

# Supply Chain Planning in the Food and Beverage Industries

## Planting More Opportunities for Success

WHITE PAPER

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Data-driven planning + analytics-driven insight + powerful optimization = a great recipe for food and beverage companies

### 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, high demand uncertainty and seasonality, high promotional activity, 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 advanced supply chain planning, optimization capabilities and powerful analytics, along with the changing market conditions listed below, makes the timing ripe to take your food and beverage (F&B) supply chain to the next level

- Less expensive and more powerful computers
- More mature and user friendly supply chain solutions
- Access to richer internal and external structured and unstructured data
- Proven supply chain optimization algorithms
- Technology savvy workforce—Millennials

In this paper we will discuss the capabilities required to build a strong supply chain planning foundation and next steps food and beverage companies should take to reap the greatest harvest from supply chain investments.

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Decisions based on data and the application of powerful algorithms, not emotions, can help stakeholders concentrate on building a highly efficient supply chain, enhancing throughput and achieving operational flexibility.

## Sowing Seeds for Supply Chain Planning & Optimization

To establish a firm foundation for success, food and beverage companies must leverage the flexible processes in the list below, run by knowledgeable and experienced people, enabled by integrated and agile systems:

- Consensus Demand Planning
- Advanced Inventory Management
- Time-Phased Replenishment Planning
- Demand-Driven Manufacturing Planning
- Sales and Operations Planning (S&OP)

Let's take a closer look at each area.

### Consensus 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 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 and using a consensus demand plan—someone who has the organizational influence to lead process improvement, motivate people and identify new technology-enabling improvements. 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. Additionally, the champion and team need a modern demand planning solution, one that enables the development of baseline forecasts and facilitates collaboration on a consensus demand plan that works for all functional teams.

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.

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

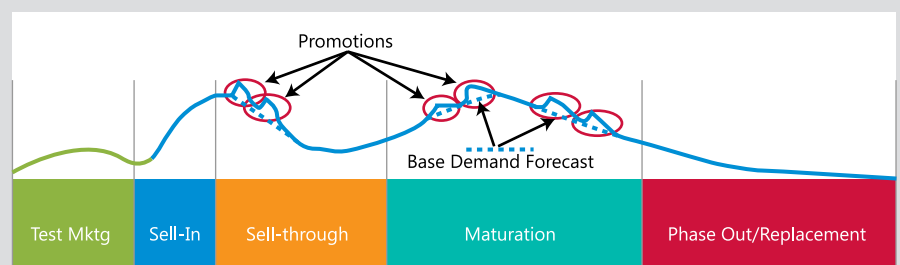


Figure 1. Product Life Cycle Forecasting—Increase visibility into the demand patterns across a product's life cycle including new, mature or dynamic products, and increase accuracy to drive revenue and boost profitability

Modern forecasting models can automatically generate forecasts at business levels you define, from sales and marketing to logistics and financials (Read more/ Download the [\*Eight Methods that Improve Forecast Accuracy White Paper\*](#)). Automatic model switching ensures that the best-fit forecasting method is applied at every stage of a product's life cycle.

## Advanced Inventory Management

**The issue:** Inventory is one of the most visible supply chain expenses. For public F&B companies, inventory is a line 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 and produce in a timely manner. Basic inventory policies that do not consider the unique 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 levels. Optimal inventory control parameters can then be uploaded to a company's manufacturing, purchasing and distribution solutions to ensure the right raw materials are purchased at the right time, the right products are produced at the right time, and the right products are moved to the right distribution location at the right time to meet customer requirements.

Inventory planning allows you to effectively measure the trade-off between inventory investment 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.

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## Time-Phased Replenishment Planning

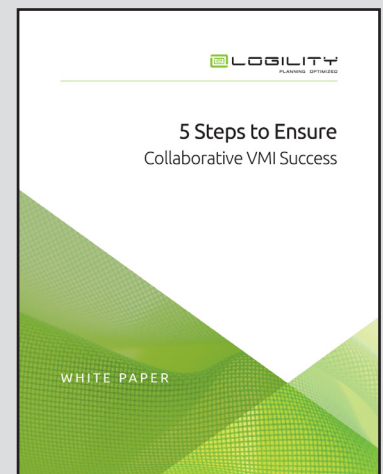
**The issue:** Using the outputs from demand and inventory planning, replenishment planning provides future visibility of customer demands, product and material requirements, and the actions needed by suppliers and manufacturing to efficiently satisfy market demand. As you are increasingly asked to manage 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:”** To resolve potential problems in advance, 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. You can easily consider the effects of inventory investment, service levels, and current orders and commitments. Leveraging Distribution Resource Planning (DRP), you can gain multi-level insights into demand and inventory. You can view 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.

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.

### Five Steps to Ensure Collaborative VMI Success

1. Select the Right Trading Partner
2. Be Flexible
3. Document Expectations
4. Understand the Data
5. Automate Where Possible



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## Demand-Driven Manufacturing Planning

**The issue:** In some food and beverage companies, manufacturing facilities operate somewhat independently from the rest of the supply chain. F&B 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. Less efficient operations in one area of the supply chain can lead to greater efficiencies in other areas, providing a lower overall supply chain cost.

**The “must-have:”** Manufacturing planning uses the output from demand, inventory and replenishment planning to synchronize how much of what products to produce to minimize cost while meeting customer requirements. Manufacturing planning helps to develop capacity plans and detailed schedules that respect manufacturing constraints, optimize changeovers and lower inventory of finished goods and raw materials.

Manufacturing planning helps you create long-term capacity plans and short-term detailed schedules that can increase production throughput, respect manufacturing constraints, optimize changeovers, and lower inventory of finished goods and raw materials.

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

- Manage single and multi-period forecast consumption, demand netting against inventory and time phased safety stocks
- Create optimal planning manufacturing orders
- 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

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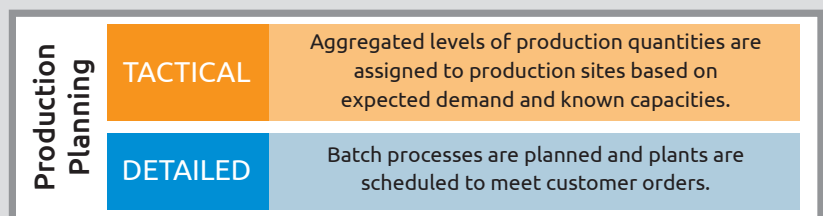


Figure 2. Two levels of manufacturing planning



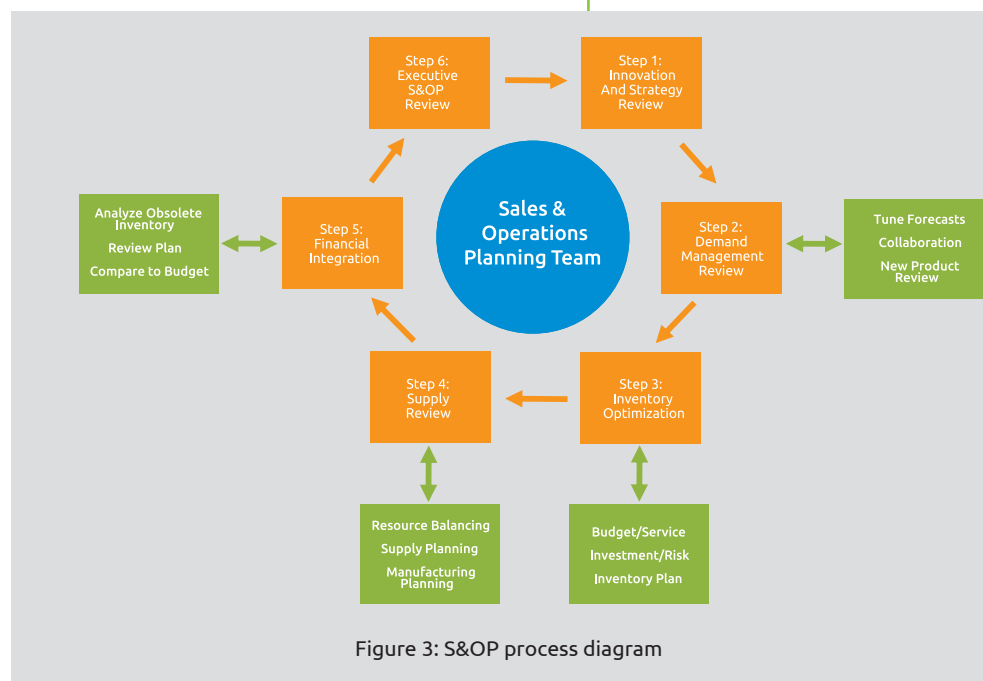
## Sales and Operations Planning (S&OP)

**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 time horizon while aligning with company financial objectives.

**The “must-have:”** Sales and operations planning can transform diverse information from sales, production, finance, marketing, transportation and procurement into one powerful central resource. With a comprehensive S&OP solution in place, you can cut days or weeks from your planning process, streamline the planning cycle and complete multi-divisional analysis in a fraction of the time. S&OP best practices let you compare multiple “what-if” scenarios, evaluate critical decisions, and prepare contingency strategies to avoid risk and pre-empt your competition when market situations 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.

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## What's Next: Six Areas to Take Supply Chain Planning & Optimization to the Next Level

Without a doubt, the supply chain organizations in F&B companies face mounting pressure to reduce costs, add more value and do more with fewer resources. Once your supply chain planning foundation is established, these six areas are the logical places to focus if you want to develop more mature supply chain practices and add more value to your organization:

### 1. Supply Planning and Optimization

The ultimate goal of supply planning is to minimize total supply costs while meeting demand requirements. The only way to accomplish this is through solving for the optimal plan while simultaneously considering all constraints, costs and capacities across the extended supply chain. Supply planning enables you to profitably satisfy market demand through dynamically sourcing materials, optimizing production and manufacturing plans, reducing distribution costs and slashing lead times.

Food and beverage companies run on razor-thin margins. Optimizing end-to-end supply chain operations should be a top objective of an F&B supply chain leader.

A supply planning solution should provide powerful yet flexible and easy-to-use optimization capabilities; have the ability to evaluate multiple supply plan alternatives through numerical and graphical simulations; and be able to perform multiple “what-if” analysis. The system should incorporate both volumetric and financial information to enable evaluation of supply, production, transportation and storage alternatives in the context of financial impacts.

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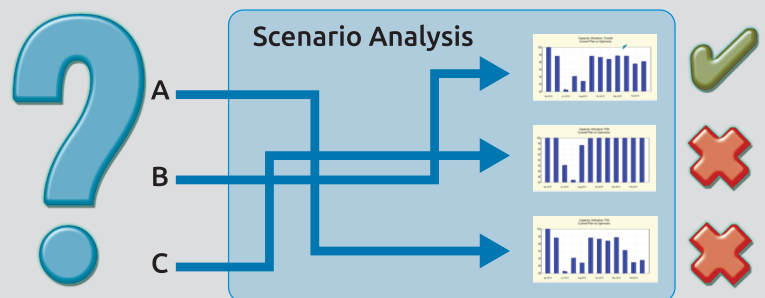


Figure 4: “What-if” scenario analysis

## 2. Multi-Echelon Inventory Optimization (MEIO)

Many inventory optimization efforts determine the best finished good inventory positions at each inventory stocking location independent of other stocking locations, raw and work in process inventory. Location-by-location and type-by-type inventory optimization produces sub-optimal results.

A superior method is to take a holistic approach to inventory optimization by considering all levels and locations of inventory within an enterprise simultaneously (Multi-Echelon Inventory Optimization [MEIO]). Properly executed, MEIO provides deeper insight into the inventory challenges of an end-to-end supply chain, including manufacturing, distribution centers, suppliers and in-transit product. An MEIO approach addresses both demand and supply variability determining the optimal locations to hold inventory in the optimal amounts to minimize overall system inventory while meeting customer requirements.

Companies that have implemented a MEIO strategy have been able to reduce total system inventory by 20% or more. F&B supply chains tend to be inventory rich with average days of inventory still hovering in the high 30 range. Reducing inventory by 20% or more while maintaining or improving customer fill rates should be a high priority project for any F&B company.

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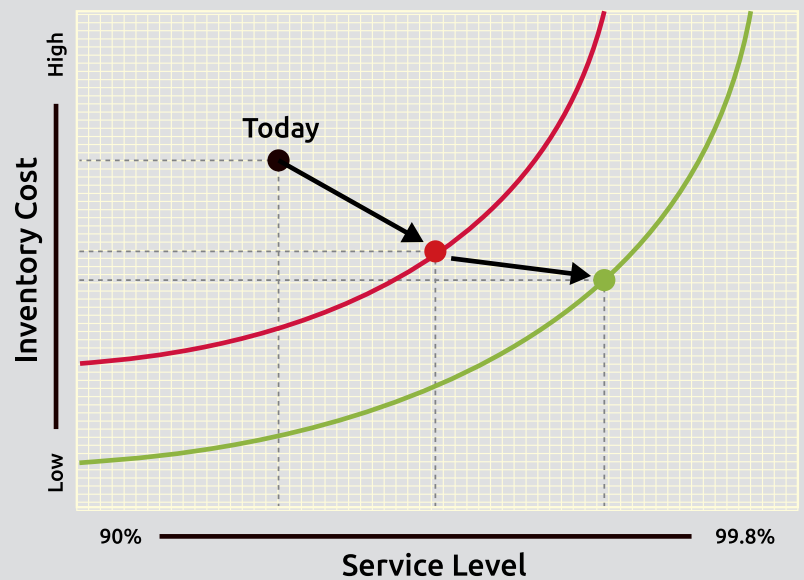


Figure 5: Efficient Frontier—MEIO considers demand variability and supply reliability to determine inventory investments required to achieve service goals

### 3. Advanced Planning and Scheduling (APS)

As food and beverage manufacturers become more demand-driven, often there is a shift toward more frequent changes in production runs. These market requirements must be balanced with the traditional desire for maximum production efficiency. Changeovers are among the most difficult constraints to optimize, and this places even greater pressure on manufacturing teams to be more agile to minimize lost production time and capacity.

You can minimize changes due to activities such as allergen cleans and packaging configuration by optimizing the sequence of products through the manufacturing line. If changeovers vary considerably, you may need to optimize the sequence of the products in a given production timeframe.

Every manufacturing plant has its own distinct characteristics and operating requirements, so your planning solution must quickly adapt to the characteristics of the plant and not the other way around. Efficient capacity utilization depends on an advanced manufacturing planning system's ability to represent changeovers easily and to prescribe the optimal production sequence that delivers the required output with minimal changeover downtime. It must plan and optimize sequence-dependent changeovers with scheduling granularity of hours and minutes, not daily buckets.

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## 4. Transportation Optimization

Inbound and outbound transportation is one of the largest expenses for F&B supply chains. Food and beverage products are either very bulky and/or very heavy, are often transported within a certain temperature range and have very small delivery windows. For all of these reasons and more, deploying an advanced transportation planning and management (TPM) system is critical for your success in the F&B industry.

An advanced TPM provides the key for F&B companies to gain real-time information on orders, shipments and global inventories across the supply chain. It can facilitate collaboration with customers, suppliers and transportation providers to increase efficiency and accuracy on deliveries.

Automated, exception-driven and based on real-time information, an advanced transportation planning and management solution should deliver five essential elements:

1. Optimized multi-modal shipment planning and carrier selection
2. Real-time transportation visibility in shipment management
3. Financial risk mitigation in freight accounting
4. Rules-based automation and management by exception
5. Trading partner communication and stakeholder collaboration

With these elements in place, TPM transforms into a strategic business weapon that automates and optimizes the flow of orders and shipments from order management systems through the shipment life cycle to the settlement process in financial systems.

An advanced transportation planning and management system (TPM) provides the key for F&B companies to gain real-time information on orders, shipments and global inventories across the supply chain.

| Shipment Planning              | Shipment Management        | Freight Accounting      |
|--------------------------------|----------------------------|-------------------------|
| Visibility to all orders       | Load tendering and bidding | Audit and payment       |
| Load building and optimization | Private freight exchange   | Self-invoicing          |
| Mode/carrier selection         | Scheduling                 | Allocation and accruals |
| Multi-modal freight rating     | Shipping and tracking      |                         |

Figure 6: Typical Transportation Planning and Management (TPM) solution capabilities

## 5. Integrated Business Planning (IBP)

Today most F&B companies conduct a tactical sales and operations planning (S&OP) process to align and synchronize supply with demand. Many also have strategic planning processes for financial planning and long-term investment decisions. However, few F&B companies have integrated their tactical and strategic planning processes. S&OP and strategic planning processes are run by different people—based on different data and business assumptions—and therefore they produce completely separate plans.

Integrated Business Planning (IBP) gives you the opportunity to unite strategic and tactical planning to represent both volumetric and financial information into one flexible planning and decision support system for strategic and tactical planning. IBP combines data from sales, marketing, production, procurement, transportation and finance to create a powerful decision center for all stakeholders. By removing organizational and technology barriers and aligning and synchronizing plans, an IBP platform ensures your business plans are rooted in feasible supply chain network capabilities, with resources and investments deployed where they are most effective in achieving business goals.

Because IBP involves multiple collaborative, cross-functional processes, it requires a technology solution specifically designed to accomplish these tasks within one holistic shared platform. A superior IBP platform must provide collaborative workflow, configurable alerts, active messaging capabilities, and powerful algorithms to streamline and facilitate plan development. Also crucial is the flexibility to view data in varying time horizons from weekly to yearly and from five years of history to ten years of projections. The ability to aggregate and disaggregate data allows team members to analyze data and develop plans at the level appropriate to their position, while staying synchronized with users planning at other levels of aggregation. Finally, an IBP solution must work in various volumetric measures and in multiple currencies.

Integrated Business Planning (IBP) gives you the opportunity to unite strategic and tactical planning to represent both volumetric and financial information into one flexible planning and decision support system for strategic and tactical planning.

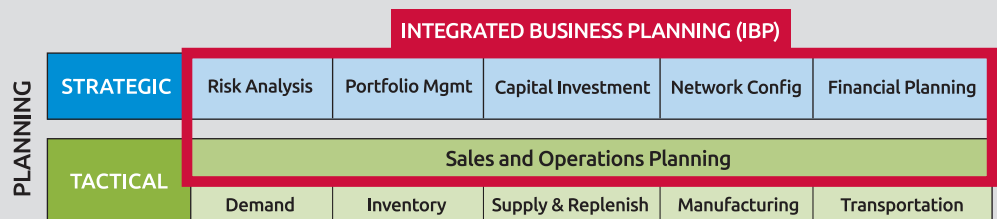


Figure 7: Integrated Business Planning

## 6. Supply Chain Master Data Management

As the F&B industry continues to increase in speed and 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 such as Integrated Business Planning, Multi-Echelon Inventory Optimization, Advanced Planning and Scheduling, and Supply Optimization, plus the ability to leverage the Internet-of-Things (IoT), further drives the need to connect multiple enterprise systems across your organization.

A supply chain system integration and master data management solution can simplify the process of connecting disparate systems to a supply chain planning and optimization solution while also enabling the ability to incorporate information that originates from external systems. By simplifying the integration and upgrade process, you can realize lower total cost of ownership and increase the rate of system adoption within your organization.

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## Conclusion

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. F&B companies need to build a strong foundation of supply chain capabilities today to be in a position to take advantage of more mature capabilities in the future.

Industry-leading technology enables a strong supply chain planning foundation including; consensus demand planning, advanced inventory control, time-phased replenishment plans, demand centric manufacturing plans, and sales and operations planning. 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, transportation optimization, integrated business planning, and supply chain master data management.

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.



## About Logility

With more than 1,250 customers worldwide, Logility is a leading provider of collaborative supply chain optimization and advanced retail planning solutions that help small, medium, large, and Fortune 500 companies realize substantial bottom-line results in record time.

Logility Voyager Solutions™ is a complete supply chain management and retail optimization solution that features a performance monitoring architecture and provides supply chain visibility; demand, inventory and replenishment planning; sales and operations planning (S&OP); integrated business planning (IBP); supply and inventory optimization; manufacturing planning and scheduling; retail merchandise planning, assortment and allocation; and transportation planning and management.

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