

## ***Supply Chain Management Professional Education Review***

A monthly e-Newsletter by

Department of Supply Chain Management and Marketing Sciences

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The ***Supply Chain Management Professional Education Review*** is a monthly e-newsletter published by the Rutgers Center for Supply Chain Management and Marketing Sciences (SCMMS -[www.scm.rutgers.edu](http://www.scm.rutgers.edu)). SCMMS is a major provider of supply chain education for today's and tomorrow's supply chain professionals and executives. The ***Professional Education Review*** will provide information concerning current and emerging supply chain issues.

We value your input. Please contact us at [cscm@business.rutgers.edu](mailto:cscm@business.rutgers.edu) regarding this newsletter or other SCM issues.

<b>Supply Chain Management Research Seminar Series (Spring 2009)</b>			<b><u>Upcoming Events</u></b>
Date	Speaker	Title	
February 9	Dr. Xiaowei Xu and Lei Wang	Optimal Return Policies in a Segmented Market	<b>Annual SCM Executive Certificate Program</b> <ul style="list-style-type: none"> <li>• June 10 – 12, 2009</li> </ul>
March 2	Wayne Eastman	Optimization through Value Competition	<b>2009 SCM Summit Meetings</b> <ul style="list-style-type: none"> <li>• April 1 (Transportation Security)</li> <li>• June 4 (SC Collaboration)</li> <li>• Sept. 18 (Organization Transformation)</li> </ul>
March 30	Dr. Sengun Yenyurt	An Evolutionary Perspective of Brand Expansion in International Markets	<b>Strategic Project Management</b> <ul style="list-style-type: none"> <li>• May 8, 2009</li> </ul>
April 13	Dr. Aaron Shenhar	The Integration of Strategic Mgt. and Project Mgt.	<b>Six Sigma Black Belt Training</b> <ul style="list-style-type: none"> <li>• Starting May 15, 2009</li> </ul>
April 27	Dr. Lei Lei	Models and Search Algorithms for a New Multi-modal Shipping Network	<b>For more information, please go to <a href="http://www.scm.rutgers.edu">www.scm.rutgers.edu</a> and click on our link for Executive Education.</b>
<p><b>All presentations will be held on the Rutgers – Newark campus in the Management Education Center from 12:00 – 1:00 p.m.</b></p>			

### ***Managing Supply Risks (Part 2)***

In our first article on this topic (see the January newsletter at [http://scm.rutgers.edu/Newsletters/January\\_09.pdf](http://scm.rutgers.edu/Newsletters/January_09.pdf)), we identified the potentially devastating financial impacts to companies for supply chain failures.

- Have 30 to 40% lower stock returns over a three year period
- The share price volatility is 13.5% higher
- Operating income drops 10%
- Sales growth is 7% less
- Costs go up by about 10%

## ***Managing Supply Risks (Part 2)***

### ***Keeping the Pirates at Bay***

***How can companies address the management of risks? Are your supply chain professionals trained on the identification and mitigation of supply risks?***

We need to attack supply risks through both internal and external actions. Although it sounds self-evident - the first step to risk management is to identify the risks to which we are exposed. To identify potential risks, start by making sure you have a thorough understanding of your entire supply stream.

#### ***Value Stream Mapping***

Value Stream Mapping (VSM) provides a powerful tool that too few supply management professionals know about. VSM is a technique used to identify and flowchart the supply chain elements/steps from your supplier, through your own facilities, to your end use customer. It can help identify activities that add value (or do not), as well as help identify risks in the supply chain. Steps in VSM typically include the following (note: while we refer to "material" throughout this section, VSM can be applied to critical services or equipment as well):

- Describe / draw the current supply chain for the selected commodity (from supplier's supply through to your customers)
- Show flow of materials, information, and funds
- Indicate timing of the flows
- Brainstorm what can go wrong at each step of the supply chain, as well as between steps (i.e. warehousing and transportation) - both for current business levels, and for forecast business levels 3-5 years into the future

Unless your supply chain management team is aware of the complete supply stream from raw materials to your supplier's actual product, a disruption could threaten your end product long before you become aware of it. An item may be one of the least costly ingredients in your product but it may also be the most critical because of the limited supply base and long pipeline. From the flow chart, you should also determine which materials are strategic to the business. This determination may be based on such factors as whether it is a high spend product, whether you require the material to meet critical specifications, how many suppliers there are for the material, and what the effect would be on your business if the material flow was interrupted. Your team should carefully consider what makes an item strategic. Sometimes a small specification change can move an item from being "strategic" to a more readily available commodity, thus reducing your risk. For instance, say a company started testing the resin it uses in a process to reline old pipes. It had been specifying a "special" resin that was intended to seal better before liquid chemicals are applied. Testing reveals no difference in performance when off-the-shelf resin was used instead of the preferred one. At that point, the material became a commodity, and the company has much better control of price and supply risks.

**Identify and Assess Risk Impact**

For each material deemed strategic through VSM, conduct a structured analysis of the key suppliers. The data you gather might include who are their approved suppliers, information about manufacturing plants, the supplier's financial status, manufacturing and procurement processes, physical condition of the supplier's facilities, any areas of environmental vulnerability (for example whether the supplier's facility is in a flood plain or on an earthquake fault), supplier's own risk management efforts and contingency plans, freight routing, and recommended inventory levels at each stage in the supply chain.

Our objective from this effort is the systematic identification of risks that potentially exist in our upstream supply chain. This is painstaking work and can be a costly exercise if your supply chain is extended across several continents.

The next step is to assess the risk. What is the probability of occurrence and the impact if it were to occur? Evaluate the supply risks for each identified strategic material throughout its entire supply chain. What are the potential vulnerabilities or events that create the risk?

For each potential risk event, assess its impact on your company's production:

- Are there alternate material suppliers or is material single sourced?
- How much time is required to obtain alternate materials or qualify another supply source?
- Are inventories of materials adequate to protect from an event?
- Is another technology available to provide a backup in case an event occurs?
- Are suppliers financially stable?
- Are regulatory issues likely to negatively affect or impede a new supplier or raw material?
- Is there a disaster recovery plan?

Take into account all the identified risks and prioritize them. Using a risk template, rank the risks in order by assigning a risk score. As discussed in a recent CSCMP Quarterly, Hewlett Packard has developed a sophisticated risk assessment matrix which is illustrated below.

	Natural/man-made hazards	Country risks	Supplier bankruptcy	Network/soft-ware outage	Internet provider risks	Regulatory risk	Commodity price risks	Workforce practices	Logistics failure	Inventory risks	Quality risks
Globalization and outsourcing	Moderate impact	High impact		Moderate impact	High impact	High impact		High impact	Moderate impact		High impact
Sole sourcing	High impact	Moderate impact	High impact		High impact		Moderate impact	Moderate impact			High impact
Lean practices	High impact		Moderate impact	Moderate impact					High impact	High impact	Moderate impact
Distribution hubs	High impact			Moderate impact					High impact		
Commodity dependency	Moderate impact	Moderate impact					High impact		Moderate impact		
Demand visibility/variability				Moderate impact			High impact			High impact	
Supply tiering	Moderate impact		High impact		Moderate impact	Moderate impact			Moderate impact		High impact
Returns management					Moderate impact	High impact			Moderate impact	Moderate impact	High impact

HP Risk Matrix Illustration

### ***Create a Risk Management Plan***

The third step is to then create mitigation and contingency plans. Risk mitigation encompasses loss prevention and developing acceptable alternatives and plans to reduce the probability that a risk event will occur. Mitigation plans must include contingency actions for all high-probability risk events. There should be precise signals or triggers that touch off the action that will commence efforts to mitigate the risk. The action step and timing should be clearly spelled out. The best way to drive down the cost of risk management is to develop a thorough risk mitigation plan that considers all the cost drivers associated with the risk. Use the risk template and information developed to rate or quantify the identified risks after mitigation. By describing action steps and estimating costs for these actions, a total mitigation cost can be estimated after factoring in the probability of an occurrence.

The fourth step is to develop your plan and to organize for implementation. Risk management planning should also include a process for encouraging suppliers to provide risk management to the greatest extent possible. This could be in the form of back-up manufacturing facilities, stockpiles of raw materials, or even assumption of purchasing materials from their competitors in the event of a supply issue. The point is, do not overlook an opportunity to have a supply source assume a major role in managing a risk factor.

Before reaching out to your suppliers, however, you need to clarify internally who is responsible for:

- Identifying the needs that suppliers must meet.
- Identifying and qualifying potential supply sources.
- Establishing sound commercial relationships.
- Integrating suppliers with your company.
- Managing supplier performance.

Your suppliers must understand the performance expectations they have to meet. Such a supplier relationship can provide mutual benefits that will enhance the overall performance of the two companies while managing the appropriate areas of risk in an open way. Collaborating on information sharing can help identify potential areas of vulnerability and lead to stronger emergency plans.

For your risk management to be effective, it must be fully integrated into your company's business processes. The process of identifying risks, analyzing them, and planning mitigation strategies must be documented and reported throughout the organization. To effectively evaluate risk strategy, management must balance the cost of mitigation with available resources and optimum cost management objectives. The risk management strategy should apply to everyone at all levels in the organization and focus on achieving the company's business objectives.

The risks are many and the impact may be devastating. That is the bad news. The good news is that we can plan for and manage most risks. So what are companies doing to mitigate these risks?

First, let's talk about internal preparation. Preparing the plan we just discussed is clearly the first step. The second phase of internal preparation is to ensure that everyone in the firm is trained on your risk management plan. The plan is no good if the people that

need to execute are unaware of what is required. The third phase is a communications plan. If disaster strikes within the supply chain, “who needs to know what” and “when do they need to know it” is critical to appropriate and timely response. Clear and consistent messages from the company to customers, shareholders, regulators, financial communities and governments will lessen the immediate and long-term impact of the issue. The fourth phase is monitoring and measuring performance throughout the supply chain. Reporting, periodic auditing, management reviews of plans and results (for example developing lessons learned from “near misses”) complete the internal preparations for risk management.

One approach to managing risks inherent in supply chains therefore has to do with how we design our supply chains in the first place. As suggested by the Boston Consulting Group, “The goal is to match supply with demand at every stage, at every value-added point, so that at the end of the day there is a customer who has a demand and the supply chain figures out how to get the product to that customer at a time and place and a price that they are willing to pay.” Using this as a foundation, they suggest at least three key elements for the optimal design of your supply chain. First is to use metrics to create visibility of your end-to-end supply chain. Measure what is important for the customer and ensure that throughout the supply chain we are making the trade-offs between cost, service and risk that exceed the customer’s expectations. Using an example from the pharmaceutical industry in America, one leading company felt that they were doing an excellent job because their order fill rate to their immediate customer (a large wholesale distribution company) exceeded 99%. However, after adopting a philosophy for total supply visibility, they were shocked to find out that the average order fill rate at the patient / consumer level was under 80%.

The second key to managing risk is to foster collaboration and cooperation along the entire supply chain. In a competitive environment, this is very difficult to obtain. The elements of coordination and collaboration in supply chain management range from the very basic concepts of communication to the most sophisticated technology and electronic data interchange available, as well as managing or tracking everything from purchase orders to physical logistics of inventory and tracking the flow of funds among business partners.

With longer paths and shorter clock speeds in our supply chains, there are more opportunities for disruption and a smaller margin for error if a disruption takes place. This leads to our third element in design of our supply chains – agility, adaptability and alignment. This model has been labeled as the “Triple-A” supply chain by Hau Lee of Stanford University. Agile supply chains respond quickly to sudden changes in supply and demand by providing critical information to all supply partners. Adaptable supply chains adjust supply chain design to accommodate market changes. And, agile supply chains establish incentives for supply chain partners to improve performance of the entire chain. Dr. Lee uses the convenience store chain 7-11 in Tokyo as an example. They operate 9000 convenience stores. By implementing a Triple-A supply chain design, they increased stock turnover to 55 times, decreased out of stock conditions and increased gross profits by 30%.

Once we have completed our internal preparations and designed our supply chain, is our work completed? The answer is still “no”. We have many other decisions to make. How much inventory shall we have? Where shall inventory be located? Who will own it? How many redundant suppliers do we need for each material category? Where will

plants be located? What back-ups are needed? When it comes to managing supply risks, the questions never end. Perhaps that is why McKinsey found that most managers feel unprepared to deal with supply chain risks.

### ***Concluding Thoughts***

First, we must remain ever vigilant. The nature and environment for our global supply chains are continuously changing and evolving. So must our risk plans. Second, we are not in this by ourselves. We must collaborate with our suppliers and expect / demand that they are prepared and ready to manage the risks in the supply chain. If you represent a smaller company, differentiate yourself by proving to your customers that you are ready, willing and able to assist in managing supply risks. Third, use technology wisely. Structure your information technology in support of supply chain effectiveness and efficiency and at the same time to make your supply chain agile, adaptable and aligned. Fourth, plan for the inevitable failure of the supply network and make sure that you have adequate supplies to sustain operations and to meet customer demand. Finally, keep supply risk management at the forefront of management's agenda. The leadership of the organization has many challenges in today's dynamic business environment. Risks that we cannot easily see can be overlooked. Do not let that happen for your company.

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Based on MBA student research and independent research