

HOW CISCO SUCCEEDS

Supply chains have become increasingly vulnerable to disruptions, from natural disasters to the global credit freeze. Some companies take a reactive stance to this potential, scrambling to make do when an event does occur. Cisco pursued a different approach: a comprehensive, proactive risk management program that embraces all of its worldwide supply chain partners. Here's the practitioners' perspective on that program in action.

By Kevin Harrington and John O'Connor

One of the largest earthquakes ever to hit China occurred on May 12, 2008. With a magnitude of 7.9, its epicenter was 80 km northwest of Chengdu, capital of Sichuan province. Events like this challenge global supply chains to the limit. For Cisco, the Chengdu earthquake presented a potentially high-stakes test for our new supply chain risk management framework.

Supply chains have become increasingly vulnerable to world events, from natural disasters to the global credit freeze. According to the recent study from IBM titled "The Smarter Supply Chain of the Future," supply chain risk management has emerged as the second largest challenge for supply chain executives after supply chain visibility—placing even higher than increasing customer demands and higher costs.¹ As a result, supply chains and the risks they face have gone from a back-office item to a prominent position on the boardroom agenda for many companies, including for Cisco, the San Jose, California-based provider of networking and communications solutions.

Risk Management Grows in Importance at Cisco

Over the last few years, supply chain crisis monitoring has become a key element of Cisco's Supply Chain Risk Management (SCRM) program within the company's Customer Value Chain Management (CVCVM) organization. At Cisco, CVCVM is a central function that collaborates with other Cisco teams and external partners to plan, design, manufacture, deliver, manage customer orders, and ensure the quality of the company's products and solutions. Formerly called Global Supply Chain Management, CVCVM acquired its new name recently as part of a broader reorganization to better focus on the total customer experience.

In order to drive this program, the Supply Chain Risk Management team partners closely with several other CVCVM functions. These include Global Supplier Management (GSM), which oversees sourcing decisions and manages relationships with Cisco's component suppliers globally;

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Product Operations, responsible for transforming engineering innovation into robust products; and Global Manufacturing Operations, which oversees the company's global manufacturing and logistics operations through a network of outsourcing partners.

Cisco's Supply Chain Risk Management Program consists of four key elements:

1. *Business Continuity Planning (BCP) Program.* This provides a strong focus on Cisco's suppliers, manufacturing partners (i.e., the EMS, or Electronic Manufacturing Services companies that do contract manufacturing in this industry), and transportation and logistics providers to document recovery plans and recovery times and drive resiliency standards.

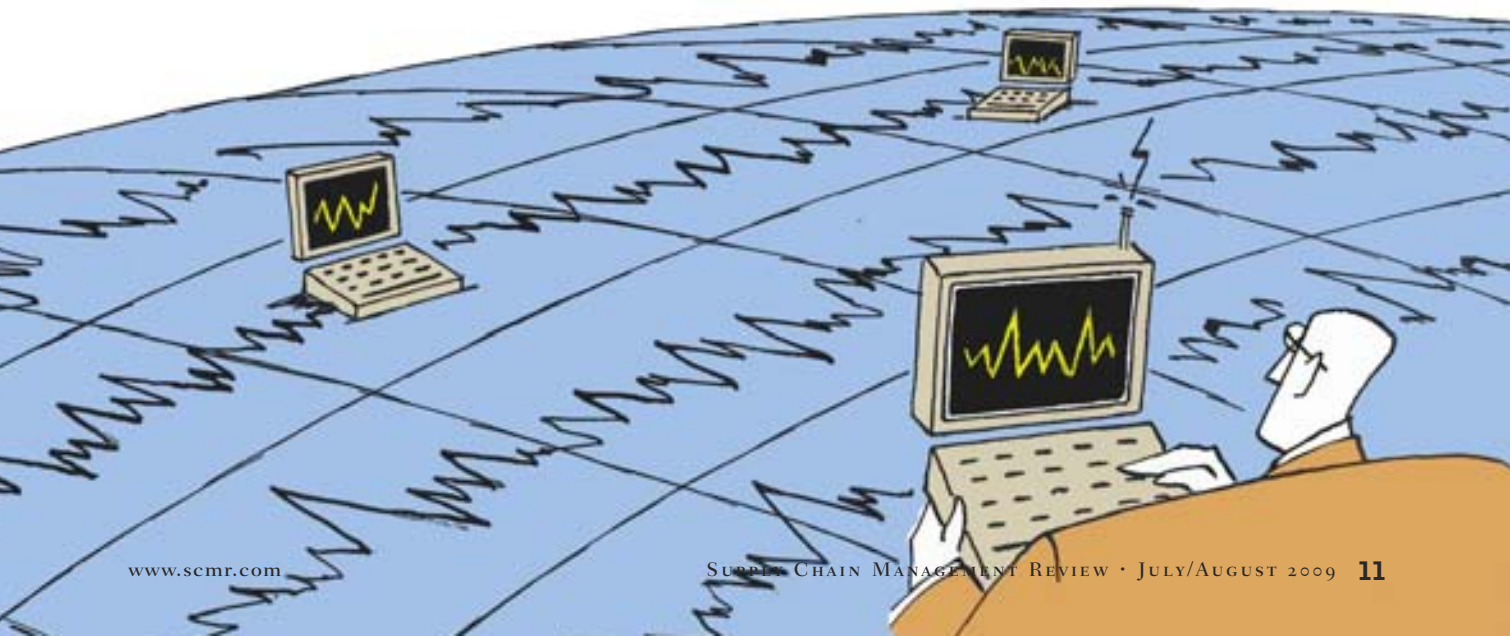
2. *Crisis Management.* Cisco's global crisis management team is responsible for monitoring and responding

to disruptions globally on a 24/7 basis.

3. *Product Resiliency.* GSM and SCRM teams in particular partner to address three key issues:

- Helping business units make informed and strategic decisions that address vulnerabilities in product design decisions.
- Translating long-term risk mitigation strategies into short-term priorities.
- Reducing the cost of risk mitigation strategies and programs.

4. *Supply Chain Resiliency.* SCRM works closely with Manufacturing Operations, EMS partners and transportation and logistics providers to identify nodes in the supply chain with recovery times that are outside of Cisco's established tolerances and to develop corresponding resiliency plans.



Key Business Partners

Cisco's Supply Chain Risk Management Program requires a truly collaborative effort to deliver resiliency for Cisco's highly complex supply chain. To illustrate, SCRM partners with Cisco engineering to assess the resiliency attributes for new products. This engagement occurs well in advance of "first customer ship," giving development engineers time, if needed, to consider alternate or more resilient components before the design is finalized. Similarly, SCRM engages with the Product Operations and Manufacturing Operations functions to assess the resiliency attributes of the anticipated build-to-ship supply chain. This forward-looking assessment allows Cisco to incorporate supply chain resiliency as a consideration in supply chain design and business awards to EMS partners.

For sustaining products, the team has developed a highly collaborative model with GSM and Manufacturing Operations, working closely together to define the resiliency programs that need to be executed. However, once these programs are scoped, it falls upon the GSM and Manufacturing Operations teams to do the heavy lifting by working with Cisco's component suppliers and EMS partners to implement the applicable resiliency program (for example, qualifying second sourcing and alternate sites and negotiating and implementing buffers).

In certain cases, design mandates are at odds with optimal supply chain resiliency. There can be some inherent risks in designing-in a product from a start-up supplier—a company that has no demonstrated ability to ramp, deploy a robust BCP, troubleshoot quality or maintain financial stability over time but provides required technology to differentiate product functionality. By designing a plan to mitigate against these elevated risks, SCRM enables the company to move forward, to adopt an innovative component it might not otherwise have had the risk tolerance to use.

Risk Management Program in Action

Cisco has hundreds of suppliers producing components at thousands of sites that feed its EMS partners around the world. With 95 percent of its production outsourced, Cisco's supply chain footprint is very global. To enable supply chain monitoring, the team first had to understand the footprint, or more specifically, where Cisco components were being built. To collect this critical informa-

Key Abbreviations Used

- SCRM**—Supply Chain Risk Management
- CVCM**—Customer Value Chain Management
- GSM**—Global Supplier Management
- GCRM**—Global Component Risk Management
- BCP**—Business Continuity Planning
- FRA**—Financial Risk Assessment

tion, the SCRM team developed the Business Continuity Planning (BCP) program, which collects key information required to perform a supply chain risk assessment, in addition to an effective crisis response. Data collected from suppliers include: physical address of supplier sites, emergency contacts, alternate manufacturing locations and time-to-recover to an alternate site. The continuity planning process also includes gathering data to evaluate a supplier site's own business continuity plans, or readiness and resiliency in the event of a supply chain disruption.

With the footprint defined, the SCRM organization was then ready to begin correlating world events to strategic locations on the map. The team utilizes NC4 (National Center for Crisis and Continuity Coordination), which allows it to build alert profiles based on specific locations or geographies. NC4 customers, such as Cisco, are then able to subscribe to alerts based on a set of filters for attributes including event severity and event type. In the case of Chengdu, the team was alerted based on the following NC4 profile: *Moderate to extreme meteorological and geophysical incidents within 100 miles of a supply chain location.*

This real-time monitoring, coupled with supply chain locations, provides the SCRM team near-immediate notification of incidents and greatly shortens the response time to events that are out of the team's control. In most cases, many companies are learning about impacts to their supply chains days or even weeks after incidents such as earthquakes and labor disputes occur.

In the case of the Chengdu earthquake, within 48 hours Cisco was able to conduct a full impact analysis, including evaluating affected supplier sites, parts and products. The robust BCP platform allowed the team to gain complete visibility into the supplier footprint in the area. Within two days of the earthquake, SCRM had initiated a crisis survey targeted at the suppliers' emergency contacts in the region. Meanwhile, the crisis team had partnered with affected Cisco organizations and reviewed any potential revenue impact.

The analysis performed within the first 24 hours of the earthquake revealed that Cisco had approximately 20 suppliers in the affected area. While there was no impact to any of the manufacturing sites and logistics centers, there were two suppliers potentially at risk: Supplier X, which presented a significant revenue expo-

sure for Cisco in addition to the risk of being single sourced, and Supplier Y, with a smaller revenue impact but with physical damage to one of its buildings.

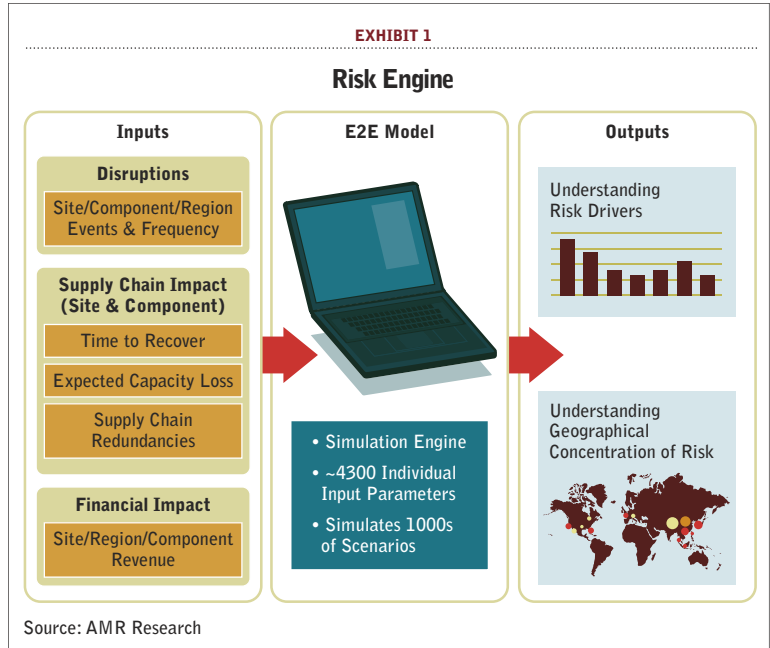
It turned out that the SCRM team, in conjunction with the Global Supplier Management function, had proactively been working to address the single-source risk with Supplier X and had already identified a second source a few months prior to the earthquake. However, the situation with Supplier Y remained an issue. A group within SCRM, the Crisis Management Team, engaged its internal sourcing, planning and operations colleagues to deploy previously identified second sourcing options as well as to gain commitments from the supplier for additional capacity.

Despite facing a natural disaster of huge proportions, Cisco was able to respond rapidly, ensure the safety of the extended supply chain, identify the risk exposure to the company and work with its EMS partners to mitigate the risk, thus ensuring no impact to customer shipments. The continuity planning, crisis management and risk mitigation arms of the SCRM team worked in close collaboration with internal partners in this endeavor.

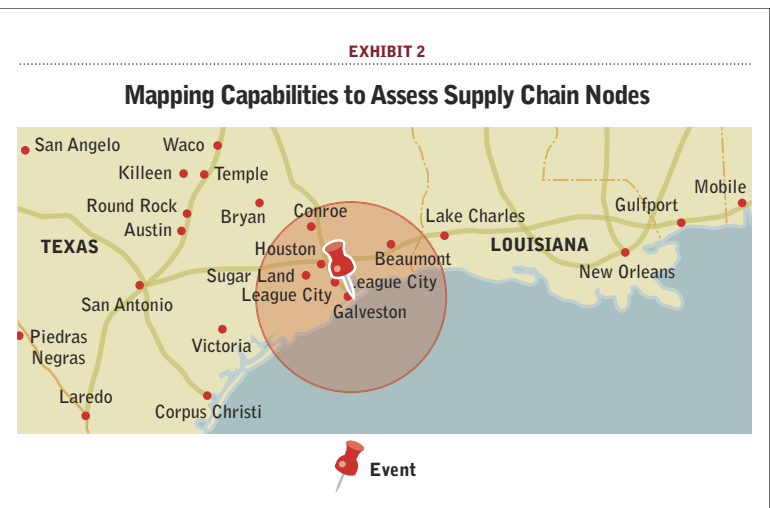
Quantifying the Impact

Once the sites impacted by the earthquake in China were identified, we could quickly leverage and combine the BCP information with supply chain visibility data to determine any potential impact to Cisco’s customer shipments or financial bottom line by quantifying the exposure. The BCP data provides time-to-recovery data for each of the supply chain locations, including raw material suppliers, logistics and transportation providers, and EMS partners. This includes visibility into which components, materials or products are produced at each supplier locations. In addition, the supply chain data allows us to determine which products and how much revenue is enabled by each of the logistics and EMS partner locations.

We are able to leverage these same analytical capabilities to develop supply chain risk assessments, helping Cisco focus on proactive risk mitigation programs with the right priorities. To accomplish this, Cisco uses a “risk engine” to assess the likelihood of a disruption. (See Exhibit 1.) The risk engine incorporates many data sets (such



as 100-year flood data, actuary data, geological and geopolitical data, site incident data, supplier performance data) to assess the likelihood of a disruption. These disruptions are correlated to Cisco supply chain locations including supplier sites, contract manufacturing facilities and logistics centers. The impact of a disruption is determined based on the revenue enabled by each node in the supply chain and that node’s recovery time. Cisco also uses simulation capabilities to integrate all of these data sets into a single model that generates “heat maps” based on likelihood and impact. (Exhibit 2 depicts the mapping capabilities to assess supply chain nodes, which include suppliers, contract manufacturers, and strategic logistics centers, within the radius of an event.)



Mitigating Risk in the Supply Base

Supplier and component resiliency has always been core to Cisco; for this reason, the company takes a very proactive approach to ensuring that whenever possible its products have two or more sources qualified for each part. GSM and Product Operations have dedicated resources and funding to identify and “de-risk” single sourced and other risky components. Each part has a risk attribute that identifies its sourcing status (single vs. multi sourced), quality history, technology status (legacy vs. new) and lifecycle (new, end of life). These risk and other, component-level attributes provide design guidance for new products. A key function of component teams is to find and qualify alternate sources for the single-sourced parts. Where second sources cannot be found, Cisco has dedicated resources and funding to develop an alternate source for certain key components with very high impact to revenue.

Cisco launched the Global Component Risk Management (GCRM) program to formally streamline the efforts of the diverse groups engaging in risk mitigation efforts throughout the organization. The program prioritizes their efforts and provides a tool-based system to log history of risk mitigation efforts at the component level. It also provides the capability to track and manage progress and status of risk mitigation by different groups. This approach eliminates duplication of efforts, establishes clear ownership and target completion dates, and helps keep track of mitigation activities being pursued on thousands of components in one central repository.

A centrally coordinated program facilitates a quick and coordinated response to any crisis requiring component mitigation. For instance, when the economic downturn worsened at the end of 2008, Cisco was concerned about the financial well being of many of its core suppliers. The company quickly launched a Financial Risk Assessment (FRA) initiative to identify those suppliers with single-sourced parts that have high revenue implications for Cisco. In collaboration with the GSM and finance teams, Cisco quickly set up meetings with most of the privately held suppliers and select public ones. Once the financial assessment was complete, the team separated suppliers into three categories: “Green,” requiring no action; “Yellow,” needing to be monitored; and “Red,” needing mitigation. If a supplier fell into the “Red” category the GCRM program was leveraged to quickly identify, prioritize and mitigate all the single-sourced parts that were purchased from affected suppliers.

This proactive approach proved timely. When two

of the suppliers filed for bankruptcy protection, Cisco already had put in place “last time buys” and established second sources for their parts.

Mitigating Risk in Manufacturing Footprint

Going back to the Chengdu earthquake, based on the impact assessment, Cisco was able to quickly determine if there was any impact on manufacturing, transportation and/or logistics nodes. If there had been disruptions, our proactive risk mitigation program would have identified alternatives and ensured that they could have been enabled quickly through product qualifications and defined recovery plans that achieve the stated recovery time objectives.

In order to achieve mitigation, SCRM’s Business Continuity Planning team, in conjunction with the applicable functional group (i.e., Global Supplier

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Management for suppliers, Manufacturing Operations for manufacturing partners) assesses the current recovery capabilities and identifies any gaps that could limit Cisco from recovering within the desired timeframe. These gaps form the basis of the mitigation program. Specifically, Cisco works with its EMS partners to close these gaps through developing work-around processes, reducing equipment lead times, and enabling quick ramp-up at the alternate facility.

For example, to mitigate the risk around the EMS partner locations, Cisco looks at developing recovery plans with their partners, including agreements for additional capacity that we can leverage in the event of a disruption. The goal is to integrate risk requirements into the company’s capacity planning processes. For test equipment with a lead time longer than the recovery objective, the Supply Chain Resiliency team in conjunction with the applicable test team will work with a supplier to determine the appropriate mitigation solution. These solutions can range from setting lead time agreements to purchasing inventory of long lead time materials and securing burst capacity to meet demand surges.

For logistics centers, the team works with the EMS partners to identify additional space and/or facilities that can be leveraged, including redundant warehouse pro-

cessing equipment. These proactive mitigation solutions and recovery plans became useful during the Chengdu earthquake. They allowed Cisco to leverage alternate transportation solutions, offer additional transportation capacity, and expedite capabilities to the impacted suppliers in the region.

The Silver Lining to Disruptions

Disruptions provide a unique opportunity to enhance your capabilities. While the core mission of any supply chain risk management program is to mitigate disruptions (if not avoid them altogether), there is a silver lining to even the most unfortunate occurrences. Process development, mitigation programs, and even drills will only tell you so much about your supply chain's readiness and responsiveness in the case of a disruption. The true test of supply chain resiliency comes in the face of events like the Chengdu earthquake. Even the most thoughtful and thorough crisis management program will not anticipate every aspect of a disruption. Moreover, disruptions tend to be idiosyncratic in nature—each taking on dimensions and requiring a different response tailored to that event. In the face of real disruptions, however, organizations are presented with unique opportunities to refine their programs.

When events do occur, it becomes clear very quickly whether your program has had the right focus and can respond with the required resiliency.

In the case of the Chengdu earthquake, Cisco learned several things about its own program and made appropriate changes. As a result of the event, Cisco revised the membership of its crisis management teams to include key external players like manufacturing and logistics partners and adjusted the activation process. The company also made its risk management playbooks and trigger points more forward looking and proactive based on the type of event. More importantly perhaps, we gained a fuller appreciation of the importance of having a closed-loop post-mortem process that allows the team to capture key lessons and evolve the program. Cisco understands that a program will never be “baked,” but rather must be capable of incorporating useful learnings from new experiences.

Events also play an important role in ensuring ongoing senior management support, which as we dis-

cuss below is essential to a program's success. When events do occur, it becomes clear very quickly whether your program has had the right focus and can respond with the required resiliency. Provided that it can (if it can't, we recommend your risk manager gets his or her resume in order), the event provides an opportunity to move beyond a theoretical value proposition and demonstrate the program's real benefits. By creating a historical log of events and the benefits realized (and pain avoided) from the risk management program, the SCRM gains important business intelligence that is particularly valuable during the planning cycle. Moreover, this does not need to be a complicated process or calculation. By understanding the improvement in recovery time resulting from the program, you can very easily track avoided impacts to revenue, on-time shipment, and other critical business metrics.

Securing Senior Management Support

A SCRM program cannot function in a vacuum; it needs to be a top priority at the highest level and across the organization. Further, effective SCRM requires coordination across a wide range of corporate functions. Despite the overwhelming presence of persistent risk in supply chains, however, only 12 percent of companies report having a risk-resilient global supply chain, according to a survey conducted by the Aberdeen Group.²

Support for Cisco's program comes from the very top. CEO John Chambers and Angel Mendez, SVP of the Customer Value Chain Management organization, are staunch supporters and maintain an active role in promoting and driving ongoing attention to supply chain resiliency. Chambers is briefed quarterly and sees SCRM as an integral part of the corporation's risk profile. Mendez, too, has great passion around SCRM and has often found himself in areas where a crisis is going to develop. For example, he was in Hong Kong in the midst of severe typhoons last year. When the H1N1 flu virus broke out, guess where he was? In Mexico City, as part of a Cisco delegation meeting with the Mexican president!

For Cisco, events like 9/11 and Hurricane Katrina were catalysts. Even though these events did not significantly impact Cisco, senior management saw the potential for disruption resulting from supply chain issues. Thus, the SCRM team was formed to proactively put in place infrastructure, processes, programs and tools to prevent, thwart and recover quickly from a major disruption.

Building resiliency can be an expensive proposition. After all, it's a highly complex undertaking. In Cisco's case it involves collecting BCP data from over 700 suppliers, identifying and qualifying second sources on thousands of single-sourced components, and building a crisis response capability that enables a coordinated response for more than 8,000 products. Dedicated funding is required, with a budget set aside each year with a clear set of objectives to be accomplished.

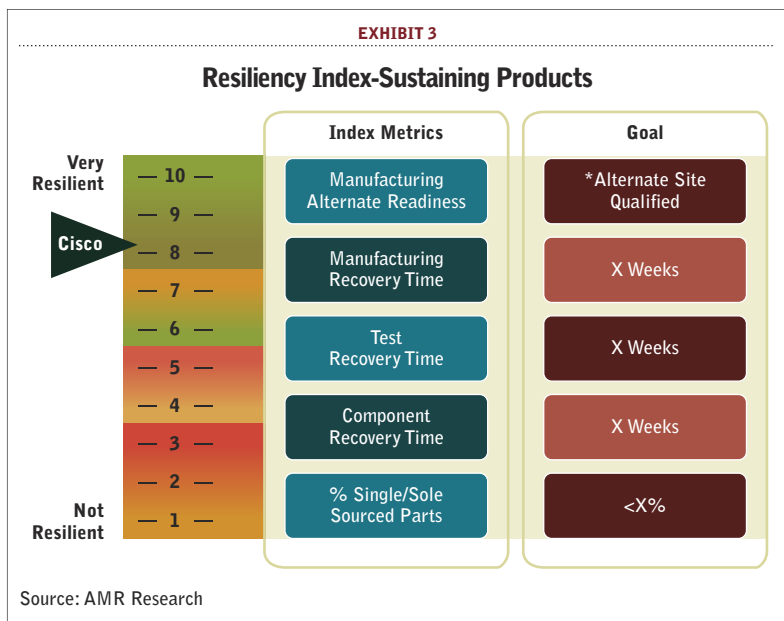
Finally, the team has developed metrics that enable Cisco to measure resiliency at the product, site, regional, geography and business unit level. (See Exhibit 3.) In particular, Cisco developed a "Resiliency Index," which is a composite of resiliency attributes that is calculated and reported by the business units at Cisco's semi-annual operations review with senior management. By having a resiliency metric which is shared among the Business Units and supply chain, we have driven a common awareness and understanding of what resiliency means to Cisco as well as a common framework for driving improvements.

Where to Start?

For a company looking to develop its own supply chain risk management program, our advice would be:

- Secure support from senior leadership within your company and especially the major stakeholders.
- Start with a basic business continuity planning program and build it out as a robust foundation to your risk management program.
- Effective crisis management requires coordination, playbooks and trigger points. So set up a cross-functional team and a timeline to flesh out a detailed playbook(s). Regularly update to reflect the realities of the crisis you are dealing with real-time.
- Develop clearly understood and accepted priorities for the resiliency and mitigation programs to facilitate decision making and action prioritization.

In this new globally connected economy, companies are facing an increasing array of risks. According to the



World Economic Forum, "...the global risks landscape is a crowded one and the window of opportunity we have to address some of the greatest challenges of our time is narrow."³ It is incumbent upon management to formulate and implement a SCRM strategy attuned to the needs of their markets and customers, with support and funding from the management team.

A successful risk management strategy will include a collaborative framework practiced across the organization and the larger external supply chain, supported by robust tools and comprehensive metrics. Importantly, it also will have a dynamic nature about it that allows the flexibility to evolve with the changing needs of the business. Successful risk management programs know how to strike the right balance between being completely unprepared and aiming for unaffordable (and unrealistic) resilience. ∞∞

References:

- 1 "IBM Global Chief Supply Chain Officer Study: The Smarter Supply Chain of the Future" – February 2009.
- 2 Aberdeen Group Report – "Supply Chain Risk Management: Building a Resilient Global Supply Chain" – July 2008.
- 3 "Global Risk 2009" – A Global Risk Network Report from the World Economic Forum.