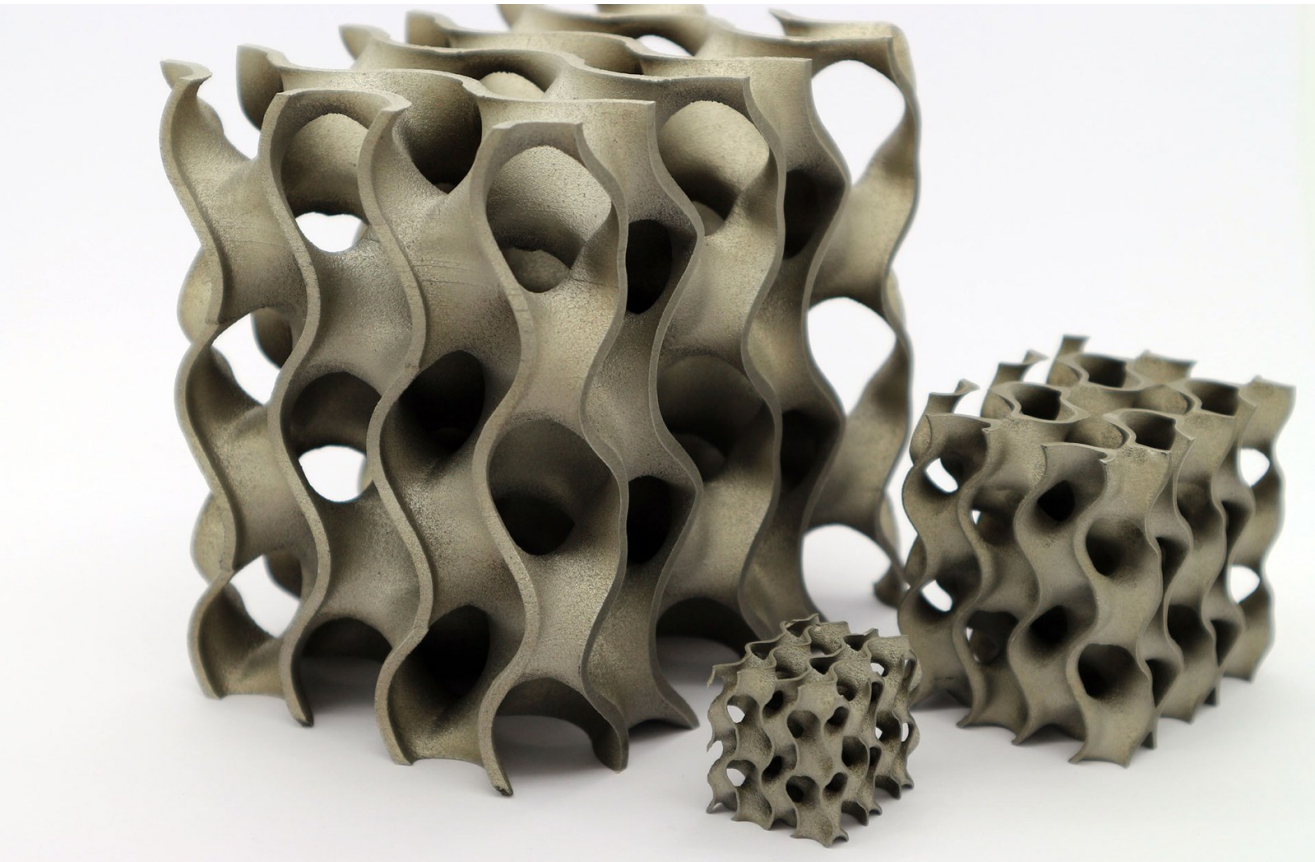
Homepage ↗

86159 Augsburg, Germany

Industry: Research, additive manufacturing

Products: Additive components for industry and research

S4P solutions: 4APS, 4BDE, 4MDE, 4PRO, 4AVO



Initial situation

For additive manufacturing at Fraunhofer IGCV, end-to-end digital order handling and data acquisition of the production processes were required. The goal was complete traceability of AM orders, powder batches and machine and manufacturing data as a complement to the existing SAP ERP, in which only purchase orders, delivery notes and invoices are captured for customer orders.

Challenge

The complex process chains of additive manufacturing and the requirements for reproducibility and documentation demanded end-to-end integration of order, raw material, operating and machine data. Without integrated digital control, the transparency and controllability of AM production remained limited.

Solution

With the software4production solutions, end-to-end traceability for AM orders and the powder was implemented. Shop-floor and machine data acquisition and warehouse management – from goods receipt to shipping of parts – interlock seamlessly. Modules deployed: 4AVO for Order Management, 4APS – Advanced Planning and Scheduling for graphical fine planning; 4BDE for shop-floor data collection; 4MDE for machine data acquisition via MQTT to all RP systems; 4PRO for warehouse and batch management, goods receipt and picking.

Results and benefits

With the software4production solutions, Fraunhofer IGCV achieves end-to-end digital control and transparency in additive manufacturing. Orders, machines and manufacturing data are captured and controllable in real time – enabling efficient and traceable production.

Gaugler & Lutz GmbH & Co. KG

Homepage ↗

73432 Aalen-Ebnat, Germany

Industry: Plastics processing, foams, wood-based materials, aerospace, insulation materials

Products: Lightweight foam boards, sandwich panels, technical foams, packaging, insulation and lightweight constructio…

S4P solutions: 4APS, 4PZE, 4MDE, 4BDE



Initial situation

Manufacturing at Gaugler & Lutz GmbH & Co. KG is characterised by variant-rich products and demanding quality requirements in lightweight and sandwich construction. The ERP system Sage 100 covers commercial and order-related processes. Standard tools were insufficient for realistic planning and transparent control of around 150 employees across the various processing lines. Lightweight foam boards, sandwich panels and technical foams for aerospace and insulation applications require precise coordination of cutting, bonding and finishing processes.

Challenge

Variant-rich orders, fluctuating workloads and high quality requirements across different sectors placed high demands on production planning. Without end-to-end fine planning and shop-floor data collection, bottlenecks and scheduling conflicts were difficult to identify and manage early. Short-notice order changes or machine faults could not be incorporated into planning quickly enough, leading to delays and unnecessary setup effort. In addition, a reliable data basis for utilisation evaluations and the assessment of on-time delivery and machine efficiency was missing.

Solution

To optimise production planning, Gaugler & Lutz GmbH & Co. KG relies on the solutions from S4P. Through integration with the ERP system Sage 100, order, production and feedback data are used end-to-end to enable realistic and transparent production control. Modules in use: 4APS — graphical fine planning with bottleneck detection and sequence optimisation; 4PZE — time and attendance data collection; 4MDE — automatic machine data collection and OEE evaluation. Planners and shift supervisors always have a current overview of capacity utilisation and order progress.

Results and benefits

With the S4P solutions, Gaugler & Lutz GmbH & Co. KG achieves greater planning reliability and transparency in manufacturing. Bottlenecks are detected early, capacities are better utilised and deadlines are met more reliably — delivering higher on-time delivery performance and efficiency. Machine KPIs such as OEE, availability and performance are available for evaluations and provide the foundation for data-driven optimisation of processing operations in lightweight construction manufacturing.

Kinkele GmbH & Co. KG

Homepage ↗

97199 Ochsenfurt, Germany

Industry: Contract manufacturing, mechanical engineering, metalworking, plant engineering

Products: Large weldments, mechanical engineering components, plant engineering assemblies, contract manufacturing…

S4P solutions: 4APS





Initial situation

As a large, broadly diversified contract manufacturer in mechanical and plant engineering, Kinkele faces the challenge of simultaneously managing an enormous variety of variants in lot size 1, fluctuating project workloads and high price pressure. Capacity utilisation, on-time delivery and margin management therefore become increasingly critical success factors. To remain profitable in this environment, the company needed to move from a relatively coarse, approximate project planning in ams.erp to a significantly more detailed fine planning that takes resources such as personnel and machines into account. Only with such fine planning can bottlenecks be identified early, delivery dates committed reliably, rework and downtime minimised and complex major projects with many individual orders synchronised so that quality and on-time delivery are assured.

Challenge

In contract manufacturing with lot size 1 and high project complexity, planning accuracy is the central challenge. Without resource-specific fine planning, bottlenecks were only visible late, delivery commitments were difficult to make reliably and the synchronisation of parallel large-scale projects with many individual orders was too slow. The goal was to move from approximate weekly or monthly planning to day-accurate, resource-specific scheduling that can incorporate short-notice changes and simulate alternative scenarios in real time.

Solution

After an intensive selection process, Kinkele chose ams.leitstand powered by 4APS for backlog-free scheduling of orders and operations from ams.erp. With this integrated fine planning solution, Kinkele can now control the high variant diversity and the many concurrently running projects not merely at week or month level but with day and resource accuracy, detect bottlenecks early and simulate alternative scenarios. Machine utilisation and personnel deployment become more transparent, delivery dates are committed more realistically and met more reliably, while unplanned lead time extensions and costly changeover or waiting times are significantly reduced. The close coupling of ERP and scheduling creates a single data basis for sales, work preparation, manufacturing and project management.

Results and benefits

Instead of relying on intuition and rough weekly plans, Kinkele now keeps its complex contract manufacturing visibly in step with ams.leitstand powered by 4APS: through backlog-free fine planning in real time, on-time delivery improves, utilisation of key resources increases measurably and lead and waiting times decrease — with simultaneously higher transparency for sales, work preparation and manufacturing. Kinkele detects bottlenecks early, works through alternatives via what-if simulation and can give customers realistic, dependable delivery dates — a clear competitive advantage in a market defined by schedule pressure and individual projects.

Bühler Heidenreichstein MKE GmbH

Homepage ↗

3860 Heidenreichstein, Austria

Industry: Mechanical engineering, plant engineering, toolmaking, automotive, metalworking

Products: Precision parts, assemblies, brewery plant components, toolmaking and automotive components

S4P solutions: 4AVO, 4APS, 4BDE



Initial situation

Manufacturing at Bühler Heidenreichstein MKE GmbH is characterised by complex workflows, high variant diversity and demanding manufacturing conditions in metalworking and toolmaking. With around 220 employees, precision parts, assemblies and automotive components are produced. In this environment, there is a growing need for continuous real-time data from production to assess states, progress and deviations quickly and reliably. The ERP system Sage FAMAC covers the commercial core processes; a complementary solution for work preparation, fine planning and shop-floor data collection was required.

Challenge

Without sufficient transparency over production and machine data, it becomes considerably more difficult to monitor manufacturing processes reliably, detect faults early and make well-founded decisions for fine planning and production control. In a complex production environment with diverse customer projects and different lot sizes, this required a continuous digital connection between work preparation, planning and shop-floor feedback. Manual data entry was error-prone, time-delayed and made reliable capacity planning as well as the analysis of process deviations difficult.

Solution

S4P provided solutions for work preparation, fine planning and structured capture of production data to improve transparency across manufacturing processes. This creates a reliable data basis for production control, the analysis of process deviations and continuous shop-floor improvement. Modules in use: 4AVO for work preparation and structuring of manufacturing orders; 4APS for advanced fine planning with bottleneck detection and a graphical scheduling board; 4BDE for shop-floor data collection for order, quantity and time feedback. All modules are connected to the ERP system Sage FAMAC and support planning, control and feedback of relevant production data within a continuous digital environment.

Results and benefits

Greater availability and usability of production data enable processes to be planned, controlled and evaluated with higher transparency. This supports faster responses to deviations, improves the data basis for fine planning and creates an important foundation for more efficient workflows, greater process reliability and data-driven production improvement at the Heidenreichstein site.

UTS Maschinenbau GmbH & Co. KG

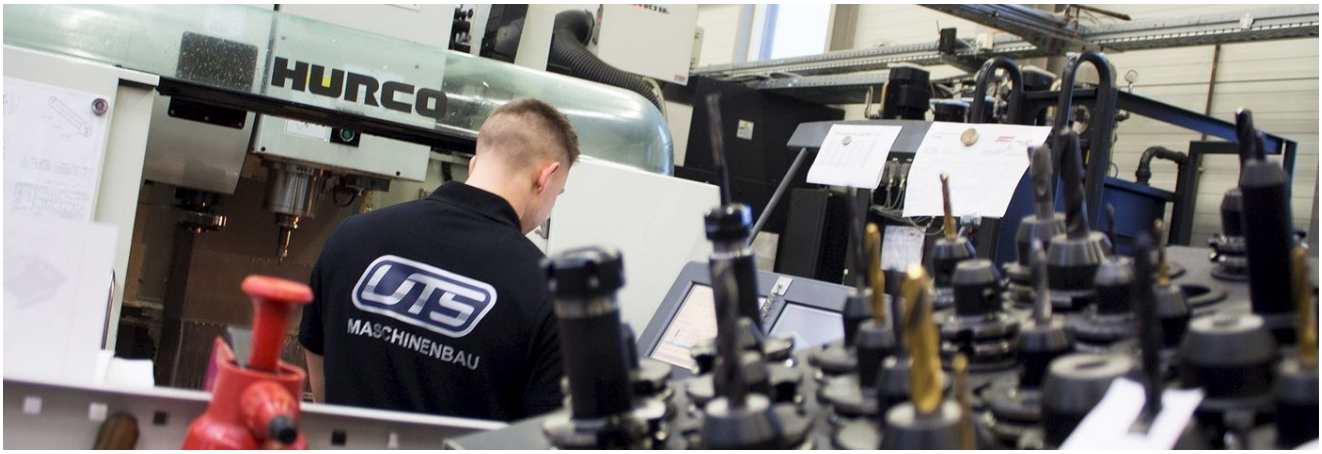
Homepage ↗

28816 Stuhr, Germany

Industry: Mechanical engineering, plant engineering, metalworking, aerospace, special-purpose machine manufacturing

Products: Special-purpose machines, automation solutions, assembly systems, fixtures and metal assemblies

S4P solutions: ams.leitstand powered by 4APS, 4BDE



Initial situation

UTS Maschinenbau GmbH & Co. KG, with around 40 employees, required end-to-end production planning and shop-floor data collection to control its project-based manufacturing of special-purpose machines and automation solutions transparently and on schedule. The existing ams.erp environment was to be supplemented with real-time fine planning and data collection capability. In special-purpose machine manufacturing with small lot sizes and customer-specific projects, a precise capacity overview is decisive for meeting delivery dates reliably and deploying resources optimally.

Challenge

The manufacture of special-purpose machines and automation solutions demands high planning accuracy and gap-free transparency. The goal was to utilise capacities optimally, capture manufacturing progress in real time and sustainably improve on-time delivery to customers. Without graphical fine planning and digital shop-floor data collection, bottlenecks and scheduling risks were only identifiable with significant manual effort. The solution had to integrate seamlessly into ams.erp without requiring extensive modifications to the ERP core installation.

Solution

The solution deployed is ams.leitstand powered by 4APS for digital production planning in real time and 4BDE for end-to-end shop-floor data collection. The ams.leitstand provides a graphical scheduling board with drag-and-drop functionality and enables resource-optimised sequence planning for all manufacturing orders. 4BDE captures order feedback, times and quantities directly at the terminal on the shop floor. Both solutions integrate seamlessly into the existing ams.erp environment so that order and master data are exchanged bidirectionally.

Results and benefits

With the S4P solutions, UTS Maschinenbau GmbH & Co. KG achieves improved capacity utilisation, gap-free capture of production data and higher on-time delivery in special-purpose machine manufacturing. Planning-reliable order confirmations to customers become possible, bottlenecks are detected early and manual data-entry effort is significantly reduced. The end-to-end data basis from planning and feedback creates transparency for manufacturing management and scheduling.

Rollstar AG

Homepage ↗

5704 Egliswil, Switzerland

Industry: Drive technology, gearbox manufacturing, hydraulic motors, mechanical engineering

Products: Planetary gearboxes, hydraulic motors, compact drives, brakes and geared motors

S4P solutions: ams.leitstand powered by 4APS, 4BDE



Initial situation

Rollstar AG, with around 80 employees, required capable production planning to manage its manufacturing of drive components transparently and on schedule. The existing ams.erp environment was to be supplemented with real-time fine planning capability. Planetary gearboxes, hydraulic motors and compact drives are produced in variant-rich order manufacturing, requiring precise capacity and schedule planning to reliably fulfil delivery commitments.

Challenge

The manufacture of variant-rich drive components demands high planning accuracy. The goal was to optimise capacity utilisation, shorten lead times and sustainably improve on-time delivery to customers. Without graphical fine planning, bottlenecks and conflicts in machine utilisation were difficult to identify early. Short-notice order changes and rush orders could not be incorporated into planning quickly enough, leading to unnecessary setup and waiting times.

Solution

The solution deployed is ams.leitstand powered by 4APS for digital production planning in real time, supplied as an OEM solution by ams, the market leader for make-to-order manufacturers, from Achim. The solution integrates seamlessly into the existing ams.erp environment and delivers a transparent view of all manufacturing processes. The graphical scheduling board displays all orders, capacities and deadlines in a single view; planners can adjust sequences via drag-and-drop and immediately assess the impact on delivery dates. Loading, capacity management and schedule feedback are handled end-to-end in one interface.

Results and benefits

With ams.leitstand powered by 4APS, Rollstar AG achieves improved capacity utilisation, shorter lead times and higher on-time delivery in the manufacturing of its drive components. Planning-reliable order confirmations to customers become possible, bottlenecks are detected early and the planning quality of scheduling is sustainably raised. Seamless integration with ams.erp avoids duplicate data entry and ensures a consistent data basis in planning and order processing.

Goldammer Wasserfuhr Stahl GmbH

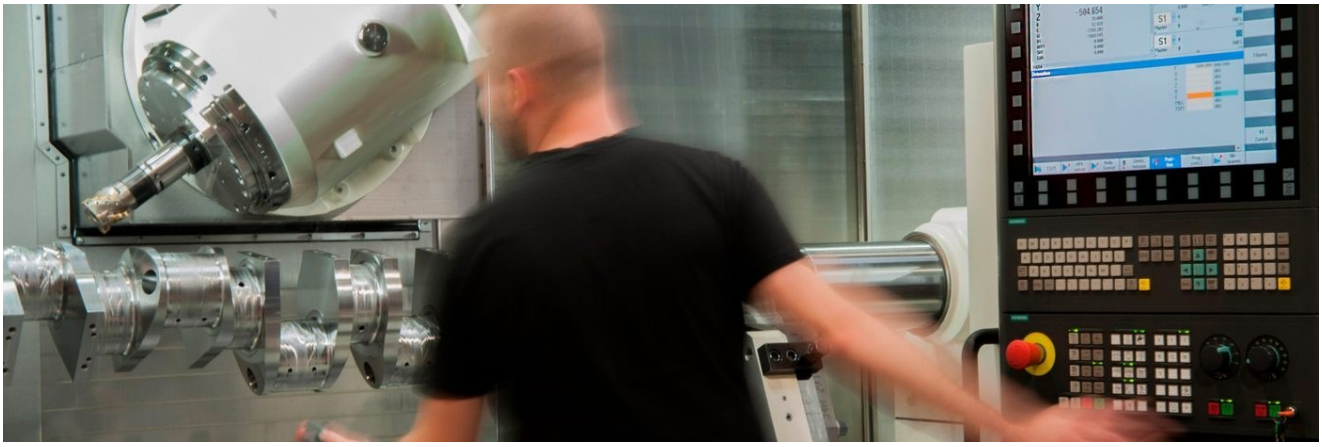
Homepage ↗

42499 Hückeswagen, Germany

Industry: Metalworking, steel trading, processing

Products: Steel products, cut-to-length pieces, saw cuts, flame-cut parts, processing and steel trading services

S4P solutions: 4APS, 4BDE



Initial situation

Manufacturing at Goldammer Wasserfuhr Stahl GmbH, with around 65 employees, is characterised by variant-rich processes and demanding quality requirements in metalworking and steel trading. Cut-to-length pieces, saw cuts, flame-cut parts and processing services are produced in customer-specific order manufacturing. With the ERP system Sage 100 as the central data source, planning and shop-floor data collection were to be more closely integrated and transparency in production increased. Fluctuating order volumes and tight delivery deadlines required capable digital fine planning and reliable shop-floor feedback.

Challenge

In steel trading and processing, variant-rich orders, fluctuating workloads and tight scheduling windows coincide. Without end-to-end fine planning and shop-floor data collection, capacity bottlenecks and scheduling risks were only identifiable with significant manual effort. The goal was to map order and production data in real time, to automate feedback from production to the ERP system Sage 100 and to create a reliable basis for planning-secure order confirmations to customers.

Solution

To optimise its manufacturing processes, Goldammer Wasserfuhr Stahl GmbH relies on S4P solutions. Through integration with the ERP system Sage 100, order, production and operating data are used end-to-end to enable realistic and transparent fine planning as well as reliable shop-floor data collection. Modules in use: 4APS — Advanced Planning and Scheduling for graphical fine planning and capacity management, and 4BDE — shop-floor data collection for transparent and current production control. All modules are bidirectionally connected to Sage 100.

Results and benefits

With the S4P solutions, Goldammer Wasserfuhr Stahl GmbH achieved higher planning reliability and transparency in production. Bottlenecks are detected early, capacities are better utilised and deadlines are met more reliably — delivering greater on-time delivery performance and efficiency. Planning-reliable order confirmations to customers are possible, manual feedback effort has been reduced and a solid data basis for evaluations and process improvements in metalworking and steel trading has been established.

Lochanstalt Aherhammer Stahlschmidt & Flender GmbH

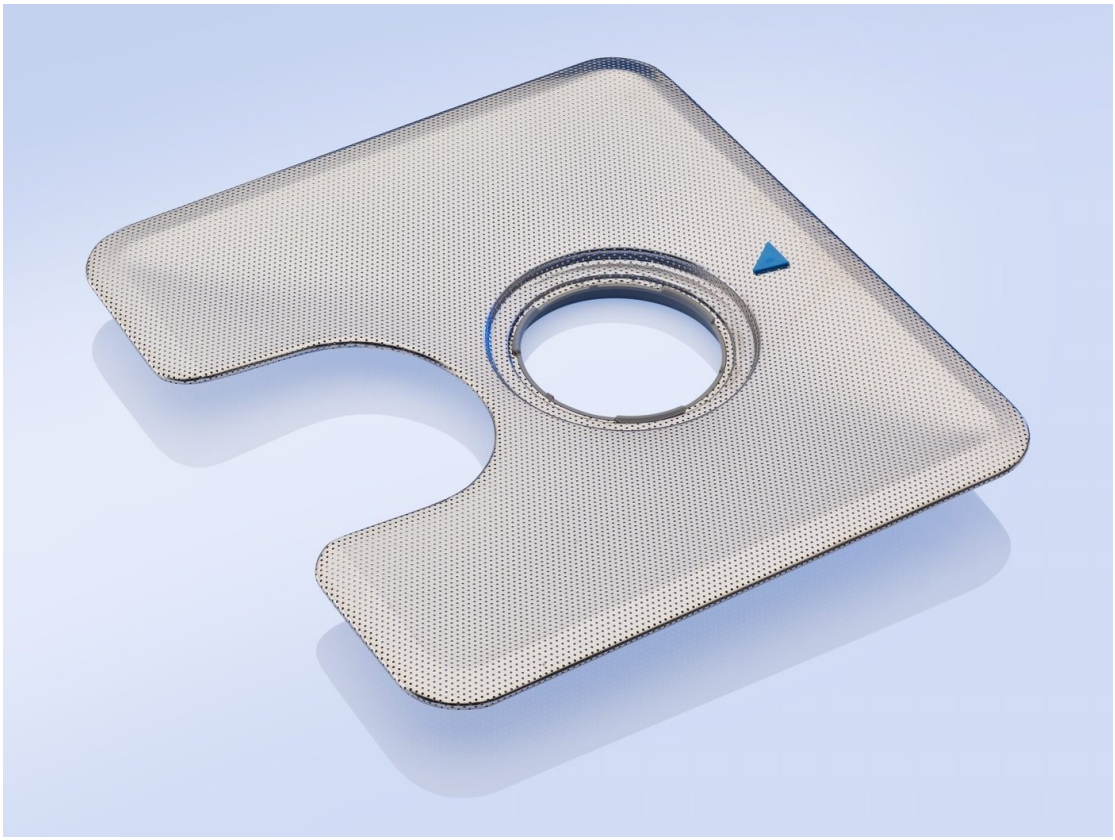
Homepage ↗

57223 Kreuztal, Germany

Industry: Metalworking, perforated sheet metal, tool manufacturing, sheet metal processing

Products: Perforated sheet metal, stamped parts, sheet metal blanks, custom perforations and metallic semi-finished pr...

S4P solutions: 4APS



Initial situation

Manufacturing at Lochanstalt Aherhammer Stahlschmidt & Flender GmbH is characterised by the production of high-quality perforated sheet metal in metalworking and tool manufacturing. With the ERP system ams.erp, commercial and order-related processes are covered. For realistic planning and transparent production control with around 75 employees, the standard tools were insufficient. Fluctuating order volumes, different perforation patterns and material variants require flexible fine planning that reflects capacities and schedules at all times.

Challenge

Fluctuating order volumes, short-notice changes and the need to optimally utilise limited capacities placed high demands on production planning. Without end-to-end graphical fine planning, bottlenecks and scheduling conflicts were difficult to identify and manage early. Planners worked with manually maintained lists, which led to considerable planning effort when orders changed and put pressure on on-time delivery to customers.

Solution

To optimise production planning, Lochanstalt Aherhammer Stahlschmidt & Flender GmbH relies on S4P solutions. Through integration with the ERP system ams.erp, order and production data are used end-to-end for realistic and transparent fine planning. Module in use: ams.leitstand powered by 4APS for graphical fine planning with a scheduling board, bottleneck detection and sequence optimisation. Order and capacity data from ams.erp are transferred automatically; planning changes are fed back directly. Planners receive a complete overview of machine utilisation, open orders and delivery deadlines.

Results and benefits

With the S4P fine planning solution, Lochanstalt Aherhammer Stahlschmidt & Flender GmbH achieves greater planning reliability and transparency in production. Bottlenecks are detected early, capacities are better utilised and deadlines are met more reliably — delivering higher on-time delivery performance and efficiency. Planning effort has been reduced and planning-reliable order confirmations to customers are now dependably possible. Seamless integration with ams.erp ensures a consistent data basis in planning and order processing.

INTERPRECISE Donath GmbH

Homepage ↗

90587 Obermichelbach, Germany

Industry: Mechanical engineering, metalworking, precision parts, plant construction

Products: Precision roller bearings, special bearings, guide rollers, metal components and mechanical engineering precisi…

S4P solutions: 4AVO, 4APS, 4BDE



Initial situation

The manufacture of precision roller bearings at INTERPRECISE Donath GmbH, with around 100 employees, demands exact planning and coordination of sophisticated machining steps. With the ERP system Alphaplan and its connection to S4P solutions, work preparation, fine planning and shop-floor data collection are integrated end-to-end. Guide rollers, special bearings and metal components with tight tolerances require precise coordination of turning, grinding and assembly processes as well as reliable documentation of all manufacturing steps.

Challenge

Complex manufacturing processes with high accuracy requirements led to significant planning effort. A continuous link between work preparation, production planning and shop-floor feedback was missing. Bottlenecks and capacity utilisation were difficult to identify in real time, which made reliable delivery commitments to customers challenging. Manual maintenance of routings and planning data was time-consuming and error-prone; end-to-end digitalisation from order receipt to manufacturing feedback was therefore urgently needed.

Solution

Together with S4P, the ERP system Alphaplan was extended with the following modules: 4AVO for work preparation, 4APS for digital production planning in real time and 4BDE for shop-floor data collection. Work preparation provides structured preparation of manufacturing orders; the APS system enables graphical fine planning with bottleneck detection; and the BDE terminals capture order times, good and scrap quantities directly on the shop floor. All modules are bidirectionally connected to Alphaplan so that order and master data are synchronised automatically.

Results and benefits

Through end-to-end digitalisation of planning and feedback, INTERPRECISE Donath GmbH has significantly increased transparency across the entire manufacturing process. Realistic fine planning improves on-time delivery, while real-time operating data enables rapid response to deviations. Planning-reliable order confirmations to customers are now possible, manual entry effort has been reduced and a solid data basis for post-calculation and continuous improvement of precision manufacturing has been established.

Fraunhofer IGCV – Learning Factory for Digitalisation

Homepage ↗

86159 Augsburg, Germany

Industry: Research, learning factory, production technology, Industry 4.0, further education

Products: Learning factory modules, demonstrators, research equipment and training environments for digitalisation an...

S4P solutions: 4AVO, 4APS, 4BDE, 4MDE, 4PRO



Initial situation

The learning factory at Fraunhofer Institute for Casting, Composite and Processing Technology IGCV maps real production workflows to research and demonstrate methods of digitalisation and networked manufacturing. Based on SAP ERP, an end-to-end planning and data acquisition solution was required that supports research and teaching in a realistic setting. With around 100 employees and varying research and teaching scenarios, the institute has high demands for flexibility in production software and for suitability in training and demonstration contexts.

Challenge

Variant-rich orders, changing scenarios and the ambition to make digitalisation tangible placed high demands on planning and data acquisition. An integrated solution was required that seamlessly connects work preparation, fine planning and shop-floor data collection while embedding SAP ERP as the leading system. For training purposes it was important that the solution allows different planning scenarios to be simulated and typical Industry 4.0 questions — such as bottleneck management, OEE evaluation and sequence optimisation — to be demonstrated in a practical way.

Solution

To support the learning factory, Fraunhofer IGCV relies on S4P solutions. Through integration with SAP ERP, order, planning and feedback data are used end-to-end — from work preparation through fine planning to shop-floor data collection. Modules in use: 4AVO for work preparation and order structuring, 4APS for graphical fine planning with simulation scenarios and a scheduling board, and 4BDE for shop-floor data collection at terminals with order feedback and KPI evaluation. The solution enables different manufacturing scenarios to be mapped live and prepared for didactic use.

Results and benefits

With the S4P solutions, Fraunhofer IGCV can map and convey digitalisation in production in a realistic and practical way. End-to-end data from planning to feedback creates transparency and makes the learning factory a hands-on platform for research and teaching. Planning scenarios can be simulated, KPIs evaluated in real time and typical shop-floor challenges demonstrated. The solution supports the institute in giving companies practical insights into the capabilities of modern MES and APS solutions.

ABC Service & Produktion Integrativer Betrieb GmbH

Homepage ↗

9020 Klagenfurt, Austria

Industry: Contract manufacturing, mechanical engineering, metalworking

Products: Contract manufacturing, metal assemblies, assembly services, packaging and production services

S4P solutions: 4APS



Initial situation

At ABC Service & Produktion Integrativer Betrieb GmbH, with around 270 employees, varying orders, high quality requirements and the need for greater planning reliability converge in metalworking and contract manufacturing. Metal assemblies, assembly services and production services are provided in variant-rich contract manufacturing. Manufacturing was to be efficiently planned and integrated with the ERP system ams.erp to optimally utilise capacities, shorten lead times and reliably ensure on-time delivery.

Challenge

In metalworking with varying orders and a broad product range, reliable fine planning was essential to optimally utilise capacities and meet delivery dates. Without graphical production planning, bottlenecks and scheduling risks were difficult to identify at an early stage. The goal was to closely integrate fine planning with the ERP system ams.erp, reduce manual planning effort and enable planning-reliable order confirmations to customers.

Solution

To optimise manufacturing processes, ABC Service & Produktion Integrativer Betrieb GmbH relies on solutions from S4P. Through integration with the ERP system ams.erp, production is comprehensively fine-planned and controlled in the ams.leitstand powered by S4P to enable transparent and reliable utilisation of manufacturing. Module deployed: 4APS – fine planning for optimal utilisation of capacities and higher on-time delivery. The graphical scheduling board displays all orders and capacities in a single view; dispatchers can adjust sequences and identify bottlenecks early. Master and order data from ams.erp are automatically transferred and planning changes bidirectionally synchronised.

Results and benefits

With solutions from S4P, ABC Service & Produktion Integrativer Betrieb GmbH achieved higher transparency across all production and a reliable data basis for production control. Capacities are planned optimally, lead times shortened and on-time delivery improved – for greater productivity and schedule adherence. Planning-reliable order confirmations to customers are possible and manual planning effort was significantly reduced.

Furtak & Salvenmoser GmbH

Homepage ↗

86674 Baar, Germany

Industry: Metalworking, silencer technology, plant engineering

Products: Industrial silencers, exhaust silencers, sound protection systems and plant engineering components

S4P solutions: 4AVO, 4APS, 4BDE



Initial situation

In metalworking, varying orders, high quality requirements and the desire for greater transparency in manufacturing converge. Work preparation, production planning and shop-floor data collection were to be more closely integrated with the ERP system TopM to efficiently prepare orders, reliably plan capacities and make operating data transparent in real time.

Challenge

In the manufacturing of industrial silencers with high variant diversity and individual customer requirements, a continuous link between work preparation, fine planning and shop-floor data collection was required. Without this integration, manual transfer effort, information gaps and scheduling risks emerged. The goal was to closely integrate planning and feedback processes with the ERP system TopM, map capacities transparently and capture operating data directly from manufacturing.

Solution

To optimise manufacturing processes, Furtak & Salvenmoser GmbH relies on solutions from S4P. Through integration with the ERP system TopM, work preparation, production planning and shop-floor data collection are mapped end-to-end to enable transparent and reliable control of manufacturing. Modules deployed: 4AVO – digital work preparation for efficient planning and preparation of manufacturing orders; 4APS – production planning for transparent scheduling of manufacturing orders and capacities; 4BDE – shop-floor data collection for transparent capture and evaluation of order and operating data.

Results and benefits

With the solutions from S4P, Furtak & Salvenmoser GmbH achieved higher transparency in manufacturing and a reliable data basis for production control. Orders are prepared efficiently, capacities planned optimally and operating data captured reliably – for greater efficiency and on-time delivery. The end-to-end integration of work preparation, planning and feedback into TopM eliminates information gaps, reduces manual effort and creates a solid foundation for planning-reliable order confirmations in industrial silencer manufacturing.

Pauli + Sohn GmbH

Homepage ↗

51597 Morsbach, Germany

Industry: Metalworking, fitting technology, glass fittings, building supplies

Products: Glass fittings, railing systems, shower fittings, canopy systems and fastener technology for glazing

S4P solutions: 4APS, 4BDE



Initial situation

Pauli + Sohn GmbH, with around 150 employees, required optimised fine planning and transparent shop-floor data collection in its manufacturing of fastener technology for glazing applications. The goal was end-to-end and traceable production control based on the existing ERP system SAP ERP. Glass fittings, railing systems and shower fittings are produced in high variant diversity, requiring precise coordination of machining, assembly and inspection processes.

Challenge

As a manufacturer of fastener technology with high variant diversity, the company required reliable planning and feedback from manufacturing. Manual processes were time-consuming and did not deliver timely data on current production status. Bottlenecks and capacity utilisation were difficult to anticipate without graphical fine planning. The integration of both solutions into SAP ERP had to be seamless to avoid duplicate data entry and ensure a consistent data basis.

Solution

With fine planning solution 4APS and shop-floor data collection 4BDE from S4P, Pauli + Sohn GmbH controls its manufacturing end-to-end. Both solutions are connected to the existing ERP system SAP ERP. The graphical scheduling board of 4APS gives dispatchers a current overview of capacities, dates and open orders at all times. 4BDE captures order times, good and scrap quantities directly at the shop-floor terminal and returns the data automatically to SAP. Shift supervisors and manufacturing management receive reliable real-time insight into production status.

Results and benefits

Manufacturing now has a transparent and current data basis. Fine planning and order status are traceable at any time, planning quality has improved and manual effort was significantly reduced. Capacities are optimally utilised, bottlenecks identified early and delivery dates met more reliably. The foundation for planning-reliable order confirmations and data-driven improvement of glass fitting manufacturing has been established.

Winning CoFo – Räuchle GmbH

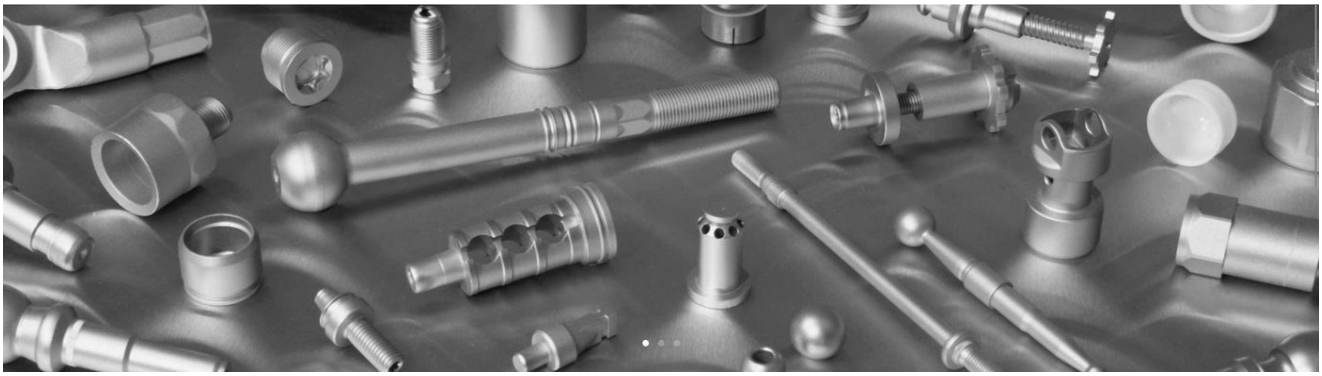
Homepage ↗

89165 Dietenheim, Germany

Industry: Metalworking, cold forming, toolmaking, automotive, fastener technology

Products: Solid formed parts, cold-formed parts, fasteners, automotive components and toolmaking services

S4P solutions: 4APS, 4AVO, 4BDE, 4PZE



Initial situation

Winning CoFo – Räuchle GmbH, with around 200 employees, required end-to-end and transparent control of its manufacturing of solid formed parts and cold-formed parts. The goal was reliable planning and gapless capture of operating and machine data as a complement to the existing ERP system PSIPenta. Automotive components and fasteners with high quality requirements demand precise control of forming, heat treatment and inspection processes.

Challenge

Complex manufacturing processes with high schedule pressure and strict quality standards required end-to-end digitalisation of the shop floor. Lack of transparency over current machine and order states as well as manual, time-consuming data capture made reliable control and evaluation of manufacturing difficult. Without digital fine planning, capacity bottlenecks were difficult to identify at an early stage, placing a burden on on-time delivery to automotive customers.

Solution

To optimise manufacturing processes, Winning CoFo – Räuchle GmbH relies on solutions from software4production: 4AVO for work preparation and order management and 4APS for Advanced Planning and Scheduling with graphical fine planning and bottleneck management, and 4BDE for real-time operating and machine data collection. All modules are bidirectionally connected to PSIPenta, so that order and master data are automatically synchronised and feedback data is returned. Shift supervisors and dispatchers receive an up-to-date overview of order progress and machine utilisation.

Results and benefits

Winning CoFo – Räuchle GmbH benefits from transparent and reliable fine planning of manufacturing and a real-time overview of machine and order data. Manual capture effort was reduced, on-time delivery improved and supply capability to automotive customers increased. Key performance indicators for capacity utilisation and manufacturing progress are available at all times for evaluations and well-founded decisions.

Ulmer Maschinenteile GmbH

Homepage ↗

89079 Ulm, Germany

Industry: Metalworking, mechanical engineering, CNC manufacturing, contract manufacturing, precision parts

Products: CNC precision parts, individual components, series parts, welded assemblies and complete assemblies

S4P solutions: ams.leitstand powered by 4APS



Initial situation

Ulmer Maschinenteile GmbH, with around 130 employees, required a capable production planning solution to transparently and punctually control its variant-rich manufacturing of CNC precision parts, individual components and assemblies. The existing ams.erp environment was to be extended with a real-time capable fine planning solution without requiring extensive ERP customisation. Welded assemblies and complete assemblies in contract manufacturing demand precise coordination of capacities and delivery dates.

Challenge

The manufacturing of individual parts through to complete assemblies requires high planning accuracy. The goal was to optimally utilise capacities, shorten lead times and sustainably improve on-time delivery to customers. Without graphical fine planning, bottlenecks and scheduling risks were only identifiable with manual effort. Short-notice order changes and urgent orders could not be incorporated into planning quickly enough, leading to unnecessary setup and waiting times.

Solution

The solution deployed is 4APS for digital real-time production planning as the OEM solution ams.leitstand from the market leader for single-unit manufacturers, ams of Achim. The solution integrates seamlessly into the existing ams.erp environment and provides a transparent view of all manufacturing processes. The graphical scheduling board displays all orders, capacities and dates clearly; dispatchers can adjust sequences and identify bottlenecks at an early stage. Master and order data from ams.erp are automatically transferred; planning changes are returned bidirectionally.

Results and benefits

With the S4P solution, Ulmer Maschinenteile GmbH achieves improved capacity utilisation, shorter lead times and higher on-time delivery in the manufacturing of its parts and assemblies. Planning effort was reduced, planning-reliable order confirmations to customers became possible and responsiveness to order changes improved. Seamless integration with ams.erp ensures a consistent data basis without duplicate data entry.

Carl Nolte Technik GmbH

Homepage ↗

48268 Greven, Germany

Industry: Plastics processing, packaging, injection moulding, industrial components

Products: Plastic components, technical injection moulded parts, hose and pneumatic technology, operating supplies

S4P solutions: 4AVO, 4APS, 4BDE



Initial situation

Carl Nolte Technik GmbH develops and manufactures products for hose and pneumatic technology as well as operating supplies with around 200 employees (Nolte Group including noltewerk). Plastic components, technical injection moulded parts and pneumatic accessories are produced in variant-rich order manufacturing. In plastics processing, reliable production data and transparent manufacturing control are decisive for on-time delivery, quality and operational efficiency. Work preparation, fine planning and shop-floor feedback were to be integrated into a seamless end-to-end solution.

Challenge

As a manufacturer of hose and pneumatic technology with variant-rich plastics production and small to medium batch sizes, close interlocking of work preparation, planning and shop-floor feedback was essential. Manual interfaces between work preparation, planning and manufacturing led to information gaps and scheduling risks. The goal was end-to-end digitalisation that incorporates Alphaplan as the leading ERP system and covers all relevant production processes without gaps.

Solution

Carl Nolte Technik GmbH relies on the integrated solutions 4AVO, 4APS and 4BDE from S4P, fully integrated with the ERP system Alphaplan by CVS. This links work preparation, production planning and shop-floor data collection end-to-end, so that the entire production is controlled and transparently mapped by S4P from a single source. Orders, operations, capacities and feedback interlock seamlessly, creating a reliable basis for efficient, plannable and responsive manufacturing processes.

Results and benefits

Through the integrated deployment of 4AVO, 4APS and 4BDE in conjunction with Alphaplan, Carl Nolte Technik benefits from end-to-end and transparent control of the entire production. Coordination between work preparation, planning and manufacturing improved significantly, manual interfaces were reduced and data quality sustainably increased. The company gains greater planning reliability, higher on-time delivery rates and more efficient production control – from work preparation through to shop-floor feedback.

Lorenz GmbH & Co. KG

Homepage ↗

89601 Schelklingen, Germany

Industry: Electronics, electrical engineering, industrial electronics, manufacturing

Products: Water meters, measuring capsules, electronic meters, radio modules and metering system technology

S4P solutions: 4AVO, 4APS, 4BDE



Initial situation

Lorenz GmbH & Co. KG, with around 200 employees, required efficient work preparation, optimised fine planning and transparent shop-floor data collection in its manufacturing of water meters, electronic meters and radio modules. The goal was end-to-end and traceable production control based on the ERP system SAP Business One. The production of smart water meters in an Industry 4.0 manufacturing system demands close integration of planning, assembly and quality assurance.

Challenge

As a manufacturer of smart water meters with high volumes and variant diversity, the company required reliable planning and feedback from its Industry 4.0 production system. Manual processes were time-consuming and did not deliver timely data on current production progress. A particular challenge was the transition from conventional assembly to a cyber-physical system in which work preparation, fine planning and shop-floor data collection interlock seamlessly and are integrated with SAP Business One.

Solution

Together with partner Software Factory, Lorenz converted its conventional assembly to an Industry 4.0-capable system. With 4AVO for work preparation and order management, 4APS for fine planning and 4BDE for shop-floor data collection, Lorenz GmbH & Co. KG controls its manufacturing end-to-end. All modules are connected to the existing ERP system SAP Business One, so that order and master data are synchronised automatically. At the assembly terminal, order feedback and quality data are captured and automatically returned to SAP Business One.

Results and benefits

Manufacturing now has a transparent and current data basis. Work plans, fine planning and order status are traceable at all times, planning quality has improved and manual effort has been significantly reduced. The Industry 4.0 assembly system enables complete traceability of meter components, improves quality assurance and provides a solid data basis for continuous improvement in meter production.

MEV Möbel-Elemente-Vertriebs GmbH

Homepage ↗

74223 Flein, Germany

Industry: Furniture production, wood processing, furniture fittings, interior finishing

Products: Furniture parts, wooden components, drawers, furniture fronts, furniture components and interior finishing el...

S4P solutions: 4APS, 4PRO



Initial situation

With around 75 employees, MEV Möbel-Elemente-Vertriebs GmbH required end-to-end planning and control of its manufacturing of wooden components and furniture. The goal was reliable fine planning and efficient production control as a complement to the existing ERP system Sage 100. Furniture parts, fronts and drawers are manufactured in a wide variant mix with individual customer requirements, which demands precise capacity and schedule planning.

Challenge

Variant-rich furniture manufacturing with individual customer requirements required powerful fine planning and transparent production control. A lack of transparency over current order and capacity situations made reliable delivery date commitments difficult. Without a graphical fine planning tool, bottlenecks and schedule risks were difficult to recognise early. The integration of fine planning and production control with Sage 100 was intended to avoid double entries and create a unified data basis.

Solution

To optimise its manufacturing processes, MEV Möbel-Elemente-Vertriebs GmbH uses the solutions from software4production: 4APS for Advanced Planning and Scheduling with graphical fine planning and capacity control, and 4PRO for production control and manufacturing management. Both modules are connected to Sage 100 and ensure a consistent data basis from order scheduling to production feedback. Planners receive an up-to-date overview of capacities and deadlines; production control coordinates material staging and manufacturing workflows.

Results and benefits

MEV Möbel-Elemente-Vertriebs GmbH benefits from transparent, reliable fine planning and optimised utilisation of production capacities. On-time delivery and delivery capability were improved, manual planning effort was reduced and a solid basis for planning-reliable order confirmations towards customers was created. Control of the variant-rich furniture manufacturing has become more efficient and more transparent.

Burgsmüller GmbH

Homepage ↗

37574 Einbeck, Germany

Industry: Tooling, metalworking, thread technology, mechanical engineering

Products: Screw elements, threaded spindles, gears, special threads and components for extrusion machines

S4P solutions: FELIOS|FLS powered by 4APS, FELIOS|PRO powered by 4PRO, 4BDE



Initial situation

Production at Burgsmüller GmbH is characterised by complex workflows, high variant diversity and demanding manufacturing conditions in mechanical machining. Specialised suppliers are also integrated into the value chain. In this environment, the need for continuous real-time data from production is growing, to assess states, progress and deviations quickly and reliably.

Challenge

In the course of constructing a new factory at Burgsmüller, real-time control and automation also became relevant topics. Without sufficient transparency, it is difficult to reliably monitor manufacturing processes, detect disruptions early and make well-founded decisions. In a complex production environment with high quality requirements, this demands a digital connection between work preparation, planning, production and data collection – in close integration with the existing ERP system SAP ERP.

Solution

Alongside the day-current planning system FELIOS|APS, a real-time fine planning system was required, and FELIOS|FLS powered by 4APS was selected. Particularly important for Burgsmüller is the dynamic setup optimisation in FELIOS|FLS, as production was simultaneously converted to a container-based workflow. FELIOS|PRO powered by 4PRO was introduced to uniquely identify containers, manage storage locations, and provide suppliers with unique container numbers on SAP delivery notes – enabling traceability for end-to-end container-based value creation. Simultaneously, two DMG lathes were equipped with a KUKA robot and a roller conveyor system as an autonomous manufacturing cell by KraussMaffei Automation. S4P was commissioned to handle control, automation and networking of the cell.

Results and benefits

The closed control loop between planning and execution produces a reliable data basis for production control and enables continuous improvement. This allows processes to be planned, controlled and evaluated with greater transparency. Faster responses to deviations provide an important foundation for more efficient workflows, higher process reliability and sustained production improvements.

DRAENERT STUDIO GmbH

Homepage ↗

88090 Immenstaad, Germany

Industry: Furniture production, designer furniture, woodworking, interior design

Products: Designer furniture, dining tables, coffee tables, chairs, natural stone furniture and bespoke interior solutions

S4P solutions: 4APS



Initial situation

Manufacturing at DRAENERT STUDIO GmbH, with around 120 employees, is characterised by individual order production with high variant diversity and demanding quality requirements. Designer furniture, dining tables and natural stone pieces are produced as single units; every order is a one-of-a-kind item with specific dimensions, materials and surface finishes. Based on the ERP system ams.erp, the goal was to refine production planning further and manage delivery dates more reliably.

Challenge

Fluctuating order loads, short-notice changes and the complexity of designer furniture production required a capable fine planning solution. The goal was to optimally utilise capacities, reduce lead times and provide reliable delivery dates. Without graphical fine planning, bottlenecks and scheduling risks were only identifiable with considerable manual planning effort. Seamless integration with ams.erp was mandatory to ensure a consistent data basis between order management and fine planning.

Solution

With the Advanced Planning and Scheduling system ams.leitstand powered by 4APS, DRAENERT STUDIO GmbH established end-to-end graphical fine planning. The solution provides transparency over capacities and order progress and enables realistic, resource-optimised scheduling in close connection with ams.erp. Order and master data are automatically transferred from ams.erp; the graphical scheduling board displays all orders, resources and dates at a glance. Planners can adjust sequences by drag-and-drop and immediately assess the impact on delivery dates.

Results and benefits

By using 4APS, DRAENERT STUDIO GmbH benefits from optimally utilised capacities, shorter lead times and higher on-time delivery rates. The transparent planning improves delivery performance, increases operational efficiency and enables planning-reliable order confirmations to customers – a decisive advantage in the premium designer furniture segment. Manual planning effort was significantly reduced and a solid data basis for order management was established.

GDS Präzisionszerspanungs GmbH

Homepage ↗

72131 Ofterdingen, Germany

Industry: Tool making, precision machining, metalworking, CNC manufacturing

Products: Clamping technology, precision clamping devices, grinding wheel adapters, tool holders and CNC machined p...

S4P solutions: 4APS



Initial situation

Manufacturing at GDS Präzisionszerspanungs GmbH is characterised by high-precision production processes and demanding quality requirements in the manufacture of clamping technology and grinding wheel adapters. The commercial and order-related processes are mapped in the ERP system Sage 100. A powerful detailed scheduling solution was needed for realistic planning and on-time utilisation of production.

Challenge

Fluctuating order volumes, short-term changes and the need to make optimal use of scarce capacities placed high demands on production planning. Without end-to-end graphical detailed scheduling, bottlenecks and scheduling conflicts were difficult to identify and manage at an early stage.

Solution

To optimise production planning, GDS Präzisionszerspanungs GmbH relies on the solutions from S4P. Through integration with the ERP system Sage 100, order and production data are used end-to-end to enable realistic and transparent detailed scheduling. Modules used:

• 4APS – Advanced Planning and Scheduling for graphical detailed scheduling and capacity control

The S4P solutions are integrated into Sage 100 as certified add-ons. At GDS Präzisionszerspanung, articles, orders and work plans remain in Sage 100, while detailed scheduling and production feedback run in the S4P modules and are synchronised bidirectionally with the ERP.

Results and benefits

With the detailed scheduling solution from S4P, GDS Präzisionszerspanungs GmbH achieves greater planning reliability and transparency in production. Bottlenecks are identified early, capacities are better utilised and delivery dates are met more reliably – for greater delivery reliability and efficiency.

BÜHLER CNC-TECHNIK

Homepage ↗

72175 Dornhan, Germany

Industry: Metalworking, mechanical engineering, precision parts

Products: CNC precision parts, clamping technology, fixtures, assemblies and metal components

S4P solutions: 4APS



Initial situation

Manufacturing at BÜHLER CNC-TECHNIK, with around 40 employees, is characterised by complex workflows, high variant diversity and demanding planning requirements in the production of CNC precision parts, clamping technology and fixtures. Production data was not consistently structured, which hampered transparency, fine planning and the analysis of process deviations. The ERP system Sage 100 covers commercial core processes; a capable fine planning solution was required as a complement.

Challenge

Fluctuating order volumes, high variant diversity and the need to optimally utilise limited machine capacities placed high demands on production planning for CNC precision parts and clamping technology. Without continuous, graphical fine planning, bottlenecks and scheduling conflicts were difficult to identify and manage at an early stage. Production data was not structured, making the analysis of process deviations and reliable delivery commitments to customers more difficult.

Solution

S4P provided advanced fine planning and structured production control solutions to improve transparency across manufacturing processes. This creates a reliable data basis for production control, process deviation analysis and continuous improvement on the shop floor. The solution centres on 4APS – Advanced Planning and Scheduling for graphical fine planning and capacity control. This module supports the planning, control and feedback of relevant manufacturing data within a seamless digital environment, connected to the ERP system Sage 100.

Results and benefits

Improved availability and usability of production data enable processes to be planned, controlled and evaluated with greater transparency. This supports faster responses to deviations, improves the data basis for fine planning and creates an important foundation for more efficient workflows, higher process reliability and data-driven production improvement. Planning-reliable order confirmations to customers and a solid basis for lead-time analysis are the result of the integrated 4APS solution at BÜHLER CNC-TECHNIK.

Großewinkelmann GmbH & Co. KG

Homepage ↗

33397 Rietberg, Germany

Industry: Metalworking, steel construction, storage technology, logistics, Sage 100

Products: Steel profiles, storage technology, racking systems, steel construction components and customised metal st…

S4P solutions: 4APS, 4BDE



Initial situation

In metalworking and steel construction at Großewinkelmann GmbH & Co. KG, with around 65 employees, changing orders, high quality requirements and the desire for more transparency in manufacturing come together. Steel profiles, racking systems, storage technology and customised metal structures are manufactured in customer-specific order production. Production planning and shop-floor data collection were to be more closely integrated with the ERP system Sage 100 in order to plan capacities reliably, control orders on schedule and make operating data transparent in real time.

Challenge

In metalworking and steel construction, changing orders, high quality requirements and the desire for more transparency in manufacturing come together. Without end-to-end fine planning and shop-floor data collection, capacity bottlenecks and schedule risks were difficult to detect early. The goal was to closely integrate production planning and shop-floor data collection with the ERP system Sage 100, reduce manual feedback effort and enable planning-reliable control of steel construction and storage technology manufacturing.

Solution

To optimise its manufacturing processes, Großewinkelmann GmbH & Co. KG relies on the solutions from S4P. Through integration with the ERP system Sage 100, production planning and shop-floor data collection are mapped end-to-end in order to enable transparent and reliable manufacturing control. Modules deployed are 4APS for production planning and scheduling of manufacturing and 4BDE for shop-floor data collection.

Results and benefits

With the solutions from S4P, Großewinkelmann GmbH & Co. KG achieved greater transparency in manufacturing and a reliable data basis for production control. Capacities are planned optimally, operating data are captured reliably and manufacturing orders are scheduled dependably – for more efficiency and on-time delivery. Manual feedback effort was reduced and a solid basis for planning-reliable order confirmations towards customers in steel construction and storage technology manufacturing was created.

Inoyad GmbH

Homepage ↗

86159 Augsburg, Germany

Industry: Further education, learning factory, Industry 4.0, training, production technology

Products: Learning factories, training facilities, Industry 4.0 training systems and didactic production modules

S4P solutions: 4AVO, 4APS, 4BDE, 4MDE, 4PRO



Initial situation

Operating the learning factories at Inoyad GmbH requires a realistic representation of industrial production and planning processes. With the ERP system from S4P, order-related and planning workflows are covered end-to-end, so that participants experience an authentic industrial environment. With around 5 employees, Inoyad operates training facilities and Industry 4.0 training systems that reproduce real production processes together with all relevant MES modules.

Challenge

Fluctuating course occupancy, short-term changes and the need to make optimum use of scarce resources placed high demands on planning. Without end-to-end, graphical fine planning and integrated acquisition of operating and machine data, bottlenecks and scheduling conflicts were difficult to detect and manage early. For training purposes it was essential that all relevant S4P modules – from work preparation to process data acquisition – were available in a realistic, comprehensible and integrated environment.

Solution

To optimise its processes, Inoyad GmbH relies on the S4P solutions. Through their end-to-end integration, order, manufacturing and operating data are used to enable realistic and transparent planning and control. Modules deployed: 4AVO – work preparation for efficient order and manufacturing preparation; 4APS – Advanced Planning and Scheduling for graphical fine planning; 4BDE – shop-floor data collection at the terminal; 4MDE – machine data acquisition with OEE analysis; 4PRO – process data collection and warehouse management. All modules are fully integrated and form a realistic industrial environment for training and demonstrations.

Results and benefits

With the S4P solutions, Inoyad GmbH achieves greater planning reliability and transparency. Bottlenecks are detected early, resources are better utilised and workflows are managed more reliably – for a realistic learning environment and more efficiency. The fully integrated S4P learning factory offers participants an authentic insight into modern MES and APS processes and creates a practical basis for Industry 4.0 qualification.

Eagleyard Photonics GmbH

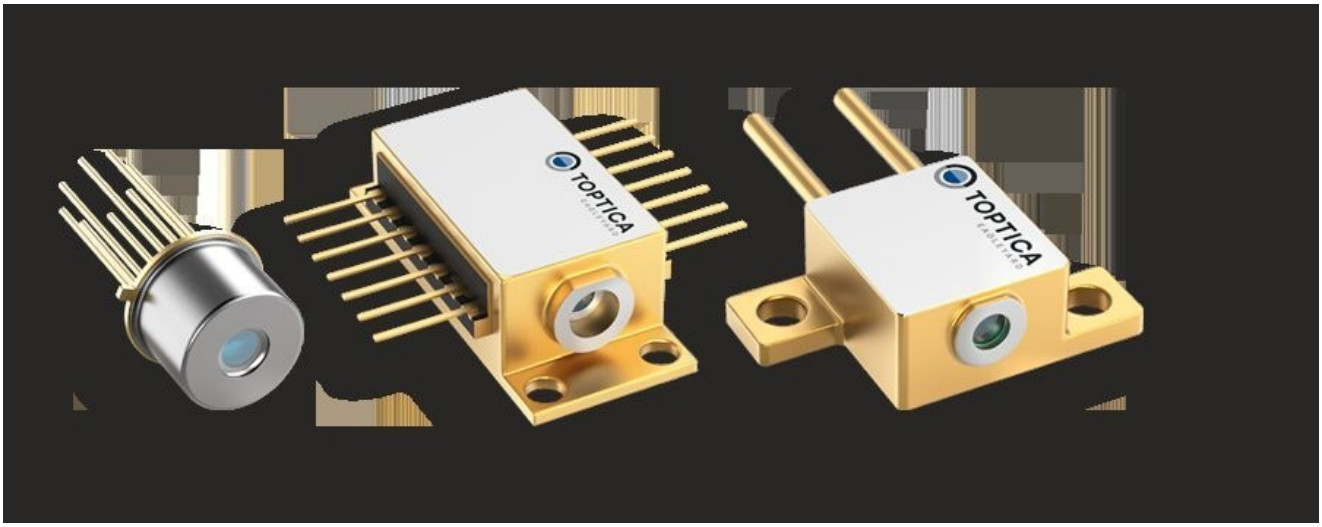
Homepage ↗

12489 Berlin, Germany

Industry: Photonics, semiconductors, electronics, laser diodes, optoelectronics

Products: High-power laser diodes, semiconductor lasers, photonics and optoelectronics components

S4P solutions: 4APS, 4BDE



Initial situation

Manufacturing at Eagleyard Photonics GmbH, with around 75 employees, is characterised by high-precision processes and demanding quality requirements in semiconductor and laser diode production. High-power laser diodes, semiconductor lasers and photonics components require precise process control and complete quality documentation. On top of the ERP system Sage 100, fine planning and shop-floor data collection had to be integrated end-to-end.

Challenge

The production of laser diodes requires reliable fine planning of complex manufacturing steps and complete acquisition of operating data. The goal was to utilise capacities optimally, shorten lead times and increase transparency over manufacturing progress. Without graphical fine planning and digital shop-floor data collection, bottlenecks and schedule risks were difficult to detect early. Both solutions had to integrate seamlessly with Sage 100 in order to create a consistent data basis.

Solution

Modules deployed: 4APS, 4BDE. With the Advanced Planning and Scheduling system 4APS and the shop-floor data collection 4BDE, an end-to-end, transparent production control was established at Eagleyard Photonics GmbH. The solutions provide transparency over capacities and order progress and are closely integrated with Sage 100. Order and master data are synchronised automatically; operators book times and quantities at the shop-floor terminal. The graphical Gantt board in 4APS gives planners an up-to-date view of capacities and delivery dates at any time.

Results and benefits

By deploying 4APS and 4BDE, Eagleyard Photonics GmbH benefits from optimally utilised capacities, shorter lead times and improved on-time delivery. Complete shop-floor data collection creates transparency and increases operational efficiency. Manual feedback effort was reduced, data quality in Sage 100 was improved, and a solid foundation was created for evaluations and process optimisation in photonics manufacturing.

Timmer GmbH

Homepage ↗

48485 Neuenkirchen, Germany

Industry: Pneumatics, hydraulics, drive technology, mechanical engineering

Products: Pneumatic pumps, vacuum pumps, dosing technology, hydraulic and drive components

S4P solutions: 4APS, 4AVO, 4BDE



Initial situation

Timmer GmbH, with around 150 employees, needed end-to-end and transparent control of its manufacturing of pneumatic and vacuum technology. The goal was reliable fine planning and complete acquisition of operating data as a complement to the existing ERP system Alphaplan. Pneumatic pumps, vacuum pumps and dosing technology are produced in variant-rich order manufacturing, which requires precise capacity and schedule planning.

Challenge

Variant-rich manufacturing with high schedule pressure and a growing order mix required end-to-end digitalisation of planning and shop-floor feedback. A lack of transparency over current machine and order data as well as manual, time-consuming data acquisition made reliable control difficult. An integrated solution was required that closely combines work preparation, fine planning and shop-floor data collection with Alphaplan and enables planning-reliable order confirmations towards customers.

Solution

To optimise its manufacturing processes, Timmer GmbH relies on the solutions from software4production: 4APS – Advanced Planning and Scheduling for graphical fine planning with a Gantt board and bottleneck detection, 4AVO – work preparation and order management, and 4BDE – shop-floor and machine data collection in real time. All modules are bidirectionally connected to Alphaplan; order and master data are synchronised automatically and feedback data is returned in real time. Planners, shift supervisors and manufacturing management receive role-specific views of capacities, order progress and machine states.

Results and benefits

Timmer GmbH benefits from transparent, reliable fine planning and a real-time overview of machine and order data. Manual acquisition effort was reduced, on-time delivery improved and delivery capability in pneumatic and vacuum technology manufacturing strengthened. Planning-reliable order confirmations and a solid data basis for continuous improvements are the result of the integrated solution.

Let's talk.

We look forward to your enquiry on digital manufacturing.

software4production GmbH

Phone: +49 89 4161406-0
Email: info@s4p.de
Website: www.s4p.de