

WHITEPAPER

Digital Production Planning

Simple. Real-Time. Planning.

- Create transparency
- Achieve on-time delivery
- React with flexibility
- Optimize capacity utilization

Production Planning as a Key Factor for Success

Flexible, Valid and Real-Time Planning as a Competitive Advantage

Everyday life in production: Production orders that pass through many different process steps have to be distributed among limited resources. Not „somehow“, but in an efficient manner and in consideration of different, partly dynamic framework conditions. For this purpose, production planning must have access to all data in order to be able to make quick and correct decisions and to reschedule if necessary. What is needed are complete transparency as well as synchronization in real-time in order to achieve maximum on-time delivery, highest productivity and lowest costs.

The tool required for this is a digital, (semi-) automated production planning system that significantly reduces the workload of planners.

This opens up time resources to further optimize processes and ensure quality. In addition, efficient planning makes it easier to meet delivery deadlines, enables sequence-optimized production and helps companies avoid waste and reduce costs.

All these benefits increase competitiveness, promote sustainable production and strengthen the resilience of the company.

Content:

- Reality check
- From Analog to Digital Planning
- Relief for Your Team
- Preplanning: The Quick Way to Get Started
- Detailed Scheduling: Holistic Planning Solution
- Interaction: Preplanning and Detailed Scheduling
- 4 Steps to Digital Production Planning
- Best Practices
- Customer Testimonials
- Summary/Benefits
- Contact

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Reality Check Production Planning

How is your company doing?

In Most Companies, the Reality Still Looks Different:

In practice, many manufacturing companies plan as they did 30 years ago - with Excel or „pen and paper“ or they use stand-alone solutions they developed themselves. Thus, there are no integrated planning systems in use that provide a complete overview of the current production situation in real-time (i.e., at the „push of a button“). Wrong decisions in production planning as a result of this lack of transparency and not having up-to-date status information lead to poor delivery service, a lack of flexibility and productivity, and high operating costs. On-time delivery of less than 90% and productivity below 80% are the rule rather than the exception. Many production schedules are partially analog and depend on the knowledge and experience of the planner and team leader. The production plan is created manually at regular intervals.

„Partially automated scheduling in the MES gives your planners the flexibility they need to act individually and safely – and thus take the pressure off their day-to-day decision-making processes!“



Lars Knitter

Authorized signatory / Head of Sales & Marketing, FASTEC GmbH

Challenges

- Additional work for employees
- Monopoly on Expertise
- Reacting to unpredictable situations (customer requests, supply chain issues, etc.)
- Time-consuming and inflexible determination of optimal production planning
- Missing or insufficient standards slow down productivity
- Inadequate master data complicates digitalization projects
- Inefficient use of resources (materials, staff, equipment)



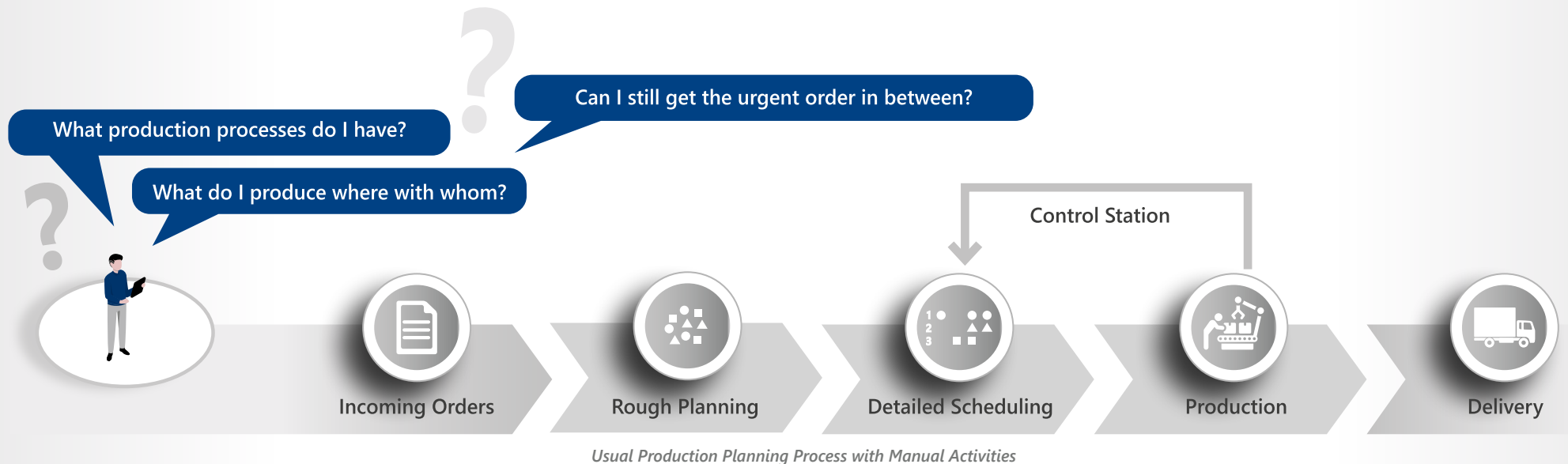
Reduce and Control Complexity

Planning Software as Assistance for Production Planners

With their extensive understanding of production processes, possible bottlenecks, utilization of machines and availability of personnel, planners are at the heart of a functioning Production Planning. In everyday life, this is subject to additional influencing factors that are complex on the one hand and change dynamically on the other. Unexpected malfunctions of machines, delivery problems with raw materials, tool breakages or priority shifts in orders, to name just a few examples, are conceivable.

The quality of Production Planning is largely dependent on how quickly these influences can be reacted to and rescheduled in time. When considering all causalities during a rescheduling, even experienced planners reach their limits.

The extensive information about machinery, Production orders and staff availability, which is necessary for the detailed planning of production, can be made available to the planner through digital solutions. He is supported in his work and thus has more freedom to focus on important activities instead of performing routine tasks and continuously monitoring numerous variables. It is much easier for digital planning tools to keep track of workloads and sequences, and to clearly display causal relationships when reacting to changes. Repeated optimization of all parameters as disruptions occur is also child's play for software and takes little more than a few minutes. All parties involved can view the status of production in real-time. All relevant parameters can be measured, analyzed and optimized.



Elevate Your Production to the Next Level

Relief Your Team!



Work Preparation and Planner

Problem:

- You spend several hours a day transferring data instead of planning?
- You lack a transparent overview of your planning process?

Solution:

- Easy handling
- Clear, correct data
- Flexible rescheduling
- Immediate transparency of modifications everywhere



Project Managers and System Architects

Problem:

- Do you want to make complexity manageable?
- Would you like support in conceptualizing and executing your planning project?

Solution:

- Single source of truth: no duplicate data storage.
- Data transparency through visual preparation – individually adaptable
- Easy implementation – personally accompanied by experts



Decision Makers and Supervisors

Problem:

- Do you have little master data?
- Your current system does not offer sufficient possibilities?
- Do you want to reduce monopoly knowledge?

Solution:

- Efficient, error-free planning
- Adherence to delivery dates
- Overview of scheduled orders
- Cost reduction
- ROI in a short time
- Avoidance of waste

Common Goals

Clean Master Data + Single Source of Truth + Real-Time Information + Flexible Scheduling + Automatic Synchronization

Preplanning: The Quick Way to Get Started

The Ideal Tool for Increasing Your Data Quality!



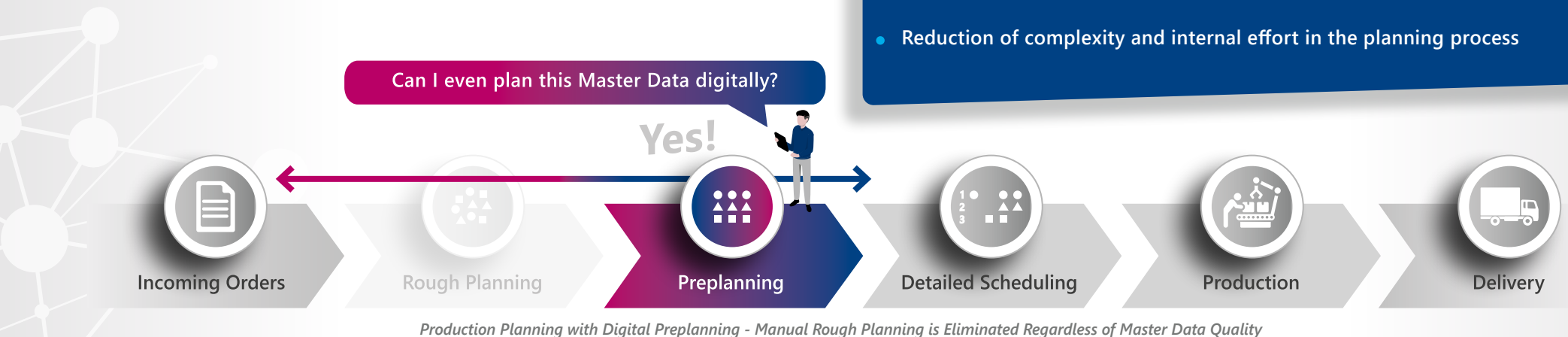
Efficient planning is based on well-maintained master data – regardless of whether this is to be done manually, partially automated or automated. The individually configurable MES Additional Functions of Preplanning sort and group your existing data for automated planning – without having to extend/adapt the data in the ERP system.

The Most Important Functions at a Glance

- Simple and individual configuration of all Transaction data – independent of the existing master data quality
- Full data preparation without programming effort
- Scheduling of equipment that can be used throughout the entire production process
- Planning groups (campaigns) are formed and transferred to detailed scheduling

Benefits for Your Planning:

- Error-free and lead-time optimized planning through individually prepared data
- Simple sequence planning for a fixed time horizon without detailed planning down to the second
- Reduced setup effort through coordinated use of resources that can be scheduled over the entire production process
- Transparent, simplified planning through the creation of inherently ideal planning groups
- Commonalities of the products become apparent
- Reduction of complexity and internal effort in the planning process



Preplanning: The Quick Way to Get Started

In Detail



1) Quick and Easy to the Optimal Data Basis

When we talk about production optimization or increased efficiency through optimized planning, we are usually referring to the optimization of lead times. In order to optimize production planning, high-quality master data and stable processes are required.

2) With the Additional Functions of Preplanning, we support you in digitalizing the daily planning tasks

By sorting and grouping operations based on article characteristics in combination with the experience of the planners, you increase the quality of the transaction data. This enrichment significantly improves the planning result. You would normally only achieve this with high-quality and well-maintained master data.

3) Sequence Optimized Planning

A first step towards optimized planning is improved planning of the sequence of items to be produced. Of particular relevance are the setup time, the cleaning time and the compatibility of successive items. Preplanning is used to optimize the sequence for a specific time horizon based on article characteristics.

4) Allocation of Tasks and Scaling

With Preplanning, the responsibilities for the respective production processes are logically divided. This results in a task distribution that controls the workload of the planners and promotes scalability.

5) Grouping of Operations Into Planning Groups

The various framework conditions in the production planning process usually follow a sensible logic and therefore cannot be changed. This includes, for example, producing light products first, then dark products, or producing a batch completely on one machine. This is particularly important in bulk production.

Planning groups offer the possibility of scheduling operations jointly and efficiently in accordance with these framework conditions. These planning groups are already ideal in themselves and optimized according to production time. One can schedule these planning groups in different places. An optimization as well as the overview of the related operations are always guaranteed.

How to Get the Most out of Optimized Planning

- Error-free multi-resource planning taking into account dependencies and available capacities
- Increased adherence to schedules, early detection of bottlenecks and uncovering of capacity reserves
- Uniform, digital Production Planning
- Consistent transparency throughout the entire planning process

Simple preparation of Master data without manual activities!



Detailed Scheduling: Holistic Planning Solution

Validly and Flexibly Mastering Complexity



Convenience functions for efficient and error-free Production Planning: You assign orders and operations to the possible work centers by drag & drop, whereby you can easily schedule early or late and any rule violations are automatically checked and listed just in time.

The Most Important Functions at a Glance:

- Dynamic calculation of setup time depending on the planned sequence of operations
- Automatic consideration of available capacities, e.g. personnel, material, other equipment
- Adaptive resource visibility: When manually scheduling an operation, only planned resources are displayed
- Scheduling of production order networks
- Consideration of alternative operations or routings including necessary transport and idle times
- Checking for individually definable rule violations, e.g. regarding sequences, deadlines, capacities
- Alternative planning scenarios as a basis for decision-making
- Summary of Production orders and batches to campaigns/planning groups

Benefits for Your Planning:

- Relief through valid planning
- Digital, uniform production plan - consistent transparency throughout the entire planning process right up to the machine terminal
- Reduction of effort: Multi-resource planning taking into account dependencies and available capacities
- Automatic consideration of personnel, equipment and material availabilities
- Increased adherence to schedules
- Planning instead of reacting: Detect bottlenecks at an early stage, uncover capacity reserves
- Live data from production allows you to react in real-time to unexpected events



Detailed Scheduling: Holistic Planning Solution

Convenient Planning – Error-Free and Effective



Professional planning of production and planned orders is the most important basis for your cost-optimized production. Only in this way can you meet delivery deadlines, reduce lead times, lower production costs and at the same time react flexibly to changes in plans.

The FASTEC 4 PRO module detailed scheduling/control station helps you to cope with these complex requirements.

The detailed scheduling/control station module is made up of several tools that save you a lot of time compared to scheduling methods using spreadsheets or planning tables, e.g. by:

- Reports and dashboards that provide information on the current status of production and facilitate readjustment in the event of deviations from the plan.
- Gantt chart displays that incorporate current production data and machine status in real-time, if you also use the MES module Machine Data Acquisition (MDA)
- Ergonomic and user-friendly operation, e.g. by simply dragging and dropping orders in the Gantt chart
- Immediate visualization of effects of changed planning on other orders
- Idle and waiting times between operations and production orders are taken into account in the Production Planning
- Automatic consideration of required capacities for the processing of the work steps

“As a long-time user of FASTEC 4 PRO, we have a competent and reliable partner at our side who supports us in solving complex tasks in a professional as well as goal-oriented manner.”

Karl Fritschi

Head of ERP and Organization Projects
at Emil Frei GmbH & Co. KG

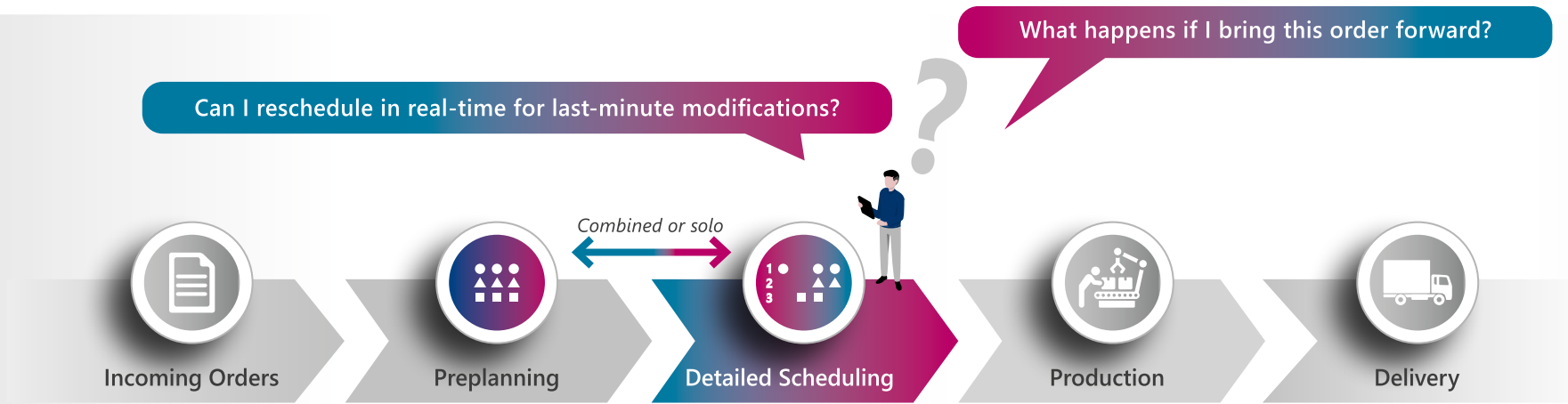
- Consideration of alternative operations or work schedules including necessary transport and idle times
- Check for individually definable rule violations, e.g. sequences, deadlines, capacities
- Optional scheduling of production order networks
- Alternative planning scenarios for comparing different strategies

Controlled, partially automated scheduling gives your planners the option of initializing automatism. This gives you the necessary flexibility to act individually and safely. Algorithms with different target directions relieve them in their daily decision-making processes.

Detailed Scheduling: Holistic Planning Solution



Plan Dynamically – in a Team With Our Additional Function Preplanning and/or via Interface to Your ERP!



- Personnel
- Machine availability
- Materials
- Operating Equipment
- Working plans
- Set-up sequences
- Bills of materials

"Companies face the challenge of bringing master data to an interpretable format even before implementing detailed scheduling software. The combination of preplanning and detailed scheduling is the ideal tool for this and makes it much easier to get started with digital Production Planning."



Marcel Brockmann

Leader of Business Unit Production Planning, FASTEC GmbH

4 Steps to Digital Production Planning

Benefit From Our Many Years of Experience

1 | ANALYSIS

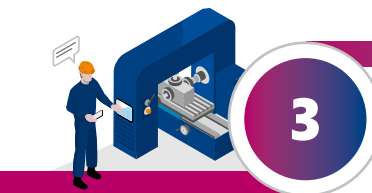
Concept: Tailored to Your Production Process

- Personal consultation
- Analysis of your manufacturing process by our consultants
- Development of conceptual ideas and proposals
- Individual workshop

2 | PROJECT START

Configuration by Step-by-Step Procedure

- Setting up the bidirectional interfaces
- First steps in digital planning
- Continuous exchange with our consultants
- Step-by-step adaptation and configuration



4 | DIGITAL PRODUCTION:

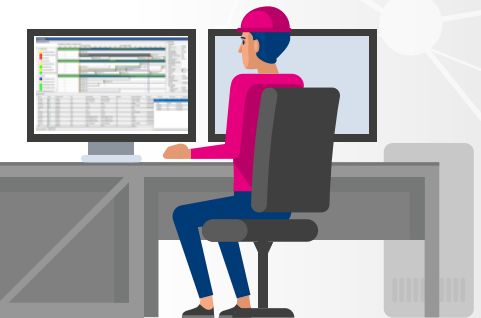
Benefit From the Opportunities

- Schedule digitally, in real-time
- Evaluate and interpret data
- Continuously optimize processes
- Derive complementary digitalization measures

3 | TEST PHASE:

Testing for a Smooth Production Start

- Testing of your different data
- Testing of various process constellations
- Supporting your team with test plans
- Supporting your team with automated tests



Best Practices

Diverse Solutions for Individual Customers

Cosmetics / Pharmaceuticals Industry Demand Handling and Detailed Scheduling

1

Special Feature/Implementation:

The early scheduling of bulk orders to filling orders of a batch is often difficult in practice, since the quantities of the filling orders are still subject to frequent and lengthy modifications and thus the optimum production times and lot sizes for the bulks are variable for a long time. Accordingly, the appropriate bulk orders are created comparatively late in the customer's ERP system and can be planned with a delay in FASTEC 4 PRO. This is where the demand handling in FASTEC 4 PRO comes into play. The customer can bundle the production requirements, the semi-finished products that result from the filling orders, into blanket orders in FASTEC 4 PRO and create a production order in FASTEC 4 PRO to cover the production requirements and link it to the blanket order. This production order can thus be scheduled in FASTEC 4 PRO at an early stage. The planner gets an overall picture of his planning long before the bulk order is generated in the ERP system.

Results:

- **Early overview of demand handling** (when are production requirements for certain filling orders covered or does another bulk order have to be generated?)
- **Early generation of a production order**
- **Planner gets overall view of his planning and his capacity planning**

Paint and Varnish Industry Preplanning and Detailed Scheduling

2

Special Feature/Implementation:

For a customer in the powder coatings sector, a whole number of associated filling production orders are transferred from the ERP system to FASTEC 4 PRO for the filling of a bulk order. These production orders are to be planned together on one system and produced one after the other. Here, the creation of planning groups in FASTEC 4 PRO helps the customer. FASTEC 4 PRO uses the batch number to recognize that the individual Production orders belong together and automatically forms planning groups of the operations that belong together. The planner can schedule these planning groups in detailed planning as a block on a system, taking into account the setup times in the group, thus saving the separate scheduling of each of the individual Production orders in a group.

Results:

- **Massive relief for the planner when scheduling production orders in the filling area** (place or move production orders directly as a whole group in the gantt of detailed scheduling).
- **Reduction of the error rate and minimization of setup times** (Production orders belonging together are always kept together in the detailed scheduling of FASTEC 4 PRO to avoid unnecessary setup or cleaning times).

Food Industry Planning Groups and Detailed Scheduling

3

Special Feature/Implementation:

Many customers with several areas to be planned have isolated solutions, often based on Excel. This was also the case for a customer who carried out all of his planning for the raw materials' tank containers and the various filling areas in a wide variety of Excel files. This led to a variety of problems, and the lack of an overall view and linkage in turn led to a high level of effort in the coordination between the planners and contributed to planning errors. In addition, shifting and sorting, for example to form an optimal setup sequence, is very time-consuming. FASTEC Production Planning provides the optimal solution for this. In the planning group part of FASTEC 4 PRO, the planners can combine the individual filling orders for their areas into well-sorted planning groups and also decide here on which system the planning group should run. Together with the tank orders and the link between them, a complete overview of the planning is then formed for the planners in the detailed planning.

Results:

- **Complete overview** of planning incl. effects of deadline postponements
- **Scheduling of entire groups of orders at once**
- **Reduced complexity** through the formation of planning groups
- **Focus on the controlling of planning**



Advantages of Digital Planning

Conclusion

Our software solutions for digital Production Planning provide companies with a tool to move directly into (partially) automated planning.

This tool significantly reduces the workload of planners. This opens up time resources to further optimize processes and ensure quality. In addition, efficient planning makes it easier to meet delivery deadlines, enables sequence-optimized production, and helps companies avoid waste and reduce costs.

“The agile project implementation enabled us to make adjustments to the planning process at short notice, flexibly and without complications. We were particularly impressed by FASTEC’s goal-oriented and cross-process consulting.”

Martin Kaus
Manager Packing Excellence Endfertigung
CSL Behring

- Convenient Planning – Error-Free and Effective:**
Professional planning of planned and Production orders is the most important basis for your cost-optimized production. This is the only way you can meet delivery deadlines, reduce lead times, lower production costs and at the same time react flexibly to market changes. FASTEC Production Planning helps you to cope with these complex requirements.
- Transparency at All Levels:**
With a uniform production plan, you achieve consistent transparency throughout the entire planning process, all the way to the machine terminal. The current states of the orders are clearly summarized and resource bottlenecks are identifiable from the first day through Gantt charts.
- High Flexibility for Fast Responsiveness:**
Planners must react flexibly to everyday challenges such as order changes, delivery problems or staff shortages and provide a resilient response within the shortest possible time. Thanks to the numerous convenience functions, your planners have the flexibility they need to act individually and reliably - and are thus relieved in their day-to-day decision-making processes. The Production Planning is recalculated and optimized as modifications occur. In this way, waste is avoided and the production process is designed efficiently.
- Metadata Instead of Expertise Monopoly:**
Production Planning efficiency often suffers due to uneven knowledge levels or decentrally distributed information. Digital solutions address this problem by allowing knowledge to be stored and made available centrally. Multiple people can work simultaneously on a single plan instead of emailing copies of spreadsheets back and forth or manually merging them on planning boards.
- No More Obstacles to Optimal Production Planning – Simply Clean Master Data:**
Efficient planning is based on well-maintained Master data – regardless of whether this is to be done manually, partially automated or automated. You do not have such a clean database yet? No problem! With our new Additional Functions for Preplanning, we support you in preparing your Master data for automated detailed planning. You can prepare, sort and group them and thus greatly increase the data quality - and all this without having to extend/adapt the data in the ERP system. You benefit from this directly in your planning projects.

We Are Happy to Consult You Individually!

We See Ourselves as Your Partner on the Way to Digital Production

- **We Have Process Experience:**

We have been digitalizing factories since 1995, meaning that we not only know many industries, but have also successfully implemented over 400 digitalization projects. Worldwide.

- **We Like It Simple:**

Not every planning process is the same. Not every data source is the same. That's why we have developed two solutions for you, which you can use in individually or in combination. Completely according to your needs.

- **We Make It Fit:**

Our solution must fit your processes and challenges today, as well as your business goals. Now. That's why you can purchase a solution from us that can be flexibly adapted and expanded as needed. To grow with you.

- **We Take Your Project to Heart:**

Our customers are important to us and we are interested in long-term cooperation. That's why we accompany our customers throughout the entire process – and afterwards, of course.

- **We Offer Software Solutions from a Single Source:**

In addition to Production Planning software solutions, FASTEC also offers the modular and cross-industry configurable MES (Manufacturing Execution System) FASTEC 4 PRO.

Our software solutions can be used autonomously and combined with existing systems. The interaction of our solutions results in additional synergy effects as well as the advantage of receiving everything from a single source.



Lars Knitter

Authorized signatory / Head of Sales & Marketing
Consulting for interested parties and customers as well as support for national and international digitalization projects with experience since 2013.



Marcel Brockmann

Leader of Business Unit Production Planning
Active in the field of Production Planning since 2017.
With professional roots in the skilled crafts, he has retained an eye for solution-oriented implementations.

We would be happy to consult you individually!

Our sales department will provide you with further
user reports and information material!
Or simply make an appointment for a presentation
at your site, at our premises in Paderborn or via web:
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