

SAT

Strategic Advisors for Transformation AG
Gesellschaft für Management Consulting



**Boehringer
Ingelheim**

microParts

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Simulation-based Complexity Management:

Leading-edge Simulation Technology creates significant value for Factory Design and Optimization at Boehringer Ingelheim microParts GmbH

Context

The success of a therapy for respiratory diseases depends inter alia on what amount of the active pharmaceutical ingredient (API) reaches the lungs of the patient. The Respimat® Soft Mist™ inhalers developed by *Boehringer Ingelheim* allow the dosage of the API to be fed to the lung effectively. Due to rising demand for this innovative inhalation system, the pharmaceutical company *Boehringer Ingelheim* is investing about 85 million Euros in their Dortmund facility. The aim is to increase the output up to 44 million devices per year by the year 2015.

The *Arena® Factory Optimizer* used by *Boehringer Ingelheim microParts GmbH* in Dortmund, Germany, was developed by *SAT Strategic Advisors for Transformation AG* (SAT AG) in three project stages.

The first version was used for a new factory design of a green field plant for Respimat® Soft Mist™ inhalers in 2005.

The product was a “blockbuster”: demand grew rapidly and so, in a second stage, a plant extension was commissioned in 2011. Again, the *Arena® Factory Optimizer* was used in order to provision an optimal equipment and personnel mix.

In 2013, another plant extension was commissioned in a third stage, as global demand for the product continues to show strong growth. The *Arena® Factory Optimizer* was again called upon for the planning of this new extension.

Scope

The plant modelled includes two main processes. First, injection molding is used to manufacture several key parts of the Respimat[®] Soft Mist[™] inhaler. In a sequential step, assembly of the end product takes place, whereby parts from injection molding together with purchased parts are assembled in several stages.

The two main processes are decoupled by an internal warehouse. Staff transport parts throughout the plant from injection molding to the internal warehouse and from the internal warehouse to the assembly lines. Also, within the assembly lines, staff transport items between the different assembly stages.

Assembly takes place using a Kanban system, whereby each assembly stage has its own inventory.

The *Arena[®] Factory Optimizer* was used for the following purposes:

- simulation-based layout optimization
- line balancing with respect to strategic long-term forecasts
- resource utilization and bottleneck analysis
- validation of the planned throughput
- buffer dimensioning for internal clean rooms and in front of single machines
- operator head count dimensioning with regard to strategic throughput projections



Simulation Technology

The simulation technology underlying the results delivered by the *Arena[®] Factory Optimizer* was developed by SAT AG using the *Arena[®]* simulation software by Rockwell Automation, Inc. The factory model designed in *Arena[®]* was controlled by an Excel Cockpit holding all relevant factory design data as well as scenarios result that were fed back from the model to the cockpit after a scenario run.

Business Benefits

The *Arena*[®] *Factory Optimizer* provided *Boehringer Ingelheim microParts GmbH* with highly sophisticated and configurable decision-support for operational, tactical and strategic planning, conveniently accessible through a spreadsheet cockpit interface on a standard business laptop.

As Thomas Mehlhorn, Leader of the factory design initiative at *Boehringer Ingelheim microParts GmbH*, says: "The *Arena*[®] *Factory Optimizer* modeled by *SAT Strategic Advisors for Transformation AG* provided us with a very powerful simulation tool that completely mapped our highly complex production landscape, and this mapping was done on a high level of granularity within the shop floor. Therefore, we could conduct line-balancing scenarios ranging from the daily operational level up to strategic scenarios for the next year, and at the same time controlling all relevant key performance indicators on a very detailed level. The *Arena*[®] *Factory Optimizer* gave us security in our design and planning process due to the fact that it integrated all the dynamics of the shop floor, which could not be done with the traditional Excel planning methods. It allowed us to quickly evaluate alternatives to reduce risk and maximize the impact of your investments in new equipment or processes, resulting in significant savings in capital investment."

About *Boehringer Ingelheim microParts GmbH*

Boehringer Ingelheim microParts GmbH, a member of the *Boehringer Ingelheim Group of Companies* since 2004, manufactures the innovative pocket inhaler *Respimat*[®] *Soft Mist*[™] Inhaler at the Dortmund site. This device works with microstructured pumps and nozzles. As exclusive provider for *Boehringer Ingelheim* with a production capacity of 20 million inhalers per year, the subsidiary maintains the world market supply. Most of the 470 employees in Dortmund work in the production of the *Respimat*[®] *Soft Mist*[™] Inhaler which is then filled and packed at the *Respimat*[®] plant in Ingelheim. In addition to the production of the resale product, they also manufacture clinical trial supplies of further developments of the *Respimat*[®] product family in Dortmund. Based on continuing increases in demand, *Boehringer Ingelheim microParts GmbH* is making preparations at its facility at Technologie Park Dortmund to boost its existing annual production capacity from 20 to 44 million inhalers by the year 2015. Previously idle space is being converted for use in the *Respimat*[®] production unit. The company is investing about 85 million euros in the new facilities and systems. Since 1994, the number of employees has grown from 40 to 467 (average in 2012, including apprentices). For additional information about *Boehringer Ingelheim microParts GmbH*, please refer to www.boehringer-ingelheim.de/microparts.

About *SAT Strategic Advisors for Transformation AG*

SAT Strategic Advisors for Transformation AG headquartered in Freiburg, Germany, is a worldwide operating simulation and optimization consulting company dedicated to the systematic application of Simulation-based Complexity Management, a new methodology set up to model and optimize complex-dynamics systems in all branches of industry. For more information on *SAT AG* please refer to www.sat-ag.com (info@sat-ag.com).