

JD EDWARDS ENTERPRISEONE PRODUCTION SCHEDULING¹



KEY BENEFITS

- Maximize overall manufacturing efficiency
- Minimize inventory since production will be scheduled as close as possible to the required date
- Improve the scheduling process
- Self-configuring and no customization is required
- Solutions are quickly discovered so more orders can ultimately be accepted
- Can be used in all industry segments
- Maximize flexibility as products can quickly follow business changes
- Schedule-to-promise is real with a fully automated solver that generates feasible schedules with minimal user involvement
- Implementation time and costs are low since there is algorithms are not customized
- Integrated process planning and scheduling enables concurrent engineering in make-to-order environments
- Solver speed allows a complete representation of all possible product routings and BOMs
- Maximize manufacturing efficiency with the ability to detect and synchronize around floating-bottlenecks and increase the total throughput of production
- Schedule repair and generation are supported allowing minimization of changes and disruption to the short-term schedule

The increased complexity of scheduling production activities demands a sophisticated solver. Meet this challenge by employing breakthrough solver technology that complements your current production scheduling needs and adds advanced planning solutions to enable powerful constraint-based approach for commercial scheduling. A constraint-based scheduling product can solve complex, discrete scheduling problems in a timely manner.

The Issue: A Need for Detailed, Realistic Scheduling

Today the supply chain environment mandates maximum efficiency and flexibility for the utmost competitiveness. Handling demand in the market means you must be certain that you have the right volume of product at the right time.

As a result, you need realistic, low-cost, and demand-driven production schedules. With JD Edwards EnterpriseOne Production Scheduling, you have the freedom to create such plans. The event-based design of JD Edwards EnterpriseOne Production Scheduling provides the detail necessary to ensure feasibility across all manufacturing stages. You can create detailed, up-to-the-minute schedules that allow you to produce the right amount of product when it is needed, thereby minimizing inventory, changeovers, overtime, and other undesirable costs.

The Solution: Intuitive, Logical Planning

JD Edwards EnterpriseOne Production Scheduling factors in the realities of the production floor. Its powerful just-in-time logic creates production plans by simultaneously balancing line capacities with optimal run sequences and quantities. In addition, Production Scheduling accounts for rates, capacities, line capabilities, changeover times, shop floor calendars, and other scheduling information pertinent to your business. Using a variety of configurable rules, it analyzes challenges and opportunities, and then displays solutions for you in easy-to-read, interactive graphics. And, with JD Edwards EnterpriseOne Production Scheduling enhanced report writing capabilities, you can create graphical standard and custom reports to communicate and support business decisions.

Unlike traditional production planning systems JD Edwards EnterpriseOne Production Scheduling accounts for the numerous factors and constraints that affect your business, and then adjusts your plans accordingly. Designed to meet the diverse requirements of tactical production planning and execution-level scheduling, JD Edwards EnterpriseOne Production Scheduling enables you to solve production problems and maximize efficiency in your supply chain.

Adapting to Change

JD Edwards EnterpriseOne Production Scheduling allows you to develop new concepts for your business and execute them in a timely fashion. You can generate and evaluate custom “what if” scenarios that help you catch potential pitfalls of particular changes

¹ Includes JD Edwards EnterpriseOne Production Scheduling – Process module

before you actually perform them. You'll also benefit from using web planning, our internet collaboration application that allows you deploy production schedules over the internet. The result is a solution that gives you the freedom to choose the best technologies and the best ideas for your business by utilizing:

- Work order or demand driven
- Flow sequencing
- Line synchronization
- Constraint optimization including throughput, cost, material, utilization
- Floating bottlenecks
- Complex routings and multiple routings
- Changeovers
- Re-configuration flexibility
- Complex bills-of-material with substitutions

Return on Investment: Simplify Production, Improve Your Business

Time is money. The shorter your planning cycle, the quicker you can put your production schedules into action. JD Edwards EnterpriseOne Production Scheduling simplifies the process of optimizing your supply chain production efforts while accounting for your business constraints and costs. That means you can reduce costly inventory and simultaneously increase customer service levels by having the right goods available at the right place and time.

Technology and Mathematics Applied to Scheduling

Constraint-based scheduling has inherently strong schedule representational capabilities and propagation is an extremely efficient method for determining the consequences of scheduling decisions. However, although this approach will find a feasible solution, it often requires an excessive amount of time, particularly on large problems. These approaches encounter the following obstacles that adversely affect both the speed and quality of a scheduling solution:

- Existing approaches must assign a start time and resolve resulting conflicts before reaching a feasible solution. This causes thrashing and leads to excessive backtracking, which significantly increases solve time;
- To prevent thrashing, implementers must develop a custom algorithm or repair development for every implementation. Because this approach takes an existing set of rules, developed according to industry, and tries to fit them to a new problem, much tinkering with the algorithm is required. This increases both implementation time and cost. In addition, custom algorithms cannot respond satisfactorily to floating bottleneck problems;
- As a result of this customization, previous generation technology provides poor generality. If the business changes, the technology cannot respond without further customization, delays, and expense;
- In many cases, current generation solvers cannot find solutions even when they exist;

To counter these common problems, JD Edwards EnterpriseOne Production Scheduling employs powerful technology, Constraint Directed Search (CDS), which enjoys the benefits of constraint-based techniques without the associated performance issues and guesswork that can lead to making a wrong decision.

- JD Edwards EnterpriseOne Production Scheduling uses breakthrough solver technology called "texture measurements" to:
 - Determine the most critical decision to make by measuring local conditions before making a decision;

- Minimize or completely eliminate backtracking by returning not simply to the last decision made but to the most uncertain decision;
- Allow much larger problems to be solved while reducing solution time;
- JD Edwards EnterpriseOne Production Scheduling uses a least commitment approach to:
 - Assign precedence constraints so that a start time need not be assigned;
 - Find the critical paths in a schedule;
 - Allow more flexibility in scheduling by tracking slack time;
 - Avoid deadlock in the propagation process;
 - Allow start time optimization after sequencing;
 - Allow dynamic schedule monitoring, for example, to determine whether a late-starting activity will also cause the order to be late;
- JD Edwards EnterpriseOne Production Scheduling seamlessly supports both generative scheduling and repair-based scheduling.
- JD Edwards EnterpriseOne Production Scheduling goes beyond bi-directional propagation by allowing not only forward and backward propagation but propagation in all dimensions of a scheduling problem, including resource utilization and inventory.

Added functionality for your Process Manufacturing Operation

JD Edwards EnterpriseOne offers a separate module for production planning that highlights process manufacturing and is fully integrated into your other JD Edwards EnterpriseOne applications.

Feature/Function Highlights

- Discrete lot or batch manufacturing (fixed activity duration)
- Discrete lot delayed during down-time (interruptible fixed activity duration)
- Machine specific batch duration and cost
- Multi-stage manufacturing process
- Labor availability is an issue (crew constraints)
- Tool availability is an issue (tool constraints)
- Purchased Material availability is an issue (inventory constraints)
- Machine cleanups exist (sequence dependent, immediately after current activity)
- Machine changeovers exist (sequence dependent, anytime prior to next activity)
- Cleanups after a specified time and/or number of batches
- Machine setups exist (sequence independent)
- Setups have resource requirements
- Machine specific duration and cost for the above
- Dedicated work-in-process storage (by item)
- Limited work-in-process storage

- Limited final product storage
- Minimum wait time between process steps (ie. product cooling, quality testing)
- Maximum wait time between process steps (i.e. product separation)
- New product introduction (i.e. product launches)
- Product formula can be modeled (i.e. product recipe reformulation)
- Product shelf-life can be modeled (i.e. inventory spoils quickly)
- Variable batch size on a machine (fixed activity duration, variable quantity)
- Floating manufacturing bottlenecks (bottleneck moves dynamically between stages)
- WIP substitution
- Purchased materials substitution

Feature/Function Highlights: Process Manufacturing Only

- Continuous manufacturing (variable activity duration typically called “runs”)
- Continuous batch manufacturing (campaigning)
- Final product substitution
- Changeover cost minimization is important (sequence optimization)
- User defined product cycle (sequence feasibility)
- Fixed product cycle (sequence feasibility)
- Shared work-in-process storage (tank scheduling)

Solution Integration

- JD Edwards EnterpriseOne Supply Chain Management
 - Manufacturing Suite
 - Demand Flow[®] Manufacturing module
 - Manufacturing – ETO Foundation module
 - Manufacturing – Shop Floor module
 - Requirements Planning module
 - Logistics Suite
 - Bulk Stock Inventory module
 - Inventory Management module

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