22 SCM in a Pharmaceutical Company

Tanguy Caillet

J & M Management Consulting AG, Willy-Brandt-Platz 5, 68161 Mannheim, Germany

Competitive advantage in the pharmaceutical industry is driven by first class research and development and by optimised supply chain operations. Harmonised SCM processes, systems and organisations will lead to reduced inventories, increased capacity utilisation, reduced order lead time, less obsolescences and lower IT system maintenance costs. Critical decisions can be made faster resulting in an improved customer service level. Based on common, standardised data, error rates are reduced and most importantly, full FDA CFR 21 part 11 and GMP compliance can be guaranteed and sustained.

The case study described in this chapter is based on a project in a European pharmaceutical company, that initiated to implement best practice supply chain operations for five European manufacturing plants and the European logistics organisation (active ingredients supply, distribution centres, affiliate customers and third party manufacturers). The project scope includes SCM planning processes, supporting the production planning and detailed scheduling within the pharmaceutical plants as well as the network planning across the company’s supply chain to optimally match supply and demand. The planning processes are implemented based on SAP R/3 4.6C and APO 3.1. The case study focuses on the implementation of the APS components SAP APO PP/DS to model the production planning and detailed scheduling in the manufacturing plants, and SAP APO SNP to model the supply network planning of the supply chain. The main results and benefits of the project will be highlighted as well as the major hurdles encountered in the implementation of the SAP APO PP/DS and SNP solution.

22.1 Case Description

22.1.1 Topology of the Pharmaceuticals Supply Chain

The supply chain consists basically of three main levels: chemical plants, pharmaceutical plants and marketing affiliates.

The chemical plants deliver the active ingredient (AI). The production of the AI within the chemical plants has not been tackled within the project as the manufacturing process differs significantly from the one of the pharmaceutical plants. The chemical plants, either part of the same company or third party suppliers, are treated as suppliers. Material requirements are planned by the Supply Network Planning module for the entire planning horizon (24 months).
The five pharmaceutical plants, spread over Europe, manufacture a wide range of product types. Solids (coated and uncoated tablets, capsules), liquids and creams, biotech medicaments, medical devices, consumer and OTC ("over the counter") products, sterile products and patches. All manufacturing processes consist of two main steps, formulation and packaging. The output of the formulation step is bulk material (unpacked tablets, liquids, etc.). The bulk material is packed in the packaging step into different put-ups (e.g. blister sizes, country specific packaging). As an order of magnitude, 50 active ingredients are formulated into 500 bulk materials, those are packed into 10 000 finished products.\(^1\)

The marketing affiliates represent the biggest customer group in terms of volume. Other customer types, e.g. tender business, small countries, wholesalers, government agencies, non-governmental agencies complete the demand picture. All customers forecast their future demand. Depending on the customer type, these forecast figures are converted into sales orders according to Service Level Agreements (SLA) within a certain horizon (on average 9 – 12 weeks). Demand assigned to one plant can also result from a dependent requirement of another plant. For example a bulk material is produced in one plant, but packed by a second plant.

The supply and demand flows are handled by a sourcing company. The sourcing company, headquartered in a tax-optimised country, owns the valuable products. The ownership of finished products is transferred immediately upon the quality release to the sourcing company. The active ingredient, as the most valuable part of the product, is always owned by the sourcing company. Thus, the plant acts as a contractor for the sourcing company, transforming the active ingredient into finished products, only invoicing the manufacturing fee.

*Distribution centers and warehouses* are mainly located close to the plants. In most cases, products are directly shipped from the DCs and warehouses to the customers. In other distribution scenarios finished goods are shipped from one manufacturing plant to another plant due to regulatory reasons and are then delivered to the customer. The distribution itself is not considered as critical, as the value of the finished goods is rather high compared to physical volume and transportation costs. From a master planning perspective the distribution and transportation lead times have to be considered.

Fig. 22.1 gives a high level overview of the pharmaceutical supply chain, including processes and IT systems. Tab. 22.1 summarises the supply chain typology of the pharmaceuticals supply chain.

\(^1\) In the remainder of this chapter the shortform "plant" is used to denote pharmaceutical plants.