Putting Together the Pieces

The 2013 Guide to S&OP Technology Selection

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Research

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Disclosure

Your trust is important to us. As such, we are open and transparent about our financial relationships and our research processes.

Research Methodology and Overview

This is the second year that we have published this report. It is designed to be part of a sequence of reports. Here are links to the prior reports:

- **Building Market-Driven Value Networks**
- **Market-Driven Sales and Operations Planning**
- **Putting Together the Pieces 2012**

This report is based on eleven years of observations of the Sales and Operations Planning software market's evolution. It is built on the premise that the best research is based on year-over-year studies and ongoing market triangulation. Input for the report includes:

- **Supply Chain Insights Quantitative Research Findings Over Two Years (for more on this see the Appendix).** Supply Chain Insights has completed multiple studies on the use of Advanced Planning Systems within manufacturing and retailing companies.
- **Vendor Briefings.** Structured interactions with suppliers of technology over the past ten years.
- **Discussions with Software Vendor Client References.** On an ongoing basis, vendors will supply references to analysts to substantiate their software claims. These are one-hour phone conversations.
- **Dialogues with Supply Chain Consultants Implementing Software.** During conferences, and through ongoing dialogues, discussions about the implementation of S&OP technologies have taken place over the years. In the process of writing this report, several experienced software implementers were consulted for input.

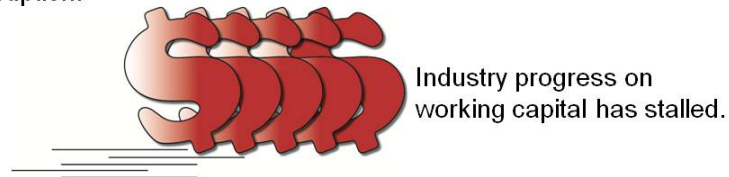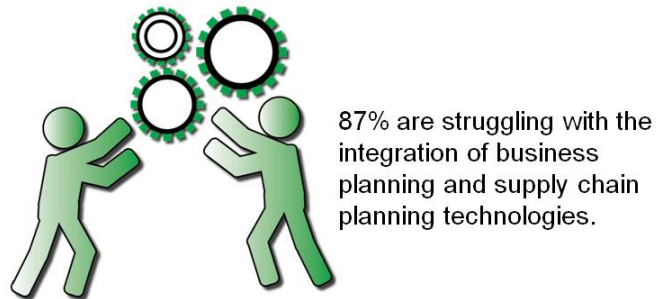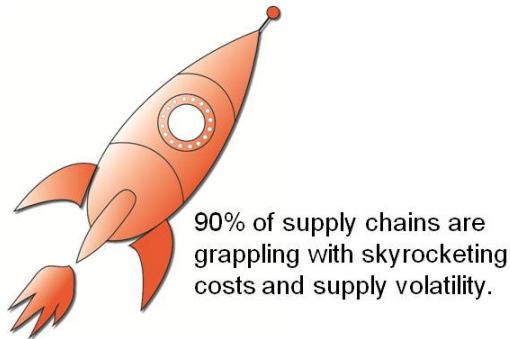- **Personal Observations of Clients Implementing Sales and Operations Planning Software.** The author of this report has worked with over 150 companies implementing S&OP software. Those observations are reflected in this report.

Before the final publication of this report, each of the vendors listed in the Appendix was asked to comment on the factual accuracy of their solution overview/descriptions.

Executive Overview

Supply chain practices are now three decades old. Over the past 30 years, supply chains have increased in complexity and become more central to driving business results. They have morphed from chains to networks requiring inter-enterprise global connectivity. It is no longer a discussion of internal and static processes. For organizations, today it is much more dynamic and fluid. For manufacturers and distributors, supply chain is now business.

90% of supply chains are grappling with skyrocketing costs and supply volatility.

87% are struggling with the integration of business planning and supply chain planning technologies.

85% of supply Chains experienced a disruption.

Companies have multiple S&OP processes.

Industry progress on working capital has stalled.

Sales and Operations Planning (S&OP)—the process of aligning demand and supply to drive a business outcome—has become more important to power growth, improve resiliency and drive efficiency improvements. Process maturity requires technology, and it cannot be sustained without it. The questions are what to buy, how to buy it, and when. That is the purpose of this report.

The selection of a solution is not easy. There are multiple solutions. In this report we share insights on 32 solutions.

Companies have defined S&OP very differently. There is no one standard definition or a perfect technology solution. Instead, there are many variants. Likewise, there are many options in the technology market. It is not as easy as picking a solution from an analyst report using a simple two-dimensional grid. Instead, better results can be achieved by following a three step methodology:

1. Identify S&OP Organizational Maturity
2. Characterize Industry-specific Requirements
3. Ascertain Organizational and Information Technology (IT) Requirements

The system selection needs to be about both demand and supply. With the advances in computing power, demand and supply modeling have both improved, and new categories of technologies have evolved for inventory and financial modeling. These new data models can enrich traditional supply chain planning processes; however, it requires a redesign in S&OP architectures to accommodate the input. It cannot be effectively accomplished through tight integration. Instead, the best modeling is accomplished through iterative planning.

Over the past five years, the solutions have also expanded in scope and capabilities to power collaborative workflows and improve human interaction. With global expansion, and mergers and acquisitions, the processes have grown more complex and even knotty. They are anything but simple. The expansion of global supply chains requires both global and regional input and modeling. The management of governance structures in these larger organizations, in the more advanced software solutions, is improved through S&OP workflows, enterprise social networking and knowledge management. In addition, these companies do not have just one supply chain; instead, the average company has five to seven distinctly different rhythms and cycles and 63% of companies have more than one S&OP process. Consequently, there is increased interest in a visualization layer and an executive dashboard to finalize operational plans and actions.

Conventional Myths - The market is rife with unsubstantiated claims and myths:

- You don't need a technology to drive an effective S&OP process.
- S&OP can be effectively modeled using a spreadsheet.
- An 80% technology fit is good enough for an enterprise solution.
- Standardize: One solution provider is all you need.
- S&OP is dead. Integrated Business Planning (IBP) is the new solution.
- Supply chains are moving so fast that companies don't have time to plan.
- Real-time S&OP is a desired outcome.
- Tight integration with Enterprise Resource Planning (ERP) improves the S&OP process.

Today, companies are faced with a dilemma. There are so many pieces, so much opportunity, and so many requirements that the selection of a solution is confusing. Companies question how to put the pieces together. They often get so caught up in assessing new technologies that they forget the foundation of a solution is the determination of a feasible plan.

In our research, over 85% of companies lack a road map of how to assemble these pieces of S&OP technology to drive process maturity. Overcoming this challenge is the goal of this report. Here we provide a five-step maturity model and provide insights on how to achieve each step.

To improve success, sidestep conventional myths and use this report to help navigate the market hype. Improve your prospects for success by charting your path with a road map and a goal in mind.

As you move through each stage of the model, stay focused on answering three questions:

1. What is the goal? The goal changes as the process evolves.
2. What needs to be measured in which duration to be successful? Companies must always balance the supply chain as a complex system in each stage of maturity with maturity in measurements for forecast accuracy, customer service, revenue, profitability, and inventory turns.
3. How do I drive alignment and balance between the S of go-to-market plans and the OP of operations? The best S&OP plans are balanced ensuring organizational alignment.

The questions stay the same, but the answers change as the processes mature.

The Evolution of S&OP Processes

Over the last 35 years of Supply Chain Management (SCM), S&OP processes have evolved. S&OP is a horizontal process that can connect and align the vertical silos of make, source and deliver to drive a better supply chain outcome. Today, based on our interviews, we see five stages of S&OP maturity. Each stage offers increasing opportunity to maximize business results and Return on Investment (ROI). It also requires the assembly of different "pieces" of technology.

The most mature stage in the S&OP model, as outlined in figure 1, is achieving a Market-Driven Sales and Operations Planning Process. Currently, this stage is aspirational. For many it is a goal or a future-looking process objective. It is a more mature end state than demand-driven.

Figure 1. Sales and Operations Planning Maturity Model
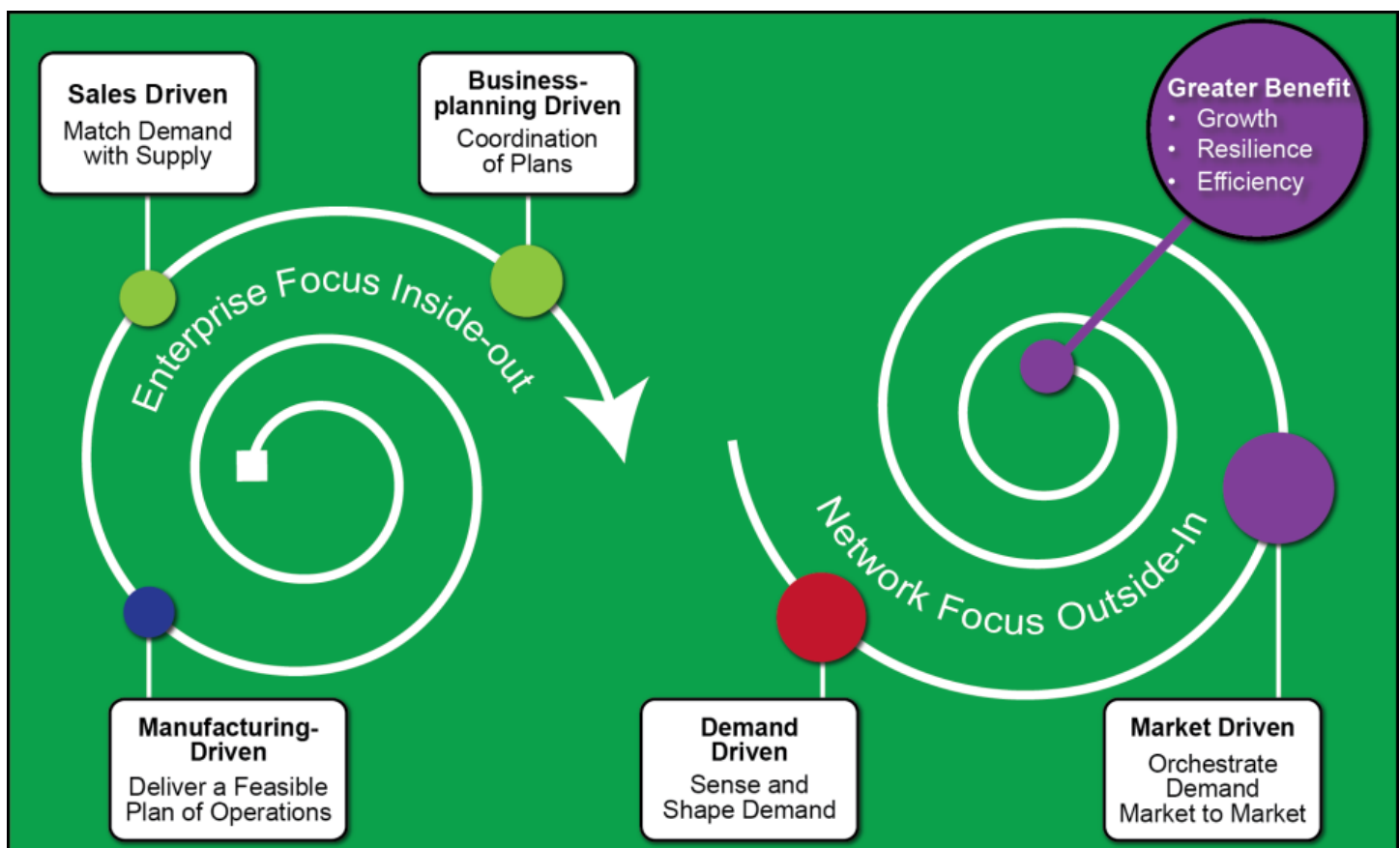
For clarity, within this report, a market-driven value network is defined as an adaptive supply chain that can quickly drive alignment within the organization market-to-market (buy- and sell-side markets) to improve value-based outcomes. When market-driven, these supply chain processes, sense and translate market changes bidirectionally with near real-time data latency to better optimize and align sell, deliver, make and sourcing operations to the goal. An example is Cargill Beef. There are 192 ways to cut up a cow. Instead of making a random decision, or one based on history, Cargill Beef studies market potential and orchestrates which plan

optimizes price potential in the market. Another example is the connection of go-to-market strategies with commodity plans. With escalating commodity prices it is important to not promote items with commodity volatility.

In the Market-Driven Value Network, the focus is on horizontal process orchestration. The redefinition of S&OP processes to be market-driven is a radical shift from the supply-centric historic process definitions in three different ways:

- **Outside-In.** As the S&OP Maturity Model progresses through its five stages, there is a shift in focus from inside-out to outside-in. Stages 1 through 3 are mapped from inside the organization to the external markets, while Stages 4 and 5 are mapped from the outside in (from the markets into the enterprise) with a focus on sensing and translating market drivers for both buy- and sell-side markets. This is a radical departure from traditional supply chains that are inside-out and are based solely on order and shipment data.

- **Depth of Analytics Required to Orchestrate the Right Response.** Each supply chain has fundamentally different levers that can be adapted to orchestrate the response market-to-market (e.g., Alternate Bills of Materials, Alternate Suppliers, Changes in the Network, Substitution of Products, Changes in Demand Shaping, etc.) The use of advanced analytics allows companies to make end-to-end trade-offs between revenue management and supplier development to orchestrate the value network.

- **Improved Planning Capabilities and Requirements.** To drive a Market-driven Value Network, companies need to invest in "what-if" capabilities and network modeling expertise to maximize opportunity and mitigate risks. In research studies, only 8% of companies feel that they have sufficient "*what-if" Modeling Capabilities* today for Stages 2 and 3 of the model, much less Stages 4 and 5.

Getting Started

Understanding where you are in the evolution of this S&OP maturity model is the first step in selecting the right technology solution. While the S&OP technologies are well defined in Stages 1 and 2 of this model, this is not true for the later and more mature stages of the market-driven value network. As companies move through the stages they will find they will need to have greater depth in supply chain what-if analysis, inventory and financial optimization modeling, and supply chain visualization. It will not be as easy as buying everything from one vendor. Instead, many mature companies will need to buy multiple pieces of technology and assemble them.

Stage 1: Deliver a Feasible Plan

The S&OP process originated with a goal of developing a feasible plan. Early evolution of the Advanced Planning Solution (APS) market enabled organizations to develop a forecast, visualize operational requirements, and align metrics. The introduction of constraint-based theory in the 1990s and the evolution of manufacturing planning enhanced this capability. It allowed organizations to identify constraints and build a feasible or a realistic plan based on operations. Note: These models are very industry-specific. A conglomerate composed of process, discrete and apparel manufacturing may find that it needs multiple modeling systems. Similarly, the building of a one-size-fits-all model by the ERP expansionists has delivered generic models that do not fit any company very well.

While many companies have become enamored with new solutions—the advanced capabilities of Software as a Service (SaaS) technologies, and advanced workflows and analytics of some of the more recent solutions— before organizations invest in these new technologies they must first ensure that they are building off a firm foundation that ensures a feasible plan. To do this, organizations have to ensure the supply chain planning models represent constraints, variability, and current capabilities of operations. This is an ongoing exercise. As operations change—outsourcing, new machinery, new modes of shipments—the planning models need to be corrected to reflect true operational capabilities. An S&OP plan that is not feasible is quickly discounted and loses credibility within the greater organization. For the greatest success, all companies need to be sure that their S&OP process can deliver a feasible plan. This is a critical building block for future stages.

Stage 2: Match Demand with Supply

As organizations mature, teams need a solution to better model the trade-offs of volume and product mix. These analyses are complex. They need to balance customer service, asset strategies and inventory plans to best match demand with supply against the business strategy. To meet this requirement, Advanced Planning System (APS) vendors introduced what-if modeling environments in the late 1990s using deterministic optimization techniques. Over the last ten years these processes were augmented by inventory management specialist capabilities to evaluate multi-tier inventory analysis.

One of the factors to getting it right is clarity of planning durations. The solution needs to have the flexibility to model the critical time frame to support decision making with telescoping planning visualization. In dealing with the problems listed below, companies will often make the mistake of only focusing short-term (1–2 weeks) and miss the value of planning, or focus on a longer-term duration (18 to 24 months) and not tie planning to execution. Both are important.

Most companies are at this stage of evolution. There are major barriers to move from an S&OP plan that focuses on volume to one that balances the trade-offs of integrated planning that we see in Stage 3. To transition well, companies at Stage 2 must carefully define the role of finance and the role of the budget.

Figure 2. Barriers with S&OP by Process Stage

S&OP Barriers

LEVEL:	I	II	III	IV	V
Goal	Build a Feasible Plan	Match Demand and Supply	Maximize Profitability	Maximize Opportunity and Mitigate Risk	Maximize Opportunity and Mitigate Risk Market to Market
Driver	Supply Driven	Supply Driven	Business Driven	Demand Driven	Market Driven
Change Management Issues	Role of the Budget	Moving from Measuring and Tracking Volume to Analyzing Profitability	Visualization and What-if Analysis Capabilities in Current Applications	Moving From Inside-out to Outside-in	

Over the past five years many of the multi-tier inventory analysis technologies merged with other S&OP technology providers (**IBM** purchased **LogicTools**, **SAP** purchased **SmartOps** and **Logility** purchased **Optiant**). In parallel, **JDA, Oracle** and **SAS Institute** introduced standalone inventory management modules. **Terra Technology** and **ToolsGroup** remain as standalone solutions to manage inventory trade-offs. While traditional technologies determine the right inventory levels for the organization's supply chain, these more advanced technologies focus on multi-tier modeling to determine the best "form and function" of inventory within the network. In the face of rising market volatility, this type of form and function inventory modeling and the determination of push/pull decoupling points is critical.

Stage 3: Drive the Most Profitable Response

While Stage 1 is supply driven, and Stage 2 is sales driven, Stage 3 is business-planning driven. This is commonly dubbed, in the market, as Integrated Business Planning (IBP). At this stage it is critical to have a clear supply chain strategy and a well-crafted definition of supply chain excellence. For most, this clarity, or the lack thereof, is a gating factor for success.

To accomplish this modeling, the demand and supply hierarchies must be decoupled to enable volume/mix what-if trade-offs iteratively between process steps. The output can then be improved through the use of financial modeling technologies (**Acorn Systems, Jonova, Oracle (Hyperion), River Logic and Tagetik).** These technologies allow companies to analyze financial trade-offs of tax and compliance; working capital impacts from changes in contracts and network relationships; fixed and variable cost impacts from changes in the network design; and margin contribution of product mix and customer scenarios. This is a very different view than plugging fixed values into an Advanced Planning System (APS) and seeing the financial impact from a change in supply. Instead, this analysis evaluates the financial options and implications of changing a supply network given manufacturing and procurement assumptions.

Corporate financials are backward-looking metrics while supply chain planning is forward-looking based on rhythms and flows. To make the transition and bridge financial mental models to supply chain processes requires a common data model and deep what-if analysis.

This S&OP Maturity Stage requires the addition of two new capabilities: demand translation and supply orchestration. The process of modeling demand volume/mix trade-offs between demand and supply is demand translation. In supply orchestration, these trade-offs are made in commodity markets to determine the most effective formulation or platform design to schedule for manufacturing. The best results happen when this analysis is iterative: starting with demand, passing it to supply modeling, evaluating the right form and function of inventory, and then doing financial analysis. This iterative approach can require multiple cycles. At the end of the analysis, a "constrained demand plan" is passed to demand planners, the nodes of the network are established and the inventory targets for each stage of the supply chain are set.

Today, only 23% of companies can easily model financial impacts of their supply chain decisions. It is not as simple as just putting financial data into traditional Advanced Planning Systems (APS).

Stage 4: Build Demand-Driven Supply Chain Capabilities

At this stage of S&OP process refinement, the technology flows are designed from the outside-in. This analysis is focused on sell-through into the channel, whereas the earlier steps of the S&OP maturity model are focused on selling into the channel.

The first step at this stage of maturity is to get really good at channel modeling using market drivers. These market drivers are based on end-user consumption and are mapped as parallel inputs or "indicators" into the demand plan. The demand plan is then used to sense market conditions based on downstream demand signals, followed by active shaping of demand, using technologies like price optimization; trade promotion planning; new-product launch plan alignment; and social, digital and mobile convergence. While demand sensing reduces the latency to see true channel demand, demand shaping combines the techniques of price, promotion, sales and marketing incentives, and new-product launch to increase demand lift.

For most companies, the movement from Stage 3 to Stage 4 of the maturity model requires a redesign and a reimplementation of the data models implemented in Stages 1 through 3. Additionally, at this phase of implementation, companies are seeking greater what-if capabilities and visualization across multiple technologies. As a result, at this stage, many companies are considering the augmentation of existing APS systems with **E2open, Kinaxis, Steelwedge,** or **SAP HANA.** Today, based on research, only 11% of companies are satisfied with current what-if capabilities of existing systems for their S&OP deployments.

Stage 5: Orchestrate Through Market-Driven Value Networks

The development of horizontal processes in Stages 1 through 4 of the S&OP Market-Driven Maturity Model is foundational, and a prerequisite, to build Market-Driven Value Networks. Companies cannot skip steps, and they cannot effectively build strong horizontal processes without operational excellence and process reliability.

When done right, this market-driven technology portfolio helps companies to sense and shape demand and supply bidirectionally between sell- and buy-side markets. This process of bidirectional trade-offs between demand and a commodity market is termed *demand orchestration*. This capability allows companies to win in this new world of changing opportunities and supply constraints. It is especially relevant with the tightening of commodity markets and increasing price pressures on today's supply chains.

To orchestrate demand horizontally, companies need to identify the leverage points in the supply chain. These include price, promotions, sales incentives, changing bills of materials, choosing alternate suppliers or modes of transportation, or substituting products. Each industry and each company has a unique profile of options. While it may be *down binning* in the semi-conductor industry, or initiating a SWAP plan in the chemical industry, or changing the process for alternate bills of materials in food and beverage, each industry has levers to pull.

The issue is how to best synchronize the coordination of buy- and sell-side market drivers. Today, with a focus on volume, they are not synchronized. As a result, companies will promote products with high price or scarce ingredients, customer commitments are made for configurations that are not profitable, and promises are made to the market for plans that are not feasible. With the growing scarcity of materials, and the intense price pressures on new product launch margins, demand and supply orchestration will grow in importance. Today, companies are cobbling together solutions in the absence of well-defined capabilities. Early evolution of this capability can be seen in **E2open'**s multi-tier visibility systems, **Kinaxis'** allocation logic based on material constraints in High-tech, and **Signal Demand's** demand orchestration capabilities for reverse bills of materials in food and beverage.

As these processes mature, a subtle but important shift in the maturation of the S&OP process is the change of the data model in the optimization and foundational level of the Advanced Planning Solutions (APS). This will often result in the reimplementation of the Advanced Planning Solution with a different focus and data model. Table 1 reviews the 5 Stages of Maturity and the key characteristics of each stage.

Table 1. Data Model Overview of the S&OP Maturity Model

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Process Goal	Feasible Plan	Match Demand with Supply	Integrate Business Plans	Demand Driven	Market Driven
Demand Model Focus	Ship from modeling: What should manufacturing make? What should I ship?	Ship from modeling: What should manufacturing make? What should I ship?	Ship to modeling: What is being sold into the channel?	Ship to modeling: What is being sold into the channel?	Ship to modeling: What is being sold into the channel?
Replenishment Model Focus	Sell into the channel	Sell into the channel	Sell into the channel	Sell through the channel	Sell through the channel
Process Model Focus	Inside-out	Inside-out	Inside-out	Outside-in	Outside-in
Model Elements	Demand Supply	Demand Supply Mix Volume Form and Function of Inventory	Demand Supply Mix Volume Form and Function of Inventory Profitability	Demand Supply Mix Volume Form and Function of Inventory Profitability Market Demand Drivers	Demand Supply Mix Volume Form and Function of Inventory Profitability Market Demand Drivers Commodity Market Drivers
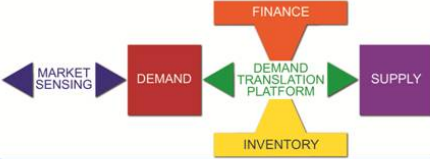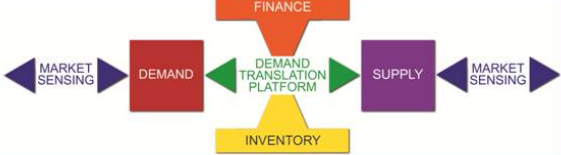
Putting Together the Pieces

After the purchase decision, companies also struggle with how to put the pieces together. The evolution of the technology to support iterative planning between demand, supply, inventory and financial planning systems requires increased functionality for demand translation, supply chain visualization and *"w*hat-if" analysis. This platform shift is outlined in figure 3. In the appendix, to help the reader, we indicate vendors' solutions by the categories in figure 3.

The demand translation elements shown in Stages 4 and 5 of the S&OP Maturity Model map the "ship-to data model configuration" for demand to the "ship-from data model configuration" of supply. This capability is found in the evolution of Software as a Service (SaaS) providers like **Kinaxis, SAP HANA, E2open** and **Steelwedge.**

Figure 3. Putting the Technology Pieces Together

Technology Platform Changes

Platform	Goal	Characteristics
DEMAND → SUPPLY	A feasible plan	• Model the network • Recognize and respect constraints • Gain plan visibility
DEMAND → SUPPLY / INVENTORY	Match demand with supply	• What-if analysis • Multi-tier inventory analysis • Network design
FINANCE / DEMAND → SUPPLY / INVENTORY	Deliver the most profitable plan	• Demand translation • Supply orchestration • Optimize financial drivers
FINANCE / MARKET SENSING → DEMAND → DEMAND TRANSLATION PLATFORM → SUPPLY / INVENTORY	Demand-driven	• Sense channel demand • Shape demand • Drive the most profitable response
FINANCE / MARKET SENSING → DEMAND → DEMAND TRANSLATION PLATFORM → SUPPLY → MARKET SENSING / INVENTORY	Market-driven	• Sense buy- and sell-side market conditions • Bi-directionally orchestrate demand

Source: Supply Chain Insights LLC

In figure 3, the definitions of the pieces of technologies outlined above are:

Demand. Demand modeling is the use of statistical modeling technologies to develop an operational forecast. The most advanced models have the ability to manage seasonality, predict lift associated with revenue shaping events, anticipate market changes based on causal factors, drive accountability in consensus forecasting, and drive continuous improvement through forecast value-added analysis.

Supply. The predictive analytical technologies allow companies to understand the available capacity of manufacturing and distribution. The more advanced technologies enable the modeling of constraints and costs in source, make, and deliver decisions processes.

Inventory. As companies mature there is a need to shift from just looking at the right level of inventory, to considering the right form (raw material, semi-finished good and finished product) and function (cycle stock, safety stock, pre-season build) of inventory to improve enterprise agility and reliability.

Financial. These models allow companies to take the inputs from demand and supply modeling and evaluate the financial impact of mix, demand or supply shifting, customer and product policies, or the financial impact of changes in network sourcing.

Demand Translation. This capability allows companies to model the market (what is going to be sold in the channel) and translate the requirement to manufacturing (what needs to be manufactured when).

Market Sensing. The use of channel data for either buy- or sell-side markets to reduce the organization's latency to recognize market shifts and evaluate the impact of these shifts on the supply chain plans.

While figure 3 shows the assembly of a single S&OP process, for companies with multiple S&OP processes the same logic holds. For most organizations, they will have to build a similar figure to show multiple S&OP processes, from different business units at various levels of maturity, knitted together. These multiple technology platforms are mapped to enable iterative planning by the business unit resources with a visualization layer for executive review. This functionality is the genesis of the **Kinaxis** Control Tower concept and the **SAP** S&OP HANA release.

Industry Requirements

The solutions are industry specific. The greatest differences are in the area of supply as compared to the areas of demand, finance and inventory. The vendor classifications in the appendix are designed to help the buyer of technology understand the industry fit for each solution.

Conglomerates or companies with multiple processes will find that they will need to assemble multiple systems to ensure that they are meeting the process requirements. While these industry-specific definitions vary greatly, a general overview is listed below:

Retail. Retail modeling is characterized by seasonal planning cycles, store format changes, markdown and price changes, and marketing calendars. In specialty retail for apparel, unique functionality is required to manage style/color/size combinations. These processes are also usually characterized by long lead times for offshoring and the management of multi-tier distribution requirements. These solutions are designed for mass merchants, grocery retail, drug and convenience retailing and specialty retailing. Orchestration includes price, markdown, merchandising strategies, changing assortment, allocation logic, shifts in channel strategies and alternate sourcing scenarios.

Process. Flow-Based Manufacturing. In general, these products flow out of tanks, through pipes, and into bags, boxes, tank cars and totes. These processes are asset intensive and involve the modeling of process-intensive scenarios like reverse bills of materials, tank yard scheduling, yield and grade variations, industry swaps between manufacturers, and floating bottlenecks on equipment with the changes in mix. These operations are usually flow-based and heavily influenced by raw material availability and costs. Demand orchestration is usually a trade-off between price, grade, service terms

and formula changes. These processes are found in the chemical, pulp and paper, textiles, oil and gas, and wine and spirits industries.

Process. Mix and Pack Manufacturing. These processes are characterized by stages of preparation, mixing and batch transfer, packaging and palletizing. This is normally based on batch size and go-to-market requirements. These operations are often make-to-stock with push-based logistics. Demand orchestration touch points are price, promotion, sales incentives, formula and recipe changes, alternate sourcing and transportation mode, and network shifts. Industries characterized by these requirements are food and beverage, consumer packaged goods, and industrial chemical.

Discrete. Make-To-Order. In these industries, there is a focus on make-to-order processes where units are discrete and assembled based on Bills of Materials (BOM) and manufacturing routings. Orchestration options include materials, finishing, sourcing, and shipping options. These processes are most frequently found in apparel, automotive, High-tech and electronics, and parts and component manufacturing for machinery.

Discrete. Configure- or Assemble-To-Order. These industries work off of variants of platforms. The platform is designed for a value-based outcome, but is configured for specific customer requirements. Orchestration includes contract terms and conditions, service and warranty plans, platform design options, and alternate assemblies. These processes are found in aerospace and defense, heavy equipment, and transportation (e.g., truck, rail, barge) industries.

Organizational Considerations

As organizations grow larger, the technology requirements change. Specifically, the bigger and more complex an organization that the team is trying to automate, the requirements for internal collaboration and workflow management, assumption archiving, and scenario management increase. To purchase a solution, map how your organization makes decisions. Note the requirements and compare them to the data in table 2.

Table 2. Criteria to Evaluate Organizational Requirements

	Small Company, Easy Requirements	Mid-sized Company, Regional Requirements	Large Company, Global Planning and Regional Deployment
Assumption Management	Plan assumptions notated as notes in third-party systems.	Assumptions captured in scenario management, but no repository to store scenarios based on like conditions.	Scenario libraries to catalogue and test assumptions. Assumptions categorized in the steps of the process.
Collaboration	Limited collaboration abilities. Collaborative demand planning completed on spreadsheets and work among team members notated in third-party technologies.	Collaborative demand planning with management overrides but no accountability measurements. Notes sections for collaboration.	Demand planning collaboration with built-in bias and error reporting. Configurable, collaborative workflow between regions and corporate to enable questions and inputs.
Scenario Management	Planners have limited ability to do what-if analysis simultaneously.	Role-based scenarios and what-if analysis to support multiple users at the same time.	Planning master data management to support multiple what-if analyses simultaneously.
Performance Management: Dashboard and Scorecard Management	Non-extensible data for reporting in organizational BI technologies. Limited data visualization.	Extensible data. Dashboards and scorecards are easy to configure and represent key scenarios.	Dashboard and scorecards are configurable in near real-time. Supports questions in an executive S&OP session in real-time.

Key: Small: Less than 10 planners. Mid-sized: 10-40 planners. Large: Greater than 40 planners.

Recommendations

No two S&OP processes are alike and no two organizations have the same need. As a result, build with the goal in mind. Sidestep the hype outlined in the executive overview and build a solution to meet your needs based on the information in this report.

Get Ready. For each stage of the maturity model, answer the following questions before contacting a technology solution vendor or a consulting partner:

> **Stage 1** - What is necessary to ensure a feasible plan? What are the constraints? What is the right time duration for the planning process? Note: Ensure that you can build and deliver a feasible plan before investing in the next steps of the road map.

Stage 2 - What is required in business analytics to support what-if modeling? What depth is required in inventory modeling? Do you need to just understand the level of inventory or do you need a broader understanding to optimize the form and function of inventory components?

Stage 3 - What are the right trade-offs to make between demand, supply, inventory and financial modeling? How are these trade-offs supported by the supply chain strategy? How many equivalent units need to be modeled? What is required in an S&OP platform for volume and mix translation?

Stage 4 - What are the right market drivers to sense demand? Given these market drivers to sense demand, how will the company shape demand? What defines excellence for revenue management?

Stage 5 - What are the important commodity market drivers? How will market drivers be traded-off (bidirectionally and horizontally) between buy- and sell-side markets? What combination of demand shaping and supply levers can be pulled to orchestrate a market-driven response?

Since one of the greatest barriers to effective S&OP is the understanding of supply chain excellence by the executive team, invest in training to ensure bottom-to-top alignment before starting the project. As shown in figure 4, technology is the third largest challenge.

Figure 4. Obstacles to Building an Effective S&OP plan.

Single Largest Challenge in Building Effective Sales and Operations Plan
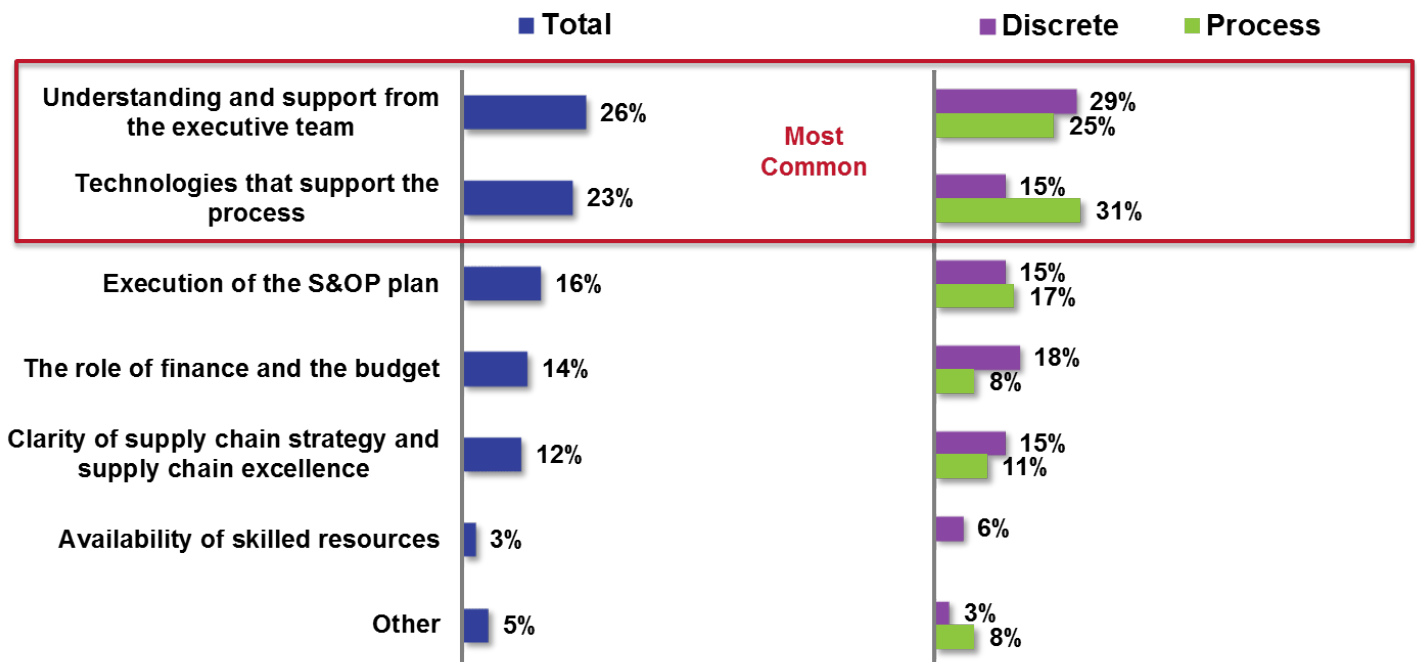
Source: Supply Chain Insights LLC, S&OP (April - May 2013)
Base: Manufacturers and have S&OP process – Total (n=74), Discrete (n=34), Process (n=36)
Q27. What is your company's single, largest challenge in building an effective Sales and Operations Plan (S&OP)?

Follow a Multiyear Road Map and Build with the Goal in Mind. While many companies would like to accelerate the time to build S&OP maturity, do not try to skip the steps. The steps build on each other with the

understanding in each step being a prerequisite for the next. Build the solutions and the processes with the goal in mind, with clarity of governance and process definition in each step. To accelerate maturation, invest in training, "what-if" modeling, and a clear definition of the supply chain strategy.

Staffing. Reward the Important. While many companies implement technology, they do not use the output of the technologies well. There are many reasons, but the most common is the lack of dedicated planning resources. Planners need time to plan. They cannot multitask between the important priorities of planning and the urgent activities of replenishment and manufacturing support. To ensure the best output, build the right solutions, and ensure that the project is staffed with adequate and trained resources. For many, this is an issue.

Recognize Differences, but Simplify Where Possible. While there are often many industries and supply chains with multiple S&OP processes within the organization, most of the time these can be implemented using the same technologies and the same metrics, but adapting the data models and metric targets to recognize process differences.

Why It Matters

Companies that can make it past Stage 2 to Stage 3 and beyond, based on the research, will achieve much higher levels of organizational alignment and agility as shown in figure 5.

Figure 5. Benefits of a Successful S&OP Process

Conclusion

The opportunity to automate S&OP is too great to pass up. A successful project requires technology to maximize long-term benefits. There is no one-size-fits-all solution. Instead, the pieces of technology have to be assembled with the goal in mind.

The first step in solving the puzzle is realizing that it will not be one technology, but multiple technologies installed over multiple years using a well-defined road map. The greatest success happens when the technology choices are based on a long-term view considering S&OP maturity, industry fit, and organizational size/maturity.

Appendix

S&OP technologies that can be assembled to solve the puzzle are listed below in alphabetical order by company name. The order of the listing does not represent solution preference:

1. Acorn Systems

Website: www.acornsys.com/
Deployment: License
Organizational Size: Medium–Large
Type: Financial Modeling
Relative Costs: $$$$$
Coverage: North America and Europe
Industries: Retail, Consumer Products, and High-tech & Electronics
Strengths: Deep analytics to understand customer cost to serve and product complexity in the S&OP process. This solution is used to rationalize business complexity in channel strategies, and to aid team product rationalization efforts.
Considerations: Expensive and requires the support of a sophisticated user and availability of financial data to drive success. It should never be considered as a piece of standalone software for S&OP. Instead, it needs to be viewed as a financial modeling technology to augment traditional demand and supply planning.

Key for Understanding Relative Cost:

$$$$$:>1500K
$$$$:1000-1500K
$$$:500-1000K
$$: 200-500K
$: Under 200K

License Software and Software as a Solution (SaaS) costs have different operating models. For the purpose of this report, when a company licenses the solution, the table represents the first year's total installed costs (software, hardware, and implementation) in US $)
When a Software as a Service solution is deployed, the costs tables represent the average of the first five years' costs.

2. Adexa

Website: www.adexa.com/
Deployment: License
Organizational Size: Medium–Large
Type: Demand and Supply Modeling
Relative Costs: $$$-$$$$
Coverage: North America and Asia
Industries: High-tech, Apparel and Textiles, and Semiconductor industries
Strengths: The solution has deep modeling for constraint-based planning with a strong presence in Japan. The modeling is stronger in supply than demand.
Considerations: The solution is not appropriate for process companies. It is stronger in supply than demand, and has recently introduced an inventory optimization solution. For companies seeking depth in discrete modeling for process industries that cannot be found in Oracle or SAP, consider Adexa.

3. Aspen Technology

Website: www.aspentech.com/

Deployment: License

Organizational Size: Medium–Large

Type: Demand and Supply Modeling

Relative Costs: $$$$

Coverage: North America and Europe

Industries: Chemical and Consumer Products

Strengths: The solution is a very configurable product and allowing for great depth in process modeling (reverse bill of materials, multiple levels of constraints and dependent demand for multiple forms of shipment) for process and mix and pack industries. It has the deepest supply modeling capabilities for the chemical industry.

Considerations: The solution is not appropriate for discrete companies. The modeling is stronger in supply than demand planning. Due to the level of configuration capable in the solution, the technology requires a strong understanding of what is needed in the solution requirements and a strong user skill set to maintain. Cheaper, and easier-to-use industry solutions for the chemical industry include Arkemia (Previously Supply Chain Solutions (Zemeter)), OM Partners, and/or WAM Systems.

4. Boardwalktech

Website: www.boardwalktech.com/

Deployment: Software as a Service

Organizational Size: Small–Large

Type: Demand, Finance and Supply Modeling

Relative Costs: $$-$$$$

Coverage: North America

Industries: Crosses many industries but lacks data model depth to model any industry well.

Strengths: The solution is easy to use after deployment. It is a good fit for companies that are used to spreadsheet modeling, but lack a system of record to keep all the spreadsheets in sync.

Considerations: The cost of the solution is in configuration. Due to the lack of a supply chain data model it is difficult to model trade-offs in the supply chain well. The solution can improve visibility, but lacks a constraint-based data model to determine the feasibility of supply or optimization algorithms to ensure the best plan. It is not a consideration for a supply chain that is supply-constrained or wants to improve demand forecast accuracy. Additionally, with the number of deployments, the usage should be limited to early adopters.

5. Demand Solutions

Website: www.demandsolutions.com/

Deployment: License

Organizational Size: Small–Medium

Type: Demand and Supply Matching

Relative Costs: $$-$$$

Coverage: Sold by a Global Network of Distributors

Industries: Apparel, consumer products, food & beverage and general manufacturing

Strengths: Established provider since 1985. Demand Solutions is easy-to-use software for small or globally distributed teams. The company introduced social collaboration with the embedding of Yammer in their recent release. The product has a nice, intuitive user-interface with strong customer references.

Considerations: The product has core functionality for simple demand and supply matching, but lacks depth in demand planning for larger organizations. The company has recently acquired Taylor Manufacturing to improve supply-based capabilities.

6. DCRA

Website: www.dcrasolutions.com

Deployment: Software as a Service

Organizational Size: Small

Type: Demand and Supply Modeling

Relative Costs: $-$$

Coverage: North America

Industries: Discrete

Strengths: Simple and easy-to-use S&OP modeling. It is ideal for a small or mid-size discrete manufacturing company seeking a Software as a Service (SaaS) model.

Considerations: A very simplistic approach to S&OP, the solution lacks the depth of modeling for material-centric and complex discrete manufacturers. It is best used by a company just starting on an S&OP journey that is looking for an easy to use solution for a few users without modeling depth.

7. E2open

Website: www.e2open.com

Deployment: Software as a Service

Organizational Size: Medium–Large

Type: Multi-tier S&OP

Relative Costs: $$-$$$

Coverage: Global

Industries: High-tech and Electronics companies and Consumer Durables

Strengths: E2open is a business network provider for supply chain visibility. With roots in the automation of procurement and sourcing for High-tech companies, the E2open team is developing wider solutions for multi-tier what-if capabilities for the acquisition of SCM-ICON in 2013. The E2open solution is designed to help companies with multi-tier S&OP that are dependent on an outsourced contract manufacturing network.

Considerations: S&OP is new to the E2open team and the solution is currently under development. However, the SCM-ICON integration into the E2open platform is very promising and should be viewed as a co-development opportunity for existing E2open or SCM-ICON clients.

8. Enterra Solutions

Website: www.enterrasolutions.com

Deployment: License

Organizational Size: Medium–Large

Type: Demand and Supply Orchestration

Relative Costs: $$$$$

Coverage: North America

Industries: All

Strengths: The solution uses a new technique of rules-based ontologies to map "multiple ifs to multiple thens" for a more dynamic response for multiple S&OP systems. The solution enables the automation of a "planning book" to S&OP execution. While this type of solution is a new approach today, look for the use of Enterra Solutions-like solutions in S&OP execution in the next two to three years.

Considerations: Enterra is early to the market and is only suitable for early adopters looking for a co-development partner to build supply chains that listen, think, learn and then respond. While artificial intelligence has been discussed for many years, the Enterra Solution is one of the first to apply the concept.

9. Exceedra

Website: www.exceedra.com

Deployment: License

Organizational Size: Medium

Type: Demand Modeling

Relative Costs: $$-$$$

Coverage: Europe

Industries: Consumer Products and Food and Beverage

Strengths: The Exceedra tool is designed for companies seeking to optimize go-to-market sales planning as part of their S&OP processes. The product provides the integration of demand planning, trade promotion spending and account team planning. It is a tool for consideration for a customer-centric S&OP planning process with one or two partners.

Considerations: The Exceedra solution is evolving. The product lacks supply planning capabilities and is best suited for a medium-sized consumer products company looking to do customer-centric demand planning. It would be a poor choice for a large, global company with multiple S&OP processes.

10. IBM

Website: www.ibm.com

Deployment: License

Organizational Size: Medium–Large

Type: Inventory Modeling

Relative Costs: $$-$$$$

Coverage: Global

Industries: All

Strengths: The IBM product has strong visualization capabilities augmented by inventory analytics and reporting capabilities. The S&OP solution from IBM is a group of purchased technologies that are assembled into industry solutions. This includes the ILOG manufacturing scheduling product, the Cognos financial modeling product, and the Logictools inventory modeling technologies.

Considerations: While IBM has many complementary applications for an S&OP process, as a company it struggles to put together enough pieces to deliver a total solution. The company lacks demand, supply and financial modeling capabilities, and usually partners, offering add-on IBM software components, to solutions with large ERP providers like SAP and Oracle to deliver S&OP implementations.

11. IBS

Website: http://www.ibs.net

Deployment: License

Organizational Size: Medium–Large

Type: Demand and Supply Modeling

Relative Costs: $$-$$$

Coverage: Global

Industries: Distribution-centric

Strengths: The IBS product is new and is currently being used by three clients. The product has been designed for distribution-centric companies managing contract manufacturers. Embedded within the product is functionality for distribution planning for companies managing a long supply chain based on container shipments.

Considerations: The product is new and should only be considered by IBS clients. It is not a fit for companies requiring manufacturing planning capabilities.

12. Infor

Website: www.infor.com

Deployment: License

Organizational Size: Medium–Large

Type: Demand and Supply Modeling

Relative Costs: $$$-$$$$

Coverage: Global

Industries: All

Strengths: The Infor solution has gotten stronger and more robust over the last year. It combines the Lawson and Infor assets to give a buyer many options for S&OP. The solution is ideal for companies with existing Infor infrastructures. With the myriad of acquisitions, the company has a rich stable of potential solutions to draw from. The former Intentia products have strength in reverse bill of material modeling, and the Fygir application is the most commonly used tank scheduling application for the wine and beer industries.

Considerations: The Company released a new platform over the last two years including the new S&OP product. The Infor product now has strong customer references and is maturing in "what-if" capabilities. This new INFOR solution was released to the market in 2011 and now has less than fifty deployments. The solution is stronger in supply than demand modeling.

13. JDA

Website: www.jda.com

Deployment: License or managed service

Organizational Size: Medium–Large

Type: Demand, Supply and Inventory Modeling

Relative Costs: $$$-$$$$

Coverage: Global

Industries: Retail, consumer products and discrete manufacturers

Strengths: The Company has a long legacy of acquired supply chain solutions — E3, Manugistics, i2 Technologies — with depth of solution demand, inventory and supply modeling. It is one of the strongest S&OP modeling tools in the market for retail.

Considerations: The Company is currently rationalizing footprints post-acquisition. The i2 Technologies software includes the deepest modeling technologies for the High-tech industry and the new JDA S&OP solution meets many of the needs of i2 SCP and Factory Planning customers. Previous Manugistics customers are still struggling with the evolution of the solution for the process industries with many companies defecting to SAP. In general, the solutions lack the visualization technologies and ease of use that you will find from BI reformers like SAP's use of Business Objects/HANA and IBM's use of Cognos.

14. John Galt

Website: www.johngalt.com

Deployment: License or managed service

Organizational Size: Small-Medium

Type: Demand and Supply Modeling

Relative Costs: $-$$

Coverage: North and Central America

Industries: All

Strengths: The Company offers two solutions: the Wizard and Atlas products. The Wizard product allows users to invest in a small spreadsheet-based solution and grow. The Atlas product has a fuller set of features including a new user interface and inventory optimization. John Galt's legacy is in demand planning with recent development of deterministic inventory modeling and manufacturing modeling. However, the solution is still deeper in demand than supply.

Considerations: John Galt focuses on the small to medium customer that is seeking a single solution with an easy to use data model. It does not have the depth of supply planning of other larger solutions and is not a good fit for larger companies seeking deep supply planning or trying to harmonize and visualize data across multiple S&OP systems.

15. Jonova

Website: www.jonova.com

Deployment: License, Software as a Service (SaaS) and Business Process Outsourcing (BPO)

Organizational Size: Medium–Large

Type: Financial Modeling

Relative Costs: $$$-$$$$

Coverage: North America

Industries: Aerospace, Automotive, Pharmaceutical, High-tech & Electronics

Strengths: Depth of modeling for profitability analysis on fixed versus variable costs and product portfolio complexity. It is best used in new product launch scenario analysis to evaluate platform scenarios. Jonova's customers are using it for value-cream modeling, capacity planning and supplier hedging analysis.

Considerations: The product requires a sophisticated user and access to deep financial data. Due to the breadth and depth of the solution, and the newness of the solution approach, companies should consider using Jonova Managed Services Offering. When implementing, companies should realize that there are limited deployments and that the solution should only be considered by an early adopter.

16. Kinaxis

Website: www.kinaxis.com

Deployment: Software as a Service

Organizational Size: Medium–Large

Type: Demand and Supply Modeling

Relative Costs: $$-$$$$

Coverage: North America and Europe

Industries: Material-intensive discrete industries

Strengths: Kinaxis is the strongest discrete-material-intensive solution on the market. The product has deep "what-if" modeling and strong customer references. New visualization capabilities make decisions easier, driving insights for the executive S&OP meeting. The 2013 introduction of mobility and the improved user interface makes the Kinaxis product a better alternative for a boardroom S&OP meeting to enable quick what-if analysis and visualization of plan alternatives.

Considerations: The product is stronger on supply modeling than demand planning. It is not the solution for a company needing a deep demand or supply optimization solution. It is not a strong constraint manufacturing modeler.

17. Logility

Website: www.logility.com

Deployment: License with a recent introduction of Software as a Service and Hosted Solutions

Organizational Size: Medium–Large

Type: Demand, Supply and Inventory Modeling

Relative Costs: $$-$$$

Coverage: North America and Europe

Industries: Consumer products, apparel, food & beverage, consumer durable manufacturing and wholesale distribution industries.

Strengths: An easy-to-use, comprehensive solution with advanced capabilities in demand management, inventory management optimization/postponement. One of the differentiating factors is the new-product launch forecasting capabilities to model and compare multiple business scenarios. The new capabilities in attribute-based planning (termed by Logility as Proportional Profile Planning) give users flexibility in the planning of new products and tracking changes in demand more accurately. The new profiling capabilities automate more granularity in the demand plan which improves the demand to supply translation critical for industries with special material requirements or configuration distributions. Logility has also delivered the depth of solution for inventory modeling and postponement and offers one of the strongest solutions for S&OP for apparel. The company has strong references and the product is supported by strong after-sale support by the organization.

Considerations: The Logility architecture and built-in analytics for visualization lacks the depth of other options, and it is not appropriate as a S&OP platform connecting multiple S&OP processes. It is also not a good fit for semiconductor or High-tech industry clients. Logility has more presence in North America than Europe and is not a good fit for an Asian implementation.

18. Oliver Wight

Website: www.oliverwight.com

Deployment: License

Organizational Size: Small

Type: Demand and Supply Modeling

Relative Costs: $-$$

Coverage: North America and Europe

Industries: All

Strengths: Complements the Oliver Wight training and enables pilot activities.

Considerations: The solution should only be considered for someone looking for a tool to get started on S&OP following training. Serious scalability and depth of modeling issues for most organizations as they move past the stage of a conference room pilot.

19. OM Partners

Website: www.ompartners.be

Deployment: License

Organizational Size: Medium–Large

Type: Demand and Supply Modeling

Relative Costs: $$-$$$

Coverage: Europe and North America

Industries: Process chemical and consumer products

Strengths: The product from OM Partners has a strong depth in manufacturing modeling and scenario modeling. The solution is a flexible toolkit with extreme flexibility in modeling. The solution is stronger in supply than demand. The company has strong client references and is often seen in European implementations. Many companies struggling with the gaps in SAP APO planning have turned to OM Partners.

Considerations: The solution requires configuration and a deep understanding of the user requirements. The modeling required for implementation requires a higher planning skill set than other solutions. However, when properly installed, the solution provides a deep constraint-based optimization and what-if analysis. For S&OP, the solution lacks the visualization capabilities of other solutions like Oracle, Steelwedge or SAP HANA. It is also not suitable for a company seeking depth in demand planning.

20. Oracle

Website: www.oracle.com

Deployment: License

Organizational Size: Medium–Large

Type: Demand, Supply, Financial and Inventory Modeling

Relative Costs: $$$$-$$$$$

Coverage: Global

Industries: Consumer Products, High-tech, and Discrete

Strengths: Oracle has many piece parts, but lacks a comprehensive solution. The Company has a strong demand planning capabilities and a great visualization platform to show the impact of decisions at the executive S&OP meeting. The strong user interface of the Oracle solution is appealing to customers. With the wide-installed base of Hyperion, many companies prefer to use their Hyperion (Oracle acquisition) modeling capabilities for Stage 3 of Financial Modeling. The company has global presence and support capabilities for emerging economies.

Considerations: The solution lacks depth of modeling for supply. While the company has a strong demand planning tool for all industries, the supply solution is not recommended for distribution-intensive industries due to the lack of a distribution requirement (DRP) modeling capability. The product lacks a demand translation platform capability and visualization for multiple S&OP processes. The inventory modeling technology is the

weakest of any multi-tier modeling technology on the market and the demand planning tool has a stronger requirement for clean data than other solutions.

21. River Logic

Website: www.riverlogic.com

Deployment: License

Organizational Size: Small–Medium

Type: Financial Modeling

Relative Costs: $$$-$$$$

Coverage: North America

Industries: All

Strengths: Financial modeling of fixed and variable costs. The product is a complementary tool for financial modeling in Stage 3 of the S&OP planning cycle.

Considerations: This technology is a complementary modeling tool for an S&OP process for financial modeling. It is not a demand or supply modeler and has limited dashboard capabilities for the executive S&OP meeting. As such, it should be considered as an add-on to an S&OP platform to complement the process.

22. Quintiq

Website: www.quintiq.com

Deployment: License

Organizational Size: Medium–Large Companies

Type: Inventory Modeling

Relative Costs: $$-$$$

Coverage: North America and Europe

Industries: Mill Products

Strengths: The Company has built an easy-to-use product focused on helping companies in mill products deliver a strong S&OP plan. The product is suitable for asset-intensive companies that are more focused on operations than demand. With strong customer references and an easy-to-use product, companies in mill products looking to build a feasible plan and align demand and supply should consider Quintiq.

Considerations: The solution is not a good fit for other industries or for companies seeking a strong solution in demand planning. The solution is also more suitable for companies with a few focused factories in regional supply chain organizations than large companies with global operations.

23. SAP

Website: www.sap.com

Deployment: License (the SAP HANA S&OP product is also offered as Software as a Service)

Organizational Size: Medium–Large

Type: Demand, Supply and Financial Modeling

Relative Costs: $$$$-$$$$$

Coverage: Global

Industries: All

Strengths: SAP has a strong global presence with an established ecosystem of implementers. The company has financial stability and a strong range of solutions suitable for all industries. The new SAP HANA solution is an in-memory solution with social collaboration and imbedded "what-if" analysis. The promise of the solution is provide faster in-memory visualization of S&OP decisions. Since the publication of the last report, SAP HANA is now live at a few client locations. The product has matured considerably. While the 2 references are very satisfied with the outcome, most of the implementations are with companies with maturity levels at Stage 1 and 2 (as defined in this report.) The product is a natural complement for a SAP-centric IT architecture within a company with multiple ERP instances. System integrators give SAP high marks for the ease of implementation of SAP HANA. The product has been easy to implement at client cites with multiple implementers reporting success.

Considerations: Demand and supply solutions (APO) require a sophisticated user and care in implementation. The product requires care in the selection of the implementer as we are seeing many SAP APO implementations that fail due to a lack of consultant implementation knowledge. Users frequently complain that the SAP APO solution is hard to use and lacks depth of modeling for both demand and supply; however, it is the most widely deployed advanced planning system in the market. The recent release of the SAP HANA platform offers promise as an S&OP integration platform for demand translation, process visualization and the harmonization of multiple S&OP systems. SAP has invested time and money to build an S&OP data model in HANA that can be deployed multiple ways (license, private and public cloud); however, the HANA solution is still maturing and there is still market confusion on how the SAP pieces fit together. The recent purchase of the ICON-SCM product (a long-term SAP partner for discrete planning in 2013) by E2open adds to this market confusion.

24. SAS Institute

Website: www.sas.com

Deployment: License

Organizational Size: Medium–Large

Type: Demand, Financial and Inventory Modeling

Relative Costs: $$$-$$$$

Coverage: Global

Industries: All

Strengths: SAS offers strong demand-planning technology for market modeling with some inventory optimization capabilities. The product is one of the deepest demand planning modeling technologies with emerging functionality for inventory optimization.

Considerations: When looking at the SAS solution for S&OP, the buyer is looking at "piece parts" that will need to be assembled using someone else's platform. The product lacks supply modeling for manufacturing and distribution constraints and S&OP process visualization, workflow and assumption management. It should be considered as an augmentation strategy to another solution needing depth in demand planning.

25. SignalDemand

Website: www.signaldemand.com

Deployment: License

Organizational Size: Medium–Large

Type: Market Sensing

Relative Costs: $$$-$$$$

Coverage: North America

Industries: Process-based industries and consumer products

Strengths: Deep optimization for demand orchestration. Should be considered by Stage 5 clients as an additional technology to make the trade-offs between revenue management and supply alternatives.

Considerations: This technology is an enhancement tool for S&OP and should not be confused as a technology to model demand- or constraint-based supply.

26. Steelwedge

Website: www.steelwedge.com

Deployment: Software as a Service

Organizational Size: Medium–Large

Type: Demand, Supply and Demand

Relative Costs: $$$-$$$$

Coverage: North America with recent expansion into Europe and Asia

Industries: Discrete, chemical, and consumer products

Strengths: Steelwedge was an innovator in the development of solutions purpose-built for Sales and Operations planning. It is an ideal solution to use for the integration and visualization of multiple S&OP processes and offers an Excel-like user interface with a collaborative workflow.

For over a decade, the company has been refining its solutions. The company now has more than fifty customers. The current product is stronger than the earlier versions and companies considering the Steelwedge product should understand that Steelwedge has had some *"growing pains"* in the evolution of the product platform.

Product strength is in mix translation and demand translation. It is one of the strongest solutions for attach-rate forecasting and mix/volume analysis. It is also a strong visualization tool for executive scenario modeling and was early to introduce social collaboration into the offering. Steelwedge was one of the first Software as a Service (SaaS) pioneers and has much more in-depth experience in this deployment offering than others.

Considerations: Steelwedge was one of the first systems built for S&OP and has a common data model that facilitates the translation of demand to understand mix changes and translate across multiple equivalent units. The platform is stronger in demand for discrete industries than process companies and stronger in demand than supply. Steelwedge is currently working on enhancing its supply capabilities in its road map, but lacks the capabilities today to deliver a "feasible plan" in Stage 1 of S&OP evolution. Until its road map comes into fruition, it is best deployed as a complementary technology to existing APS implementations in large organizations. It is an ideal solution for a heterogeneous environment with multiple S&OP processes with inputs from multiple ERP and APS technologies.

27. Tagetik

Website: www.tagetik.com/

Deployment: License

Organizational Size: Medium

Type: Financial Modeling

Relative Costs: $$-$$$

Coverage: North America and Europe

Industries: All. (Current focus in consumer products)

Strengths: Easy to use financial modeling to complement the S&OP Process.

Considerations: Tagetik is a financial modeling tool to visualize trade-offs, but does not offer predictive analytics. It is a more general financial modeling tool than Acorn Systems, Jonova, or River Logic.

28. Teradata

Website: www.teradata.com

Deployment: License

Organizational Size: Large

Type: Demand and Supply Modeling

Relative Costs: $$$-$$$$

Coverage: Global

Industries: Retail

Strengths: Very scalable product for retail distribution. Good modeling capabilities for distribution-based replenishment.

Considerations: While Teradata is usually thought of as a business intelligence solution, their purchase of Stirling Douglas software makes them fit for consideration for S&OP in a retail environment. While the solution can model demand and supply, companies will need to tailor the analytics to model the S&OP executive workbench. The solution is not a good fit for a manufacturer or for a company that needs to model multiple S&OP processes at multiple stages, or complex distribution environments.

29. Terra Technology

Website: www.terratechnology.com

Deployment: License Sales

Organizational Size: Mid-Large Companies

Type: Demand Sensing

Relative Costs: $$$$-$$$$$

Coverage: North America and Europe

Industries: Consumer Products and Distribution-Centric Industries

Strengths: Depth of optimization and co-development activities on demand sensing (reducing the latency from channel data to understand demand patterns) and inventory optimization. Demand sensing is best used to augment the platform to improve demand forecast accuracy at the warehouse distribution center in S&OP plan execution. Terra Technology is also piloting new demand solutions for long-term planning with several customers and should be considered by early-adopters seeking first-mover advantage.

Considerations: Best fit for a company that is comfortable with deep analytics in a black box. Terra Technology has the deepest experience with the use of math to sense demand from either order and shipment streams or channel data. Five years ago, the company also launched an inventory optimization solution to help companies better translate demand.

30. ToolsGroup

Website: www.toolsgroup.com

Deployment: License

Organizational Size: Medium–Large

Type: Inventory Modeling

Relative Costs: $$-$$$

Coverage: North America and Europe

Industries: Distribution Intensive

Strengths: Deep inventory optimization capabilities for organizations in distribution intensive environments like food and beverage, consumer products and wholesale distribution.

Considerations: The solution is not a good fit for a manufacturing intensive inventory data model involving work-in-process or late-stage postponement in the extended manufacturing network. ToolsGroup is piloting a demand sensing application with several customers and should be considered by early adopters.

31. TXT E-Solutions

Website: txtgroup.com

Deployment: License

Organizational Size: Medium–Large

Type: Demand and Supply Modeling

Relative Costs: $$-$$$

Coverage: North America and Europe

Industries: Apparel, Apparel Retail, Consumer Products, Footwear and Consumer Durables

Strengths: The TXT solution is an ideal solution for companies in apparel/footwear and consumer products. The solution includes financial modeling along with demand and supply modeling on a common data model. With a data model built for apparel and fashion life cycles, the TXT solution is an ideal fit for companies with changing product portfolios. It is easy to use and maintain by the line of business user.

Considerations: The solution is not a good fit for other industries where more depth in demand and supply modeling is required. The product is not as deep as others in demand- or constraint-based supply modeling or what-if analysis. The solution lacks the depth in multi-tier inventory modeling and visualization of executive S&OP sessions. Additionally, with the ups and downs of TXT in the North American market, the solution is the best fit for a regional European company seeking support from a local supplier.

32. WAM Systems

Website: www.wamsystems.com

Deployment: License

Organizational Size: Small-Medium

Type: Demand and Supply Modeling

Relative Costs: $$-$$$

Coverage: North America and Europe

Industries: Chemical and Other Process Manufacturing Industries

Strengths: Self-contained modeling workbench to model demand and constraints. System is designed for the chemical industry.

Considerations: Supply modeling is stronger than demand. User interface is not consistent across the application and the business intelligence for the executive S&OP meeting is a concern for many clients. Application has deep manufacturing scheduling logic for the small-medium chemical company looking for an easy-to-use solution.

About Supply Chain Insights LLC

Founded in February, 2012 by Lora Cecere, Supply Chain Insights LLC is focused on delivering **independent, actionable and objective advice for supply chain leaders**. If you need to know which practices and technologies make the biggest difference to corporate performance, turn to us. We are a company dedicated to this research. We help you understand supply chain trends, evolving technologies and which metrics matter.

About Lora Cecere

Lora Cecere (twitter ID @lcecere) is the Founder of Supply Chain Insights LLC and the author of popular enterprise software blog Supply Chain Shaman currently read by 5,000 supply chain professionals. Her book, *Bricks Matter*, (co-authored with Charlie Chase) published on December 26th, 2012. She is currently working on a second book, *Metrics That Matter*, to publish in 2014.

With over nine years as a research analyst with **AMR Research, Altimeter Group, and Gartner Group** and now as a Founder of Supply Chain Insights, Lora understands supply chain. She has worked with over 600 companies on their supply chain strategy and speaks at over 50 conferences a year on the evolution of supply chain processes and technologies. Her research is designed for the early adopter seeking first mover advantage.