

Genetic Optimizer (GO) for Production Scheduling

Flexible, easy-to-use tool that optimizes production scheduling and accommodates scheduling changes, easily integrated into your ERP solution.

Key Benefits

Genetic Optimizer (GO) features functionality designed to address specific production scheduling needs and to produce greater throughput. Robust functionality includes:

- Fast and effective scheduling
- Rapid rescheduling during a production run
- Capability to upload demand from spreadsheets or use planning output direct from an ERP system
- Multiple versions of schedules saved for comparative evaluation
- Full integration with virtually any system for resource-level operating hours and planned downtime
- Gantt Chart graphical output and resource-level detailed reports
- Graphic allergen alerts notifying line supervisors of required wash times
- Service reports identifying any planned late production completion
- Planned resource utilization reports
- Schedule Adherence reporting
- Load balancing
- User-defined parameters

The Challenge:

Production scheduling, by definition, is a very complex process. Planners are required to balance customer needs with raw material availability, production capacity, maintenance schedules, existing inventory, and many other factors. As a result, scheduling is often entirely reactive, and planners are forced to re-plan throughout the day, making the process a very manual one and a tricky balancing act. Planners often use a combination of spreadsheets and whiteboards to draft the schedule, and there is no true "plan" against which to measure performance. Manufacturers may start the production shift with one schedule and end the shift with a different one.

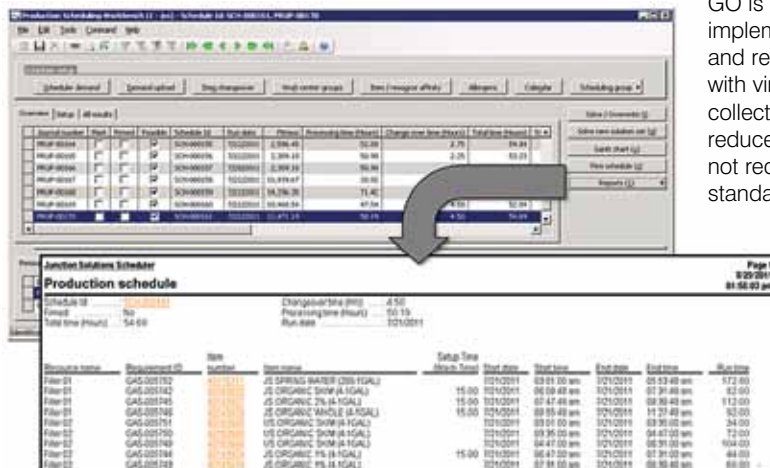
The challenges with this planning style include multiple, different versions of schedules being used across the plant simultaneously. Add to the mix, numerous planners and their unique planning processes, algorithms, and tools and you have a recipe for confusion and inefficiency. If there is no single "master schedule" for the entire operation, teams must conduct multiple meetings to review current status and changes. Additionally, these manual processes may result in an excess or shortage of inventory, late delivery or late completion of production, and excessive down time due to changeovers. But what is the simple, singular answer to these production challenges?

The Solution:

Junction Solutions' Genetic Optimizer (GO) is the answer to streamlined production scheduling. The production scheduling application provides both discrete and process manufacturers with a fast, flexible planning solution that's easily implemented and can be integrated with your ERP solution. The modularity of GO allows plug-and-play flexibility with virtually any host system, and can extend base production scheduling to enable manufacturers to meet changing consumer demands faster, while reducing costs associated with changeover-driven downtime.

While many traditional ERP-based production scheduling systems do not take changeovers into account, GO seeks to minimize planned downtime by optimizing the sequencing of changeovers. It does this while also considering allergen related downtimes, the operating calendar, individual order due dates and times, bill of materials requirements, resource (equipment and workstations) throughput capacities, and several other factors. By considering these factors, GO produces a much more efficient, economical, and effective schedule.

GO is a user-friendly application designed for quick implementation and minimal elapsed time between go-live and realization of benefits. Because it can be fully integrated with virtually any ERP software, the amount of offline data collection and manipulation can be minimized, translating to reduced workload and improved quality of schedules. It does not require a significant learning curve compared to other standalone commercial optimization tools.



Proactive, Accurate, & Optimized Scheduling

GO extends upon production scheduling based solely on demand with changeover-driven optimization. It uses proprietary sequencing heuristics and a cutting-edge genetic algorithm to minimize planned downtime due to product changeovers, allergen sequencing, planned maintenance, order due dates and times, bill of materials requirements, resource processing capacities, along with other factors, for accurate and optimized production scheduling.

With its full integration into your host system, planners are empowered to effectively balance customer needs with raw material availability, production capacity, maintenance schedules, and existing inventory. As a result, scheduling is more proactive than reactive, and the plant can focus on execution instead of making constant changes. When re-planning is necessary, GO provides a “current state” interface that allows the planner to enter what is currently running on which resources. When the changes have been made, such as quantity changes or resources taken offline, the new schedule will take these and current conditions into account.

GO – The Must-Have Single, Simple Solution for Production Scheduling in Process & Discrete Manufacturing

The GO scheduler enables manufacturers to reduce the workload associated with scheduling, while improving the quality of production schedules and quickly responding to changes within the schedule throughout the day. Simply stated – GO schedules production in the most efficient, economical way possible. The GO scheduler does the work for you, optimizing even the most complex production and packaging schedules, such as make to order. The consolidated planner workbench streamlines the planning

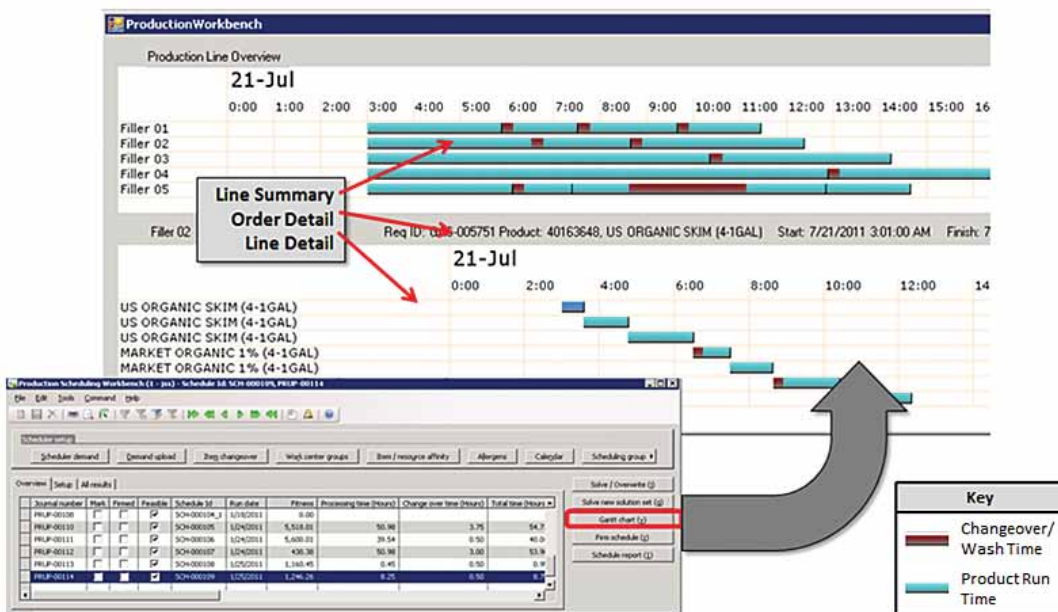
process, significantly reducing planner workload. Because the plan is created and maintained on a single centralized system, the operational teams work together across the enterprise instead of trying to plan using potentially numerous and competing objectives. A single, centralized schedule also enables monitoring and reporting performance to the plan.

Benefits of GO's complete solution offering include:

- A single, comprehensive published schedule that synchronizes the activities of all aspects of production
- Reduced planner workload, freeing up capacity of high-value staff to work on critical projects
- Consistent planning methodology across the organization
- Fewer time-consuming meetings required to review and adjust
- Reduction of excess inventory and instances of shortages
- Improved on-time delivery and completion of production
- Increased throughput capacity resulting from minimized planned downtime
- Less scrap due to inefficient changeover planning

GO supports fluid batch processing operations, such as Dairy and Brewing, as well as discrete manufacturing. Some of the specific functional capabilities include:

- Multiple inputs and outputs, such as from tanks to fillers
- Tank minimum use levels and storage capacities
- Product and resource-specific processing rates
- Multi-level bills of materials with automatic creation of dependent production orders



Streamlined Scheduling Using a State-of-the-Art Genetic Algorithm

The Genetic Optimizer evolves an answer to the scheduling problem by taking the strongest “individuals” from a population of potential solutions, and uses them to propagate additional solution sets. In this way, the ultimate solution evolves as a matter of technological “survival of the fittest”. Only in this case, the planner defines “fittest”. Characteristics such as: on-time delivery, adherence to preferred changeover sequencing, allergen avoidance, and delayed start, are set according to business priorities. An additional benefit of GO is speed. By using only the strongest individuals from each population, run time typically required to evaluate and compare every possible combination can be omitted.

Straightforward “Operator Focused” Configuration

GO is easily configured to support virtually any production operation. Any activity, process, equipment, or workstation that has quantifiable flow rates and capacities can be defined as a GO Resource and included in the schedule. For example, assembly, blending, cooking, filling, machining, and packaging can be scheduled individually or sequentially as a manufacturing process. This approach allows planners to setup and configure GO according to their requirements and processes, and using their familiar terminology.

Support for Complex Process Manufacturing Operations

The flexibility, power, and speed of GO enables it to schedule complex, multi-step process manufacturing operations such as fluid dairy. In this example, GO schedules conventional and organic products across multiple pasteurizers, tanks, and fillers. Orders, or production, are scheduled in such a way as to maximize on-time delivery, while minimizing allergen cleaning and changeover-driven downtime, and within the production constraints specified for each piece of equipment.

Quick and Flexible Rescheduling When Needed

In dynamic, high-volume production environments, it is often necessary to reschedule during a production run. GO gives the planner the ability to specify which products are running on which resources and, if tanks are involved, how much product is in each tank. GO will generate the go-forward schedule based on this user-defined “current state”. This capability, combined with the speed of the solver, gives planners significant decision support via “what-if” analysis to overcome unplanned operational challenges.

Reduce Time to Generate Plans and Enable “What If” Analysis

GO can generate schedules for single-step manufacturing processes in seconds, and for complex multi-step processes in just a few minutes. This gives planners the ability to reschedule, or conduct high-value what-if analysis throughout the day. Plant managers regularly work to determine the impact of adding or removing a piece of equipment. With GO, this is as simple as removing or adding equipment to the GO Resource Form and rerunning the schedule. Another constant concern is the issue of unplanned equipment downtime due to failure. In this case, the planner simply takes the resource offline through the GO Workbench and creates a new schedule. The remaining production orders will be reassigned as feasibly as possible, and if service violations are created, they will be highlighted to inform the manager.

Flexible Delivery Model Options

GO can be delivered as an on-premise solution, or using the on-demand delivery model. This gives customers flexibility in choosing a solution that best fits their business needs.

Genetic Optimizer - Easily integrated with virtually any ERP solution

Modular Design

GO’s modular design allows for simple integrations with virtually any host system and uses data from the host system’s database. The structure of the solution allows for quick deployments and leverages the host ERP’s data structures and functionality.

Flexible Configuration

GO is easily configured based on client requirements. The GO application is modified to utilize the available parameters and data in order to create a schedule that fits the client’s needs.

Familiar Look and Feel

GO provides a comfortable and familiar user experience because of its seamless integration and adaptability to virtually any ERP system. This serves to reduce the overall learning curve and allows for quick user understanding and acceptance.

Seamless Reporting

Since the GO scheduling solution is integrated with the host ERP’s data structures, the reporting tool native to the ERP system can be configured to generate client-customized reports. This allows for consistency across business processes.



About Junction Solutions

Junction Solutions is an award-winning provider of vertical-specific on-premise and on-demand software applications and services that help organizations enhance operational performance, reduce costs, optimize and expand delivery channels, and strengthen customer relationships. Built on Microsoft Dynamics® AX, and designed specifically for Food & Beverage, Multi-Channel Retail and Distribution companies, Junction Solutions' innovative offerings focus on enterprise resource planning (ERP), and provide users with 360-degree visibility across complex B2B and B2C operations including supply chain management, human capital management, merchandising, order entry management, call-center management, eCommerce engagement and fulfillment.

Where technology meets innovation for Food & Beverage, Distribution, Multi-Channel Retail companies.

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