Alignment Between Supply Chain and Operations Execution: The Formula for Higher Profits and Agility

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Introduction: Taking a Systems View of the Value Chain

Although supply chain planning and operations execution teams share similar goals, they approach their business from entirely different perspectives. All too often, this results in disconnects that not only limit profits but also create gaps between plans and execution. Misaligned business processes, changing demand patterns and priorities, and unexpected manufacturing operations issues keep food and beverage manufacturers from reaching the highest possible margins.

However, there are new, tech-driven approaches to develop new levels of agility in the value chain and increase profits. With the right technologies in place, food and beverage manufacturers can achieve sustainable alignment between supply chain and operations execution teams. They can close gaps between plans and actuals, leading to improved margins and agility.

According to **recent Gartner research**, 85 percent of respondents report that their biggest challenge related to smart manufacturing strategies is integration with other supply chain functions. Research participants believe "the connection to their organization's broader supply chain transformation is hazy." Greater visibility into increasingly complex supply chain networks offers the opportunity to improve decision-making and align supply chain and operations teams daily. With these in place, food and beverage manufacturers can reach unprecedented levels of agility and customer centricity.

Same Goals, Different Perspectives

Supply chain and operations execution teams both want the organization to succeed: They're focused on delivering the right products, in the right quantities, at the promised times, with the level of quality that customers expect. Yet each team takes a different approach to accomplish these goals. Some examples of how their methods and priorities vary:

Two Different Approaches: Supply Chain vs. Operations Execution		
Focus	Supply Chain Planning	Execution
Geography and assets	Regional or global: the entire supply chain network; often containing numerous manufacturing assets	Hyperlocal: A production facility
Primary considerations	Revenue, costs, forecasts, product families	Safety, orders, shipments, SKUs
Time horizon of attention	18-24 months forward visibility	Today and tomorrow
Business processes and cadence	Monthly Sales & Operations Planning (S&OP) or Integrated Business Planning (IBP) processes	Weekly Sales & Operations Execution (S&OE) processes including daily Operations team meeting to discuss Yesterday-Today-Tomorrow

Given these differences, it's no wonder the operations team finds it challenging to operationalize the high-level monthly plan and goals the supply chain team develops. Something obvious to operations—key storage constraints for specific materials at a manufacturing facility, for example—may not be so obvious to the supply chain team. Similarly, operations may not have visibility into broader-scope problems. Establishing "feed-forward "and feedback alignment processes between supply chain and operations teams, along with enabling tools to equip each to perform effectively, is a formula for higher profits and agility in food and beverage processing companies.

Leaders within capital-intensive industries are recognizing the financial benefits of implementing technologies that help manage complex, intertwined variables impacting supply chain and operations. **Boston Consulting Group research** found that many consumer-packaged goods companies are eyeing digital transformation as a way to address supply chain challenges and support future growth. Digital sales and operations planning were reported as a top initiative providing a significant transformational impact.

Better Alignment Leads to Bigger Profits

Executing a plan is a daily battle—one that often spans multiple fronts beyond a manufacturer's control. Food and beverage producers contend with last-minute customer orders, changes in raw material availability and natural events that disrupt operations. But, by focusing on the factors in their control, these producers can reduce risk and reveal opportunities to increase margins. These factors include ordering the correct quantities of raw materials and establishing business processes that support collaboration and communication. Tending to these concerns and enabling teams and individuals to reach sustainable states of alignment is the only way to win this never-ending daily battle.

High-fidelity models powered by predictive and prescriptive analytics now allow companies to evaluate the economic and operational ripple-effects of different strategic, tactical and operational business choices and scenarios. High-fidelity models also help to facilitate dialogue among teams in order to ultimately establish clear responsibility, accountability and alignment on how best to proceed.

Creating Synergies to Optimize the Value Chain, Improve Margins and Agility

In the past, even though people and processes may have been connected across departments, the systems they used were not. Supply chain planning software and manufacturing execution tools worked in isolation. New technology creates synergies between these systems, allowing food and beverage processing companies to reap the benefits of tightly aligned supply chain and manufacturing operations.

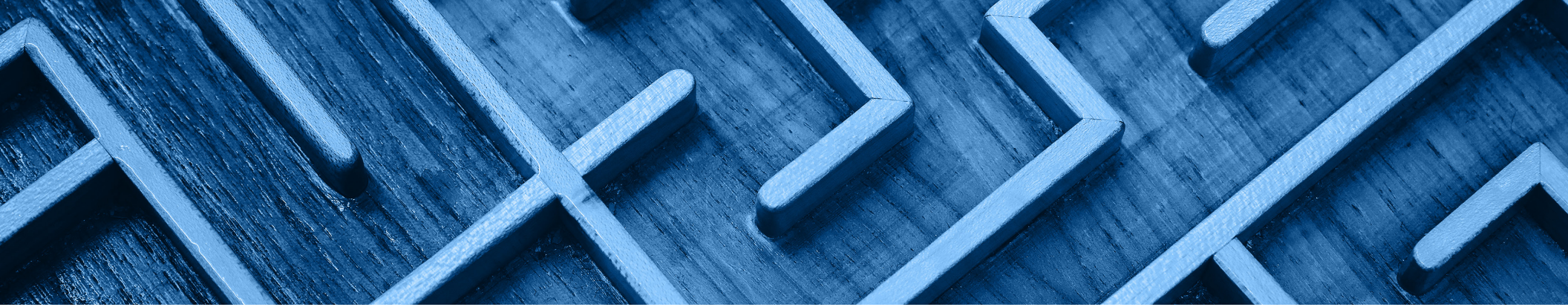
The latest supply chain tools can help strengthen both feed-forward and feedback business processes between supply chain and manufacturing operations. High-fidelity scheduling models determine the coordinated set of actions needed to achieve the monthly high-level S&OP/IBP plan.

These models consider economics and constraints that most supply chain planning tools fail to consider. Realistic daily or weekly production goals, derived from high-fidelity scheduling, can now be shared with manufacturing operations teams. As an additional benefit, both teams visualize production goal attainment in near real-time via synergies with manufacturing execution systems.

Companies further enable daily alignment across teams through collaborative web hubs where staff can instantly attend to pressing issues. These hubs offer an environment where extended team members collaborate to resolve any issues. As daily alignment takes place, a historical archive—a record of decisions made and actions taken—grows and informs future data mining and continuous improvement efforts.

New and innovative self-healing supply chain capabilities ensure supply chain models remain as accurate as possible, reflecting actual conditions. Supply chain models can be readily calibrated to ensure they are in sync with demonstrated plant, equipment and process performance—aligning models and data in much the same way teams can be better aligned.

Finally, asset performance management systems with predictive analytics can provide advanced notice of equipment failure. Incorporating this data into high-fidelity planning and scheduling models allows food and beverage processing companies to determine the best time to perform maintenance to minimize overall schedule-related costs and unplanned downtime.

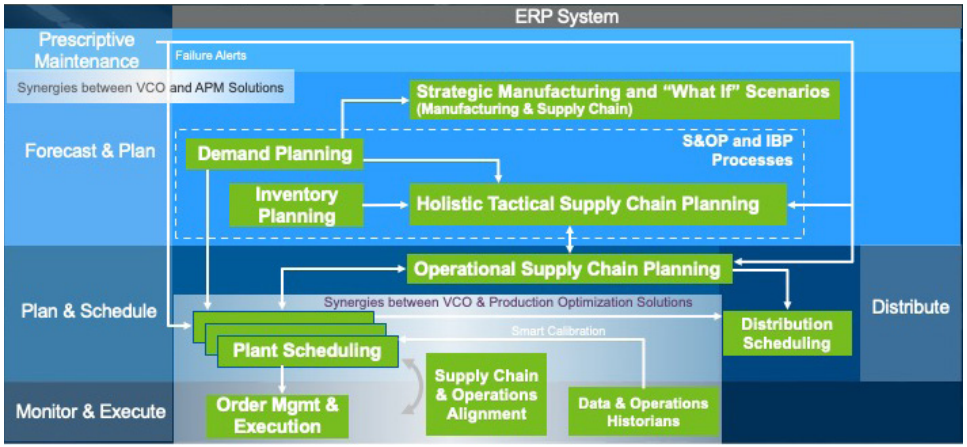


After a detailed evaluation, FPCO implemented the aspenONE® Supply Chain Management (SCM) solution. Morimasa Sato, FPCO's president and chief operating officer, said, "AspenTech's solution was the only solution that could manage FPCO's complex supply chain requirements." After implementation, FPCO achieved reductions in planning cycle time, costs, and inventory.

The latest supply chain management tools can help create sustainable states of alignment in numerous business processes:

- **Strategic manufacturing and logistics scenarios:** Align on the economic and operational impacts of strategic "what-if" scenarios, such as capital investment studies, manufacturing footprint optimization studies, product mix and volume transfer studies, as well as make-versus-buy strategy studies.
- **Tactical planning:** Optimize and align the organization's overall supply and demand during the monthly S&OP/IBP process.
- **Operational planning:** Determine the coordinated actions required to optimize stock transfer order movements aligned with internal and external demands.

Value Chain Optimization (VCO) Process Flow and Synergies to Improve Margins



- **Detailed scheduling:** Create realistic production schedules aligned with S&OP/IBP goals that can also minimize inventories while simultaneously achieving high levels of on-time in-full order fulfillment.
- **Daily operations alignment meetings:** Align supply chain and operations execution teams through a collaborative Sales & Operations Execution web hub that improves productivity by providing quick and easy visibility to the information that drives proactive and informed decisions during execution.

- **Historical schedules and operations analysis:** Share the context that led to previous scheduling and operational decisions and actions, with a goal of shared understanding.
- **Order management and execution:** Employ high-fidelity schedules to set achievable daily or weekly goals to align manufacturing operations with supply chain monthly S&OP/IBP goals.
- **Production goals attainment:** Align everyone on actual and historical goals attainment along with embedded comments and reason codes that help explain variances.
- **Periodic calibration of supply chain models:** Calibrate supply chain models based on demonstrated plant, equipment and process performance by quickly detecting manufacturing master data inputs that may no longer be valid.
- **Prescriptive maintenance**: Align maintenance, supply chain and operations on the best course of action in the face of unplanned downtime.

Japanese Manufacturer Solves Complex, Near-Term Distribution Problem

FP Corporation (FPCO) is Japan's largest manufacturer of plastic trays for food service packaging in supermarkets. FPCO sells more than a billion containers monthly in 10,000 styles and colors. FPCO realized that its forecasting, planning, scheduling and distribution processes needed improvement. With 88 manufacturing locations, the process to determine which plant should manufacture products to optimize transportation and inventory costs was extremely complicated. This resulted in significant excess inventory across the country. The use of contract manufacturers to meet seasonal demand only added to the complexity of FPCO's supply chain.

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"What the AspenTech solution brings to FPCO is something that other supply chain management vendors do not: an optimized plan to move our 6,000 molds between factories. This is a very challenging task."

- Morimasa Sato, president and chief operating officer, FPCO

The integrated aspenONE Supply Chain Management solution includes demand management to help reduce uncertainty, weekly enterprise planning with optimization to help FPCO respond to short-term changes in demand, daily finite scheduling for each sales region with visibility into open customer orders and a weekly distribution plan that is based on actual orders and the current manufacturing plan. The integrated solution delivered impressive benefits totaling $28M in recurring yearly benefits.

Another major benefit for FPCO: the ability to shorten the planning cycle. With their previous process, teams required seven Excel spreadsheets and three weeks to develop a monthly plan. Now, thanks to AspenTech solutions, they develop a plan every week.

FPCO highlighted the SCM solution in its 2018 annual report:

> SCM performs the complex calculations needed to determine how much or how many of what items are available where, and how much of an item can be produced at what locations to achieve delivery.... The core brain of FP Corporation's value chain evolves each day through a hybrid of computer and human intelligence.[1]

Aligning People, Processes and Goals

Creating alignment across the organization is the first step in optimizing the value chain. Linking supply chain and manufacturing operations teams via collaborative Sales and Operations Execution web portals helps to break down functional silos while enabling precise coordination and execution on both sides. It also ensures consistency and accountability: Everyone on the team can see the goals and detailed game plan, track progress and adjust as new opportunities and issues emerge.

Establishing both feed-forward and feedback loops between supply chain and operations execution business processes—and connecting more frequently to align on changing priorities and assess progress—allows food and beverage companies to become more customer centric, agile and profitable.

Forecasting and planning: Determining the most efficient and profitable way to operate the supply chain to meet expected demand over the course of the next 18 to 24 months is challenging, to say the least. Implementing an effective S&OP or IBP process is key. This monthly process connects demand planners, supply planners, product managers and sales and account teams to better predict demands and balance supply to come up with the most profitable game plan.

Aspen customer Tyson Foods produces a wide variety of protein-based and prepared food products and is the recognized market leader in the markets it serves. The company's Renewal Products Division had identified significant opportunities to optimize production capacity, decrease transportation costs and improve raw materials allocation.

Capturing these opportunities would require the use of advanced supply chain planning optimization solutions. The business implemented Aspen Supply Chain Planner and reported a 23 percent decrease in transportation costs, a 14 percent reduction in capacity hours needed to meet overall demand, and an 8 percent decrease in time spent on planning compared to its previous tools and process.[2]

Scheduling: Many organizations have invested heavily in S&OP and IBP tools. Yet they're still trying to schedule using unwieldy Excel spreadsheets. Moving from low-fidelity "buckets of time" resolution to a high-fidelity "continuous time" resolution with more sophisticated scheduling tools can deliver massive value. These allow operations teams to more easily visualize the constraints linked to different manufacturing resources and create executable tasks aligned to achieve monthly S&OP/ IBP goals. Such tools can also factor in shifting daily demand, and support different scheduling approaches—interactive drag-and-drop, business rules automation or even optimization—depending on the readiness of the businesses or users. In addition, the latest scheduling technologies work with the complete spectrum of production processes, including continuous, semi-continuous or batch.

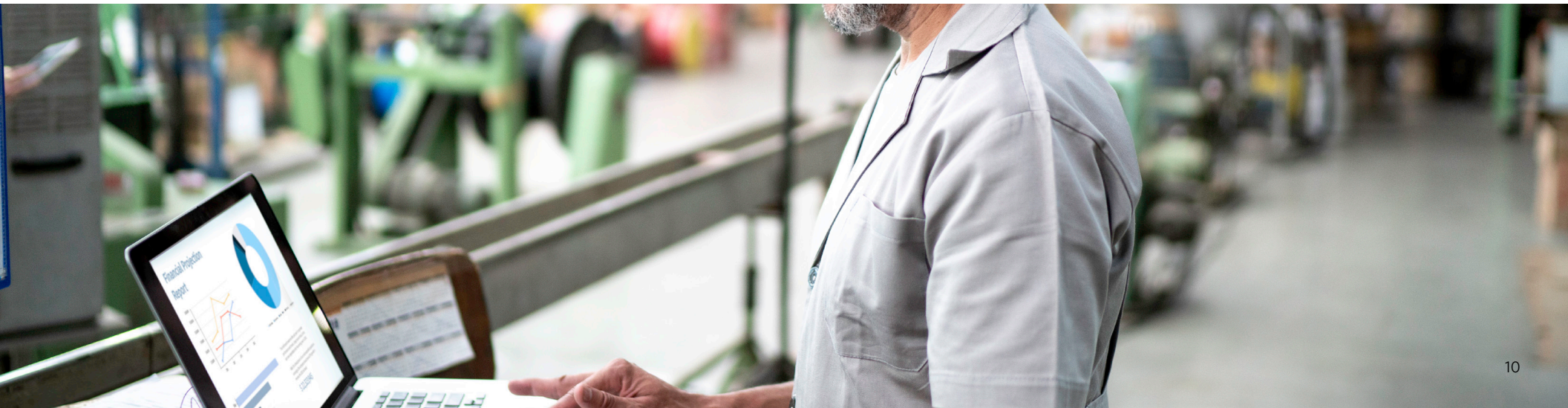
Equipped with a collaborative hub where they can discuss scheduled activities, manufacturing teams, schedulers, unit leaders, operators, material planners, research and development teams and maintenance groups can drive unprecedented levels of alignment. This is a much better alternative to endless email chains where people may be left out or miss critical information.

A single source of truth can also provide visibility into the context that led to certain decisions. For example, documenting changes such as raw material delays, changes in negotiated times for carrier loading activities, or equipment problems, provides clarity and detail around historic data used to adjust plans and models.

Monitoring and execution: Many manufacturing facilities track monthly production goal achievement using hand-drawn charts on whiteboards. This old-school approach limits visibility into production goal attainment versus the monthly goals, and fails to provide context for factors contributing to deviations and variances in production goal achievement. Modern systems let teams display key performance indicators in production portals in conference rooms at each plant. This creates awareness and focuses employees on the importance of meeting production goals.

"Self-healing" supply chain capabilities can quickly surface inaccurate information within the master data that drives planning and scheduling models. Until recently, planners and schedulers typically requested that plant production engineers validate tens to hundreds of thousands of master manufacturing data inputs (processing times, yields, setup times, cleanout times, transition times, etc.) used in their models. Engineers often defer these time- and data-intensive analyses, resulting in less accurate models. This increases risks, as these models are often used to make customer order promises and commitments. Self-healing supply chain capabilities help identify these proverbial needles in the haystack with minimal time and talent input.

Prescriptive Maintenance: Traditional preventive maintenance alone cannot eliminate unexpected equipment breakdowns. With breakthroughs in predictive maintenance powered by low-touch machine learning, it's possible to extract value from decades of design and operations data to recognize precise failure patterns and accurately predict equipment breakdowns weeks or even months in advance. Longer-term visibility of impending equipment failures may prompt the question, "When should we take planned downtime to ensure minimal disruptions, costs and impact to customer order commitments and relationships?" Incorporating potential failure scenarios into supply chain planning and scheduling models powered by mathematical optimization methods can provide the answer.



Here are examples of prescriptive maintenance in action:

- **Aspen Mtell® Agents** have **detected vibrations in pumps** that led to the replacement of mechanical seals before failure. They also **identified signatures** that led to the replacement of a high-pressure pump with 39 days of lead time. In the same plant, Agents **detected problems with a wash oil pump** 48 days in advance.
- One facility, where fouling was of particular concern, sought better notification of fouling for better planning of critical equipment usage. Drawing on fouling data from the previous year, Aspen Mtell Agents **provided an alert with a 125-day lead time**.
- Vacuum bottom pumps can be mission-critical, but also vulnerable to seal and bearing failures. Aspen Mtell **learned the failure history**, which included more than a dozen different failure signatures. The Agents **provided lead times of 28 and 31 days for future seal failure** on the pumps, as well as **lead times of 10 and 28 days for future bearing failures**.
- A customer saw how advanced technology improved safety when Aspen Mtell alerted them to a particular failure mode that would have resulted in a major fire. The tool **provided nine days of advance warning**.

In a **2019 Forbes article**, Steve Banker of ARC Advisory Group stated, "In supply planning, a self-healing supply chain would seek to determine when a key production machine might go down, and then using planning to proactively deal with that situation. AspenTech is probably the closest to a productized solution in this area."

Alignment Creates Greater Profit, Agility and Customer Centricity

Aligning the entire value chain allows food and beverage manufacturers to be more agile and responsive to changes in supply and demand. More accurate forecasts and holistic supply chain optimization—coupled with high-fidelity schedules designed to achieve on-time in-full order fulfillment goals—give producers a competitive advantage. Establishing a reputation as a reliable, customer-centric supplier helps create brand preference among customers.

With new synergies spanning supply chain management, manufacturing execution and asset performance management systems, food and beverage companies can reach unprecedented levels of customer centricity, agility, productivity and profitability. Focusing on value chain optimization delivers far greater margin increases than simply tackling portions of the supply chain or production processes. In his **analysis**, Gartner's Simon Jacobson advises, "Pursue the supply chain convergence aggressively by focusing on the horizontal alignment of manufacturing operations with other supply chain functions." Aligning supply chain and manufacturing operations teams every day via feed-forward and feedback business processes can allow specialty food manufacturers to capture millions of dollars per year in savings.

Conclusion

According to the **2020 State of Food Manufacturing Survey**, demand changes and other manufacturing challenges are driving a need for greater productivity. Some of the key challenges discovered in the survey included improving maintenance systems (68% of respondents) and improving communications between manufacturing levels/areas (65% of respondents). Food and beverage companies can leverage the latest solutions to meet these challenges.

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[1] FP Corporation Annual Report 2018

[2] "Beyond the Dinner Table: Tyson Foods' Use of Aspen Supply Chain Planner for Strategic Scheduling of Renewable Products", Tyson Foods, Inc.; Optimize 2013 Global Conference, Boston, MA.