26 Event-Based Planning for Standard Polymer Products

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In a highly dynamic market environment, the required planning quality for the entire supply chain can increase to such an extent that it can be reached with fixed planning cycles only at the very high cost of frequent planning. If demand or the raw materials market develops differently from what is anticipated, a readjustment of the entire supply chain becomes necessary to re-attain maximum planning quality and hence profitability. In a highly dynamic environment, an event-controlled synchronization of the production and sales planning in place of the timetable-controlled synchronization can ensure the necessary increase of planning quality and limit planning expenses to the necessary minimum. This study describes the planning scenario of a chemical industry company which has fully integrated the demand planning, master planning as well as production planning and detailed scheduling; its results are used as quotas in the availability check of customer requirements (see chapter 9). This integrated planning system is carried out, in whole or in part, event-controlled as a function of market trends.

The case study breaks down in four parts. Problem description, planning environment, and current market conditions; Introduction of a solution concept; Detailed description of planning levels already realized using SAP APO, as part of mySAP SCM and an optimized solution on the basis of ILOG; Summary of results and major findings gained during project realization.

26.1 Current Situation and Definition of Problem

The chemical manufacturer described herein produces several standard polymer products which are manufactured in various versions. The product is made from crude oil in several refinement stages. It is used in numerous applications for the production of packaging, films, casings of electrical appliances, components for entertainment electronics or household goods. The polymer is manufactured as a granulate and then injection-molded or extruded by the customer in the final application. The company produces for the European market at several locations. The various sites preferentially supply selected European countries. In addition, depending on the supply situation, allocation of countries to production sites is also handled dynamically.

The limitation to a few product versions is a response to the development of the market in the direction of a commodity market with standardized
products that are produced at high volumes. The individualization of the products, e.g. by dyeing with pigments is increasingly carried out by the final consumer. The flexibility of being able to produce different products has therefore increasingly shifted to the final consumer.

The company is in a highly competitive environment. While it retains a major position in the overall market, its market share is comparable with that of other competitors. From the viewpoint of the customer, polymer manufacturers are easily replaced. The product price is highly dependent on the price trends of crude oil, and other raw materials. The demand is likewise highly sensitive to price revisions. Hence, pricing is an essential marketing instrument of the company. Differentiating features with regard to quality and delivery reliability do not exist as they are taken for granted by the market.

As a rule, price changes of crude oil impact on subsequent raw material costs at a very short notice. These cost changes can, however, be passed on to the customer only with a certain time lag. This can cause the obtainable profit margin to shrink very quickly and in extreme cases even become negative. A possible reaction to this situation is the deliberate reduction of quantities put onto the market. With this measure, quantities which need to be marketed at a negative margin are kept under control without giving up major market shares at the same time.

The falling sales prices result in subjecting raw materials and finished product stocks to a very high valuation risk. Stocks which were produced with raw materials at high costs can in such a situation be sold only at relatively low selling prices which clearly reduce the available profit margin.

To achieve high profitability, it becomes necessary to pay consistent attention to low production costs and to combine this with efficient responsiveness to market prices. To do this, it is necessary on the one hand to plan resources efficiently, and on the other to forecast market changes as well as possible, and incorporate them into planning with little delay. The entire supply chain should be coordinated with the highest possible degree of integration. Not only individual components such as allocating production quantities to different production sites must be carried out but also be combined with other planning steps such as defining production sequences and planned output as well as the distribution of production quantities to the different markets. The planning must be very closely linked to the various business functions, such as procurement, sales and production planning which must be coordinated with each other with little time lag.

These requirements can be met by a system which demonstrates both a high degree of integration and a rapid response to changes in the planning conditions.