



Elevate S&OP with Enterprise Optimization™

Why Successful S&OP Processes Uses Enterprise Optimization™

Most manufacturing organizations have adopted some form of Sales & Operations Planning (S&OP). Nevertheless, many executives and S&OP professionals feel there are still many questions that are, at best, poorly answered. Such questions include things like:

- ✓ When capacity is limited, should demand be shorted? What if inventory policies were relaxed to build ahead?
- ✓ If demand must be shorted, which demand? Which products, geographies and customers?
- ✓ Where should funds and capacity be allocated to drive additional growth or profit?
- ✓ What's the true profitability of each product or SKU?

In other words, companies are unable to anticipate the real impact of their decisions. Not only that, but companies simply aren't the same as they used to be. Many now manufacture and sell hundreds, thousands or tens of thousands of products all across the world. With increasing complexity and accelerated demand trends that shorten product life cycles, companies are unable to make optimal decisions within required timeframes. Simply put, they lack agility and speed.

That's where Enterprise Optimization™ comes into play. It addresses these challenges by providing managers, executives and other professionals with the ability to find the optimal set of decisions that maximize the company's key strategic and financial metrics. **By explicitly linking decisions with the most important corporate metrics, Enterprise Optimization™ enables S&OP alignment with corporate strategy and facilitates value capture.**

ENTERPRISE OPTIMIZATION™



FOR COMPANIES

Companies that have adopted Enterprise Optimization™ have captured as much as 1% to 5% of revenue in additional profitability and drastically increased their decision-making agility.



FOR S&OP PROFESSIONALS

Those S&OP professionals who implement Enterprise Optimization™ have significantly elevated their roles away from intense, reactive data analysis to proactive, trusted business partners. They're recognized as major drivers of business value within their company.

The Limitations of Current Planning Approaches

Most companies plan sequentially, first translating a forecast into a demand plan. While it may be optimized for revenue, most of the time the demand plan is not optimized to profit. As it gets locked for generating the supply plan, companies lose all ability to optimize their product mix, optimize their promotional plan and choose the right demand to short based on profit.

The supply plan is currently generated one of two ways: using heuristics and rules-based approaches or using a packaged optimization approach. Let's explore these two approaches a bit more in order to better understand current planning limitations.

Heuristics and Rules-based Approaches

Heuristics approaches work on a defined path, much like you would define things in an Excel model and leverage multiple worksheets and calculations. Typically, they start by translating demand into units required at the distribution center (DC). This result is then translated into inventory required. The heuristic rules then work backwards to consider lead times (customs, shipping) and then production requirements.

An example heuristics rule for production might be "assign production of this product into this line first, then that line ..." and so on. Although they can sometimes generate alerts when constraints are being broken, **heuristics approaches typically don't respect constraints**. Even the alerts are often wrong. For example, if the heuristics rules aren't optimally using capacity (as would typically be the case in the priority rules for production), then plans might either be infeasible or incorrectly labelled.

With heuristics and rules-based approaches, users have to spend a large amount of time:

- | | |
|---|---|
| 1 | Ensuring the heuristics stay accurate, especially when volume/mix changes, new products are introduced, throughput changes, inventory policies change, etc. |
| 2 | Dissecting the output and translating it into a plan that can actually be executed |

Since the average company's plan typically has well over a million alternatives, heuristics based plans are only optimal if the user is extremely lucky. Furthermore, **they often leave significant knowledge (i.e. understanding of where constraints lie, understanding of average and marginal unit profitability on a forward-looking basis etc.) and money on the table.**

Heuristics-based approaches are only able to focus on the short term. Longer term plans deteriorate quickly, thereby limiting both the value of the information and the ability to plan effectively. **Therefore firms often find they have to complement heuristics based approaches with medium/long term "rough cut" capacity planning tools.** Even in the short term, users don't know how feasible the plans really are. They struggle to adapt the heuristics approach every time their business changes. These approaches require intensive, on-going care to stay current.

Packaged Optimization Approaches

Optimization with packaged applications (for example SAP APO’s SNP module) enables companies to represent: a) a supply plan b) a capacity plan and c) most typical supply planning constraints. **However, companies have to adapt their business to the software – the underlying model cannot be changed.**

Packaged optimization solutions are mainly focused on producing a feasible plan, as opposed to the aforementioned heuristics/rules-based approach which focuses simply on producing a plan, feasible or not. Users can typically manipulate certain levers in order to fine tune their analysis – for example, using cost allocations (i.e. “steering costs” in SAP’s vernacular) in convoluted ways to bias the optimization objectives in one or another direction.

Using optimization from a packaged application typically achieves mixed results, as the vendor forces significant trade-offs to create a “one size fits all” model that is supposed to work in every industry.

Common limitations of packaged optimization applications include:

●	Underlying, pre-built models that are inaccessible to the user, making it impossible to alter or understand (i.e. a “black box” model)
●	Inability to identify which demand to pursue because demand is a fixed input
●	Limited ability to find the best plan. Packaged optimizers typically simplify the problem by breaking it (e.g., they might solve first for material requirements at the DC, then allocate production to manufacturing plants)
●	Inability to account for contractual or multi-enterprise relationships (What if a customer or supplier contracts contain SLAs and specific penalties or discounts that might be incurred?)
●	No representation of advanced constraints (What if it’s important to substitute products for a customer? What if a planner needs the software to help manage carbon emissions?)
●	Limited financials that only define a few factors like manufacturing costs by product and facility. Limited financials lead to, at best, approximating a minimum cost solution
●	Complex optimization management approaches intended to limit the size of a problem or allow the users to get around complex data (i.e. “decomposing” the problem by product, step in the value chain or time period and ignoring important constraints). When combined with the “black box” nature of these solutions, they greatly compromise quality of plans due to a user’s inability to truly understand and adequately manage the underlying model

Because of these limitations and despite the benefits of optimization, most users have turned to heuristics-based systems to run their supply. Along the way, they are leaving significant upside on the table.

Limited One-way Financials in Manufacturing

The final step in S&OP is translating the constrained demand plan and the supply plan into financials. This is typically done by feeding the key inputs into a budget-planning-forecasting application that creates a forward-looking P&L and cash flow forecast.

Quite simply, this step is a complicated one-way street. The aggregations required make it impossible to go back and run real-life what-if analyses about the demand or supply plan within the financial tool. **By making this a distinct step, users once again limit their ability to gain knowledge and truly optimize their decisions.** They're simply not able to properly consider financials in their decision making.

The Need for Better Planning is Apparent

Given the aforementioned problems inherent in current S&OP processes – including how much money is left on the table and its limited alignment with financials and corporate objectives – there is a clear need for improvement. In the following section, we discuss targeted enhancement opportunities possible through Enterprise Optimization.

How is Enterprise Optimization™ Different?

Users often want to know how Enterprise Optimization™ may differ from what they're already doing. More specifically, they want to know how the technology is different. Because demand forecasting is still required for both current approaches and Enterprise Optimization™, the question really focuses on how users enhance and interpret a demand plan to create a full business plan that includes financial outcomes as an integral component.

Enterprise Optimization™ rests on the principle of global planning — i.e. that users make decisions with the ability to understand and optimize their choices across their entire business unit, product portfolio or division. They have the ability to query their business from any angle, and each time get an optimal, feasible plan in return.

Sample Enterprise Optimization™ Analyses



Optimizing demand generation efforts: promotional allocations, new customer bids



Evaluating which demand to prioritize based on strategic metrics: profitability, new product introduction, growth in a new region or channel



Optimizing the supply plan: capacity, sourcing, procurement, distribution, stocking



Evaluating alternative policies: premium providers/co-packers, inventory min/max constraints



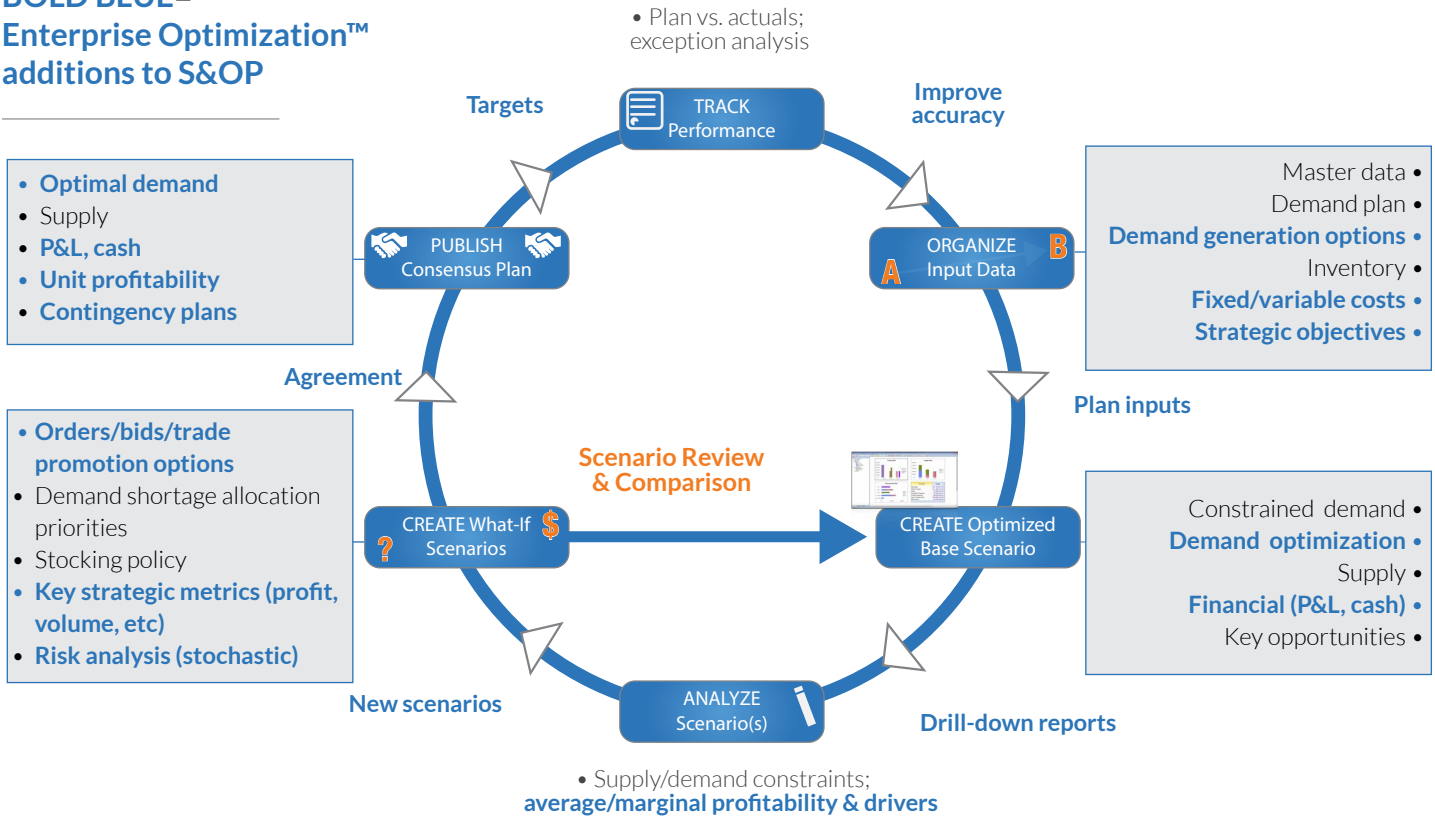
Understanding the impact of different plans based on varying the objectives: growth, profitability, total inventory, cash flow, volume



Understanding the impact of different plans given the uncertainty of the inputs and ultimately determine the appropriate risk management strategies address any situation

Enterprise Optimization™ Process

BOLD BLUE= Enterprise Optimization™ additions to S&OP



Enterprise Optimization™ requires a different paradigm. It needs a closer tie to corporate and strategy planning, deep participation from finance and stronger collaboration between the commercial and supply departments to optimize the use of demand generation and supply resources. That being said, Enterprise Optimization™ also requires a new generation of technology.

Next Generation Optimization: The Intelligent Model

To achieve Enterprise Optimization™, software vendors must address the key challenges with rules-based and packaged optimization solutions and deliver significant value to users that drive change into a business. There's a need for an intelligent model that has the following key characteristics:

1	Represents the client's unique situation instead of forcing everyone into a "one size" application
2	Represents unique constraints like dependent demand or carbon emission limits
3	Offers extensive built-in error checking and material balances to ensure output is always a feasible, quality plan
4	Contains an explicit underlying model that is both configurable through visual drag and drop and intuitive to advanced users, thus enhancing the user experience and eliminating the black box nature of packaged optimization systems
5	Enables model designers to leverage extensive sets of embedded best practices
6	Supports and optimizes all key analyses that drive maximum value, i.e. demand optimization, supply planning, policy evaluation and full financials
7	Offers flexible objective function that can represent one or multiple business objectives (e.g. minimizing demand shortages, maximizing revenue/profit/cash flow, maximizing volume on new SKUs or geographies, etc.)

An Enterprise Optimization™ model also offers extremely fast, scalable performance. A typical Enterprise Optimization™ model **generates between 1 million and 25 million equations with about the same number of decision variables**. Such a model should:

●	Return an answer in, at most, a few minutes
●	Provide the best feasible plan for every scenario
●	Enable users to spend less time evaluating and more time to proactively working with the business to drive value

In other words, the intelligent model behind Enterprise Optimization™ represents the business with relatively high fidelity – akin to "SimCity" or "Minecraft" but far more powerful.



It accurately represents all key aspects of the business (e.g. baseline demand, demand optionality, product mix, manufacturing, distribution, warehousing and stocking).



It represents cost accounting associated with the value chain (e.g. revenue, discounts/promotions, fixed and variable costs, marginal contribution and opportunity costs).



It represents the chart of accounts (e.g. P&L, balance sheet and cash flow).



Finally, the model represents the key constraints of the business whether physical (i.e. capacity, throughput), financial (i.e. cash flow, working capital), policy (i.e. stocking, sustainability) or market driven (i.e. upside demand).

Each time a user runs one of the “queries,” the model leverages **mathematical optimization** to find the optimal answer while respecting all the important constraints in the business. Users can:



Vary the company’s objectives to ask the model for the optimal answer by prioritizing some over others (e.g. growth vs. profit or profit vs. cash flow)



Simulate a decision



Run open-ended “what-if” analyses that let the model suggest a “best outcome”

Plans produced from Enterprise Optimization™ are of high quality because they accurately represent the realities of the business.

The Impact of a Quality Plan

The importance of having a quality plan inevitably impacts the key trade-offs in the business as it drives the understanding of profitability. Imagine now that you need to plan promotions three to six months out, and that you have a limited budget and capacity to support the promotions. You want to know where to allocate the promotional budget and production capacity optimally – i.e. the plan that would maximize profit and satisfy strategic priorities (e.g. top customers, innovation SKUs, growth in a new geography, etc.). If the underlying plan is not feasible and/or not optimal, not only will users have the wrong idea of what is achievable, but the forecasted cost and profitability will be ill-informed. Costs will be incorrect in total and their allocation to SKUs will be based not in how they incur cost in reality, but rather on some allocation rule akin to standard costing.

Therefore, a poor quality plan (i.e. infeasible or suboptimal) will result in decisions that fall short of maximizing the impact of a firms’ resources on achieving its strategic objectives.

Conclusion

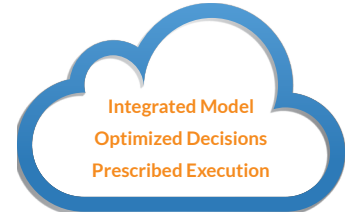
Enterprise Optimization™ provides users with the best plan and a guarantee that the underlying model is correctly assigning fixed and variable costs. Therefore, as volume, mix, SKUs and priorities change, the forecasted profitability impact of promotional spend and capacity allocation is accurate and can be optimized. In this way, **planners and managers are able to identify as much as 5% of revenue in additional profit** while aligning the organization on a more agile, inclusive process that relies on shared knowledge and a relentless focus on improving business outcomes.

About River Logic

Founded in 2000, River Logic is a privately held technology firm with a mission to establish prescriptive analytics (optimization) as the leading scientific approach to business planning and decision support. Its focus is on helping customers and business partners increase their performance, decision-making agility and ability to predict business outcomes.

River Logic provides a prescriptive analytics platform, Enterprise Optimizer®, on a service-oriented architecture that supports SaaS and on-premise deployments. This is complemented by an Integrated Business Planning application that simplifies customer adoption of the solution and platform into their business. This solution enables the ability to create an integrated model of an enterprise (including multienterprise), optimize decision points associated with an Integrated Business Planning process and prescribe a set of play books for execution.

FREE DEMO
OF
RIVER LOGIC'S
ENTERPRISE OPTIMIZER®



**GET A
FREE DEMO**

FREE DEMO

EMAIL
Sales@RiverLogic.com

OR CALL
866.326.0171

FIND US ON SOCIAL

