



Image Copyright © 2014 Supply Chain Process Improvement, Inc.

Supply Chain Network Optimization

Three Ways to Avoid a Project Mishap

Presented in partnership with Supply Chain Process Improvement Inc.



Authors: Kevin Vahey
Ian Hobkirk
April 2014

Table of Contents

Introduction	3
Why Some Supply Chain Network Optimization Projects are Less Successful than Others	3
Critical Success Factors for Supply Chain Network Optimization Projects.....	4
Making Your Company’s Supply Chain Network Optimization Project Successful	4
1. Correct Data.....	4
2. Correct Techniques	5
3. Correct Application and Ongoing Use of Your Company’s Model	7
Conclusion.....	8
Resources on Supply Chain Network Optimization	9
Additional Resources:	9
About the Authors	10

Supply Chain Network Optimization

Three Ways to Avoid a Project Mishap

Introduction

A supply chain network optimization analysis, when executed properly, can set the stage for a company's operations strategy for years to come, revealing the optimal locations for manufacturing and distribution points, as well as the best way to leverage inventory and transportation to support growth. Unfortunately however, many companies have found that their supply chain network optimization projects have not been effective initiatives. This paper examines the reasons why some projects are less successful than others and outlines ways to ensure your company's next strategic modeling analysis is a success.

Why Some Supply Chain Network Optimization Projects are Less Successful than Others

The failure of some network optimization studies to meet expectations can often be traced back to two root causes: emphasis on tactics over broader strategy and failure to prepare properly for the analysis.

Too Much Emphasis on Tactics and Operations

The majority of supply chain costs are locked-in to the supply chain design. Once facility locations and inventory points are set, and service areas are defined from these facilities, all other costs are essentially locked in, including transportation, fixed distribution costs, and inventory holding costs. According to AMR Research and in Commonwealth's experience, the tactical and operational activities like minimizing inventory, maximizing transportation utilization, managing variable distribution costs, etc. can only influence the remaining supply chain costs, which can sometimes only amount to about 20% of total costs. However, companies spend a significant amount of money and resources trying to get savings out of the last 20%. Perhaps they feel more comfortable working on operational issues but even these costs are often locked in by company policy.

Poor Project Preparation and Management

Very few companies regularly run supply chain network optimization projects; therefore, they often can't justify the investment in the right tools and experience within their own organizations. Additionally, some companies do not have accurate data in a format that is conducive to modeling. For many companies, these projects fall into the "this is the first time we've done this as a team" category and are subject to extended project timelines associated with the learning curve.

Critical Success Factors for Supply Chain Network Optimization Projects

The bottom line is that in order to capture the savings potential of a company's supply chain network optimization project, executives must develop a responsive business planning process that avoids the pitfalls of unusable data or applying the wrong tools and principles. Following these guidelines can place your company in a position to fully leverage the power of supply chain network optimization to support the current business plan and contingencies.



Three Key Project Success Drivers:

- **Correct Data**
 - **Correct Tools and Techniques**
 - **Correct Ongoing Application**
-

Making Your Company's Supply Chain Network Optimization Project Successful

1. Correct Data

Supply chain network optimization starts with data which is critical to the success of the project. Some specific things a company can do to prepare for a network study include:

- 1. Make the time for accurate data gathering, correction and validation:** The urgency that comes from the initial project push often gets beaten down by the quest for real data. In Commonwealth's experience, most companies significantly underestimate the time required to get the data right. The stakeholders are anxious for results, but it is vital to make time for this. If this is your company's first recent network study, plan to spend as much as half of the project timeline cleansing and validating data and building model databases.

- 2. Improve transportation data capture - this will provide payback:** There can be significant savings in transportation costs in a well-done study, but it is particularly difficult to get an accurate picture of transportation costs out of payment systems that were set up for payments, not transportation analysis. Many companies have found that they are lucky to be able to match up the correct General Ledger (GL) accounts, let alone tie the data to a particular customer order or product transfer. Make sure your company's systems are capturing waybill

Data Tip: Make sure waybill information is captured with each order shipped

information with each order shipped. This information will allow an accurate view of cost-to-serve for a given customer and can help identify short-term cost saving opportunities.

3. **Spend time with future demand projections:** The biggest variable in any supply chain network optimization is usually the demand volume. Using a single demand projection by product, channel and region mix is often a gross oversimplification, as is using next year's annual operating plan. How often do mix and volume assumptions for next year actually come to fruition, let alone three to five years out? In reality there are usually too many variables to estimate, and because each of these variables can influence the overall cost in a big way, ranges of volume should be tested within the product/channel subsets. Don't forget to include variables on service time and delivery frequency along with volume demand. While network optimization software can give an optimal answer for a given demand, if your company's analysts only provide one set of demand inputs, then this results in a myopic set of outputs. Optimizing using demand ranges provides a clearer picture of cost curves and the levers that influence costs.
4. **Validate the data assumptions that the modelers have to make:** Every analysis requires filling in some missing data gaps. The goal is to have all of these assumptions be benign and directionally correct, but patently wrong estimates can be made by inexperienced analysts. The project's executive sponsors should be aware of all assumptions which have been incorporated into the model.
5. **Develop sustainable data practices:** Improving data integrity and getting the data into a position to be extracted accurately and repeatedly in the future is possibly the biggest payback item from your company's initial network analysis, because it will allow more studies, faster and with less effort. If your company has determined that on-going supply chain network optimization studies represent a best practice, then invest time into improving the data connections and analytical databases to be reusable.

Data Tip: Improving data integrity and getting the data into a position to be extracted accurately and repeatedly in the future is possibly the biggest payback item from the initial network study

2. Correct Techniques

Additional pitfalls exist in the realm of supply chain modeling techniques. Some key ways to avoid mistakes include:

1. **Get real world inputs:** Many times a study requires key cost and location inputs in new service areas. Understanding the flow of goods, and the cost of real estate, labor, taxes, incentives and other factors when looking to expand into new regions is integral to making a good long-term decision. Your company's logistics team likely understands the value of open backhaul volume on lane rates – the network optimization team needs to also. The analyst will need to find a source for relevant data, or direct inputs on the key financial issues that will help them to understand these costs in the analysis.

2. Avoid only ‘optimizing’ a portion of the supply chain network:

Any study that doesn’t look at the full flow of goods and total costs might be adding costs or service time when it is intended to achieve the opposite. An obvious example is a distribution change such as adding more regional distribution centers. This addition brings inventory closer to customers and will reduce delivery miles and delivery costs, but it also increases safety stock required, multiplies demand variability, adds distribution overhead and increases inbound costs to the distribution points. A total cost perspective is vital.

Any study that that doesn’t look at the full flow of goods and total costs might be adding costs or service time

3. Ensure that customer service time is a central part of the discussion: When deep in the trenches of a data exercise, it can be easy to forget that the reason your company needs distribution centers at all is because customers want products faster than they can be produced to order. If this isn’t one of the first discussion points with the modeling team then this point can get lost in the effort to reduce costs. Market trends for most industries indicate that consumers clearly expect more product variety available in shorter and shorter delivery times. This will continue to be a huge driver of future networks in general.

4. Take a hard look at cost sensitivity of the ‘best’ network: There should be two primary concerns with sensitivity: testing different demand sets (see demand in *Data* section) and running sensitivity analysis against a given demand set. Some supply chain network optimization tools provide the “absolute best answer” for how to utilize supply chain resources; a closer look at the scenarios not chosen might reveal that they are only marginally more costly to execute than the best option. The network modelers need to demonstrate this reality and run different scenarios that represent a range of demand to provide feedback on how sensitive a network is to these different forecasts. Some tools are particularly good at taking advantage of the embedded sensitivity capability which allows users to easily perform sensitivity analysis as a standard process step. For the most complex situations, it can be helpful to use simulation tools for the sensitivity analysis. Optimization helps reduce a large number of options down to a few, and simulation helps find the best solution from the few.

5. Don’t include non-activity-based fixed costs in the model: As the model is constructed, often the real costs that are meaningful to the optimization are activity-based costs. For this reason many standard fixed costs are correctly left out of the model and added back only when comparing the total costs of each potential scenario. If a particular cost doesn’t vary when the analyst adds one more unit of demand, or produces one more product, then the cost is likely overhead driven, not activity driven.

6. Do not ignore seasonal effects: In the interest of time, many modelers take an average of historic demand, supply and capacity numbers, when in fact the profitability and service that the network delivers can vary greatly when stressed by peak demand. As an example, designing many direct-store delivery networks based on averages will increase costs in both low and high periods: having too many assets in slow periods, and stressing capability during peak periods. This can result in service issues and higher short-term costs for adding unplanned temporary capacity. The most accurate way to handle seasonality is to model each season separately, which results in a network plan that best matches seasonal demand throughout the year.

7. Form the right team - strategic supply chain network optimization projects need to be supported across functional areas: A warning sign can be seen if the kick-off meeting begins and the team thinks they are there to do a “logistics study”. The project sponsors need to form the right team to both study and implement changes based on clear strategic value. The team must know the

targeted performance goals (the “why”) and the importance to the business of the task they are assisting with, and be accountable for the changes in their functional area. Because supply chain network optimization projects cross so many functional boundaries, they can be challenging to manage; but if all of the right players are shown the vision and engaged, then the analysis will provide actionable insight to future costs.

3. Correct Application and Ongoing Use of Your Company’s Model

Performing a supply chain network analysis is usually only half the battle: knowing how to apply the results is just as vital to achieving supply chain objectives. Both long-term strategic optimization and shorter-term tactical optimization can be used for decision making and maximizing Return on Assets (ROA) or Return on Capital Employed (ROCE). Typically, tactical decisions are focused on getting the best utilization and costs using the ‘fixed’ network (the 20%), while strategic optimization is focused on identifying the impact of changing the fixed assets (the 80%). Some key suggestions for properly applying network optimization results include:

- 1. Have a process to act quickly on improvement recommendations:** Windows of opportunity can close quickly. A typical project takes months to complete, uses last year’s cost data, has future channel and customer demand expectations that are fuzzy, and will require strong teamwork to implement. If your company has a war story about what the last project team (shouldn’t have) recommended, caution is understandable. Caution is a good thing, but it can be trumped by a solid continuous improvement process that works to improve methods and data.
- 2. Use supply chain network optimization scenarios to shape the business plan:** Companies don’t set business plans once every five years and then not revisit them - nor should they with supply chain models. Companies should use the baseline model to identify ways to rebalance how to use the network each year, or sooner, as things change. Use this model to analyze every significant capital and network investment. Many automotive companies analyze their supply chains for each model car many years in advance. This allows them to know what costs to expect, and to plan network changes to reduce the total costs. As the company’s goals and priorities change, they can either use supply chain network optimization to drive the changes or prepare for the changes.
- 3. Make supply chain network optimization part of continuous improvement:** Using supply chain network optimization practices to understand the impact of channel transformation is an untapped opportunity for many businesses. When doing this, it can be a huge mistake to not spend significant time on future potential product and channel growth assumptions. Most companies understand that the supply chain will change but fail to optimize the costs to support the changes while looking at a wide range of possible outcomes. By focusing on the range of demands that might occur (what and where) it is possible to avoid the impact of simplified demand projections; this allows a company to develop a decision tree of key decisions as they shape the new channel. Looking back, most businesses would say that they didn’t envision today’s customer demand, product mix, and service requirements even a few short years ago. Did most retailers envision omni-channel fulfillment five years ago? Were they modeling the total cost impact of the new network? Often, change is the only constant. Given that analysis can test most types of changes to demand, time and capacity, it’s incumbent to scale demand and time constraints in ways that really stress the network. In the end, even in the face of huge uncertainty, it is possible to shape a plan that helps the company learn about possible outcomes and how they should react to them.
- 4. Always have a baseline model in sync with the current business plan:** Keeping the operating model tuned shortens the lead-time to understand the impact of channel and product changes, and allows a company to measure and understand performance to plan. As a target, companies should

have an updated baseline model of the business, including the individual supply chains within the business.

5. **Incorporate modeled activity-based costs in operational metrics:** An output of the supply chain network optimization is a clean and updated view of the company's true activity-based costs. The company can use this information to rank different customers for cost-to-serve and products for landed-costs. The optimization tools themselves will point to which are the least profitable products or customers by simply limiting capacity. This is very powerful and often overlooked.
6. **Use supply chain network optimization as part of your Sales & Operations Planning:** The expectation of many supply chain teams is that all decisions are being made using a least cost, most profit basis. The truth is that ERP transaction-based tools are generally adept at reporting costs, not controlling them. Using optimization tools to set enterprise plans is a largely untapped area. Many businesses try to add sales without adding capacity, and so are constantly stressing their bottlenecked resources. How these are planned in the Sales & Operations Planning process has great impact on the bottom line. Supply chain network optimization tools can be applied to any constraint-based planning exercise (production, distribution capacity) where the goal is to optimize supply options, including inventory build-ahead, in order to work around constraints. Good tools can simultaneously optimize major resources while showing how to fulfill demand at the least cost.

Conclusion

In summary, supply chain network optimization projects can seem daunting, especially if a company has never undertaken such an exercise before. But, with proper attention to data and techniques, and a holistic application of the findings, companies often discover that supply chain network optimization studies become a critical key to the long-term success of the enterprise.

Resources on Supply Chain Network Optimization

Additional Resources:

[Report: Geographic Distribution Network Optimization – Getting Past the Feasibility Stage](#)

Learn how to combat one of the biggest enemies of positive supply chain change – passing a basic feasibility test. The Hybrid Network Optimization Method, devised by Commonwealth Supply Chain Advisors, is a highly effective way to get network re-designs off of the back of the napkin and into the board room for consideration. This paper can be found in the Commonwealth Resource Library at:

<http://www.commonwealth-sca.com/resources/supply-chain-network-optimization-getting-past-the-feasibility-stage/>

[Retailer-Driven Network Design: The Trend of the Future?](#)

A topic that is coming up with greater frequency amongst our client base is that many consumer goods manufacturers are feeling more pressure from retailers to relocate their distribution centers to more centralized locations. This places suppliers in a real dilemma – how do they offset some of the additional costs of centralized distribution while still remaining flexible to their retail customers? This article can be found in the Commonwealth Blog at: <http://www.commonwealth-sca.com/retailer-driven-network-design-the-trend-of-the-future/>

About the Authors

Kevin Vahey, Supply Chain Process Improvement, Inc.



Mr. Vahey is a Vice President with Supply Chain Process Improvement, Inc. (SCPI) and had 19 years' experience managing complex Supply Chains and improving performance in diverse industries before helping start SCPI in 2003.

He has run Sales, Inventory & Operations Planning processes (S&OP) and has been responsible for Planning and Fulfillment operations for companies including Allied-Signal, Texas Instruments and AVX Corporation. Additionally, he has been a contractor/consultant serving in a variety of roles to help customers improve their planning, execution and supply chain performance.

About Supply Chain Process Improvement, Inc.

Supply Chain Process Improvement (SCPI) is a focused provider of profit improvement, coaching, consulting and analysis services. The company helps customers implement Demand Driven Supply Chain processes. Core competencies are in Network Optimization, Inventory Planning, Sales & Operations Planning, and Operations Master Planning (helping customers move from push to pull planning).

Ian Hobkirk, Commonwealth Supply Chain Advisors



Mr. Hobkirk is the founder and Managing Director of Commonwealth Supply Chain Advisors. Over his 20-year career, he has helped hundreds of companies reduce their distribution labor costs, improve space utilization, and meet their customer service objectives. He has formed supply chain consulting organizations for two different systems integration firms, and managed the supply chain execution practice at The AberdeenGroup, a leading technology analyst firm. His career has provided him with a broad perspective on how to solve supply chain problems without automatically resorting to expensive technology. Mr. Hobkirk has authored dozens of white papers on supply chain topics, and his opinions have been featured in publications such as DC Velocity, Modern Materials Handling, and The Journal of Commerce.

About Commonwealth Supply Chain Advisors

Commonwealth is a leading supply chain consulting firm that helps companies of all sizes structure their supply chain networks, design distribution centers, and select and implement warehouse management systems (WMS). Commonwealth is based in Boston and works with clients across the globe.