

# Delivering a competitive edge to chemical companies



Industry leaders within chemical companies face significant challenges today amid market volatility and growing competition. Success across the supply chain relies upon having an effective integrated strategy between planning and scheduling in order to remain profitable and for meeting customer demand. Investment in technology is a vital step to ensure flexible and measurable supply planning and modelling, and to overcome asset constraints within a chemical supply network.

## ■ Sunil Chaudhari

All chemical supply chains – from the simplest to the most intricate – constantly look to achieve streamlined operational efficiency. In doing so, they face a range of issues. Most chemical companies have a wide array of products with different manufacturing methods. Each will have different bills of materials, product grades and specifications that must be represented and managed as part of the manufacturing process.

A key area where chemical supply chain companies often struggle is having sufficient agility to be able to react quickly to sudden shifts in the business or market environment. In part, this is about being made aware of quickly when a change has happened or if an incident has occurred to be able to respond immediately.

While these unexpected events can come in many different forms, most typically fall into three distinct categories. The first is around operational offsets. Typically, this is when there is an equipment failure – when a system or application stops working, for example, bringing production to a halt. The second category is an environmental disaster – flooding, tsunami, hurricanes – that could potentially disrupt the supply chain and logistics supply in particular. The third key area is unexpected customer orders where chemical companies need to weigh the pros and cons of disrupting the rest of their production operations in order to accommodate the opportunity to fulfill a lucrative project with a tier-1 customer.

### Key role of forecasting and planning

For companies across the chemical supply chain, success in meeting these

challenges will largely rely on their ability to deliver efficient business processes and seamless integration between business functions. Most chemical companies generate forecasts of what they believe they are likely to sell over a 12-18 month timeframe – typically in monthly time schedules. That information then gets fed to the planning function. In a perfect world, these companies would like to always fulfill the demand and meet their forecasts. The planning model brings them back to reality as it creates an optimal production plan based on the assets that they have, the number of locations and corresponding capacity and the most cost-effective way to store and transport material.

Planning in this context is typically a part of Sales and Operational Planning (S&OP) – the process of aligning demand and supply to drive a business outcome. Businesses across the chemical supply chain need to look at how they can most profitably meet customer demand while at the same time help to drive operational agility. The planning function needs to consider high-level transport and logistics issues. With the flexibility built in today's chemical supply chain, decision-makers often have the luxury of being able to choose from several different options with regard to plant location. They may need to take into account transportation times and costs, for example, before deciding on whether to have a manufacturing base in Europe, China or the US. Competing effectively in today's process industries requires a fundamental shift from supply push to demand pull (essentially manufacturing to demand, which delivers improved margins and higher levels of customer satisfaction).

### The importance of visibility

Visibility is important to planning. Planners need to have an excellent overview of what is happening not just in a single plant, but across a multiple network of plants. Having a high level of awareness across the supply chain balanced with the needs of the business will help at a regional and global level. For chemical



companies, it is crucial that they are clear about the problems within individual plants and make them transparent to others within their organisation.

In this context, being able to proactively look ahead is vital. Planners need to ask themselves – will they have raw material capability five months from now and do they need to order now to avoid any problem? Another key area of focus should be around inventory storage. Ideally, planners will be looking to ensure that products are manufactured just in time to be shipped, so as not only to drive agility, but also to avoid the product using up limited storage space for an extended period. At the same time, planners must find ways in which they can improve the business process by delivering a framework for cost reduction and service improvement while reducing effort in the planning development. They also need to be focussed on improving user productivity by facilitating quick analysis and decision-making through clear, visible and understandable reporting.

### The link to scheduling

The long-term plan for the chemical supply chain needs to integrate with the overall budget and business strategy. While planning works to a 12-18 month time horizon, it is important to schedule works to a much tighter timeframe – typically three months at the longest. In an ideal scenario, schedulers should work to the inventory target guidelines provided by the planners, but they will also need to react to immediate needs and changes in the plant and be agile enough to spot opportunities and act fast for the benefit of the plant.

At the beginning of each shift, or possibly just nightly, schedulers will receive an updated snapshot of information that specifies what has been produced, the actual inventory positions and whether there are new orders. Once the model has been updated with the latest information, the scheduler will generally adjust it to resolve inventory problems, avoid late shipments and bring in ad hoc production opportunities. The schedule keeps track

of all of those changes and maps them back to the system of record, typically the ERP. In practical operational terms, there are a host of challenges associated with scheduling across the chemical supply chain. While schedulers typically have intimate knowledge of their business and manufacturing process, they need help in balancing several competing constraints that must be considered when developing the best schedule. It is crucial that schedulers have technology at their disposal that enables them to visualise potential schedule conflicts and provide guidance on how to analyse and resolve them as quickly as possible.

The other big issue is that while many companies are successful at achieving tightly coupled integration between scheduling and the ERP system, data integration between scheduling and planning remains generally poor in some organisations. According to a market study of the specialty chemicals industry conducted in 2011, information passed between the planning and scheduling functions is largely manual and underutilised. This is largely the result of silo business processes, which create disconnect between supply chain planning and schedule execution. The value of integration is to align business processes, providing the ability to evaluate multiple scenarios for constrained production lines to optimise assets and maximise earning potential.

### Finding a solution

In overcoming these issues, companies across the chemical supply chain should above all look for solutions that enable them to develop integrated, optimised plans and schedules with the agility to respond to market opportunities as they arise. To deliver competitive edge in this area, they need to increase operational efficiency and the best way to achieve that is through solutions that support improved planning and scheduling of the production and distribution process. Ease-of-use is also important here. The simple, straightforward user interfaces offered by supply chain solutions,

## Proactive planning and scheduling

for example, provide fast access to information that can expedite profitable responses to unexpected market demands and opportunities, which is becoming a necessity in an increasingly competitive marketplace. For schedulers, in particular, who may have little formal supply chain training, software ease-of-use is invaluable not just in enabling users to carry out their work effectively and in helping the company to become more agile, but also in ensuring that the software tools can help to make more informed decisions rather than using traditional spreadsheets.

### Remaining competitive

Supply chain leaders in the process industries are constantly seeking ways to drive better business results from their supply chain processes. High forecast error due to market volatility and large infrequent orders are just a few of the barriers to improve supply chain performance. Good visibility and supply agility will enable improved insights into the most profitable options for shaping demand. Crucially, supply planning must enable and connect to scheduling at the operating level.

Better alignment of processes and equipment from the plant floor through to executive decision-making levels will also provide the ability to distribute, visualise and analyse information more intelligently. Chemical and process manufacturers must increase the alignment of their supply planning and scheduling practices to maximise opportunities in the market. The transition to a demand-driven business model is an essential foundation from which process manufacturers can launch a more transaction-oriented and astute approach to their business. The short-term prize is profit and optimisation; the long-term reward is market competitiveness and commercial sustainability across the supply chain. ■



Sunil Chaudhari is the Country Manager - South Asia at AspenTech. For details, contact Alroy Kenny on email: [alroy@gri.co.in](mailto:alroy@gri.co.in)