

# Building a Resilient Supply Chain

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Threats to your supply chain, and therefore to your company, abound—natural disasters, accidents, and intentional disruptions—their likelihood and consequences heightened by long, global supply chains, ever-shrinking product lifecycles, and volatile and unpredictable markets.

No sure way exists for overcoming all such risks, especially high-impact/low-probability events such as an outbreak of SARS or foot-and-mouth disease, or a major terrorist attack, because the absence of historical data excludes the use of predictive statistical tools to help ensure containment of those risks.

But some organizations cope far better than others with both the prospect and the manifestation of unquantifiable risk. They don't have in common a secret formula or even many of the same processes for dealing with risk, but they share a critical trait: resilience.

The notion of organizational resilience is not new: the ability of an organization to successfully confront the unforeseen has always been a core element of success. But because the numbers and types of threats that can undermine a supply chain are now greater than ever, resilience has taken on even more significance in supply chain management. As a result, leaders in the discipline have worked to better understand what makes a particular enterprise resilient, and thus there is a burgeoning body of knowledge from which other companies stand to benefit.

Supply chain resilience no longer implies merely the ability to manage risk. It now assumes that the ability to manage risk means being better positioned than competitors to deal with—and even gain advantage from—disruptions.

My three-year research project at MIT into organizational resilience, which included interviews with dozens of companies and analysis of hundreds of disruptions, uncovered key themes in how organizations can and should build resilience—an overview of how this can be done follows. My book *The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage* covers these topics in depth.

## **ACHIEVING RESILIENCE**

In materials sciences, resilience represents the ability of a material to recover its original shape following a deformation. In the corporate world, resilience refers to the ability of a company to bounce back from a large disruption—this includes, for instance, the speed with which it returns to normal performance levels (production, services, fill rate, etc.).

Companies can develop resilience in three main ways: increasing redundancy, building flexibility, and changing the corporate culture. The first has limited utility; the others are essential.

### **Redundancy.**

Theoretically, a resilient enterprise can be built by creating redundancies throughout the supply chain. The organization could hold extra inventory, maintain low capacity utilization, have many suppliers, etc. Yet although redundancy can provide some breathing room to continue operating after a disruption, typically it is a temporary—and very expensive—measure.

A company must pay for the redundant stock, capacity, and workers; moreover, such excesses are likely to lead to sloppy operations, reduced quality, and significant cost increases.

Admired and emulated supply chain strategies such as the Toyota Production System, lean production processes, and Six Sigma practices aim to create hyperefficient enterprises—those that operate with little inventory to deliver high-quality products in a timely fashion. A focus on redundancy actually inhibits an organization's ability to achieve such efficiency.

### **Flexibility.**

In contrast, when a company increases supply chain flexibility, it can both withstand significant disruptions and better respond to demand fluctuations.

To achieve built-in flexibility, a company should take the following actions:

- *Adopt standardized processes.* Master the ability to move production among plants by using interchangeable and generic parts in many products, relying on similar and even identical plant designs and processes across the company, and cross-training employees. Interchangeable parts, production facilities, and people allow a company to respond quickly to a disruption by reallocating resources where the need is greatest. Intel, for example, builds semiconductor fabrication factories with identical layouts for machinery and production processes. Because of its standard fabrication design, Intel can switch production among facilities if the need arises.
- *Use concurrent instead of sequential processes.* Employing simultaneous rather than sequential processes in such key areas as product development and production/distribution speeds up the recovery phase after a disruption and provides collateral benefits in improved market responses. Lucent Technologies achieves concurrency through a centralized supply chain organization that spans various company functions, including engineering and sales. By aligning these activities with the supply chain, the company can view each operational area simultaneously—and quickly assess the status of the activity in each if an emergency arises.

- *Plan to postpone.* Design products and processes for maximum postponement of as many operations and decisions as possible in the supply chain. Keeping products in semifinished form affords flexibility to move products from surplus to deficit areas. It also increases fill rates and improves customer service without increasing inventory carrying costs, because the products can be completed when more accurate information about what the customer wants becomes available. Italian clothing manufacturer and retailer Benetton redesigned its manufacturing processes so that select products—particularly those subject to extreme demand variability—are made as generic, undyed items to be finished later, when the company obtains more accurate demand information.

- *Align procurement strategy with supplier relationships.* If a company relies on a small group of key suppliers, it must maintain a deep relationship with each. Such suppliers are so vital to an enterprise that the failure of any among them can have a catastrophic effect on that enterprise. By knowing each trading partner intimately, a company can better monitor the group to detect potential problems—and rely on them for help to deal in unforeseen circumstances.

On the other hand, if a company is not closely allied with a small group of suppliers, its supplier network had better be extensive if it is to be resilient and responsive to the market. A company with shallow relationships is less knowledgeable about its trading partners and therefore less likely to be forewarned about supply problems. Therefore, maintaining a large network of arm's-length suppliers would distribute the risk should a failure occur. Neither strategy is necessarily correct; the issue is to choose the approach that aligns a company's supplier relationships with its procurement strategy.

Inadequate monitoring of its supplier base almost cost Land Rover its business when UPF-Thompson, its sole supplier of chassis frames for the Discovery models, unexpectedly went bankrupt in December 2001. Land Rover was totally unprepared and eventually had to pay off some of UPF's debt to ensure the resumption of chassis supplies. A deeper relationship with UPF would likely have alerted Land Rover before the crisis.

### **Cultural change.**

After a disruption, the factor that clearly distinguishes those companies that recover quickly, and even profitably, from those that falter is corporate culture. On the surface, Nokia, Toyota, UPS, Dell, Southwest Airlines, and the U.S. Navy may not seem to have much in common, but these resilient organizations share several cultural traits:

- *Continuous communication among informed employees.* They keep all personnel aware of the strategic goals, tactical factors, and day-by-day and even minute-by-minute pulse of the business. Dell employees have continuous access to product manufacturing and shipment data and a wide variety of other information. Thus, when a disruption takes place, employees know the company's status: what is selling, where the raw materials are, what it is they were trying to do before the disruption hit, and so on. They can use that knowledge to make better decisions in the face of the unforeseen.

- *Distributed power, so that teams and individuals are empowered to take necessary actions.* Toyota assembly-line workers can halt production by pushing a special alarm button, and the members of U.S. Navy aircraft carrier crews can stop flight operations if they detect an emergency. Before a potential disruption is even visible to managers, those that are thus empowered and are “close to the action” can take necessary measures; moreover, they can respond quickly, significantly enhancing the chances of containing a disruption early on.
- *Passion for work.* Successful companies engender a sense of the greater good in their employees. Southwest Airlines CEO Herb Kelleher recounts the words of one of his managers: “The important thing is to take the bricklayer and make him understand that he’s building a home, not just laying bricks.”
- *Conditioning for disruptions.* Resilient and flexible organizations are apparently conditioned, as a result of frequent and continuous “small” operational interruptions, to become innovative and flexible in the face of HILP disruptions. Albert Wright, speaking of working conditions at UPS, has said that “disruptions are really normal.” Since its operations are subject to adverse weather, traffic congestion, road closures, and many other problems that cause delay, the company’s recovery processes are tested daily.

## **RESILIENCE ENHANCES COMPETITIVENESS**

The rewards for building a resilient organization are substantial. The “hardened” enterprise will be able to not only withstand all manner of disruption but also increase its competitiveness. Unforeseen disruptions can create shortages that are not dissimilar to the demand spikes caused by supply/demand imbalances; resilient enterprises can thus react to changing market demand ahead of their competitors.

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