



# Visibility and Integration - The Key Ingredients for a Successful Supply Chain

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*An Industry White Paper*

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## ||||||| About AspenTech

AspenTech is a leading supplier of software that optimizes process manufacturing—for energy, chemicals, pharmaceuticals, engineering and construction, power & utilities, mining, pulp and paper, and other mill products industries that manufacture and produce products from a chemical process. With integrated aspenONE® solutions, process manufacturers can implement best practices for optimizing their engineering, manufacturing, and supply chain operations. As a result, AspenTech customers are better able to increase capacity, improve margins, reduce costs, and become more energy efficient. To see how the world's leading process manufacturers rely on AspenTech to achieve their operational excellence goals, visit [www.aspentech.com](http://www.aspentech.com).

## Introduction

Supply chain and logistics are vital to a company's success. They have moved up to become a top business priority because they represent a high share of cost, and they are critical for service-level and top-line results, in addition to representing a means for companies to fight back against the pressure imposed by fuel price increases.

The trend toward more global supply chains presents a challenge for many companies in that it creates supply chain complexity and competition that did not exist even 5 years ago. Globalization opens up the number of degrees of freedom in the supply chain: there are more places that products can be made, customers are spread across the globe, and demand is shifting to Asia, with rapidly growing consumption especially in China.

## Overcoming Challenges

Further exacerbating supply chain issues is the fact that many companies rely on a complex mix of spreadsheets, enterprise resource planning (ERP) systems, and supply chain management applications to manage their assets. While the ERP is typically the system of record, supply chain technology solutions often require data that is in a different form than what the ERP contains, or falls outside of the ERP system entirely. One example of this would be setups and transitions in the polymers industry, which are typically not captured in the proper level of detail, if at all, in the ERP system. Polymers producers are looking to minimize time spent in transition from one grade to another, which takes up valuable capacity of assets and produces off-spec material that must be sold at a discount or on the scrap market.

Unfortunately, this complicated blend of solutions is not well-suited for tracking assets throughout the enterprise and into the wider realm of supplier and customer supply chains if a framework is not in place for both business process and technology integration. When information is stored in many different places and systems, it limits visibility and silos of information can develop. Planners, schedulers, operations, and business leaders may be looking at different information. Integrated systems and business processes are necessary for everyone to be working from "one version of the truth."

To achieve actionable insight into key supply chain issues requires a comprehensive, tightly integrated solution, capable of melding together collaborative demand management, planning, and scheduling that, in turn, integrates with manufacturing execution systems (MES) and enterprise resource planning (ERP).

This type of integration is critical if manufacturers are to manage their assets as effectively as possible and truly optimize their production processes. Any application that sits in isolation—whether it is scheduling, advanced process control, or MES-related—will only result in a small proportion of the requisite value. The success of an individual plant or the wider supply chain is not about isolated technological capability. Implementing integrated software solutions will deliver more effective business value and help to avoid a technological "disconnect" among key stakeholders.

## Supply Chain Best Practices

Certain best practices and capabilities are key components in achieving the necessary visibility and integration of software systems to best manage process industry supply chains. These include:

- An easy-to-use, interactive interface for viewing the schedule and providing forward visibility of inventory positions
- Modeling of operational constraints at the level of detail required to represent real-world capabilities with enough fidelity to accurately evaluate alternatives
- Fast optimization and robust what-if analysis to holistically simulate the impact and trade-offs of business decisions
- Advanced visual exception reporting that supports the Sales & Operations Planning process by highlighting the most urgent problems along with guided analysis on resolving them
- Dynamic scheduling with real-time response, allowing the scheduler to quickly make feasible changes to the schedule, respecting equipment constraints, raw material availability, and batch dependencies.

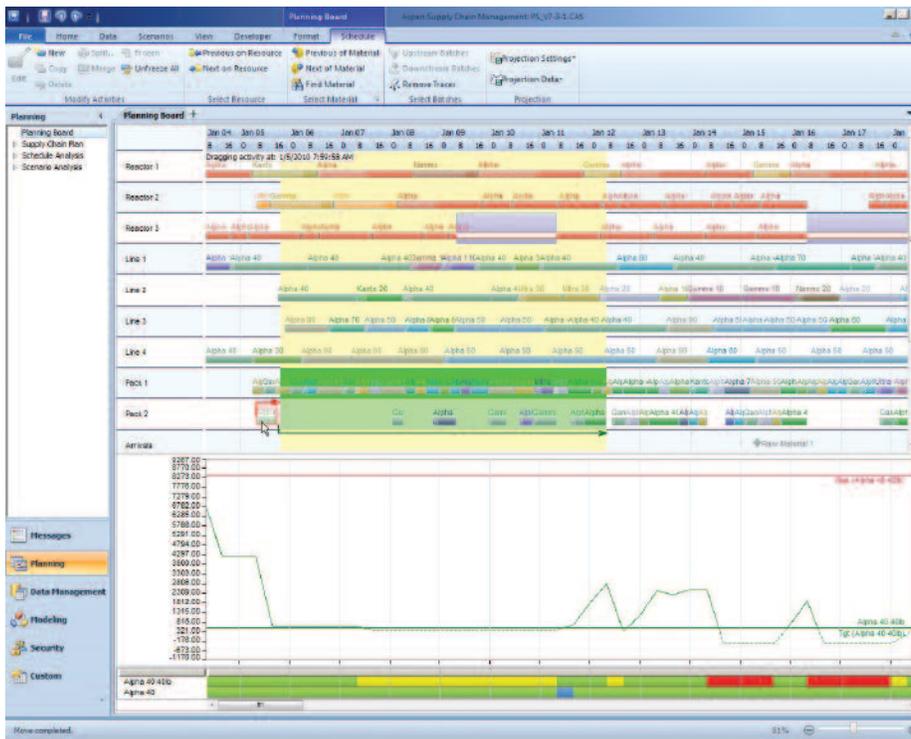


Figure 1. Aspen Plant Scheduler's planning board features a Gantt chart, forward visibility of inventory positions, and drag-and-drop rescheduling with active user assistance for faster, smarter scheduling.

There is also a drive to standardize and simplify supply chain solutions. Companies are moving away from the highly customized applications that they had a decade ago and want solutions that are easier to use and easier to support. For example, AspenTech has customers that use Aspen Plant Scheduler as their global scheduling solution for all of their plants worldwide (see Figure 1). Plant-specific customizations are limited, resulting in a scalable application with a common look and feel and similar capabilities, regardless of location.

## Tracking and Tracing

Manufacturers, especially in industries such as chemicals, food and beverage, and pharmaceuticals, typically need to have sufficient insight into the entire process to allow them to trace or assess materials and identify any discrepancies in the production process. Obtaining this kind of feedback is vital for plant planners and schedulers if they want to improve performance. It is a continuous cycle, which improves planning continually over time.

In batch process industries, like specialty chemicals, for example, traceability typically takes two forms. The first, known as product tracking, is the capability to follow the path of a specified unit of a product (or asset) through the supply chain as it moves between organizations. The second, product tracing, is the capability to identify the origin of a particular unit and/or batch of product located within the supply chain by reference to records held upstream in the supply chain. Products are traced for purposes such as identifying quality problems, recalling product, and investigating complaints.

AspenTech is a perfect example of a leading software solution provider that helps companies address these issues. AspenTech's Manufacturing and Supply Chain product suites contain traceability solutions, which are able to collect and capture data and "interrogate" it to find the source of problems across the manufacturing process. The additional benefit of these tools is that they successfully integrate with systems, including distributed control systems (DCS), laboratory information management systems (LIMS), and enterprise resource planning (ERP).

## Visible Benefits

One of the key objectives of traceability is to provide visibility across the supply chain, where all key stakeholders have a common view of activity across the chain. In a typical supply chain, visibility of plan versus actual information is an essential metric for detecting potential problems in time to make necessary adjustments going forward.

One of the main requirements for a process company is to comply with existing and impending regulatory, business, and operational requirements. Accurate representation of these requirements through models and constraints benefits process manufacturers in both the short and long term. In the short term, it enables quick decision-making when a planner or scheduler is faced with an unexpected production upset, such as an equipment failure or raw material shortage. Over longer time periods, detailed planning and scheduling models give companies the ability to manage long lead-time raw materials, avoid delivery date violations, optimally position inventory, and plan for scheduled maintenance activities.

Timeliness is also a key issue here. Companies need to ensure that they receive information quickly enough to be a useful aid to decision-making. Investment in technology—including process optimization software solutions—allows them to see and use real-time information from operations. These solutions facilitate excellent manufacturing performance and enterprise-wide process synchronization.

## Positive Prospects

Process companies, particularly in the chemicals industry, are in a dynamic growth phase--- and the prospects for future growth look positive. However, if the sector's potential is to be fulfilled, clear visibility and high-quality integrated supply chain management will be essential ingredients for success. The use of process optimization software tools needs to be an integral part of monitoring and measuring plant performance and should be seen as mission critical to achieving high levels of efficiency across the entire chain.



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