

Supply Chain Planning with Prescriptive Analytics

Technology Enables a More Effective Process



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Advanced Analytics Drive Better Planning

Technology has steadily advanced the analytic techniques that enable businesses to undertake the challenge of supply chain optimization. These have evolved from basic inventory optimization routines to more complex algorithms that address multiple objectives and constraints simultaneously. Analytics facilitate even complex scenario analyses to provide a more complete picture of the future. They have moved beyond merely being descriptive, explaining what just happened, to being able to prescribe one or more options. Prescriptive analytics suggest decision options and calculate the consequences that follow from each. This allows executives and managers to accelerate decision-making cycles because they can rapidly explore alternative courses of action and identify the best options because they understand the impacts of each. Being able to speed up decision cycles by quickly getting answers to “what if” questions can give companies a competitive advantage in today’s dynamic markets.

Managing Ever More Moving Parts

Managing supply chains is a complex task because of the ever-increasing number of moving parts that must be considered. Supply chains link otherwise unconnected business units, each of which has its own set of business objectives and constraints that will impact supply chain efficiency – minimizing unit costs by maximizing production, for example, or only shipping full truckloads. On their own, each of these business units would choose trade-offs that optimize their individual results. In the aggregate, though, they could result in, for example, longer than necessary delivery lead times for priority customers, higher freight costs and bloated inventories.

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In the face of challenges such as these, many companies struggle to optimize their supply chain plans – to maximize customer-facing metrics such as market share, output and fulfillment while achieving higher returns on assets and equity. Our research finds that fewer than half (47%) of companies

say their supply chain plans are accurate.

Preparing the optimal supply chain plan for a company almost always involves making trade-offs between business units; the best result never is achieved when the process consists of each unit applying simple rules to optimize its own performance. Yet our research finds that a majority (53%) of organizations have a limited or no ability to understand the trade-offs.



Planning also is an inherently dynamic process. Markets change constantly and product demand, input costs and currencies are always in flux, so plans won't remain optimal for long. Thus, being able to reassess feasible options and quickly adjust pricing, promotions and volumes is critical. In any enterprise planning process, these should be treated as variables instead of static inputs.

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Moreover, a supply chain plan isn't optimal unless it incorporates both operational and financial considerations – for example, defining the capacity that will have the optimal financial outcome on the balance sheet (such as inventory turns or achieving a targeted return on equity) or on the income statement (gross margin) while meeting revenue and fulfillment goals. To improve the accuracy of plans and ensure they can achieve their objectives, companies must use actual revenue and cost data

rather than averages and standard costing. Financial data is essential both for accurately measuring trade-offs involving multiple operational silos and for strategic planning.

Prescriptive Analytics for Effective Planning

Prescriptive analytics uses a digital model of the company to assess a range of scenarios, considering both operational and financial variables, and calculate their outcomes. It boils down the results of multiple iterations of analyses, sometimes thousands, to present decision makers with a set of their most attractive options based on the specifics of their products, processes, constraints and desired outcomes consistent with their strategy. It presents the solution set that achieves the desired result – for example, the products and volumes, number of shifts and particular plants that would achieve the desired result and unit price realizations. Then, it shows the impact of each option on key financial and operational performance metrics.

Prescriptive analytics are especially useful when dealing with complex planning models with multiple constraints and stepwise dependencies – for instance, where limiting production of an intermediate part limits the total amount of finished goods available. When applied to a dynamic supply chain model, prescriptive analytics are most effective when they incorporate all possible manufacturing and sourcing options and paths for the movement of products and services.

Organizations must be able to treat pricing, promotions and resource allocations as variables to be considered simultaneously in finding the best supply chain plan. Properly constructed, prescriptive analytics also help companies uncover the most significant risks to achieving their plans and help perform sensitivity analysis to

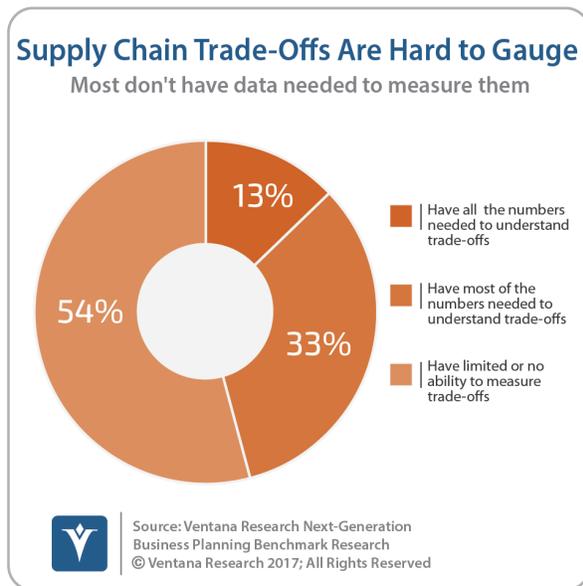


identify the factors that have the greatest impact on achieving their financial and operational objectives.

Organizations must be able to view and analyze operational and financial data simultaneously in applying prescriptive analytics. This is because it's essential organizations understand the impact of decisions on company-wide profitability as well as on the balance sheet and cash flow. A plan may be operationally feasible but nevertheless impractical with respect to impact on cash flow (because there's insufficient liquidity for the plan to be workable) or the balance sheet (because the plan would violate debt covenants). Also, a plan that's optimized based on average costs can have unforeseen negative consequences on profitability because, for example, it doesn't include extra expense to accelerate orders.

Technology to Improve Planning

Our research shows that four out of five companies (79%) use spreadsheets for their supply chain planning. Spreadsheets are a familiar tool and are perfect for prototyping or for a one-off analysis. However, they are error-prone, difficult to audit and not conducive to collaborative work. And they cannot provide the competitive advantages achieved through more intelligent supply chain planning.



Optimizing a complex system like a supply chain requires close collaboration. Yet only 39 percent of our research participants that use spreadsheets said that their organization collaborates effectively in supply chain planning. Spreadsheets reinforce silos: fewer than one-fourth of organizations say their supply chain plans are integrated with their company's manufacturing, procurement or sales departments.

Agility in supply chain planning enables a company to respond to markets faster. Consolidating a mass of spreadsheet models and iteratively testing their output is too time-consuming to be practical

and too error-prone to be reliable. A majority (58%) of companies in our research say that spreadsheets make it difficult to manage their supply chain process.

Prescriptive analytics provides companies' decision makers with the means to progressively achieve more rapid and accurate supply chain planning cycles, enabling them to be increasingly more effective in responding to dynamic market conditions. A dedicated planning application that uses prescriptive analytics can give managers and executives the ability to assess trade-offs with greater insight and precision, especially if the analysis incorporates financial data.



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