

## STRENGTH

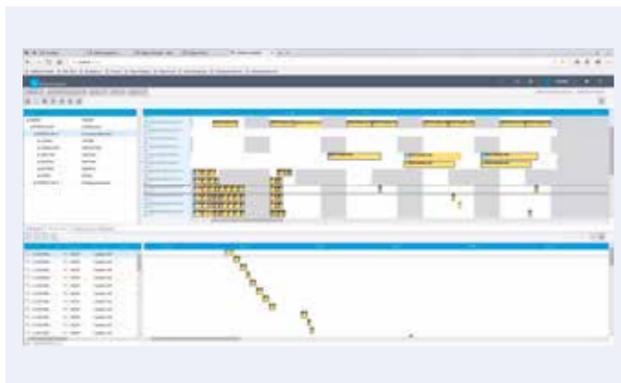
- High simulation speed
- Multi-scenario simulation environment, What-if analysis
- In-memory database
- High quantity of configurable standard algorithm and KPIs
- Full integration to material management generating on the fly material availability forecasts
- Efficient comparison of results and KPIs of different simulations
- Easy to build reports
- Real time Web Scheduling
- Scalability & modularity

## OPPORTUNITIES

- Adaptable to every ERP in the market
- Expansion of the ERP functionalities, instead of a replacement
- Ability to realize models, even the complex ones, completely adapting the system to the customers' needs
- Possibility to realize reports, scenario simulations, rules, KPIs, warnings, custom process logics for each kind of market and users skill
- Opportunity to realize and use the verticalization for specific market segments

## REAL-TIME WEB SCHEDULING

**Real Time Web Scheduler** is the web tool that allows department managers to visualize and modify manually their share of the global production plan. In particular this module allows users to:



- Starting from the global plan, manually intervene on a «frozen period» defining the optimal sequence while respecting all constraints, also thanks to graphical utilities that guide the user through the process.
- **Introduce forcings for production**, with respect to start/end dates, machines status (automatically flagged thanks to the integration to PAS-X MES) and resources availability.
- **Automatically elaborate the production plan** obtained (keeping unchanged the frozen period), using the algorithm included in the Finite Scheduling module or custom made algorithm.

## INTEGRATION OF SEDAPTA'S SCHEDULING SOLUTION IN PAS-X



- **sedApta & Werum** collaborate to offer an integrated suite of solutions enabling planning, execution and optimization across all supply chain functions and manufacturing operations.
- **sedApta & Werum** create visibility across a multi-tier network to reduce inventory across thousands of products, dozens of plants, hundreds of suppliers and many planners.
- **sedApta & Werum** support decision making processes in real-time by valuating multiple supply-demand balancing scenarios against various metrics enabling optimal trade-offs.



# PAS-X FINITE SCHEDULING

powered by sedApta's Factory Scheduler

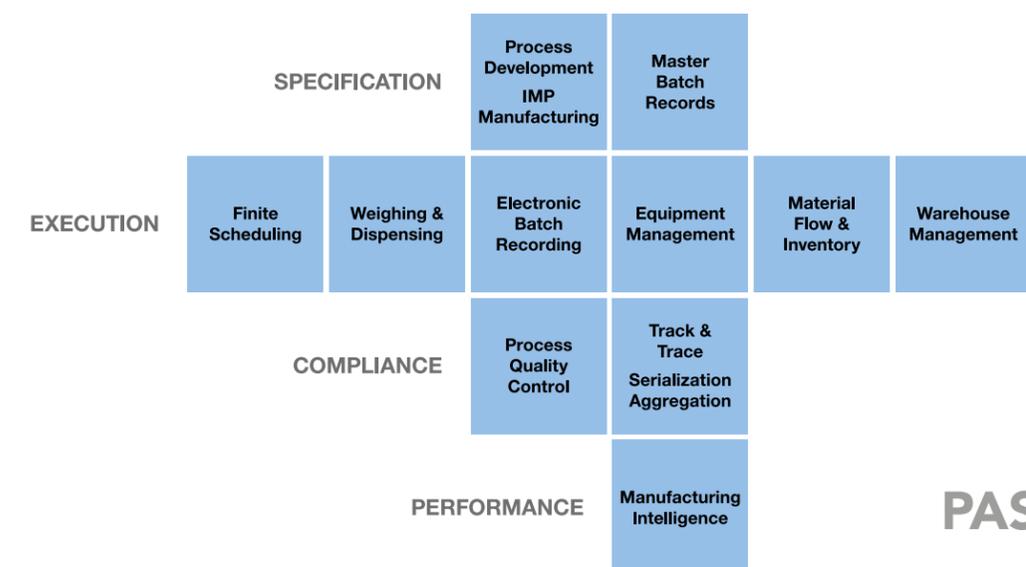
Detailed planning of manufacturing processes to optimize your pharma production

Today's trends in pharma production, such as digitization, increased demand on flexibility, pharmaceutical serialization, functional integration, and personalized medicine are forcing pharma companies to adapt their production to a schedule-oriented operating model. Synchronizing the production operations with supporting activities requires a tight integration of scheduled activities with the actual as-is status of the production. In particular, this is the focus of Werum's tight integration with sedApta's planning and scheduling architecture.

**Werum's PAS-X Finite Scheduling is covering the production planning process and has answers to these trends. You benefit from:**

- Resources scheduling with finite capacity
- Production sequences optimization
- Materials management and multi-scenario analysis

Finite Scheduling allows users to generate optimized plans, both in terms of lead time for fulfilling orders and production costs, with customizable heuristics. In order to provide today's best-of-the-breed solutions Werum's PAS-X Finite Scheduling is now powered by sedApta's Factory Scheduler.



## PROCESS

The logical steps of the scheduling process can be defined as:

1. Analyzing the existing production plan;
2. Creating of a new optimized production plan;
3. Cloning of an already-implemented simulation;
4. Completing several different scheduling simulations;
5. Saving on a file the different simulations carried out;
6. Cross-comparing the different simulations;
7. Manually modifying the working plan;
8. Saving on the database the new working plan and/or any (potential) constraint imposed.

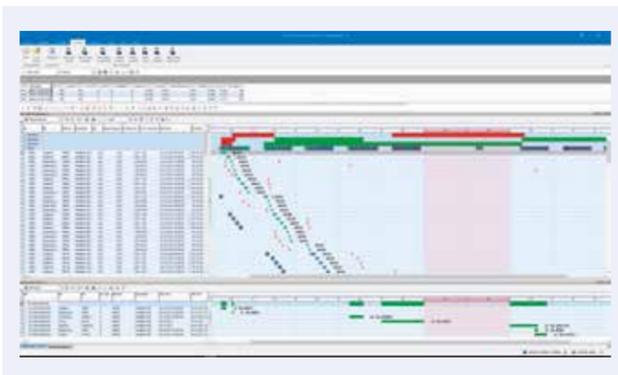
## SCENARIOS & SIMULATION

PAS-X Finite Scheduling allows the creation of different simulated scenarios.

For each scenario a set of Key Performance Indicators (KPI) are calculated to allow for the comparative analysis of the results obtained from the different simulations.

Based on this analysis it is then possible for decision makers to choose the “best-fit” plan that optimizes results on productive activities.

## KPIS & REPORTS



## ANALYSIS

PAS-X Finite Scheduling allows, through integration with the Analytics module of the sedApta Suite, to generate different reports for the analysis of results. Furthermore, all generated KPIs are defined to respect the criteria and the principles given by the SCOR (Supply-Chain Operations Reference) model for supplier management to facilitate results comparison.

## CONSTRAINTS MODELING

PAS-X Finite Scheduling manages different constraints such as molds/tools, teams, productive resources, and personalized constraints both static and dynamic.

All constraints can be defined by the user in terms of existence, capacity, multiplicity and calendar.

Every constraint can be considered in the simulation with three different states: do not consider, hard constraint, and soft constraint.

## HEURISTICS

PAS-X Finite Scheduling allows users to employ different configurable heuristics.

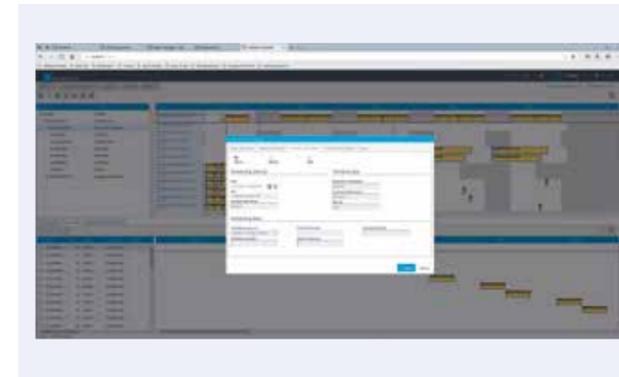
The categories of heuristics that can be configured are:

- **Scheduling heuristics**
- **Sorting heuristics** (**Work Orders**, to define work sequences for the different machines; **Customer Orders**, to define the order in which customer orders are fulfilled).

During the scheduling phase, PAS-X Finite Scheduling can generate several KPIs to support decision processes. The main KPIs supported are:

- KPIs on work orders
- KPIs on customer orders
- KPIs on orders
- KPIs on resources
- KPIs on work teams

## FORCING



PAS-X Finite Scheduling allows users to execute data forcings during different phases of the demand scheduling process, as to ensure timely responses to unexpected events. Data forcings can be done:

- **during a work session**, inside the simulative environment and independently for each simulation;
- **during the outputs analysis**, intervening on the Gantt reports to manually reposition the different order phases, as to manage the plan in real time.

Furthermore, Finite Scheduling allows to intervene manually to consolidate specific sequences, and/or the allocation of certain resources or machines on certain orders.

## EXTENDABILITY

The integration of sedApta's Factory Scheduler with PAS-X creates the ability for production scheduling on the plant floor level with the possibility of extending the functional scope in the direction of sales and operation planning with the sedApta modules Resource & Supply Planning, Demand Management, Inventory Management and Order Promising.



**Resource & Supply Planning** to balance and optimize mid- to long-term demand forecasts, to adjust capacities and leverage supplier capacities as well as to integrate personnel planning (e.g. workforce and shift models).

**Demand Management** to improve demand planning and forecasting of volumes and future revenues in a collaborative way.

**Inventory Management** to improve demand planning and forecasting of volumes and future revenues in a collaborative way.

**Order Promising** to integrate the customer order fulfilment process in the planning environment, either in an ATP like process from stock or in a CTP oriented mode to check for earliest delivery date.

**Web Supply Engine** enables communication among the different actors of the company's competitive system, eliminating dispersions and inefficiencies due to lack of communication. WSE is capable of managing the whole contracted work and supply operative flow, connecting in the easiest way all remote plants with the headquarters.

## MODULES

PAS-X Finite Scheduling is divided in two modules:

### ■ Factory Scheduling

The desktop component is for global production planning and for the dynamic allocation of production orders. Factory Scheduling allows users to create the production plan balancing medium and long term production objectives with short term operative needs.

### ■ Real Time Web Scheduling

The web component allows each area planner to intervene manually on the plan generated by the Factory Scheduling module and respond to unexpected events (e.g. new order priorities, machine downtimes).

## BENEFITS

- Improved visibility
- Management of resources & distributed workload
- Prompt reactions to disruptive events with immediate update of the work plan
- Generate work plans which are both feasible and optimized
- Increase quality and speed of supplier communication
- Decrease waiting time for each machine
- Improve synchronization between planning and dispatching
- Leverage best practices from other industries