# Balancing Service Levels, Production Costs, and Working Capital

How food and beverage companies manage the conflicting priorities of meeting contractual service levels, maximizing production efficiency, and minimizing inventory.

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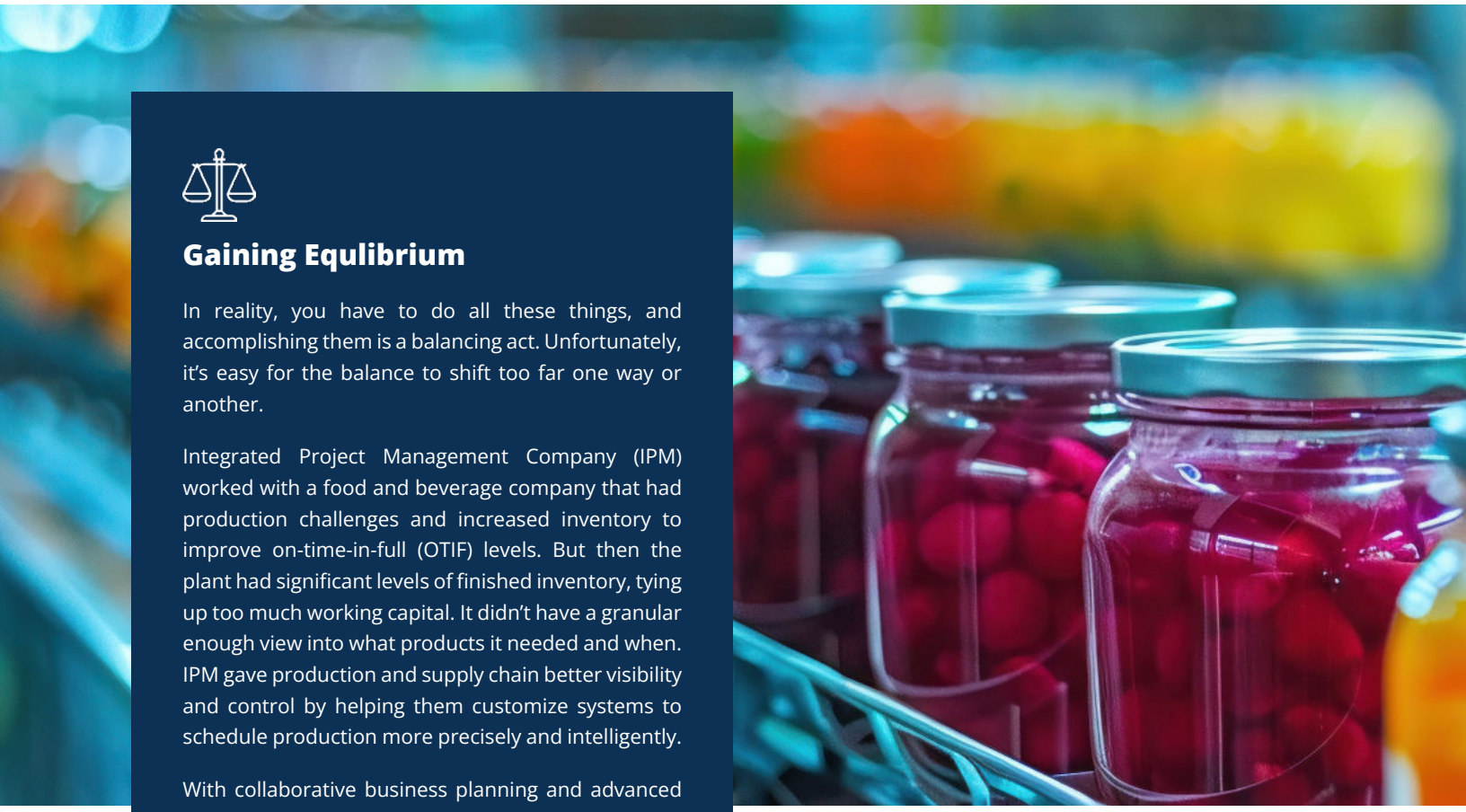
**There is a dynamic, recurring tension in manufacturing operations among the concurrent needs to minimize production costs, meet contractual obligations to customers, and minimize inventory.**

The push-and-pull plays out in many ways:

- *Flexibility for shorter runs, more products, and last-minute changes (which cost more in labor, equipment use, and waste) vs. the stability, predictability, and economy of long production runs and minimal changeovers.*
- *Running up finished goods inventory levels vs. tying up working capital.*
- *Complexity from the variety of sizes, flavors, and packaging formats vs. production line efficiency.*
- *Customer relationships, aggressive sales teams, and strategic commitments vs. schedule adherence, minimized expedited shipping costs, and minimized overtime.*

It's rational for each group to act according to its own interest. The production team has the goal of making products at the lowest cost per unit. Supply chain managers want to maximize service levels and minimize inventory.



## Gaining Equlibrium

In reality, you have to do all these things, and accomplishing them is a balancing act. Unfortunately, it's easy for the balance to shift too far one way or another.

Integrated Project Management Company (IPM) worked with a food and beverage company that had production challenges and increased inventory to improve on-time-in-full (OTIF) levels. But then the plant had significant levels of finished inventory, tying up too much working capital. It didn't have a granular enough view into what products it needed and when. IPM gave production and supply chain better visibility and control by helping them customize systems to schedule production more precisely and intelligently.

With collaborative business planning and advanced techniques and technology, operations teams can balance customer demand and production efficiency in a nuanced way. Importantly, the balance can change as needed, like a skilled conductor leading an orchestra, subtly adjusting tempo and dynamics in real time to create perfect harmony. For example, if you need to maximize OTIF or build up inventory in advance of a promotion, you can use digital twins or simulation modeling to test how best to do that without causing problems.

## Build Cross-Functional Alignment

Such nuanced balance requires a finely tuned team. Encouraging collaboration among different departments, including supply chain, production, procurement, sales, and marketing, can improve the accuracy of demand forecasts and the efficiency of production schedules.

In cases where they have goals that seem to conflict, such as producing more volume vs. producing more variety, they can find common ground. Shared objectives will help them meet the company's vision and key performance indicators (KPIs).

Bring together teams monthly to align on what's realistic in the forecast and identify potential risks. If there are upcoming promotions or new customer contracts, they will have a chance to negotiate trade-offs up front. Segmented service levels can be a helpful tool. For example, not all customers need 98 percent OTIF. Some may allow more variability, giving production more flexibility.

Integrated business planning (IBP) and sales and operations planning (S&OP) software helps to align demand, supply, inventory, and finance into one plan. Many platforms enable scenario planning, demand–supply balancing, and executive dashboards for making trade-offs.

## Technology Enables Data-Driven Decision-Making

Similarly, advanced demand planning and production scheduling technology solutions can work together to optimize both inventories and schedules. If they are tailored to your business structure, goals, and limitations, these tools let you move from a static approach to dynamic decision-making. You can shift a few degrees this way or that to accommodate seasonal orders, upcoming shutdowns, new product launches, etc.

***Demand forecasting and planning software*** uses historical data, market data, and sometimes artificial intelligence and machine learning to create more accurate forecasts. The intention is to improve customer satisfaction, on-time delivery, and finished inventory.

Advanced analytics tools can help identify patterns and trends that inform demand forecasts through statistical models, machine-learning algorithms, and techniques such as time-series analysis, regression models, and causal models.

***Production scheduling and optimization*** helps manage plant capacity, optimize run sequences, and reduce downtime. The intention is to ensure manufacturing processes run smoothly, resources are used efficiently, and production costs are kept in check.

Production scheduling software typically enables planners to improve:

- **Capacity planning:** *using historical data (vs. theoretical or expected) to assess the production capacity required to meet demand, including evaluating the availability of machinery, labor, and materials, and ensuring that production schedules are feasible.*
- **Resource allocation:** *assigning labor, equipment, and materials to specific production tasks to minimize downtime and maximize productivity.*
- **Production sequencing:** *determining the best order in which to manufacture products, considering factors such as setup times, product similarity, allergens, changeover costs, and production priorities.*
- **Monitoring and control:** *continuously tracking production progress and adjusting as needed in real time.*

IPM tailored and optimized advanced production planning software for a food and beverage manufacturing plant. The facility's 11 lines produced both ready-to-eat and ready-to-cook goods, and the company wanted to increase volume. IPM studied the plant's existing production processes, scheduling methods, and historical data to customize the software and sequence production. Using the tool's analytics, we worked with the plant to completely separate ready-to-eat products and sequence similar products to reduce changeover hours by 25 percent. Because the software includes scenario planning, they can test different "levers" to determine how to maximize capacity and still meet their cost goals and inventory targets.

***Simulation tools like digital twins*** also enable companies to visualize trade-offs. What happens to costs if demand increases by X percent? If you dedicate a manufacturing line to a specific product family, what is the impact on overall factory throughput? Creating contingency plans for different demand levels, production disruptions, and other uncertainties can improve your ability to respond quickly and effectively. Not only are you more proactive, but you will also be able to determine options.

IPM's consultants worked with management at a food plant to model a new production planning method that would change inventory strategy. The digital twin gained the trust of leadership, who approved a test pilot. In the month-long test, the production line achieved an 18 percent reduction in changeover hours, which amounted to more than 150 line-hours. Because the factory was in cost-reduction mode and not over capacity, they could use those hours to rebalance production and shut down lines on certain shifts.

## Understanding Complexity's Dual Impact in F&B Manufacturing

**Complexity isn't inherently negative. While often challenging, it can also deliver critical advantages.**

- Customized products drive customer loyalty.
- Unique recipes/formulations create competitive barriers.
- Flexible product portfolios protect market share.
- Variety increases the ability to serve diverse market segments or channels.

**But there are challenges that need to be managed to avoid unnecessary complexity.**

- Inefficient scheduling can cause excessive downtime and frequent changeovers.
- You risk escalating inventory and spoilage costs.
- It is more difficult to maintain consistent quality standards.
- Service levels can decline, and overtime costs can increase.

***Balancing beneficial complexity, which strengthens market position, against unnecessary complexity, which erodes margins and agility, is crucial to sustainable growth.***

## Achieving Balance

The ability to quickly adapt to changes in demand or production conditions is crucial. It requires a responsive supply chain, agile production processes, and real-time data analytics to make informed decisions.

If demand planners and manufacturing operations personnel treat each other as enemies ("They're always changing the plan!" "They never deliver on time!"), leadership needs to get them aligned. When they work as a unit, the organization can better balance demand planning and production efficiency.

You'll never eliminate this tension completely, nor should you. Support it with information and real-time tools that produce best-case, cost-effective scenarios. Managed deliberately—with the right structure, information transparency, and discernable and actionable options—the facility will stop reacting from crisis to crisis and begin controlling critical variables that enable balancing service, cost, and inventory like never before.

**Integrated Project Management Company, Inc.**

is a business consulting firm focused on planning and implementing strategically critical initiatives across multiple industries, including life sciences, healthcare, consumer products, and industrial products. Since its inception in 1988, IPM has served more than 600 clients and completed more than 5,000 projects. Headquartered in Chicago, IPM has regional offices in Boston, St. Louis, Los Angeles, San Francisco, Minneapolis, and Parsippany. IPM was a recipient of the 2018 Malcolm Baldrige National Quality Award. To learn more about IPM and its services, visit *www.ipmcinc.com* or call 630-789-8600.