

Supporting the M&A Wave with Supply Chain Optimization



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A Wave of M&A Activity

It is no surprise we are in another wave of mergers and acquisitions (M&A) activity with more on the horizon. Across the consumer goods industry alone Unilever stirred up quite the excitement with their acquisition of Dollar Shave Club and more recently Sir Kensington's, and their rebuff of a Kraft Heinz merger. SC Johnson has quietly acquired at least six companies broadening their portfolio and P&G's Gillette business is rumored to be up for sale. In retail Walmart acquired Jet.com and Walgreens is divesting up to 1,000 stores in the Rite Aid deal. In industrial, Akzo Nobel completed their acquisition of BASF's Industrial Coatings business and just rejected a *third* takeover proposal from U.S. rival PPG Industries, and Ball Corp's acquisition of Rexam PLC was approved. These are only a handful of examples of recent M&A activity in the marketplace. There are a lot of reasons that fuel M&A activity, and we are most interested in those with an operations focus - synergies in consolidation, route to market, and portfolio offerings.

The Elusive "Size of the Prize"

In far too many cases, supply chain executives become involved in a merger or divestiture only at or after the announcement of the deal. Traditional views are to bring in a management consulting company to advise on the synergies associated with consolidation, divestiture, etc. Output of these efforts may indicate attractive cost savings associated with an activity, but companies often find it difficult to truly operationalize and achieve these synergies. We have seen many companies struggle to go after the elusive "size of the prize" without really knowing how to achieve at an operational level.

Value of Supply Chain Optimization

This is where supply chain optimization comes in. There is a highly underutilized benefit that supply chain optimization can play in supporting these strategic efforts. Supply chain optimization efforts can enable executives to identify additional synergies that the C-level group hadn't considered, and may challenge some of the early assumptions in cost savings opportunity. Supply chain optimization cuts through operational silos that tend to be barriers when savings/synergies are being defined, and can provide better up front feasibility analysis.

As mergers take place, the supply chain complexity often increases due to increase in the supply chain size and dependencies between supply chain entities, changes in supply chain configuration, increasing portfolio complexity and possibility of new product introduction, etc. Supply chain optimization is an efficient and effective way to harvest potential savings and overcome many arising challenges.

Supply chain optimization initiatives can be classified into two main categories: strategic optimization and operational optimization.

Strategic Optimization

Any initiatives that seek to reduce supply chain costs and increase profit in the long term (2-10 years) at a high level are considered strategic optimization. Normally, a strategic optimization process requires a great deal of science and takes time for analysis. It does not always need to be automated or run frequently. Here, we provide some examples of strategic optimization that should be explored in M&A activity:

1. Traditional network design. Whether looking through the lens of consolidation or divestiture, there are key decisions to be made regarding separation or integration of asset base across companies, level of flexibility and redundancy for risk mitigation, and opportunity to consolidate the footprint to drive down operational costs while increasing or sustaining service level. Network design can also support the development of strategies to support growth. Can a growing business acquire a company to integrate their underutilized assets into their network and avoid incremental capital expenditure, or are they better served to keep separate and focused factories?
2. Transportation optimization. If two companies are merging but not yet on “one invoice, one order” there are ways to leverage optimization to develop tools to help maximize short-term synergies to combine loads to an overlapping customer base.
3. Load consolidation and source assignment. Used with network design, companies can leverage both load consolidation and source assignment. The strategic optimization model decides the best way to group customers, assigns them to cost effective sources (i.e. warehouses) and consolidates loads for those customers to mitigate further LTL shipping costs. This requires simultaneous supply chain planning and transportation management which is challenging and difficult. Optimization models can overcome most of these problems and discover untapped potentials. One might set up a Mixed-Integer Programming model where the objective is to minimize total production, inventory, and transportation costs while maintaining the same service level and constraining capacities. Here, you can create value well beyond traditional methods (like getting the lowest transportation rates), and with optimization you have better planning and scheduling which may incentivize transportation service providers to provide even lower rates.
4. Tailored Network. Supply chain optimization can help understand trade-offs in your network. There may be hard cost advantages (like conversion and transportation cost reduction), but consumer trade-off's, like a less responsive network or longer lead-times, may outweigh these benefits, and are sometimes more difficult to quantify. Supply chain optimization allows you to get focused and strategic in developing a tailored network to best support your customer base, with transparency in trade-off's.
5. Business model innovation. Dollar Shave Club brought in a disruptive business model - providing product as a service, driven by quicker adoption of Ecommerce and mobile technology, and more intelligence on consumer needs. Unilever's acquisition of Dollar Shave Club is an opportunity to crack the code of

Ecommerce, immediately buying mind share in this space. Strength in supply chain optimization will be required to fully operationalize the benefits associated with this marriage.

6. Supply chain resilience to disruption and disasters. As the supply chain grows in size, it is more likely to suffer more from disruptions which not only affect customer service level, but also cost implications. We recommend to consider the risk of disruptions both in design and operation of the supply chain. In academia, the former is achieved with a two-stage stochastic program, and the latter with inventory optimization under uncertainty. In practice, Simulation-optimization method is one of the best tools for supply chain resilience studies, where decision makers can run significantly large scenarios and optimize the supply chain accordingly. Supply chain optimization enables solving a math problem, but also starting broader conversations in how to factor geopolitical and other risks into decision-making.
7. A New Frontier. There is one angle not yet covered - something no one talks about and is very hard to do. What if you could create a dataset that combines product attributes and supply chain attributes (features) for all products of both companies and then segment the two portfolios separately and then in a combined way. This could be the hub around which all kinds of product and supply chain decisions could be made.

Operational Optimization

An operational optimization process looks for cost savings at a tactical level. It requires more frequent analysis as compared to a strategic optimization process. Normally, the output of an operational optimization initiative is customized software that makes automated optimal decisions. Some examples of operational optimization that should be explored in M&A activity are:

1. Inventory optimization and multi-echelon safety stock calculation. The basic models dealing with inventory optimization are EOQ (Economic Order Quantity) and Newsvendor model. EOQ model finds the optimal batch size or order quantity when demand is deterministic or accurately forecastable. On the other hand, Newsvendor model deals with uncertainty of demand, and finds the optimal order quantity plus optimal safety stock to buffer against this uncertainty. These models can be expanded to address the complexity of inventory management in the supply chain - optimizing inventory in a multi-echelon supply network. At Opex Analytics, we developed a tool to optimally calculate the safety stocks of different stocking locations given demand forecast, BOM and sourcing configuration. This tool uses an inventory optimization engine as its decision making brain and automatically calculates the safety stocks and order quantities.
2. Transportation planning and vehicle routing in optimizing distribution operations and increasing fleet utilization. In theory, transportation optimization and planning problems like TSP and VRP are among the hardest problems to solve. In practice, these problems are also complex. However, recent increases in computing power have helped the transportation optimization. One example would be planning of the optimal multi-stop routes with consolidated loads for trucks to deliver products to customers. This will increase truck utilization and drive more benefit from truck load.
3. Sourcing optimization. Selecting competitive suppliers and maintaining time-based competitiveness is important. Optimization models can be used to determine the optimal number of sources and the ordering lot size. The importance of transportation operations and costs in sourcing decisions highlights the value of

aggregated optimization and decision making in supply chain. In addition, Multi-Objective optimization models are good tools for supplier selection based on price, delivery, lead time, quality and risk criteria.

What about Revenue and Pricing Management?

Most supply chain optimization models assume inelastic demands and start optimizing the supply operations accordingly. However, the actions taken on supply chain might change the demand process and an effective pricing optimization in conjunction with network design, transportation and inventory optimization could increase profit. Effective M&A work should include revenue and pricing management coupled with supply chain optimization to maximize profit across the enterprise.

In Summary

We are in another wave of M&A activity and there are no signs of slowing as companies across industries go after the elusive “size of the prize”. Much has been written about the difficulty in truly operationalizing and achieving expected synergies. If supply chain leaders are brought into these efforts early enough, supply chain optimization efforts can enable the identification of additional synergies not considered, and may challenge some early cost savings assumptions that companies could struggle to operationalize. We have provided examples of both strategic and operational optimization that could aid in going after the “size of the prize” in M&A activity. There is a lot of upside to leveraging supply chain optimization to support M&A activity beyond traditional network design. Companies will serve their shareholders well by understanding all the potential applications of supply chain optimization to maximize enterprise value.