



# mySAP™ SUPPLY CHAIN MANAGEMENT AT ASTRAZENECA



## DEMAND-DRIVEN SOLUTION FOR PRODUCTION SCHEDULING BASED ON SAP® ADVANCED PLANNING & OPTIMIZATION

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## AT A GLANCE

### Company

AstraZeneca, one of the top-five pharmaceutical companies worldwide, is among the leading pharmaceutical manufacturers engaging in research and development in Germany.

### Challenges and Opportunities

Faced with the need for improved efficiency levels through production unit specialization and supply chain management (SCM) best practices, AstraZeneca saw an opportunity to implement “make to demand” processes in its packaging plants – driven not by medium-term forecasts but by daily sales requirements.

### Strategic Goals

- Improved delivery performance
- Market-driven planning
- Consumption-based procurement
- Reduced lead times
- Enhanced effectiveness
- Better information exchange between sites in supply chain
- Supply chain transparency

### Approach

- Detailed analysis of “as-is” planning processes and existing data structures
- Revision and consolidation of ERP master data in GMP-based production environment
- Modeling of planning scenarios with the production planning and detailed scheduling functions of SAP® Advanced Planning & Optimization (SAP APO)
- Review of different planning concepts in connection with AstraZeneca’s new demand-driven SCM philosophy
- Provision of training and intensive coaching for staff involved in the project

### Results

- Planning cycles were slashed from 14 days to 1 day
- Service level increased from 98.1% to 99.9%
- Production flexibility was enhanced – the reduction of total setup time lowered the production index and yielded a 12% capacity gain (complete line setup is now done at batch changeover)
- Total package output increased by 13% (against a period with a comparable number of orders)
- Inventory turnover rose 14%
- Software went live on schedule after a six-month project

## EXECUTIVE SUMMARY

AstraZeneca, one of the world’s largest pharmaceutical companies, is an innovator when it comes to supply chain management (SCM). A worldwide initiative is underway to integrate demand flow technology in logistical operations, leading to a major SCM project at its packaging plant in Wedel, Germany. The project was driven by the need for greater agility and flexibility in the supply chain process, with the ultimate objectives of enhancing customer service and improving the flow of information to the European bulk product manufacturing locations. AstraZeneca set out to plan and control manufacturing operations on the basis of daily requirements rather than medium-term forecasts. With an existing SAP® technology platform, AstraZeneca project leaders opted for the mySAP™ SCM solution and the SAP Advanced Planning & Optimization component (SAP APO).

### Company

AstraZeneca Group PLC, headquartered in London, was formed by the merger of the Swedish company Astra and the British company Zeneca in April 1999. One of the top-five pharmaceutical companies worldwide, AstraZeneca is one of the leading pharmaceutical manufacturers engaging in R & D in Germany, where it has two sites: Wedel, near Hamburg, and Plankstadt, near Heidelberg.

The Wedel site is integrated in the AstraZeneca worldwide supply chain network and is responsible for packaging and distributing approximately 75% of all AstraZeneca pharmaceutical products for the German-speaking market. This makes the plant a key asset in the company-wide production network, which includes sales companies and pharmaceutical manufacturing operations in Sweden and the United Kingdom.

## Challenges and Opportunities

The mergers that have taken place in the pharmaceutical industry in recent years have been driven by ambitious growth targets and the desire to strengthen innovation. Ongoing restructuring in the healthcare sector is placing pharmaceutical companies under greater cost pressure, forcing them to constantly improve efficiency levels through production unit specialization and the implementation of SCM best practices. Manufacturing complexity is increasing as a result of the growing number of new products, while batch sizes are tending to fall. Pharmaceutical manufacturers are consequently focusing more on production costs and service levels. To that end, AstraZeneca recognized an opportunity to model SCM processes on a demand-driven concept.

## Strategic Goals

The decision to implement a dynamic supply chain at the Wedel packaging plant was influenced by the AstraZeneca groupwide SCM strategy, involving the extensive integration of demand flow technology in logistical operations. The objective of this SCM strategy, considered quite innovative in the phar-

maceutical industry, is to augment conventional SCM practices based on “make to forecast” processes with dynamic supply chain processes. AstraZeneca favors “make to demand” processes, especially in the packaging plants. Instead of medium-term forecasts, daily sales requirements will drive production processes and replenishment more strongly in the future. This initiative is associated with organizational restructuring and change management processes at the manufacturing sites. AstraZeneca wanted to be able to deploy both its “make to” strategies by switching from a “lean” to an “agile” SCM system. A project team made up of SCM and IT experts was assigned the task of implementing this system at the Wedel facilities.

## Approach

A highly automated, state-of-the-art supply chain order management process is in place at the Wedel production facilities. A distributed control system based on bar codes controls the whole materials movement process, from staging at the production lines to delivery and storage in the high-rise warehouse. This process control system was integrated with SAP R/3® and production planning via a bidirectional communication

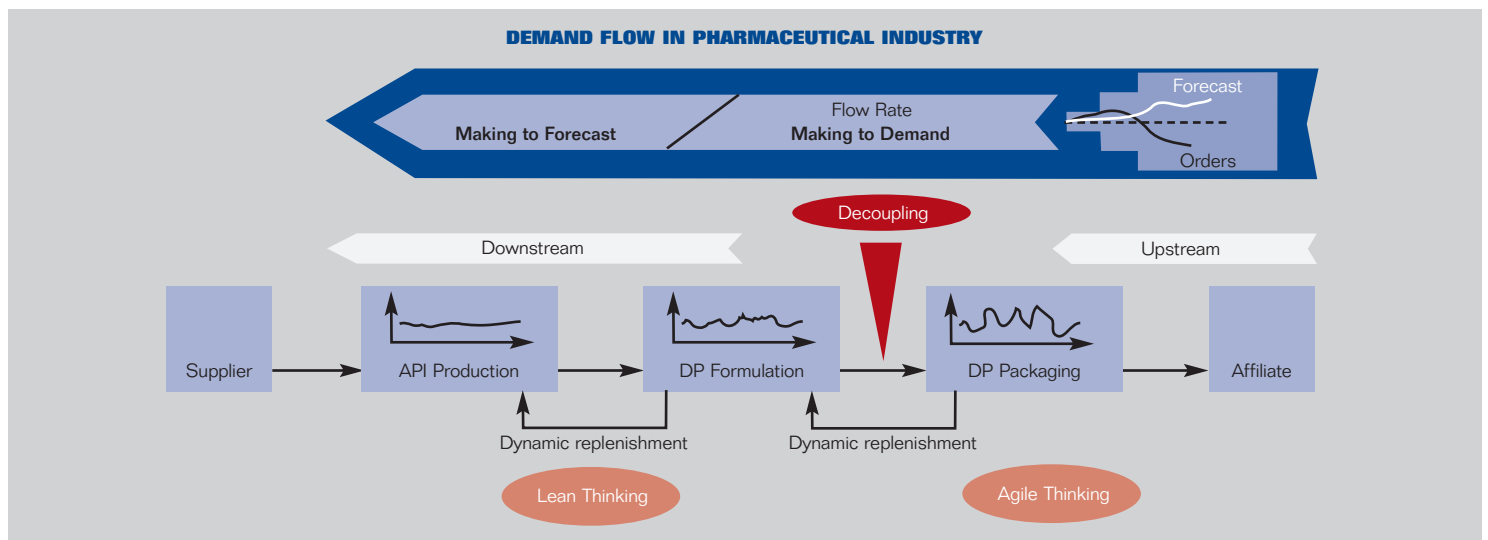


Figure 1: Typical separation of forecast-driven and market-driven demand in the pharmaceutical industry along the supply chain

system. (SAP R/3 functionality is now available in mySAP ERP.) AstraZeneca realized, however, that the SCM processes based on the ERP system did not fully meet the latest requirements for a highly dynamic, flexible supply chain organization. “The goal of our SCM project was to integrate the flow of information and improve our internal service levels,” says Bernd Lammerskötter, former vice president of operations.

#### **Agile and Demand-Driven Production Scheduling**

The SCM project initiative at the Wedel plant was dominated by the need to identify a new production scheduling solution that would introduce greater agility and flexibility into the supply chain process. The main focus was on enhancing customer service and improving the flow of information to the European bulk product manufacturing locations. To achieve this, the planning process in the packaging plant – lasting up to 10 days and based on a 14-day cycle – first had to be significantly reduced, while at the same time the quality of the process had to be improved. To develop the capability to respond more flexibly to customer requirements, concepts and tools for integrated multilevel planning had to be applied that exceeded the scope of conventional ERP planning methodologies. “We needed processes and tools to plan and control our manufacturing operations on the basis of daily requirements rather than on the basis of medium-term forecasts,” says Lammerskötter.

#### **Simultaneous Material and Capacity Planning with SAP**

The existing transaction-based SAP R/3 technology at AstraZeneca was of limited value for scheduling purposes. It was becoming more and more apparent that what AstraZeneca needed was a dynamic, demand-based production planning system including simultaneous material and capacity planning as well as sequence optimization. In light of the existing SAP technology platform, the AstraZeneca project leaders opted for the mySAP SCM solution and the SAP APO component.

## **PROJECT IMPLEMENTATION**

Several factors contributed to the project’s success: a detailed analysis of the “as-is” planning processes and existing data structures; the revision and consolidation of ERP master data in an environment based on good manufacturing practices; and the modeling of a large number of planning scenarios in SAP APO. The project was completed in six months, as anticipated, and the Wedel plant went live with the new supply chain planning system on schedule at the beginning of 2003. Coaching and training were provided, which also played an important role in ensuring the project’s success. “To achieve our project goals speedily after the software had gone live, the staff involved in the project received training in the new system and intensive coaching in the new scheduling philosophy,” says Burkhard Braatz, project manager at AstraZeneca.

#### **Realization of Demand-Driven SCM Concept with SAP APO**

SAP APO has attained a high degree of maturity for pharmaceutical production requirements. The following capabilities and functions were crucial to the success of the project:

- High level of availability of robust and powerful new SAP APO database technology combined with optimized integration handling between the real-time-based planning system and the centralized ERP system
- Characteristics-based setup time calculation: A solution that automatically generates a characteristics-based setup matrix with reference to pharmaceutical criteria such as changing folding and blister packages, and retooling. This capability significantly reduces master-data maintenance efforts.

- Day's-supply-based heuristic planning system to implement a demand-driven SCM concept for real-time calculation of dynamic safety stock levels and days' supply of finished products as a function of sales forecasts and the actual inventory situation. This information enables production schedulers – applying demand-driven principles – to automatically schedule the sequencing priorities of the manufacturing orders based on days' supply data, which varies from day to day.

Supported by the SAP APO graphic detailed scheduling planning board and alert monitoring capabilities, these functions enhance planning transparency and enable a faster response to changed scheduling requirements resulting from unforeseen situations like increased market demand or lack of resources.

The SCM solution at the Wedel facilities supports an integrated, demand-driven production scheduling system and dynamic replenishment – from sales forecasts, through the production schedule actually dispatched to the production lines, to real-time procurement planning. The solution completely fulfills AstraZeneca's specification for integrated planning between the production requirements of its sales companies and packaging plants on the one hand, and between the procurement and replenishment of pharmaceutical bulk products on the other.

## RESULTS

The principal advantages of the SAP APO implementation for AstraZeneca can be summarized as follows.

### Qualitative Improvements

- Simultaneous material and capacity views for production scheduling with reference to criteria relevant to pharmaceutical manufacturing
- Synchronized integration of execution and planning systems, allowing real-time scheduling with a high degree of transparency
- Calculation of dynamic setup times as a function of characteristics typical of pharmaceutical manufacturing, such as blister packaging changeover, batch changeover, and retooling
- Calculation of dynamic safety stock levels for local SAP APO planning as a function of forecasts
- Implementation of the demand-driven concept based on day's-supply-oriented order sequencing

### Quantitative Improvements

The quantitative improvements listed below were calculated with the support of SAP Consulting's business consulting group and classified in accordance with the Key Performance Indicator system of the Supply Chain Operations Reference (SCOR) model. All key figures are linked with each other. For example, shorter planning cycles lead to increased delivery reliability and faster inventory turnover, due to the fact that the warehouse days' supplies are recalculated daily.

The flexibility gained by reducing total setup time results in additional, transparent production capacity. This flexibility has twin benefits in that it supports both faster inventory turnover and higher output of packaging units. In turn, the freed-up production capacity provides such options as capturing new business, supporting promotional campaigns, or introducing flexible employee models.

Scope	Attribute	Key Performance Indicator	Quantitative Improvements
External	Reliability	On-Time Delivery (OTD)	Improvement of on-time delivery from 98.1% to 99.9%
	Responsiveness	Replan Cycle Time	Reduction of planning cycle from 14 days to 1 day
Flexibility	Production Flexibility		Reduction of total setup time, resulting in a 12% capacity increase and a 13% rise in output
Internal	Assets	Inventory Turns	14% increase in inventory turns

The following graphic illustrates the complete integrated process:

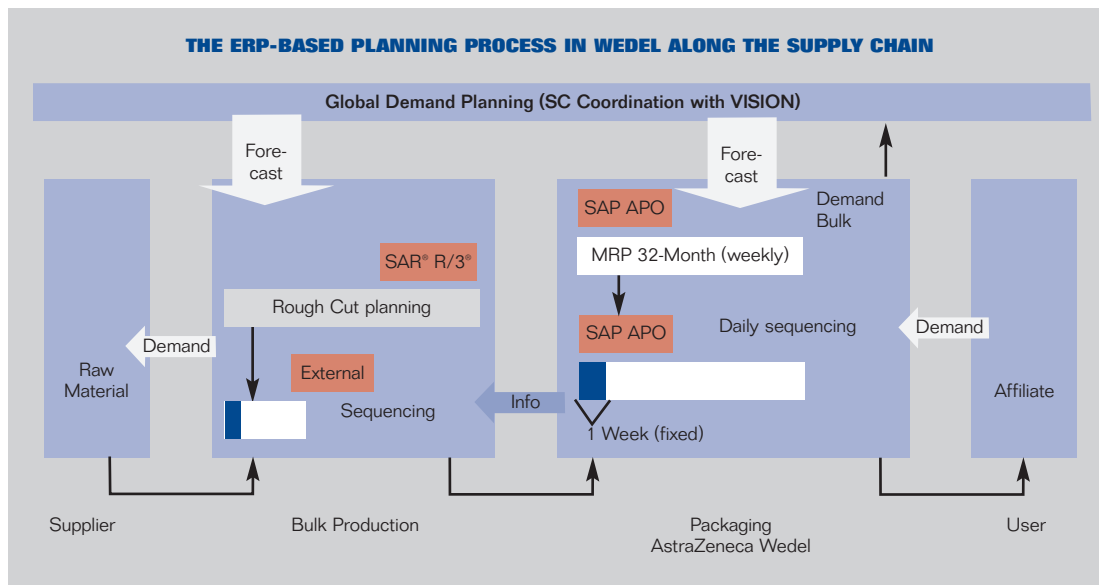


Figure 2: The ERP-based planning process in Wedel along the supply chain

## LESSONS LEARNED

**The following benefits contributed significantly to establishing a high level of buy-in for SAP APO at AstraZeneca:**

- Scheduling with SAP APO results in feasible manufacturing orders.
- A link is maintained between raw materials and finished products along the entire value chain.
- Schedulers receive automated support from “exception-based planning.”
- Dynamic setup time calculation fully integrates planning processes with execution processes.
- Planning processes have become far more transparent.
- Simulation functionality supports modeling of new product launches.



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