Three Elements of a Truly Effective Supply Chain Risk Management Strategy

**Introduction**

When you hear the term risk management, what comes to mind? Likely the first images are of hurricanes, fire or political unrest. Certainly these unplanned events and “acts of God” have the potential to create significant disturbances in your supply chain and should factor into your overall risk management strategy. But if unplanned events such as these are the sole focus of your risk management plan, the most critical risks to the competitiveness of your business are being overlooked.

The companies best prepared to rapidly and effectively react to changing market conditions utilize modeling technology to create living models of their end-to-end supply chains, with the ability to redesign and re-optimize when forecasted changes or unplanned events occur.

**What Is Risk, Really?**

Think about it this way: what constitutes risk to one business may not be for another, and what may be a significant risk for one product line may not be for another, even within the same business. For example, in order to remain competitive, a consumer electronics company may need to perform better on cost for commodity items but perform better on service and availability for new-to-market devices that sell at higher margins. And the strategy for both of these products could reverse if macro-economic conditions change, removing disposable consumer income.

There are inherent risks with every decision a business makes. The biggest risk to nearly every company is not an unplanned supply chain disruption such as a flood or fire; it’s the risk of not being competitive on a daily basis versus the other companies in the market. Are the other companies:

- Providing better service or more consistent on-time delivery of goods?
- Operating with lower end-to-end supply chain costs?
- Segmenting their customers and products to achieve maximum margins?
- Identifying sensitivity to key market variables with contingency plans?

What makes this challenging is that “superior performance versus competitors” may take on different characteristics depending on market conditions, product types, geographies, or economic circumstances. How can your business adopt the agility and insight to stay competitive and rapidly respond to unforeseen disruptions?
Truly Prepared Companies Utilize Living Supply Chain Models

Given the new global reality of sustained volatility, complexity and rapid change, supply chain design has become a critical business function. Forward-thinking businesses are continuously redesigning and improving their supply chains. They are using modeling technology to examine how their supply chain will perform under a wide range of market conditions and assumptions, and analyzing the trade-offs between cost, service and risk. Companies that maintain these living digital models of their end-to-end supply chain have the ability to redesign and re-optimize the supply chain under changing market conditions, and can test the sensitivity of their key assumptions. These companies are able to mitigate business risk through the engineering of their supply chain operations, therefore enabling significant and sustained advantage over competitors.

Three Elements of a Truly Effective Supply Chain Risk Management Strategy

By creating living models of the corporate supply chain, companies enable three key elements of supply chain risk mitigation:

1. **Visibility**: What is the current structure and flow of goods through my supply chain?
2. **Scenario analysis**: What if we try this? How would my costs or service be affected by this?
3. **Rapid response**: How should I react to an unplanned event?

Your supply chain risk analytics platform should consist of a range of modeling techniques, including network optimization, inventory optimization, flow-path optimization, simulation, route optimization, and others, and must be supplemented with benchmark data on alternative supply chain options and risk metrics that is not present within the corporate ERP environment.

In order to effectively plan for future operations, a company must be able to fully visualize and understand their current operation. Continuous redesign of the supply chain, considering...
alternative models for the scenarios that present the most risk to the business, is the best form of risk mitigation. Read on to learn how each of the three elements can help your business be truly prepared for likely changes as well as unforeseen events.

1. Visibility: What is the current structure and flow of goods through my supply chain?

Visibility into what you’re doing today is the essential first level of supply chain risk management. This activity answers the question, “What is the current structure and flow of goods through my supply chain?”

Supply chain modeling technology, utilizing your own data pulled from multiple sources, enables you to create baseline models of your existing network. Once you have a living model, you can visualize it in different ways by including maps or charts and graphs. You can create interactive dashboards to help answer specific questions or isolate problems or outliers in the model.
A major chemical company was able to pinpoint product flow problems by simply visualizing the current structure and flow of goods through their supply chain. They began by identifying their top 25 products by volume for each geographical market and ranking each geographical market by volume and cost. In doing so, the company noticed something strange: the Philippines was the region third-highest in cost, but far lower on the volume list. Why would this be? Investigation revealed that a decision had been made years ago to airship the product to this region, even though it was a commodity emulsion product, and it had been transported that way ever since. By switching to a lower-cost transport option for this region, the company was able to save millions, and lower the risk of costly cuts to the margin.

Supply Chain Visibility Isolates Inefficiency and Saves Chemical Company Millions

A consumer electronics company needed to better understand their exposure to supply chain disruptions. They began by creating an end-to-end model of the supply chain including supplier locations, production and distribution across all products. All sites were then geo-coded to visualize the product flows and identify which products rely on single source components. They also added additional geographic layers of supply chain risk factors including logistics infrastructure index, corruption and political stability, natural disaster history, nuclear facility radii, etc. This activity enabled the organization to visualize key areas of risk and derive near-term mitigation strategies.

Consumer Electronics Company Utilizes Modeling Technology to Understand Supply Chain Risk Exposure

2. Scenario Analysis: What if we try this? What if this happens?

Once you have digital models of your supply chain as it operates today, you can optimize for different scenarios, depending on which you decide present the biggest risks to your business at any given time. This scenario analysis is the key element of your risk management strategy.

When you are planning your strategy, you are making assumptions about factors such as demand, costs, lead times and availability. It’s easy, using modeling technology, to determine the cost-optimal supply chain network design, based on these assumptions. But what if any of those assumptions change? Will the cost-optimal design still be the right answer? When you have digital models of your supply chain, you can test the sensitivity of all of these assumptions, based on factors that present the most potential risk to your business. For example, you can test whether your current supply chain design is still the optimal design if your demand assumption is off by five or 10 or 15 percent.

Sensitivity analysis enables you to make decisions in a digital environment in advance, instead of testing your theories in the real world when the event actually happens.
You can create sensitivity around scenarios by adjusting variables up and down and testing the effects. You will find not only the cost optimal situation, but under what conditions that situation will no longer be cost optimal. See in advance what will happen under any circumstance and plan the best reaction in order to minimize risk. Sensitivity analysis enables you to make decisions in a digital environment in advance, instead of testing your theories in the real world when the event actually happens. Here are a few examples of when you may use sensitivity testing to create action plans for the scenarios that present the most risk to your business at any given time:

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<th>Optimize supplier configuration</th>
<th>Evaluate alternative strategies</th>
<th>Simulate and perform what-if analyses</th>
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<tr>
<td>• Single source vs. multi source</td>
<td>• Transportation mode selection</td>
<td>• Fluctuations in lead-times</td>
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<td>• Low cost vs. local</td>
<td>• Production footprint</td>
<td>• Supply disruptions</td>
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<td>• High risk vs. low risk</td>
<td>• Inventory stocking locations and levels</td>
<td>• Demand increases or decreases</td>
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<td>• Fuel-cost spikes</td>
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A high-tech company had for the first 15 years of its existence used offshore contract manufacturing facilities in coastal China. When the manufacturer attested that a move to inland manufacturing facilities was required to keep costs down, the company decided to take a detailed look at alternate sourcing scenarios. A move inland would yield lower labor costs, but it would also increase lead time and add an additional transportation leg. And of course, there was no guarantee that if the company moved inland, labor costs wouldn’t rise there too. The company wondered: “At what point would this no longer be a good sourcing decision?” By running sensitivity analyses that considered not only labor rates but also fuel costs and other duties and tariffs, the company was able to accurately evaluate the Chinese location against other possible sourcing regions such as Latin America and Mexico.

High-Tech Company Evaluates Offshore Manufacturing Locations Using Sensitivity Analysis

A large retailer had already established living models of its supply chain operations and was able to build on those models to evaluate the flow of its goods into certain markets. The company knew that over 65 percent of its products were sourced from outside of the United States, and that 95 percent of its customers were within the US. They currently used one main port in California to flow products in, and wanted to evaluate the possibility of shifting some products through the Panama Canal and receiving them in New Jersey. Because of the split in volumes, and multiple touches, there was the potential for increased cost. But when total landed cost was considered, including replenishment, demand characteristics and last-mile delivery costs, added to the fact that any lead time delays in the Long Beach port would lead to potential stockouts and lost sales, the overall cost picture changed. As a result of testing alternate sourcing scenarios, the company decided to add the New Jersey port for lower total cost as well as lowered risk of stock-outs and lost sales.

Large Retailer Reduces Total Cost While Lowering Risk of Stock-outs and Lost Sales

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3. **Rapid Response: How should I react to this unplanned event?**

Now that you have optimized for different scenarios, depending on which you decide present the biggest risks to your business at any given time, you are ready for an unforeseen event or the next attack from Mother Nature. When unplanned events occur, you can simply add them to the scenario and react rapidly and intelligently.

You can utilize simulation to test different courses of action to mitigate each unplanned event:

- **Use the supply chain models to evaluate contingency plans**
- **Balance production and sourcing against changes in demand**
- **Prioritize demand during supply short-falls**
- **Restructure when cost assumptions fail**

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**Hard Drive Manufacturer Provides Rapid Alternatives to Customers Following Flood**

When a company has visualized its current supply chain and then optimized for the scenarios that present the biggest risks to the business, it can then react rapidly to unforeseen events. A hard drive manufacturer had these models in place and had evaluated the best ways to keep landed costs down. When a catastrophic flood occurred, a primary supplier was crippled, eliminating capacity for weeks. The company had buffer stock to service all of their customers. Utilizing current supply chain models, they quickly ran scenarios to determine, given lead time, when they would stock out and which alternative methods of servicing customers would be optimal. The company was able to rapidly provide these alternatives, with associated costs, to customers, thereby avoiding uncertainty and protracted delivery delays.
Conclusion

Risk planning cycles used to occur only every two to three years—if at all—but now the business environment can change almost overnight and businesses no longer have the luxury of extended planning and reaction periods. If a business can’t properly balance cost, service, complexity and risk, it won’t be competitive and therefore won’t be in business long.

Utilizing modeling technology empowers businesses to build end-to-end living models to visualize the current supply chain and test scenarios based on what constitutes the most risk to the business. Then it will be able to quickly react to unplanned events. Supply chain design, when done right, provides the basis for a truly effective risk management strategy, enabling sustainable competitive advantage no matter what market conditions—or Mother Nature—may bring.

About LLamasoft, Inc.

LLamasoft supply chain design software helps organizations worldwide design and improve their supply chain operations. LLamasoft solutions enable companies across a wide range of industries to model, optimize and simulate their supply chain network, leading to major improvements in cost, service, sustainability and risk mitigation. Headquartered in Ann Arbor, Michigan, LLamasoft is a leader in supply chain excellence and innovation, advancing technology focused on continuous improvement of enterprise supply chains for the world’s largest organizations.