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## **ARTICLE** **OPERATIONS MANAGEMENT**

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*by James B. Rice, Jr.*

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# Prepare Your Supply Chain for Coronavirus

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KIRA-YAN/GETTY IMAGES

Developing a cogent supply chain response to the coronavirus outbreak is extremely challenging, given the scale of the crisis and the rate at which it is evolving.

The best response, of course, is to be ready before such a crisis hits, since options become more limited when a disruption is in full swing. However, there are measures that can be taken now even if you're not fully prepared. And although its long-term consequences have yet to fully play out, the coronavirus outbreak already provides some lessons about how you can better prepare your company to deal with future large-scale crises.

## What You Can Do Now

Let's first look at some actions that can be taken to mitigate the impacts of the crisis on supply chains.

***Start with your people.*** The welfare of employees is paramount, and obviously people are a critical resource. The companies that recovered the fastest after Hurricane Katrina in 2005 were those that tracked down all their employees who dispersed across the southeastern United States. Procter & Gamble even went so far as to create a local employee village on high ground with housing, foodstuffs, and cash advances for employees and their families.

It may be necessary to rethink work practices. When an [ice storm](#) shut down Louisville, Kentucky, in 2009, local workers could not get to UPS's sorting hub. But workers could still travel by air, so the company flew in personnel from other cities to keep the hub running. This interchangeability depended on job and equipment standardization.

***Maintain a healthy skepticism.*** Accurate information is a rare commodity in the early stages of emerging disasters, especially when governments are incentivized to keep the population and business community calm to avoid panic. Impact reports tend to be somewhat rose-tinted. However, local people can be a valuable and more reliable source of information, so try to maintain local contacts.

***Run outage scenarios to assess the possibility of unforeseen impacts.*** Expect the unexpected, especially when core suppliers are in the front line of disruptions. In the case of the coronavirus crisis, China's influence is so wide-ranging that there will almost inevitably be unexpected consequences. Inventory levels are not high enough to cover short-term material outages, so expect cause widespread runs on common core components and materials.

In 2005, Hurricane Rita struck Houston and western Louisiana, causing widespread shutdowns of oil refining assets located in the region. What came as a surprise to consumer-packaged-goods firms some six months later was that petroleum-based packaging was in short supply because of Rita's impact on supplies of the raw materials needed to make these materials. Many firms scrambled to redesign packaging using old-style paper and cardboard.

***Create a comprehensive, emergency operations center.*** Most organizations today have some semblance of an emergency operations center (EOC), but in our studies we've observed that these EOCs tend to exist only at the corporate or business unit level. That's not good enough — a deeper, more detailed EOC structure and process is necessary. EOCs should exist at the plant level, with predetermined action plans for communication and coordination, designated roles for functional representatives, protocols for communications and decision making, and emergency action plans that involve customers and suppliers.

## **Designing for response**

The coronavirus story will undoubtedly add to our knowledge about dealing with large-scale supply chain disruptions. Even at this relatively early stage, we can draw important lessons about managing crises of this nature that should be applied down the road.

***Know all your suppliers.*** Map your upstream suppliers several tiers back. Companies that fail to do this are less able to respond or estimate likely impacts when a crisis erupts. After the 2011 Sendai earthquake in Japan, it took weeks for many companies to understand their exposure to the disaster because they were unfamiliar with upstream suppliers. At that point any available capacity was gone. Similarly, develop relationships in advance with key resources — it's too late after the disruption has erupted.

***Understand your critical vulnerabilities and take action to spread the risk.*** Many supply chains have dependencies that put firms at risk. An example is when an enterprise is dependent on a supplier that has a single facility with a large share of the global market. The Sendai disaster highlighted this type of exposure. For example, Hitachi manufactured approximately 60% of the global supply of airflow sensors, a critical component for auto manufacturers. The anticipated shortage of these items forced some automotive original-equipment manufacturers (OEMs) to ration the remaining airflow sensors to their highest margin product lines. The coronavirus outbreak has exposed Apple's and many auto OEMs' dependency on sourcing from China.

***Create business continuity plans.*** These plans should pinpoint contingencies in critical areas and include backup plans for transportation, communications, supply, and cash flow. Involve your suppliers and customers in developing these plans.

***Don't forget your people.*** A backup plan is needed for people too. The plan may include contingencies for more automation, remote-working arrangements, or other flexible human resourcing in response to personnel constraints.

## **Revisit Your Supply Chain's Design**

Until very recently, most global companies could base their supply chain designs on the assumption that materials flow freely globally, enabling them to source, produce, and distribute products at the lowest-cost locations around the world. U.S.-China trade policy whiplash, Brexit, and now the coronavirus crisis have challenged the validity of this fundamental assumption. Specifically, the coronavirus illustrates the vulnerability of having so many sources located in one spot — and a spot that is far away from critical markets in North America, Europe, and Latin America.

We believe that a new kind of design is needed that enables companies to rapidly reconfigure their supply chains and be ultra-agile and responsive to rapidly changing global trade policies, supply dynamics, and disruptions. Therefore, the question is: How should companies design their supply chains to operate effectively in a highly volatile world where consumers are intolerant of tardy responses? There are many options, and each one involves tradeoffs between the level of risk that the

enterprises can tolerate and the amount of operational flexibility it wants to achieve. Here are two examples:

**Redesign with second sources.** This supply-chain design provides backup capacity for supply, production, and distribution outages. The backup capacity spreads the risk of a disruption across two sources (as long as the disruption does not also affect the second source location). Consequently, it is better to have a second source outside the primary source region. Although this supply chain design lowers risk levels, it incurs higher administrative, quality monitoring, and unit costs. Also, economies of scale vary according to the amount of supply allocated to each supply source.

**Redesign to source locally.** This design calls for a company to have production facilities with local sources of supply in each of its major markets. Like the above option, it spreads the risk. Since these sources are dispersed, the economies of scale are lower and the capital costs are higher, but the transportation costs are lower.

These are gross simplifications of many design options that the firm can take to reduce risk and ensure response capacity. A more detailed analysis and assessment is necessary. Obviously, in selecting a design, companies have to weigh the costs of each and how it will affect their ability to serve their customers and compete against other firms. Deciding which design is optimal is not a one-time process. Firms should regularly revisit and challenge their design choices and the strategies that underpin them.

It's impossible to anticipate the arrival of global crises such as the coronavirus outbreak, but firms can mitigate their impacts by taking supply chain preparedness to a higher level. They should act before a disruption occurs and adjust and execute new plans afterward rather than starting from scratch every time they are plunged into a new crisis.

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