



## ESSENTIAL CHARACTERISTICS OF A SUPPLY CHAIN RISK MANAGEMENT STRATEGY

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## INTRODUCTION

Since the early part of this decade, supply chain risk management has become increasingly recognized as a critical part of the corporate strategy. The move to leaner, global supply chains combined with unexpected events such as severe weather, terrorist attacks, and financial instability have magnified the risk of supply chain disruption.

Traditional approaches to supply chain risk management have focused on risk assessment and mitigation—the process of identifying those points in the supply chain that are at risk and developing strategies to mitigate the risk should the worst happen. This process is necessary and correct. The companies best able to recover from a supply chain challenge are those that are prepared.

There is another side to supply chain risk management. Despite the best planning and preparation, sometimes an unanticipated event occurs or, an anticipated event occurs but the mitigation strategy doesn't work as planned. In either situation, companies need to be able to react quickly: assess the impact, determine the best response(s), and implement those responses in a timely manner.

An analogy to consider is driving a car. Most of us drive our vehicles every day. The worst-case scenario would be to get into an accident. Similar to a supply chain event, a car accident can cause injuries and always costs money. To prevent accidents from happening, good drivers will use the following mitigation strategies:

- ▶ Follow the rules of the road
- ▶ Keep their vehicle well-maintained
- ▶ Avoid high-accident areas
- ▶ Try to avoid inclement weather

Despite our best efforts, uncontrollable external factors can create dangerous situations that could cause a serious accident if not handled appropriately. Our response in these situations can determine whether or not the accident occurs. Options include the following:

- ▶ Assess the situation (there is somebody in my lane going the wrong way!)
- ▶ Evaluate alternatives:
  - Hit the brakes (not enough time to stop)
  - Swerve to the left (cars in that lane)
  - Swerve to the right (looks clear)
- ▶ Implement the best response (swerve to the right and avoid the oncoming car)

To avoid the accident, the response must be instantaneous. If we make the wrong choice or take too long to react, the results could be disastrous. The same principles apply to supply chain disruptions.

In February of 2008, a fire at the Lite-On LCD plant in China was expected to reduce the monthly capacity of the plant by 750,000 units, from 1 million units.

—“Fire at Lite-On plant affects more than 50% of LCD monitor production capacity, says paper”, EMSNow, February 6, 2008

In supply chain risk management, companies strive to understand and mitigate the possible risks, but despite these efforts, unanticipated events caused by uncontrollable external factors may occur. The company must respond quickly if it is to recover from the event. Timely access to actionable information is crucial to informed decisions; this is often referred to as supply chain visibility.

The key elements of a company’s reaction time include how fast:

- ▶ The event is detected
- ▶ The consequences are determined and evaluated
- ▶ The people responsible for the consequences are identified and notified
- ▶ The team responding to the event can evaluate several alternatives in a rational and coordinated manner
- ▶ The suggested responses can be evaluated and a final decision made by senior management

The combination of these factors determines the effectiveness of a company’s response when a disruptive event occurs.

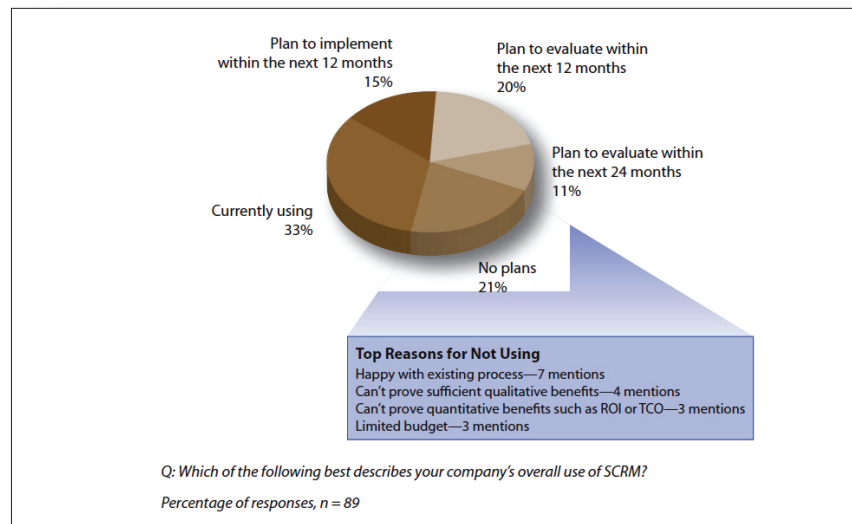
### WHY SUPPLY CHAIN RISK MANAGEMENT (SCRM)?

In recent years, supply chain risk management’s profile has increased. A 2007 AMR Research report indicated that:

“Nearly 50% of firms plan to implement or evaluate SCRM technology in the next 12 to 24 months, indicating that penetration is relatively low and interest levels are quite high.”

—“Managing Risk in the Supply Chain – a Quantitative Study,” AMR Research, Mark Hillman and Heather Keltz, January 2007

### Current Deployment of SCRM Adoption



Source: “Managing Risk in the Supply Chain – a Quantitative Study,” AMR Research, Mark Hillman and Heather Keltz, January 2007

In 2002, the International Longshore and Warehouse Union was locked out, shutting down ports along the West Coast of the United States for 10 days. The lockout was estimated to cost the US economy up to 2 billion dollars per day. The lockout closed several factories including a joint venture between GM and Toyota.

—“*Hope in West Coast port talks.*”  
CNNMoney, Chris Isidore,  
October 3, 2002

According to the same report, the following business trends are contributing to the growing awareness of supply chain risk management.

***Leaner supply chains*** – Companies have been driving the inventory out of supply chains, saving money and avoiding liability. Unfortunately, when a supply chain event occurs, there is very little buffer to enable recovery.

***Global sourcing***—More and more, companies are sourcing supply from around the world. Lead times have stretched, visibility is limited, and communications are difficult.

***Higher customer expectations***—Consumers want instant gratification. Once the decision has been made to buy, they want the product immediately. Late orders caused by supply chain slowdowns often result in lost customers.

***Complexity and interdependency of supply base***—Instead of dealing with a set of component suppliers, today’s supply chains consist of a network of contract manufacturers with material flowing in all directions. (It is not uncommon for the brand owner to supply materials for their contract manufacturers – making the brand owner a supplier and customer at the same time.)

***Volatility and variability of demand***—The shrinking lifecycles of today’s consumer products can turn late orders into cancellations.

***Increasing commodity costs and tighter logistics capacity***—These factors make it harder and more expensive to ship goods around the world.

In a 2005 study<sup>1</sup>, Aberdeen Group linked popular supply strategies to supply chain risks. As shown by the table on the following page, some of the newer practices correlate with the additional risks we are seeing today.

These trends have been further exacerbated by major events over the past several years:

- ▶ Enron and Sarbanes-Oxley
- ▶ Terrorist attacks (and the increasing security consciousness around North American ports of entry)
- ▶ SARS and Avian flu threats
- ▶ The Asian tsunami and Hurricanes Katrina and Rita
- ▶ High-profile business failures and disruptions
- ▶ The earthquake in China

1. “Supply Risk Management Benchmark: Assuring Supply and Mitigating Risks in an Uncertain Economy,” Aberdeen Group, September 2005

## The Risks of Prevailing Supply Chain Best Practices

Supply Strategy	Opportunity	Risks
<b>LCSS</b>	<ul style="list-style-type: none"> <li>• Access 20% to 30% lower material and labor costs</li> <li>• Move supply closer to manufacturing and customer sites in emerging markets<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Longer lead times</li> <li>• Increased risks of supply disruptions and transportation capacity and performance issues</li> <li>• Exposure to new political, security, regulatory, tariff, and currency risks</li> </ul>
<b>Outsourcing</b>	<ul style="list-style-type: none"> <li>• Improve operating performance and service levels</li> <li>• Lower operating costs<sup>4</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Limited visibility or control of service levels or selection and performance of sub-tier suppliers</li> </ul>
<b>Lean and JIT</b>	<ul style="list-style-type: none"> <li>• Reduce inventory costs</li> <li>• Streamline operations</li> </ul>	<ul style="list-style-type: none"> <li>• Little, if any, buffer stock or time increases risk of stockouts and manufacturing disruptions due to supply or delivery glitches</li> </ul>
<b>VMI and Integrated Supply</b>	<ul style="list-style-type: none"> <li>• Improve spend leverage</li> <li>• Improve service and fill levels</li> <li>• Reduce management burdens</li> <li>• Access "one-stop shop"</li> </ul>	<ul style="list-style-type: none"> <li>• Increased reliance on single supplier for broader range of materials and services</li> <li>• Limits ability to directly manage spend visibility, quality, and performance</li> </ul>
<b>Supply Base Rationalization</b>	<ul style="list-style-type: none"> <li>• Improve spend leverage</li> <li>• Reduce management burdens</li> <li>• Improve strategic supply relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Increased reliance on fewer or even sole-source suppliers links performance to financial and operational health of supplier</li> <li>• Increased likelihood of dual- or sole-sourced suppliers relying on single sub-tier supplier</li> </ul>

Source: Aberdeen Group, September 2005

## PROACTIVELY ANALYZING AND MITIGATING SUPPLY CHAIN RISK

There are three key phases to proactively managing supply chain risk:

- ▶ Visualize and understand risks that apply to the supply chain
- ▶ Measure and prioritize the risks
- ▶ Take action – decide which risks need to be addressed and develop mitigation strategies for those risks

Let's take these one by one to understand how you would accomplish each and the tools needed to support these efforts.

### Visualize and Understand Risks

The first step is to assess supply sources to determine which ones are most critical to the business. The most effective approach is to evaluate which suppliers contribute the most to top-level revenue. From an analytics perspective, a tool is needed that will identify the ultimate parent of each component, then assess the component's revenue contribution. Further, the assessment must be deep as well as broad. The assessment can't stop at the contract manufacturer—it must also evaluate components that the contract manufacturer uses. A low-risk contract manufacturer that uses high-risk sources is still a high risk. This broad and deep analysis requires a tool that provides visibility to the whole supply chain, including lower-tier suppliers.

Once the supply base is prioritized in terms of contribution to revenue, the risk factors that apply to each supplier need to be assessed. This assessment is typically done against the suppliers that contribute most to revenue first.

Supply chain risks come in many forms. It is the responsibility of the risk assessment team to imagine and understand these various types of risks. Supply chain risks, at a high level, fall under these general categories:

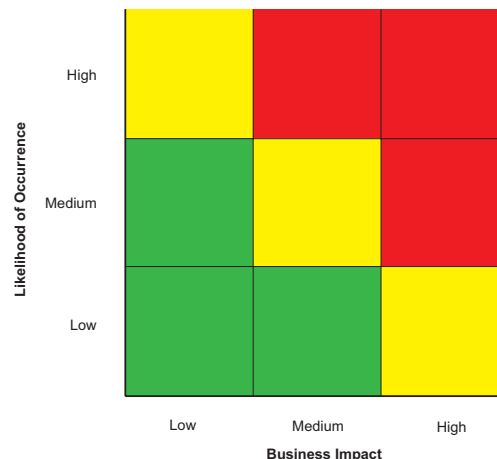
- ▶ Natural disasters (severe weather, fire, earthquake) – These types of events are very difficult to plan for; however, knowledge of the local geography of a supply source helps to identify those suppliers more at risk. (Is the area known for hurricanes, earthquakes, or wild fires?)
- ▶ Flu/Pandemic – These types of events are similar to natural disasters in that they are very difficult to predict.
- ▶ Economic risks – Which supply sources are experiencing financial difficulties?
- ▶ Political risks – Which supply sources are in politically unstable areas of the world?
- ▶ Transportation – What transportation routes are used to move materials and finished goods? What if that route is closed? (See sidebar on a previous page.)
- ▶ Unstable demand – Is demand relatively stable? What if demand falls far below expectation? What inventory liability will the company experience? If demand far exceeds expectations, will the supply chain be able to keep up?
- ▶ Unstable supply – Is the source reliable? Do they provide good quality products, on time?

### Measure and Prioritize Risks

Each supplier should be scored according to the risk factors outlined above, then plotted on a risk matrix similar to the one shown below.

The colors indicate the relative urgency for risk mitigation. Red indicates that a risk mitigation strategy should be developed and implemented immediately. Yellow is less urgent and green indicates low urgency.

### Basic Risk Matrix



Source: "Supply Chain News: Understanding Supply Chain Risk Matrices," Supply Chain Digest, SCDigest Editorial Staff, July 13, 2008

### **Take Action**

Once there is an understanding of the various risk factors, there is a need to determine where action needs to be taken. Not all risks will necessarily be addressed. For risks that fall into the green areas on the matrix, a company may decide not to develop a mitigation strategy at all.

The mitigation strategies can be different depending on the situation. For risks related to the supply base, mitigation strategies could include:

- ▶ Sourcing from different suppliers
- ▶ Developing supply sources in other parts of the world
- ▶ Alternate modes of transportation
- ▶ Product redesign to use standard components

For risks related to demand variability, mitigation strategies could include:

- ▶ Demand shaping
- ▶ Postponement strategies
- ▶ Buffer inventory

The mitigation strategies must be modeled and tested. Given a different source, how would the different lead times, costs, and supply constraints impact the corporate metrics? To test this effectively, the mitigation strategy is simulated and the results evaluated relative to other alternatives and corporate goals.

If the chosen mitigation strategy does not yield acceptable results, then a different strategy needs to be selected and evaluated.

### **Monitor, Review, and Maintain**

As time moves on, risk areas will change, as will mitigation strategies. Both need to be reviewed on a regular basis to ensure that new factors are considered.

Supply chain risk management should not occur only a few times per year; it should be a continuous monitoring process and should include trends, not just absolute numbers. Trends should be used as an early indicator to prevent risk situations from occurring. Procurement teams need to be trained in risk management so that when sourcing new suppliers, they can strive to add suppliers that reduce overall supply chain risk. Logistics teams need to be trained to understand what routes are at risk and when. Supply management teams need to recognize the potential for inventory liability if demand for a given product disappears.

## **RESPONDING TO SUPPLY CHAIN EVENTS**

As described in the introduction, there is a second side to supply chain risk management: responding to supply chain events. Depending on whether the disruption was anticipated or not, responding to supply chain events can take two forms:

- ▶ Responding to an unanticipated supply disruption
- ▶ Responding to an anticipated supply disruption by implementing the mitigation strategy

In both cases, the key element is timely alerting that an event has taken place. You can't respond to something if you don't know it has happened. The supply chain should be monitored and an alert triggered when a disruption occurs so that those who need to respond are immediately notified. But alerting is not enough. The alert mechanism should be smart enough to alert you about events according to their impact on the business.

An unanticipated event is a disruption that despite best efforts was not foreseen, and therefore a mitigation strategy has not been prepared. In this case, the speed with which the company reacts and responds can mean the difference between an insignificant blip and a full-scale crisis.

An anticipated event is a disruption for which a mitigation strategy has been prepared. In most cases, implementation of the strategy goes as planned, but sometimes there are unanticipated problems such as material shortages, capacity shortfalls, or quality issues. In these cases, being able to respond effectively can mean the difference between a fast recovery and a serious problem.

## CAPABILITIES NEEDED TO SUPPORT SUPPLY CHAIN RISK MANAGEMENT

While the need is high for supply chain risk management, the capabilities of most supply chain risk management tools are not keeping pace. Companies are looking for tools to help them assess supply chain risk, develop mitigation strategies, and respond to both anticipated and unanticipated supply chain events. As companies begin their evaluation, they should ensure that any risk management assessment and response tool provides the following capabilities:

- ▶ **Visibility**—To properly assess supply chain risk and respond to events, visibility across the entire supply chain is required. This means that the supply chain risk management tool must be capable of integrating with, and modeling ERP analytics from multiple disparate ERP systems, including systems supporting the supply and distribution nodes.
- ▶ **Event detection and alerting**—The sooner a supply chain disruption is recognized, the faster the response. An alert that shows up in e-mail or a portable e-mail device will ensure that the appropriate people are made aware of the event when it happens. Too many times, event detection is based on the event itself. To be truly valuable, an alert should be triggered based on the anticipated impact of the event. For example, if a supplier goes out of business, but the loss of this supplier doesn't impact key metrics, an alert may not be necessary.
- ▶ **Analytics**—The full suite of supply chain analytics needs to be modeled in the supply chain risk management tool to ensure the impact of a potential supply chain event is understood when it occurs. Above all, these analytics need to be performed in real time, especially when responding to an unanticipated supply chain disruption. When an event happens, every second counts, and a company can't wait days or weeks to understand the impact or to determine resolution alternatives.
- ▶ **Simulation**—Simulation is critical to both sides of supply chain risk management. When responding to an unanticipated supply chain event, simulation can be used to model different risk scenarios, propose mitigation strategies, and compare the effectiveness of various response alternatives.

- ▶ **Collaboration**—The risk management team will need to evaluate several possible mitigation alternatives. Team members may not have the knowledge necessary to explore all alternatives in sufficient detail to develop a robust mitigation strategy. The ability to bring other people into the evaluation process is critical both to validate the proposed strategy and to propose key improvements to the strategy. Similarly when responding to an unanticipated supply chain event, collaboration among the right people ensures that the response alternatives are reasonable.
- ▶ **Scenario comparison**—In the process of developing mitigation strategies or responses, the team may develop multiple approaches that potentially resolve the problem, but in differing ways. The team needs to make a decision based on which alternative best meets the goals of the organization.

## SUMMARY

While recent supply chain management optimization practices have reduced costs and kept inventory levels lean, they have also left companies with unprecedented levels of risk exposure and very little buffer inventory to help them recover from supply chain disruptions. Many companies have recognized this and are now implementing supply chain risk management programs.

There are two sides to supply chain risk management:

- ▶ Risk assessment and mitigation
- ▶ Response to unanticipated supply chain disruptions

Both are necessary components of an effective supply chain risk management strategy. With strong risk mitigation strategies in place, a company is ready to handle a variety of supply chain events. And when unanticipated events occur, a company must be prepared to respond quickly and effectively or risk suffering financial and customer service losses.

To have an effective supply chain risk management strategy, companies need a tool that addresses both risk assessment and mitigation as well as event response. This tool must support:

- ▶ Visibility and analytics capable of modeling the entire supply chain
- ▶ Simulation combined with the ability to compare resolution alternatives
- ▶ Event detection and alerting to instantly notify of supply disruptions – and their impact to the business
- ▶ Collaboration among knowledge experts in the company to develop the most robust mitigation strategies and event responses

With an effective supply chain risk management strategy that encompasses both risk mitigation and response, along with the tools that support this strategy, organizations can recover quickly from supply chain disruptions.



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## ABOUT KINAXIS

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