White Paper

Enabling Autonomous Supply Chain Planning and Optimization in the Food and Beverage Industry

Part One: Planting the Seeds for Success from Farm to Fork

Executive Summary

As a food manufacturer, you face a big list of tough supply chain challenges including long raw material lead times, volatile commodity price fluctuations, safety and quality issues, demand uncertainty and seasonality, high promotional activity, product perishability, frequent new product introductions [NPIs], exacting distribution requirements, complex manufacturing constraints, strict legal and regulatory requirements, and increasing customer expectations.

Whew! The list is long but there is good news. A convergence of people, process, data, and technology capabilities, including those listed below, makes the timing ripe to take your food and beverage supply chain to the next level.

- Automation through artificial intelligence and machine learning capabilities
- More mature and user friendly supply chain planning and optimization solutions
- Proven supply chain optimization algorithms
- Access to richer internal and external structured and unstructured data
- Technology savvy workforce—Millennials/Generation Z

Part One of this white paper presents the capabilities required to build a strong digital supply chain planning foundation, and Part Two covers the next steps food and beverage companies should take to reap the greatest harvest from supply chain investments.

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- Enables increased revenues and higher profits
- Drives improved customer service
- Identifies opportunities to improve product quality

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- Enhance product quality

Supply Chain Master Data Management

Turn supply chain data into actionable information

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- Ensure success through Good Manufacturing Practices (GMP)
- Enhance reputation with Corporate & Social Responsibility (CSR)

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- Reduce cancellations / chargebacks

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- Sense & respond to demand changes
- Reduce inventory & speed delivery
- Increase service levels

Integrated Business Planning (IBP)

Profitably align & synchronize operations

Retail Optimization
- Increase consumer satisfaction
- Enable cross-channel planning
- Automated allocation and replenishment

Planting the Seeds for Success from Farm to Fork

To establish a firm foundation for success, food and beverage companies must have knowledgeable and experienced people enabled by intelligent and agile systems to master the foundational supply chain planning processes listed below:

1. Market-driven Demand Planning
2. Advanced Inventory Management
3. Time-Phased Replenishment Planning
4. Demand-Driven Manufacturing Planning
5. Sales and Operations Planning [S&OP]
6. Supply Chain Master Data Management

Let's take a closer look at each area.

There needs to be a "business forecast champion" who understands the value of developing and using a consensus demand plan.

Advanced demand optimization solutions align high-level business planning with detailed product forecasting to boost service levels, shorten cycle times, reduce inventory investment and minimize obsolescence.

Market-driven Demand Planning

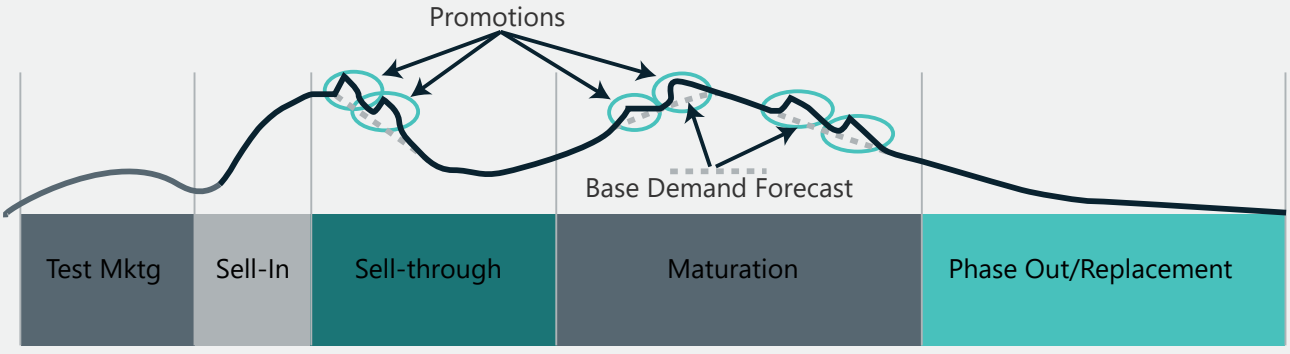
The issue: Most companies recognize the importance of a repeatable and accurate forecasting process. Accurate forecasts help minimize inventory, maximize production efficiency, streamline purchasing, optimize distribution and ensure confidence in company projections. However, developing a market-driven demand plan that people in different areas and roles can use to develop individual operating plans can be very challenging.

The "must-have:" There needs to be a "business forecast champion" who understands the value of developing a market-driven demand plan—someone who has the organizational influence to lead process improvement, motivate people and identify new technology-enabling capabilities. The demand planning team itself must include members who feel comfortable with statistics and data analysis, and can collaborate and negotiate with other business functions to drive to a consensus plan and quickly respond when market conditions change. Additionally, the champion and team need a modern demand planning solution, one that enables the development of rich forecasts based on multiple inputs, facilitates collaboration on a consensus demand plan that works for all functional teams, and enables an optimal response to short term market-based demand signals.

Advanced demand optimization solutions align high-level business planning with detailed product forecasting to boost service levels, shorten cycle times, reduce inventory investment and minimize obsolescence. The right demand planning solution can generate vital visibility for stakeholders across your global supply chain network including suppliers, partners and customers, and provide a fact-based foundation for your S&OP process.

Industry-leading forecasting solutions can automatically generate forecasts at business levels you define, from sales and marketing to logistics and financials. Automatic model selection ensures that the best-fit forecasting method is applied at every stage of a product's life cycle. Additionally, advanced solutions leverage machine learning to automatically adjust parameters and boost forecast accuracy while freeing up a planner's time to work on other value-added activities.

Product life cycle forecasting—
Automatically increase visibility into the demand patterns across a product's life cycle including new, mature or dynamic products, and increase accuracy to drive revenue and boost profitability



Advanced Inventory Management

The issue: Inventory is one of the most visible supply chain expenses. For public companies, inventory appears on the Balance Sheet under Current Assets. The amount of inventory required is a byproduct of customer service levels, supply chain design, product quality and a company's ability to predict demand, buy and produce in a timely manner and agilely respond to market demand. Basic inventory policies that do not consider demand variability, customer service targets, lead-time and lead-time variability of each product/location combination will result in misaligned inventory positions.

The "must-have:" An advanced inventory planning solution provides the power to automatically determine the proper inventory control parameters for each SKU/location combination leading to improved customer service at overall lower inventory investment levels.

Inventory planning allows you to effectively measure the trade-off between specific inventory investments and desired customer service levels. The right solution allows you to simulate and analyze the trade-offs of various inventory strategies across a wide spectrum of customers, products and distribution centers, and consider market factors like seasonality, promotions and new product introductions to have the greatest impact on your business.

Inventory planning allows you to automate and analyze the trade-offs between inventory investment and desired customer service levels. Replenishment planning software lets you accurately project demand, supply and inventory levels into the future to create a realistic picture of product and material requirements.

Time-Phased Replenishment Planning

The issue: Leveraging your demand plan and inventory strategies, replenishment planning provides future visibility of customer demands, product and material requirements, and the actions needed by suppliers and manufacturing to efficiently satisfy market demand. As you are increasingly asked to manage inventory at customer locations or guarantee a rapid replenishment cycle, advanced replenishment planning solutions can help develop a cost-effective supply chain strategy that ensures customer service levels remain high while costs are minimized.

The "must-have:" Become proactive with a Replenishment Planning solution that optimally calculates demand, supply and inventory levels into the future to create a realistic picture of product and material requirements. You can easily consider the effects of inventory investment, service levels, and current orders and commitments. Leveraging Time-phased Replenishment Planning, you can evaluate inventory from multiple perspectives: actual demand data, future distribution needs and replenishment commitments. Advanced probabilistic safety stock methods minimize inventory investments and create time-phased replenishment orders for each item.

Demand-Driven Manufacturing Planning

The issue: In some food and beverage companies, manufacturing facilities operate somewhat independently from the rest of the supply chain. Food and beverage manufacturing plants tend to be very capital intensive and often the goal is to maximize the output of these expensive resources. Unfortunately, focusing too much on manufacturing efficiency can lead to large batch sizes that are often misaligned with actual customer demand. A better approach is to focus on minimizing the end-to-end supply chain costs required to meet customer demand.

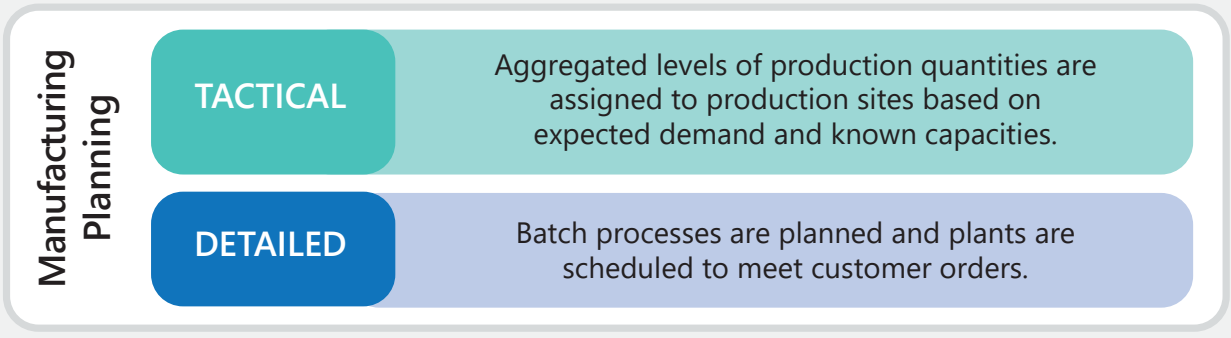
The "must-have:" Manufacturing planning uses the demand, inventory and replenishment plan to synchronize how much of specific products to produce to minimize cost while meeting customer service goals. Manufacturing planning helps to develop capacity plans and detailed schedules that respect manufacturing constraints, optimize changeovers and synchronize inventory of finished goods and raw materials with demand.

The right manufacturing planning solution gives you the power of multi-plant planning with the detail of single-plant scheduling. With this type of powerful solution, you can:

- Manage single and multi-period forecast consumption, demand netting against inventory and time phased safety stock policies
- Create feasible manufacturing plans
- Update released manufacturing orders to allow planning logic to extend far beyond the capabilities of shop order sequencing
- Manage shelf-life expiration of on-hand lots, planned production and planned receipts of raw materials, intermediates and finished goods
- Pinpoint capacity and material exceptions with easy-to-use visual tools

Manufacturing planning helps to develop capacity plans and detailed schedules that respect production constraints, optimize changeovers and lower inventory of finished goods and raw materials.

Independent planning activities create difficult handoffs



Sales and Operations Planning [S&OP]

The issue: Whereas manufacturing planning helps a company balance supply and demand in the shorter term, Sales and Operations Planning focuses on aligning and balancing supply and demand over the tactical and strategic time horizons while aligning with company financial goals and objectives.

The "must-have:" Sales and Operations Planning can transform diverse information from sales, production, finance, marketing, transportation and procurement into one powerful business plan. With a comprehensive S&OP solution, you can cut days or weeks from your planning process, automate the planning cycle and complete multi-divisional analysis in a fraction of the time. S&OP best practices let you compare multiple business scenarios, evaluate critical strategies, and prepare contingency plans to avoid risk and respond when market conditions change.

The S&OP process should focus on identifying misalignments and problems far enough into the future to provide time to make significant changes to head off the issue. Instead of determining detailed manufacturing schedules, S&OP should center on decisions such as whether to staff an additional shift, add new equipment, build new facilities, develop new partnerships, and when to launch new products or new markets. Data used in the S&OP process should be at an aggregated level and focused at helping executives determine tradeoffs between business alternatives.

S&OP process diagram

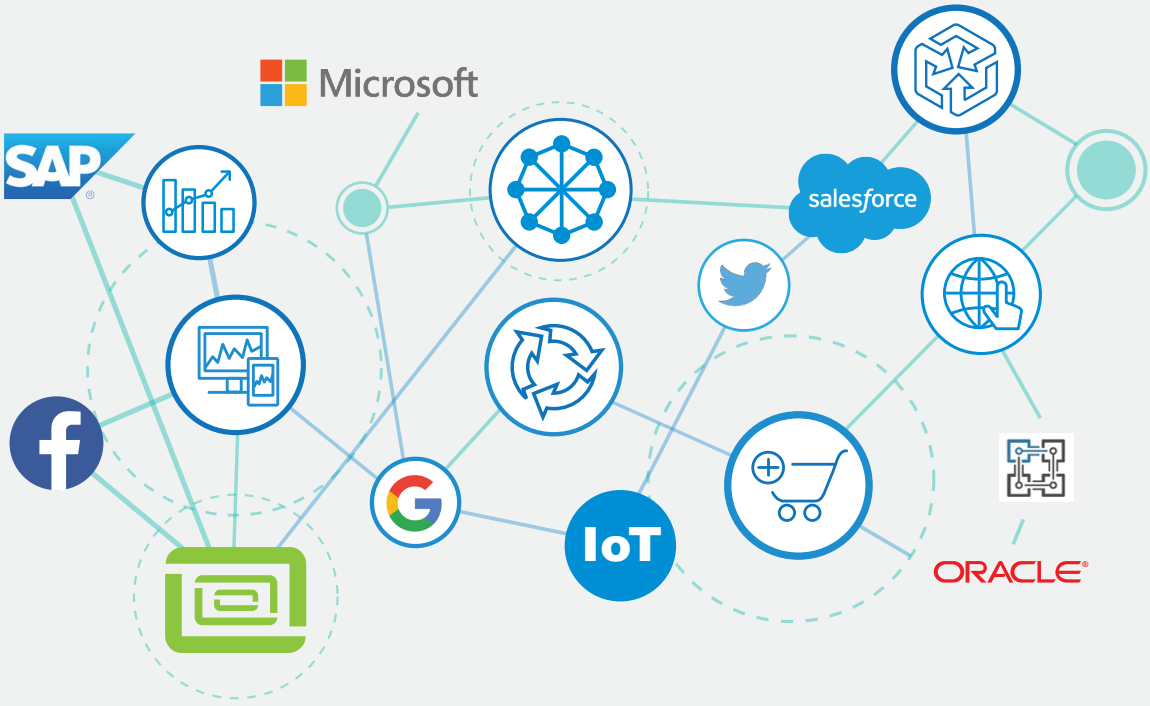
Supply Chain Master Data Management

As the food and beverage industry continues to increase complexity, you may find that your enterprise resource planning [ERP] and related enterprise business solutions do not provide the breadth and depth of data capabilities needed to support advanced supply chain planning and optimization. The continued adoption of more mature business processes—plus the ability to leverage the Internet-of-Things [IoT] and Artificial Intelligence—is driving the need to connect data from multiple enterprise systems as well as external data sources.

Connecting multiple data sources to gain increased visibility and greater accuracy requires a supply chain master data management strategy to simplify the process and feed your supply chain planning and optimization solutions. By simplifying enterprise integration and streamlining the upgrade process, you can realize lower total cost of ownership and leverage the latest supply chain planning and advanced analytics innovations.

The continued adoption of more mature business processes is driving the need to connect multiple enterprise systems across your organization and input more structured and unstructured data from external data sources.

The connected enterprise



Automate and Optimize to Accelerate Your Business

Attaining superior supply chain planning and optimization capabilities has become a necessity for survival for food and beverage companies in today's highly competitive global environment. Food and beverage companies need to build a strong foundation of supply chain capabilities today to be in a position to take advantage of more mature capabilities.

Industry-leading technology enables a strong supply chain planning foundation including; market-driven demand planning, advanced inventory control, time-phased replenishment plans, demand centric manufacturing plans, sales and operations planning and supply chain master data management. These planning capabilities lay the foundation on which to build advanced supply chain planning and optimization capabilities, including supply optimization, multi-echelon inventory optimization, advanced planning and scheduling, integrated business planning, supply chain master data management, and a digital supply chain.

Excelling at supply chain planning and optimization creates a recipe for efficient and profitable operations and provides a competitive advantage for any food or beverage company. It's time to thrive in the digital age or get left behind.

Download Part Two

About Logility

Accelerating the sustainable digital supply chain, Logility helps companies seize new opportunities, sense and respond to changing market dynamics and more profitably manage their complex global businesses. The Logility® Digital Supply Chain Platform leverages an innovative blend of artificial intelligence [AI] and advanced analytics to automate planning, accelerate cycle times, increase precision, improve operating performance, break down business silos and deliver greater visibility. Logility is a wholly owned subsidiary of American Software, Inc. [NASDAQ: AMSWA].

To learn how Logility can help you make smarter decisions faster, visit www.logility.com.

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