Supply Chain Network Optimization Technology

8-POINT BUYING CHECKLIST

INTRODUCTION

Selecting the right **network optimization tool** has become increasingly complex, and buyers should beware of going with mainstream tools that are well-known in this space. Oftentimes, these tools lack newer, innovative capabilities that enable flexible planning and scalability across users and pain points. These tools tend to force businesses into a box, causing them to miss out on profit-building opportunities because they fail to optimize end-to-end. Managers, planners, and analysts tasked with these processes will want to parallel the network optimization approach to the idiom, "measure twice, cut once," and solve for the efficiencies in part with the business as a whole.

Below, we've highlighted the **eight most important factors to consider when evaluating a network optimization technology vendor.** With these eight points, leaders will be able to narrow down their vendor list and have a highly-informed view of the market. The checklist is also intended to help buyers compile or customize their own request for information (RFI) document. Once decisions have been made based on the checklist, review the final section to see 12 more **important questions that many buyers are considering** when selecting network optimization software.

① SOLUTION TYPE: PACKAGED VS. PLATFORM

Why It's Important

The access to network optimization tools range from the single-user, singular-use packaged solution to multi-use, multi-user platform offerings that can address a wide range of decision-making challenges.

Packaged Solution

Many vendors provide packaged network optimization solutions. However, these tools are often used by one or a few users within the company. Thus, the team that's trained to use it is only supporting one use case, lessening the impact of the technology solution. Further, if the team is small, it creates a knowledge risk should a team member move on. Oftentimes, it can also mean that the team is not fully utilized and has to multi-task, thus diluting their expertise.

Platform

Some vendors offer general-purpose optimization platforms that can address network optimization challenges. The benefit is that such platforms can be used to address any number of cross-functional planning challenges at the operational, tactical or strategic levels. With a platform, buyers are investing in a single technology, but they're able to address several business challenges. This means lower efforts on the IT side (fewer pieces of technology are necessary) and more users getting value from the technology (higher ROI). The one downside of a platform is that it may take slightly longer to implement, depending on the needs of the customer and the type of platform.

2 **ANALYTICS CAPABILITIES:**
HEURISTICS VS. OPTIMIZATION

Why It's Important

When organizations optimize the network, there are several analytics approaches they can use. The two most common approaches are to apply either heuristics or optimization (e.g., linear programming) to solve for the "best" outcome or decision. It's important to understand the pros and cons of each.

Heuristics or Simulation

Heuristic approaches, by definition, do not guarantee optimized answers; they simply serve as a best guess. Also, heuristics are dependent on human inputs, so this approach is unable to consider decisions outside of the norm. They're also unable to fully consider all of the constraints and variables of a business unless the business is extremely simple. Heuristics have the benefit of producing answers quickly, and they don't require data scientists or engineers to build/modify/interpret. However, heuristics are unable to uncover significant value when "optimizing" the network.

Optimization

Optimization — most commonly done using linear programming — by definition finds the best answer within the realities of a business. Optimization differs from heuristics in its ability to not only adhere to all business constraints and satisfy one or more objectives (KPIs), it is able to consider options outside of the usual network design strategy and determine which plan of action best satisfies all objectives. It is also more robust in considering cross-functional constraints that heuristics or simulation are unable to account for, due to their inability to appropriately represent interplay.

3 DIGITAL PLANNING TWIN

Why It's Important

A digital planning twin is a digital representation of some real-world entity or system, usually a representation of assets and processes within or across a business. Digital planning twins are designed to create plans that can optimize the use of assets, like when to run upgrades, how to go about repairing machines, etc. It effectively allows companies to understand the impact that changing one or more aspects of the business (e.g., adding or removing a manufacturing plant) has on the rest of the business. Most network optimization technology will utilize a digital twin that only represents the supply chain network. However, it's important to understand the increasing need to represent a business beyond the supply chain network. We refer to the ability to go beyond the supply chain network as an advanced planning twin.

Traditional Digital Planning Twin

The simplest digital planning twins have the ability to represent a supply chain network, but there are important shortcomings that buyers need to consider. The traditional digital planning twins don't provide planners with a good understanding about several key aspects of the value chain that could be drastically impacted by network changes. Here are some examples of data that can't be represented in a traditional planning twin:

1. Manufacturing plant capacities and constraints (like work-in-progress buy/sell optionality)
2. Raw material procurement cost and availability
3. Go-to-market considerations (like product mix and product substitutions)
4. Import/export duty offsets
5. Financial constraints and objectives (customer/product profitability, NPV, etc.)

While it can recommend strategies to reduce costs across the network, a traditional planning twin can hurt the value chain, as a whole, with its decision outputs. Strategies to reduce cost in one area can negatively impact other areas of the business, and planners would have no visibility into what the impact might be.

Advanced Digital Planning Twin

An advanced digital planning twin represents more than just the supply chain network— it represents the entire value chain in digital form. This includes things like regulatory requirements, service level agreements, sustainability requirements, key financial variables or constraints, supplier contracts, and more. An advanced digital planning twin can be as detailed as necessary in order to tackle unique business challenges and ensure that a holistic view of the impact of decisions on the business is achieved. It's also possible to take into account real- time realities at the same time as it considers longer-term planning horizons, something that a traditional planning twin cannot. Especially when it comes to responding to risk and dealing with sudden market disruptions, supply chains that represent a limited or overly-simplified view of the value chain will continue to fail and damage the business. This is an opportunity for supply chain leaders to think beyond their function and be true drivers of business transformation.

4 FINANCIAL MODELING AND IMPACT ANALYSIS

Why It's Important

Financial modeling takes the guesswork out of understanding a decision's impact on financial metrics. Any network optimization solution will offer some sort of financial impact analysis, but the key difference is to understand at what level of detail cost/revenue are being modeled and determining what level of detail is best for your specific planning needs.

Less Robust

Many network optimization solutions, especially point solutions, have less robust financial modeling. These tools model steering costs, they don't necessarily consider fixed and variable costs separately, and they simplify by using cost per unit or profit per unit. This can drastically impact the accuracy of your decisions, and the expected impact your decisions will have on key performance indicators won't be reliable. For example, you might be analyzing scenarios based on simplistic assumptions that costs don't change based on business context, like changes in volume, product/service mix, etc. Or you may not be considering asset-based and labor-related costs/constraints separately. This causes errors in the plans and missed opportunities for profit-improvement or cost-cutting opportunities.

More Robust

Network optimization solutions that have robust financial modeling capabilities will model actual costs, consider fixed and variable costs separately, and use accounting practices like GAAP to represent how costs are accrued. In short, tools with robust financial modeling will exactly represent how your value chain makes money and incurs costs. These solutions also represent a full chart of accounts, transfer prices, and treat accounts or summary accounts as constraints or objectives. The best solutions from a financial modeling perspective will even provide forward-looking average and marginal profitability by product, customer, order, etc. for each scenario. Further, it will give planners the option to optimize to one or more financial line items (i.e., max revenue, max operating income, min COGS) or financial ratios (i.e., NPV, ROIC).

5 MODELING GRANULARITY

Why It's Important

The level of granularity that a supply chain model uses during network analysis is crucial to network optimization. It can impact 1) the accuracy of a network's predicted impact on KPIs and 2) the frequency at which a team can re-work network plans. Being able to more frequently analyze a network will naturally lead to better performance of the network since supply chains never sit still.

High-Level

Certain market-leading network optimization solutions can only model high-level assumptions across the value chain. Because they lack certain operational or tactical interdependencies, these technologies are unable to support weekly or monthly processes. This inhibits a supply chain's ability to quickly shift its network design strategy in response to market disruption or new market opportunity. Companies can still make educated guesses, but they won't have data-backed insights about the impact of their guesses.

Detailed

Alternatively, a solution that represents the supply chain on a granular level enables a company to go from once-a-year planning to monthly or weekly planning without sacrificing optimal performance. It's becoming more crucial for companies to have agility in network planning, since newer technological capabilities have drastically impacted the rate of change in supply chains.
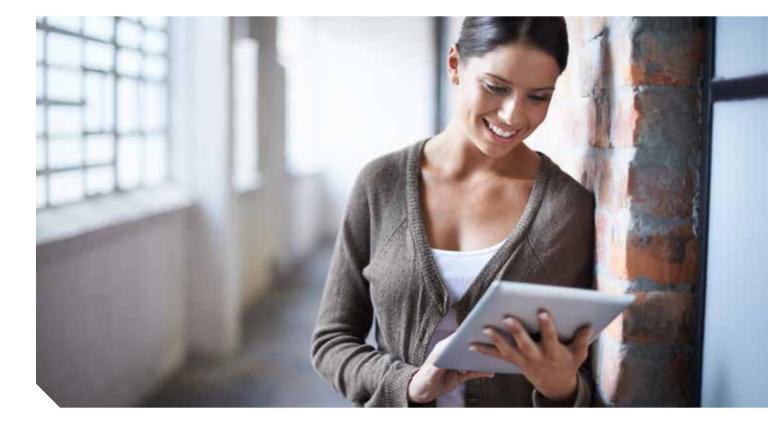
6 USER EXPERIENCE

Why It's Important

The future of advanced analytics is insights generated by collaborative planning and what-if analyses. When more users can visualize optimized opportunities, decision-making is no longer a siloed process.

Poor

A poor user experience is one that demands a lot of time for onboarding and training. It is an experience that is unable to support real-time collaboration and workflows for planning.

Good

A good user experience is one that promotes real-time collaboration, rapid scenario analysis, workflows, automated notifications, triggers, and more. It should be easily adoptable by non-technical users and should require minimal onboarding.

7 SCENARIO ANALYSIS

Why It's Important

Also related to user experience, scenario analysis is about using technology to quickly and frequently run "what-ifs" to develop optimal plans for current or potential states of the network. One of the most significant benefits of scenario analysis is it allows organizations to make rapid decisions when circumstances change. Thus, it's important to consider whether the scenario analysis supports broader collaboration and enables users to make fast decisions.

Non-Collaborative

With certain mainstream network optimization solutions, only one or a few users are interacting with the tool. This can significantly inhibit the speed at which scenarios are analyzed because there are no broader collaboration components that support rapid, cloud- based workflows and feedback loops.

Collaborative

Other tools offer out-of-the-box collaboration components and support a wider range of users, some of which might simply be visualizing outcomes and providing input on scenarios rather than running them. Collaborative capabilities that support real-time feedback, input, and analysis across a broad range of users will become more important as supply chain complexities continue to grow. Companies will find themselves needing to make network decisions much faster than in the past.

8 FAMILIARITY

Why It's Important

The familiarity of a network design solution is important because it can impact ease-of-use and implementation time. It can also impact implementation costs and resource requirements if in-depth training on proprietary tools is required.

Proprietary

Some supply chain network optimization solutions create their own reporting dashboards that users are forced to use and have custom integration requirements. These can seem less familiar than if a solution uses commonplace tools that supply chain professionals already use in their day-to-day lives. Proprietary tools force users to learn new tools, which can be extremely time-consuming. This can be made worse if the vendor doesn't have good training materials or good customer support for troubleshooting.

Standard

The benefit of a vendor using standard tools — like PowerBI or Tableau — is that most users will have less to learn when it comes to network optimization technology. This improves user adoption and boosts the likelihood that the tool will get used by more people. The same goes for network optimization solutions that have pre-built integration capabilities.

NETWORK OPTIMIZATION:
12 OTHER THINGS TO CONSIDER

Once you've gone through the eight-point checklist and decided what you need from your optimization solution, there are a few more things you might want to consider asking your technology vendors. These are based on more specific needs that companies have, and some may or may not be relevant. Run through the following questions and check off which ones you think might be relevant to your network:

☐ Can the solution support decisions to influence demand (pricing, marketing/promotions, better availability/services)?

☐ Can the solution support decisions on buying and selling intermediate/work-in-progress products? Private label contracts?

☐ Can the solution recommend an optimal product mix/assortment? Product substitutions?

☐ Can the solution forecast product, customer and order profitability? Can the solution differentiate average vs. marginal profitability?

☐ Can the solution support evaluations to segment SKUs and policy setting (pricing, promotion budget, inventory management, order quantity)?

☐ Can the solution evaluate/recommend different customer bids and contract evaluation?

☐ Does the solution capture ALL inputs and outputs, including by-products and emissions?

☐ Can the solution represent resources (labor, production lines/machine centers) and activity?

☐ Can the solution represent unique manufacturing constraints (i.e., batch and continuous process flows, conditional minimums, sequencing, blending)?

☐ Can the solution optimize capacity across labor and production, while considering inventory and service level targets?

☐ Can the solution optimize sourcing and supplier decisions? Can the solution support resource open/close decisions?

This network optimization buying guide is designed to help teams take a more hands-on, informed approach to selecting a network design solution, rather than simply relying on the most well-known tool. With an ever-increasing number of smaller, emerging technology firms, it's become more important for leaders to understand the technology market and the overall buying decision. Failing to do so will greatly hinder the potential value and return on technology investments.

ABOUT RIVER LOGIC

River Logic has been a global innovator in prescriptive analytics (optimization) since 2000. Its platform — designed for business users — enables enterprise-wide optimization, collaborative planning, and performance management, all delivered through a revolutionary user experience. By understanding how to best utilize cross- functional resources and manage trade-offs, companies make more impactful decisions.

River Logic goes to market primarily through partner organizations like PwC, Deloitte, West Monroe Partners, and Microsoft, helping them develop high-value applications that monetize their IP. Recent clients include Unilever, BHP Billiton, Boise Cascade, McKee Foods, and the Russian Post. Typical client value-add ranges from 10% in cost reduction to profit improvements equal to 2-5% of annual sales. River Logic strives to help every customer achieve at least 10X return on investment, but it is common for customers to see even higher returns.

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Schedule a complimentary consultation or demo