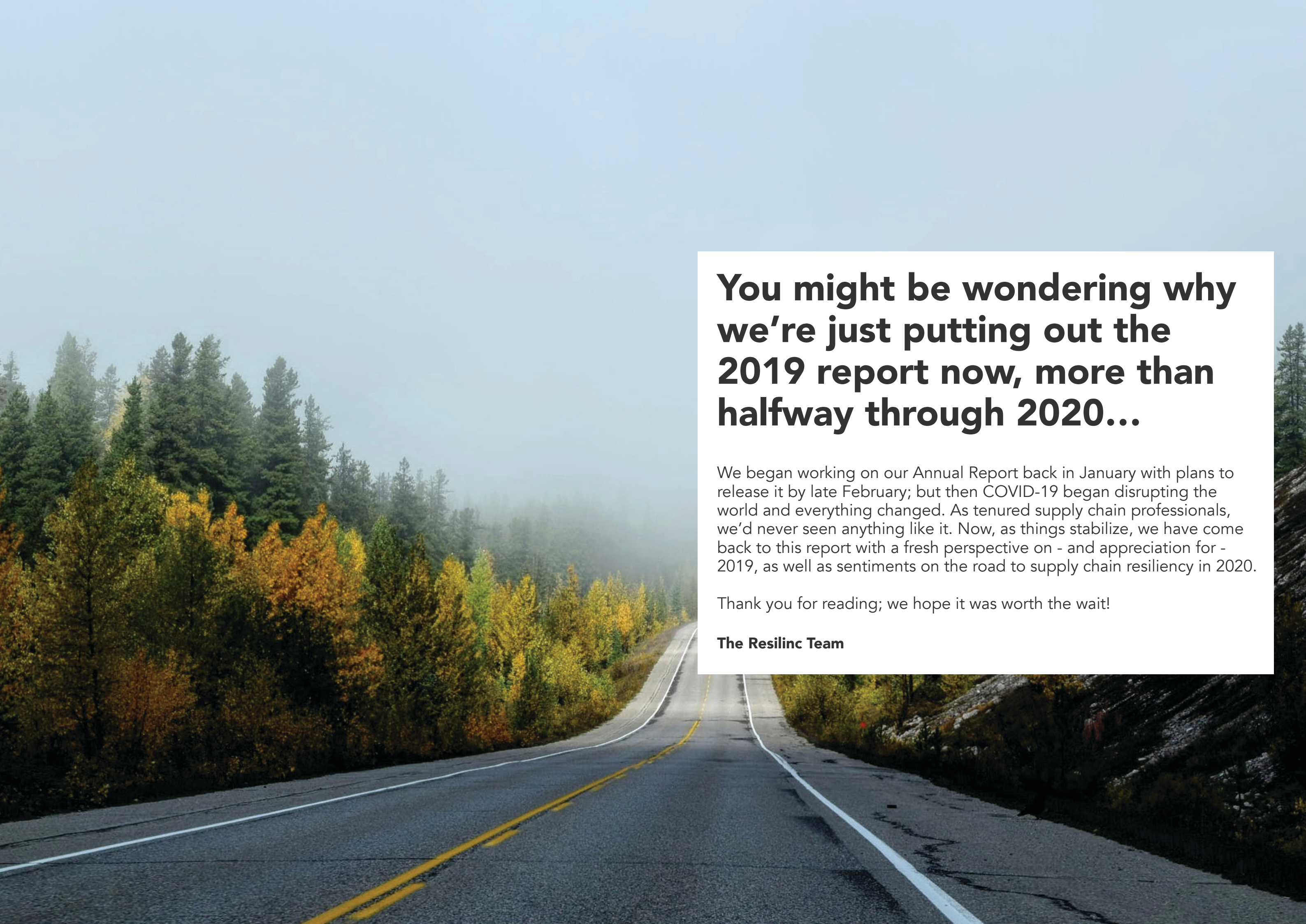




**RESILINC ANNUAL REPORT 2019**  
WITH 2020 MIDYEAR REVIEW

# The Road to Supply Chain Resiliency





## You might be wondering why we're just putting out the 2019 report now, more than halfway through 2020...

We began working on our Annual Report back in January with plans to release it by late February; but then COVID-19 began disrupting the world and everything changed. As tenured supply chain professionals, we'd never seen anything like it. Now, as things stabilize, we have come back to this report with a fresh perspective on - and appreciation for - 2019, as well as sentiments on the road to supply chain resiliency in 2020.

Thank you for reading; we hope it was worth the wait!

**The Resilinc Team**

# > From the CEO

## The value of supply chain AI can't be ignored in 2020

For over a decade I've been talking to supply chain managers about the importance of incorporating AI and machine learning into their supply chain management to mitigate risks. It can often be a tough sell: lack of budget; lack of executive buy in or understanding; and integration challenges all play a role. Now, on the heels of disruptions caused by COVID-19, tariffs, and geopolitics, the conversation has been brought to the forefront. In 2020 we are already seeing Supply Chain Risk Management going from an afterthought to a board-level discussion. A recent Gartner study indicated the number of companies looking to institute visibility and risk management into their capabilities over the next 2-3 years has soared from 21% to 66%.

For today's increasingly complex, global, and fast-paced supply chains, the data curated by AI and machine learning far exceeds any person's ability to absorb, analyze and act strategically. Especially when disruption strikes or is on the horizon. AI platforms can identify emerging risks and opportunities; they can provide valuable insights for decisions ranging from sourcing strategies to product development to playbooks. And, in the current business environment - where supply chain disruption will be the rule - supply chain AI can drive needed agility and resiliency across an enterprise.

Still, despite study results and discussions at the executive level, only a small percentage of supply chain managers are using AI at this point. There are a few reasons why:

**Cost:** AI solutions can be quite expensive; many C-level executives are understandably reluctant to divert cash from activities that would more predictably generate revenue and profits.

**Integration challenges:** To adopt AI, most large manufacturers will have to deal with a major integration to make the software work with their existing supply chain management or ERP systems. This is especially true if they're still relying on spreadsheets to manage their supply chains.

**Human replacement:** There have been exaggerated predictions that AI can entirely replace human staff, and that supply chains can be managed and operated 100 percent by algorithms. Supply chain managers would be wise to regard this with skepticism though. Our profession is certainly not at a point where we can entirely replace human expertise with automated solutions—and I don't think we'll ever reach that point.

However, it will soon become more clear that supply chain AI—or cognitive sourcing, as we and our partners like to call it—has matured to where it can offer value far beyond the cost to set it

up. We're seeing some of our leading customers apply algorithms to their supplier data (we map suppliers down to the nth-tier) to better predict and take advantage of commodity trends, as well as to respond proactively to supplier disruptions. With predictive analytics - driven by AI - they can detect previously unseen trends in raw materials pricing; foresee hidden dangers in how a supplier's level of service varies from season to season or year to year; and develop other business insights that confer important strategic advantages over competitors who aren't deploying AI. By using an AI platform that filters external data and mines supplier performance history and trends, companies can identify when any sort of change or event is likely to lead to critical supply disruptions.

As we now know, COVID-19 caused an unprecedented number of disruptions which impacted nearly every corner of the globe within a few months. In its wake, many companies were blindsided. They scrambled to identify their suppliers located in China, then Europe, and eventually across the United States that were facing lockdowns and restrictions. Most companies reported the lack of visibility into their supply chain as their number one problem, which hindered their ability to take swift and decisive action.

On the other hand, those companies that had invested in supply chain AI, emerged relatively unscathed. They had increased visibility into their global supply chain, knew the minute a potential disruption or shut down happened, where those affected suppliers were located, which items or materials were at risk, the identity, location and ranking qualifications of second and third-tier suppliers, and which had the most critical failure points. It was this type of data that was so important to mitigating a quick and organized response.

In 2020 the value of AI can't be ignored. We suggest starting out a solution that seems right-sized for your organization's needs and budget, and from there, develop a roadmap to grow your AI capabilities over time as they return value to the business.

We are here, ready to support you on your road to supply chain resiliency.

**Bindiya Vakil**

CEO



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# Eventwatch

## > 2019 in Review

Assuming 2020 is an anomaly when it comes to disruptions due to COVID-19 and human health, it's still extremely important to look back on and learn from events that happened in 2019. The 2019 data from Resilinc's EventWatch reveals important trends and insights that will be useful for supply chain professionals in their planning for greater supply chain resilience going forward in the (hopefully, soon) post COVID-19 era.

EventWatch is Resilinc's 24x7 global event monitoring, alert and analysis service. Using natural language processing, EventWatch monitors news and information from more than 3.5 million sources in 100+ languages to identify potential disruptions to supply chains. Artificial and human intelligence identifies which events could impact our customers, and the system sends alerts with detailed descriptions of the event and a ranking of its potential impact to the customer's supply chain.

In 2019, EventWatch issued 3,744 event alerts, of those 1,834 were ranked as Impact Events because they directly affected sites where our customers' parts or materials were being produced, stored, or shipped from. What's more, all of these required an impact assessment to gauge the extent of the disruption and possibly initiate mitigation measures.

### Growing supplier trust in EventWatch saves cost, time for customers

There are more than half a million suppliers in Resilinc's database; all are key collaborators in making EventWatch data accurate and actionable. In 2019 we saw the rate at which suppliers responded to Resilinc's automated supply chain event queries increase by 70%.

This increase in supplier responsiveness indicates a growing trust and partnership with Resilinc and the confidence that the information shared will be used effectively by customers.

What does it mean for our customers? It means, that when a supplier responds to an impact inquiry via EventWatch, the customer's supply chain team learns almost immediately what the supplier's status is, whether it has been disrupted, and if so, how long the estimated time to recovery is. This saves everyone time: no need to track contacts down, make phone calls, or send emails to clarify the level of disruption. It also enables our customers to quickly decide if they need to initiate a Resilinc War Room to coordinate their responses to the event. On that note, this past year 1,731 War Rooms were created by Resilinc to manage potential supply chain disruptions.

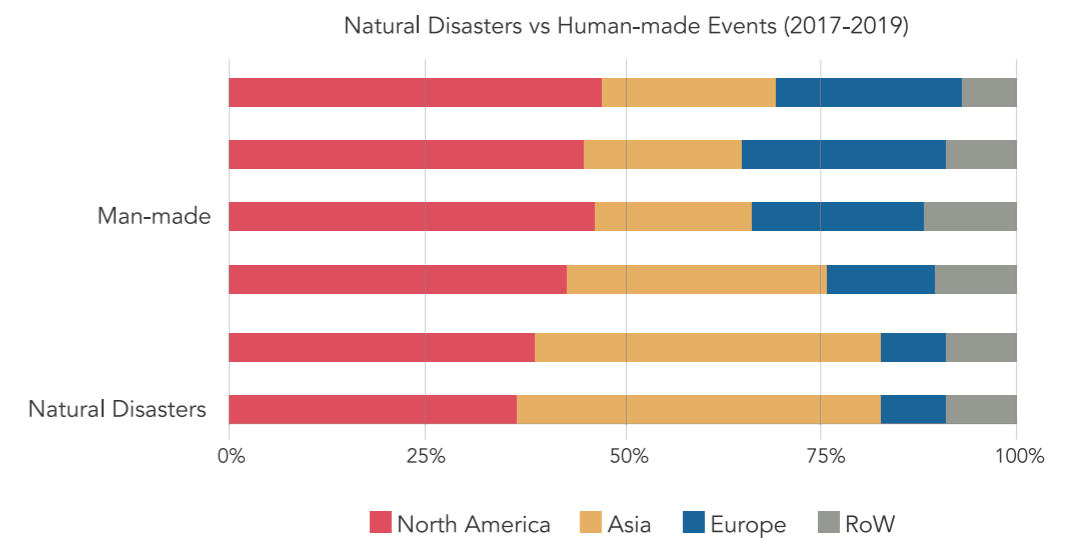
### Among the trends in global supply chain disruptions that EventWatch data reveals from 2019:

#### Small human-made disruptions were the most frequent

While many supply chain and procurement professionals devote a great deal of time to planning for natural disasters—from hurricanes to earthquakes—the reality is that there are

far more human-caused events that disrupt supply chains on a daily basis. EventWatch data has shown this for several years, but in 2019, the ratio was more disproportionate than ever: 86% of supply chain events were human-made events, while only 14% were naturally caused.

Human-made events like factory fires and changes in supplier ownership or management are often harder to predict than natural disasters like hurricanes/typhoons and floods, which occur every year within a seasonal window. But the probability of human-made events affecting certain suppliers can be assessed using supplier surveys, risk-scoring, credit-monitoring and other methods.

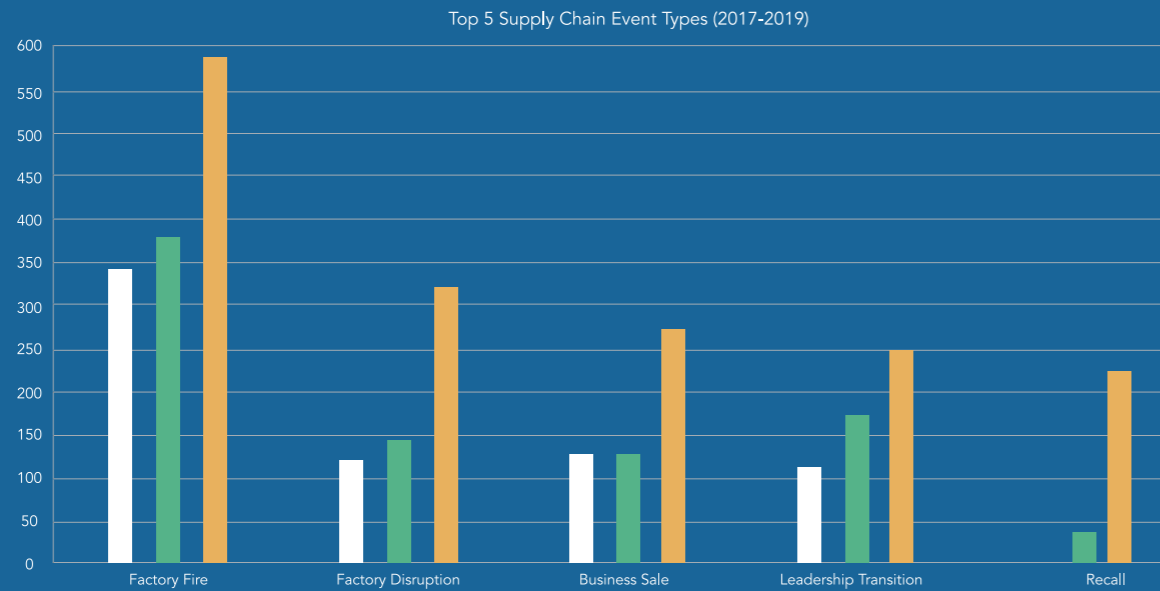


#### Factory fires and disruptions topped risk events in 2019

In 2019, EventWatch issued 587 alerts for factory fires and 321 for factory disruption (partial or complete factory shutdowns for causes other than fires). This represents a combined total of 24% of all events and 28% of all human-made events. Both types of events increased significantly from 2018: factory fires grew 54% year over year and factory disruptions increased 120% over the prior year. Overall, factory fires happened with the greatest frequency across all continents except Africa (there it was the second-most common disruptive event after airport disruptions).

While every factory fire is unique, there are some common factors that increase the odds of a fire including: the presence of combustible dust, flammable liquids and gases, and production methods that produce heat and sparks (known as "hot work"). Supply chain professionals can mitigate fire risks at their key suppliers' sites with supply chain risk management (SCRM) policies that include fire risk assessments and scoring suppliers on their fire safety and prevention capabilities.

Some of Resilinc's customers have helped their suppliers fund fire prevention investments such as sprinkler systems.

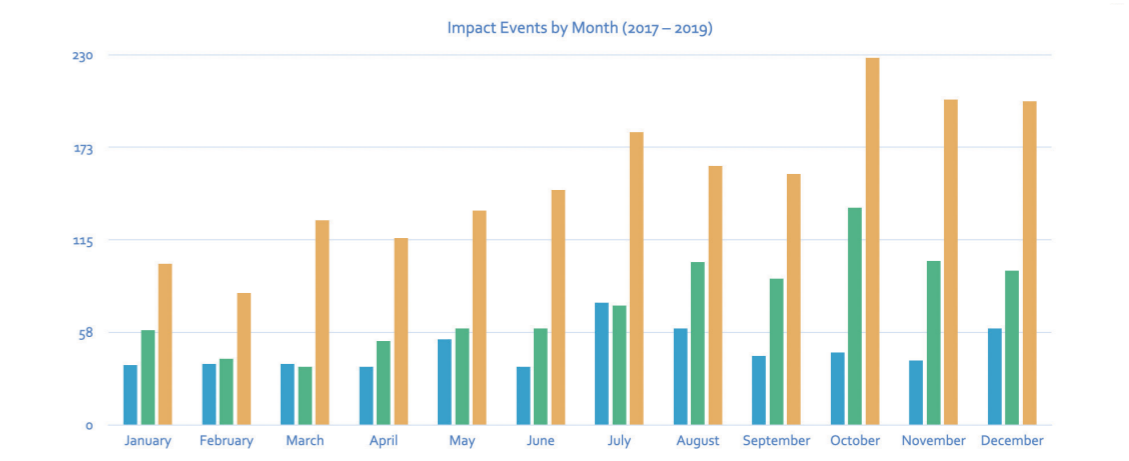
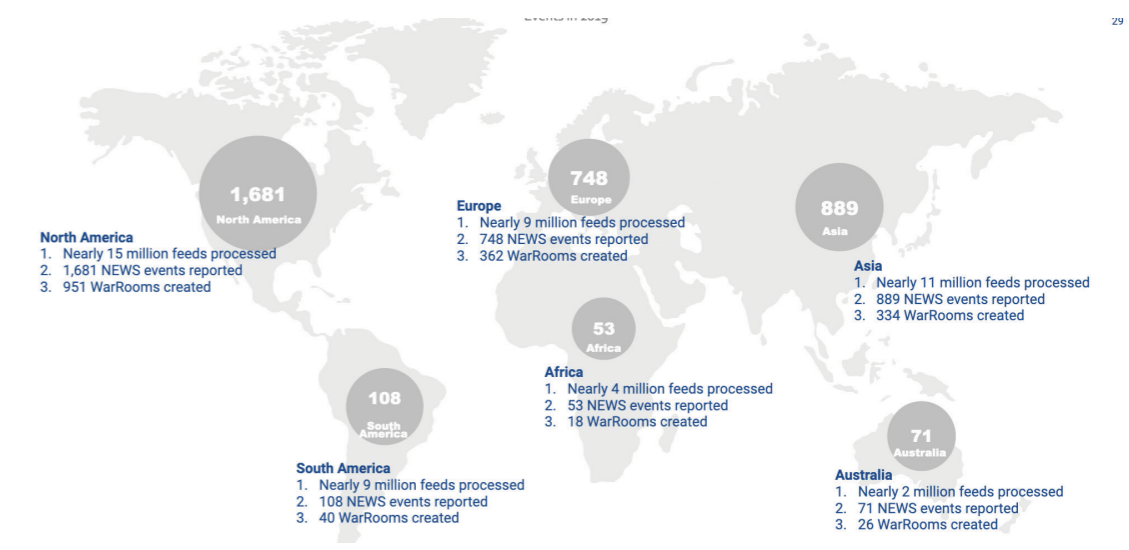
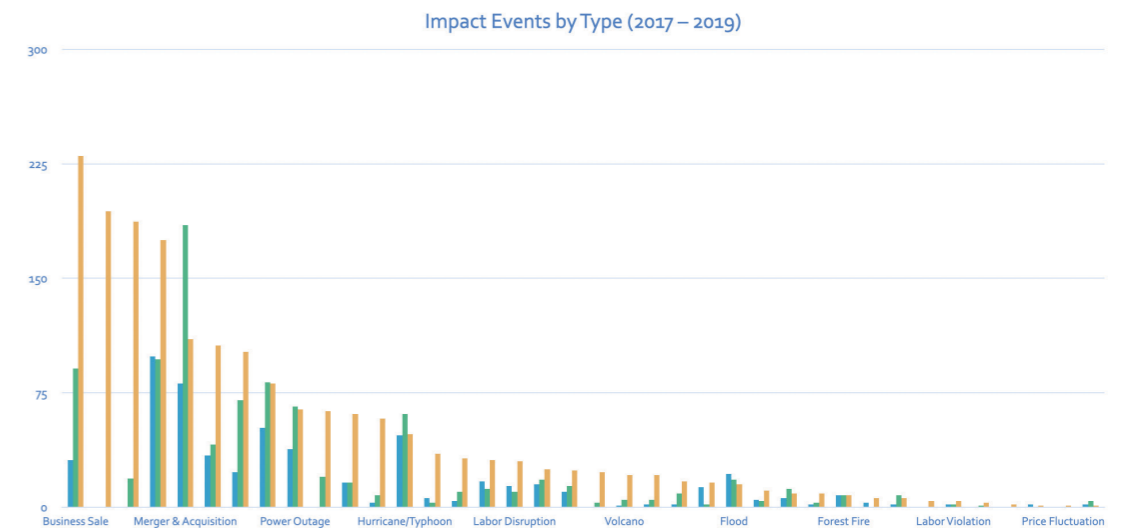


### Ownership/management changes: the slow-burning disruptions

While factory fires and factory disruptions have immediate impacts on supply chains, the effects of changes in the ownership or management of supplier firms usually take much longer to manifest. That said, the supply chain impacts of a merger, business sale, or change in leadership can be very significant. For example, to help finance an acquisition, acquiring firms frequently decide to close certain sites or even exit business lines that are not central to their strategy.

For 2019, EventWatch data showed a sharp increase in potential disruptions from business sales and leadership transition; reported as “business sale,” “leadership transition,” and “merger & acquisition.” While part of the increase is due to refinements in EventWatch reporting criteria, it’s clear that changes in ownership or management represented the second-largest group of potentially disruptive supply chain events (after factory fires and factory disruptions).

This is why an AI monitoring platform is so important: a supply chain team that relies on traditional information sources like business news or manual search methods, misses so much and can be easily surprised by disruptions that occur long after a management/ownership change has been announced. On the other hand, a team using an AI platform that filters across millions of external data sources ranging from social media feeds to company reports - in addition to mining supplier performance history and trends - can identify when an ownership/management change is likely to lead to critical supply disruptions.





## Resilinc Viewpoints

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# > The value of supply chain AI can't be ignored

Q&A with Sumit Vakil, CTO and Co-Founder

The massive datasets available to those who manage today's complex, globalized supply chains far exceed any human's or team's ability to absorb, analyze and act on strategically. AI platforms can identify emerging risks and opportunities as well as provide valuable insights for decisions on sourcing strategies, and product design, among others.

According to Sumit Vakil, Resilinc's CTO and co-founder, the business case for supply chain AI has never been stronger. In this Q&A, he describes how AI solutions—integrated with human expertise—have helped supply chain managers navigate the stormy waters of the COVID-19 crisis and how they will help forward-looking corporations achieve long-term value in supply chain risk management.

**Q: Some advocates of automated supply chain management contend that AI can entirely replace human staff. What's your view of that?**

**A: Vakil:** Our profession is not at a point where we can entirely replace human expertise with automated solutions—and I don't think we'll ever reach that point. What AI can do is free people up from number crunching and developing plans when disruptions occur, so they can do more value-added work. Our solution not only provides automated recommendations, but it also automates much of the workflow to execute solutions such as communicating with a given set of alternate suppliers and taking the steps to validate them.

Computers can't negotiate pricing and terms, but they can equip your staff with the information and recommendations they need to perform more efficiently at negotiations and other value-added functions. They can't make strategic procurement decisions involving hundreds of thousands of dollars, but they can provide a streamlined set of prescriptive recommendations that allows managers to make better, faster, and more strategically sophisticated decisions.

I like to say that AI will not replace humans but will create augmented humans.

**Q: Supply chain AI solutions are not cheap, and many company leaders are reluctant to divert cash from functions that they know will generate revenue to new technology they've never used. How can you quantify the ROI from supply chain AI?**

**A: Vakil:** In the COVID-19 context, the ROI is pretty obvious. If a company had AI monitoring tools and risk management solutions in place, like supplier mapping, they were able to react to supply chain disruptions better and faster than their competition.

In the longer term, there are a few areas to look at. One is the efficiency of your people. Every company measures staff productivity on different metrics, and in the case of supply chain departments, one of the predominant metrics is how much money you saved. Expenses to expedite shipments and procure safety stock are common ways that costs increase. With AI, you can prepare for contingencies ahead of time and keep your freight and safety stock costs down.

**Q: Can you give a specific example?**

**A: Vakil:** Let's look more closely at safety stock. Every company maintains some level of excess inventory to account for contingencies, but few actually run through scenarios to understand and plan for the kinds of contingencies they're most likely to face.

This is true even for hurricanes. Like death and taxes, hurricanes will always be with us; given this reality, it's surprising how many companies plan for hurricanes in a manner that doesn't take advantage of predictive analytics and ultimately wastes money on excess safety stock. With supply chain AI, instead of ordering, let's say, 500,000 sterilized containers to store vaccines because you're worried about supply disruptions from Puerto Rican companies, you can have your AI technology tell you—based on your suppliers' sites and logistics, the historic impacts of hurricanes in different regions and other data—how to adjust your safety stock intelligently to cover the most plausible scenarios. This can result in lower inventory, more cost savings, better investment returns, and even a healthier balance sheet that will support enhanced market valuation for your company.

**Q: What types and amounts of data are needed to use cognitive sourcing effectively?**

**A: Vakil:** For a cognitive sourcing platform to produce actionable recommendations, you need a vast volume of data and a huge diversity of data. We start with supplier data—everything from the parts and materials they supply to their performance history and business continuity plans, from their cyber-security to their ESG practices.

But as COVID-19 demonstrates so vividly, supply chains are vulnerable to disruption from a multitude of events. Resilinc's EventWatch system monitors millions of information sources: traditional and social media, blogs, government websites, company reports—in more than 100 languages.

Using natural language processing, the system filters out the noise to identify the events that could possibly impact our customers. This master data management system is combined with our AI solutions to improve supply chain risk management and resilience for our customers.

**Q: How does the pandemic underscore the value of supply chain AI?**

**A: Vakil:** It brought to the forefront the need for advanced technology in supply chain resilience and risk management. Even before the crisis, the massive datasets available to managers of complex, globalized supply chains exceeded any human's or team's ability to absorb, analyze and act on strategically. Then suddenly in the first weeks of 2020, the stress and complexity of managing supply chains increased dramatically. Just about every large manufacturer had to scramble to find materials and parts and arrange transportation in an incredibly chaotic environment.

This is when supply chain AI solutions, or cognitive sourcing, as we like to call this technology, proved its worth. While traditional spreadsheets and other systems produced data dumps of possible mitigation options for extremely stressed staff, AI platforms synthesized data, highlighted key areas that needed to be addressed and provided prescriptive recommendations for staff to act on.

**How have Resilinc's AI solutions helped its customers in the pandemic?**

**A: Vakil:** We created a set of tools to observe and analyze everything going on across the entire world that could possibly affect supply chains. This includes the regional and national lockdowns and stay-at-home orders, force majeure claims, employees getting sick and not going to work or staying home to care for a sick family member.

For parts or materials that were coming from a region under lockdown, like Hubei province, our software informed users not only which items would likely be delayed, but it also provided real-time recommendations such as a list of possible alternate suppliers to reach out to. Instead of scouring their spreadsheets or the Internet for alternate sources, supply chain managers received prescriptive recommendations on which they could take immediate action, saving days and weeks of effort and providing key competitive advantages in many cases.



## PAY IT FORWARD

# ➤ To protect revenue, consider funding key suppliers

In response to the pandemic crisis, several large manufacturers have announced measures to financially support struggling suppliers. Unilever, for example, has committed €500 million for cash flow relief to support its most vulnerable suppliers and small-scale retailers. In PWC's CFO Pulse for May 11, 2020, 52% of U.S. companies surveyed had plans to deepen their understanding of their suppliers' financial and operational health.

While this pandemic is unprecedented, this kind of emergency financial assistance for struggling suppliers is not new. During the 2008-2009 financial crisis, companies such as LG and Cisco put together packages of loans, advance buys, and other measures to keep imperiled suppliers whole. These practices helped the firms strengthen their ties with important suppliers and provided competitive advantages during the recovery.

### Best practices for assessing supplier health, prioritizing financial aid

In Resilinc's view, all companies with extensive supply chains should be assessing the financial status of their key suppliers. To prioritize which suppliers to focus on, measure the impacts to revenue that would occur with loss of a supplier, as well as the level of effort that would be needed to replace them. Be sure to include sub-tier suppliers, even those who provide prosaic items such as packaging, cables, sheet metal and any other items that are essential to high-revenue products.

Once managers have identified their most critical suppliers, financial health assessments should be done through company or third-party financial reporting, along with conversations with supplier CFOs or CEOs. Large direct suppliers who represent the highest spend are generally publicly traded, as well as closely managed by procurement staff—so assessing their status will be relatively straightforward.

Most small direct suppliers and lower-tier suppliers are privately held and therefore not required to disclose financial metrics. If they represent lower spend, they're also typically not closely managed, making their OEM customers more likely to be caught off guard by a bankruptcy. In-house tools or specialist companies such as Rapid Ratings and Credit Risk Monitor can be used to analyze these suppliers' financial health, but nothing substitutes for a frank conversation with top managers.

### Financial Lifelines to Consider for Key Suppliers

- **High-spend suppliers:** Order future demand now, to help the supplier borrow against committed receivables.
- **Medium-spend suppliers:** Improve payment terms, pay upfront, or on delivery, advance-order future demand or consider making a strategic equity investment.
- **Low-spend suppliers:** Make a loan, donation or investment. Pay upfront or otherwise sweeten payment terms. If possible, relax service level agreements that are costly for supplier to meet. During the 2008-2009 crisis, Cisco (where Resilinc CEO Bindya Vakil worked at the time), created an emergency fund governed by its supplier commodity managers, supply chain finance, and risk teams. Staff pooled information about key suppliers, used risk scores and staff knowledge of the market and industry to identify suppliers who were likely to be financially struggling.

This led to candid, confidential discussions with suppliers' CEOs and CFOs to confirm their financial status and outlook. From there the team made a business case to C-level leaders to financially support key suppliers, a case based on, among other things, the revenue impact of losing a supplier as well as cost, effort, and challenges associated with replacing or qualifying a new source.

One of the key strategies used: placing lifetime buys to accommodate several years' worth of projected demand. These purchase contracts gave troubled suppliers the ability to secure funding, and several were able to remain solvent through the darkest months. Cisco also developed stronger relationships and partnerships with these suppliers because the firm stood by them during their hour of need and never abused the transparency and trust they demonstrated by sharing proprietary financial details.

### Preserve the ecosystem for long-term prosperity

Like the world's oceans, supply chains are interdependent ecosystems. Thousands of small suppliers feed mid-sized suppliers which feed the large global corporations. A crisis like COVID threatens an ecosystem collapse comparable the ocean running out of the plankton that feeds the smaller fish that feed the larger fish that feed the world.

Let this be a call to action for all large global corporations. Your long-term success and profitability will depend on the actions taken today, including keeping smaller companies in your supply chain ecosystem alive through the COVID-19 crisis.

RISK

# > The journey to a resilient supply chain

The fast-moving COVID-19 crisis highlighted the value of supply chain risk management (SCRM), but the journey to SCRM maturity will still take years for most companies

By Bindiya Vakil, CEO

For more than 10 years, my Resilinc colleagues and I have been helping some of the world’s largest companies build more resilient supply chains. COVID-19 has highlighted the urgency of achieving supply chain resiliency, but supply chain risk management (SCRM) is still a relatively new specialty. The truth is, most firms still have a long journey ahead of them to build a truly resilient supply chain that delivers meaningful return-on-investment (ROI). In our experience, the journey to a mature SCRM program typically takes at least three years, with the following in place:

- Real-time event monitoring
- Supply chain mapping has been done through the sub-tiers, especially for sole-source or historically weak suppliers and constrained materials
- Proactive risk mitigation for critical suppliers, sites and parts is dialed-in
- SCRM strategies have been optimized by revenue impacts vs. cost/spend
- Cross-functional SCRM teams collaborate regularly
- Supply chain risk insights are informing design of new products

So, how do you get there?

**First step: the business case**

The journey to a mature SCRM starts by building a business case that will enable company leaders to decide whether to invest in the venture. ROI analysis is the main focus, but the business case should also have clear goals for a SCRM program, aligned with company strategy, and responses to likely objections. There’s more on how to develop a strong business case in “Achieving enterprise adoption,” on page 20.

**Phased approach to balance investment with return**

Typically, SCRM programs begin with a limited scope and mature as they prove their worth. For example, initially the focus could be on select risk categories for tier 1 suppliers, with the goal of later expanding the types of risks and the number of supply chain tiers under management. Here’s one roadmap for the first 24 to 48 months of an SCRM initiative:

Key services the program proposes to offer—and the metrics to evaluate success of those services—should be developed. Resilinc suggests four service categories: risk intelligence; risk monitoring and

Plan “Storm”	Plan “Storm”	Implement “Form”	Institutionalize “norm and perform”
Time frame	0-6 months	6-24 months	24-48 months +
Objective	Define SC resiliency program	Roll-out SCRP (first iteration)	“Top 5” executive priority
People	Proposal for: <ul style="list-style-type: none"> <li>• Governance</li> <li>• Customer/stakeholders</li> <li>• SCRP team structure</li> </ul>	<ul style="list-style-type: none"> <li>• Roles and job descriptions</li> <li>• Awareness building</li> <li>• Supplier communications (e.g. progressive roll-out to groups of suppliers.</li> </ul>	<ul style="list-style-type: none"> <li>• Risk governance / exec leadership crystallized</li> <li>• Regular executive/stakeholder reviews</li> <li>• Dedicated resources/crises team, category managers</li> <li>• Supplier collaboration/incentives</li> </ul>
Process	Business case	Update business case	Expand business case
Scope	Initial program scope definition	Initial program scope implementation	<ul style="list-style-type: none"> <li>• Expanded program scope</li> <li>• Risk data shared across all org levels used in network and product design</li> </ul>
	Business processes/ services definition	First iteration of SCRM services: <ul style="list-style-type: none"> <li>• SC network map</li> <li>• Tier 1 supplier on-boarding</li> <li>• Risk identification</li> <li>• Risk analysis</li> <li>• Crises preparedness</li> <li>• Event monitoring</li> <li>• Incident response/ war room</li> </ul>	<ul style="list-style-type: none"> <li>• Formalized processes (including change management risk policies, and thresholds</li> <li>• Resilience program metrics and regular reports</li> <li>• Risk used in supplier performance metrics</li> <li>• Comprehensive supplier scorecards</li> <li>• Comprehensive risk repository and collaboration nub</li> </ul>
Scope	Initial timeline/ milestones (a version of this table)	Detailed 3-year plan in collaboration with system/tool vendor	Maturity model
	Initial charter	Business plan	Updated business plan
Technology	System/tools plan	<ul style="list-style-type: none"> <li>• System deployment and training</li> <li>• System/tools used for event monitoring crises management risk identification and BCP</li> <li>• Tier 1 mapping</li> </ul>	<ul style="list-style-type: none"> <li>• Analytics, revenue based prioritization</li> <li>• User/initiative footprint expansion</li> <li>• System embedded in business processes and focused on proactive mitigations</li> <li>• N-tier network mapping</li> </ul>

response; risk analysis; and risk treatment (aka mitigation). Here’s a breakdown of the components of risk monitoring and response and the metrics that can be used to evaluate the performance of this service.

**Team and technology partners critical to success**

To leverage specialized SCRM software, supplier databases, and AI capabilities, most companies would be well advised to contract with an SCRM provider like Resilinc. Keep in mind, it takes enormous resources and investment for companies to develop their own supply chain software and risk management system in house.

Just as important as finding the right solution provider is building the right in-house team to champion the SCRM program. This team should be led by a

manager with strategic vision, drive and ability to influence staff at all levels. The ideal leader is someone willing to ‘rock the boat’ and shake up organizational inertia when necessary and to be candid with executive leadership.

**Ready for disruption**

To keep supply chains up and running, while minimizing costs for things like freight expediting and safety stock, an SCRM program must be able to rapidly and efficiently sense, evaluate and respond to hundreds of disruptions annually. In 2019, Resilinc’s EventWatch issued 3,744 event alerts—more than 10 per day. Of these, 1,834 were ranked as Impact Events that directly affected our customers’ supplier sites and therefore required an impact assessment. These ranged from slow-moving events like geopolitical developments and changes in business ownership to fires and natural disasters that demanded urgent responses.

A mature SCRM will not only respond to events as they unfold, but will strategically reduce risks and build resiliency ahead of events (whether they affect one factory in one town or the whole world). It will develop playbooks that encode institutional memory and prepare staff five or 10 years in the future to leverage the lessons of past events. Its leaders and key staff will be agents of change, working across the enterprise to train and update their peers, pilot new processes and propose new initiatives that align with corporate strategy.

A mature supply chain resiliency program requires change management to extend to day-to-day functions in the enterprise. It touches people, processes, technology, metrics, incentives, and policies. When all these elements are working in harmony, fully aligned with corporate goals, the enterprise has built a truly mature, resilient-stage supply chain risk program. Just as importantly, the company has empowered a cohesive, motivated and effective high-performance team that can outperform competition, use the supply chain to generate competitive advantage, and generate meaningful enterprise value that sustains over the long term.

# > Accelerating Enterprise Adoption

Achieving enterprise-wide adoption of supply chain risk management

A common challenge for procurement and supply chain professionals is obtaining support from C-level leaders to invest in a robust supply chain risk management (SCRM) program. Despite mountains of evidence that a truly mature SCRM pays for itself by 1) protecting revenue, 2) informing new product design strategies, and 3) enhancing brand value, many corporate leaders are still reluctant to elevate SCRM to a strategic focus.

While a mature SCRM program can deliver significant topline and bottom-line value, such an investment often doesn't start in earnest until crises like the 2008-2009 financial crash, the 2011 Fukushima disaster, the Hanjin Shipping bankruptcy in 2016, or Hurricane Maria in 2018 wake top management up to the fragility and the strategic importance of having visibility into their supply chains.

The unprecedented supply chain disruptions caused by COVID-19 provide potent arguments for supply chain pros seeking greater support of SCRM from C-level leaders. But to make their strongest case, SCRM advocates need to focus on one key metric: return on investment. And that means building the business case for category managers, functional units and especially C-level leaders.

## ROI analysis: core to a strong business case

A strong business case will articulate clear goals aligned with the company's strategy as well as providing answers to anticipated objections. But the core is the ROI analysis.

On the investment side, a detailed budget for staffing, training, software, cloud subscriptions, consulting fees, etc., is needed. To forecast anticipated returns, sensitivity analyses should be performed to evaluate a wide range of scenarios. These can be built with historical data and anecdotal expert opinions about past supply chain disruption events and outcomes in terms of costs, revenue impacts, customer relations and extra time spent scrambling to react vs. implementing the kinds of proactive risk mitigation measures that are possible with a mature SCRM—one that provides visibility into sub-tier suppliers and logistics, and uses AI to generate prescriptive mitigation measures.

To reflect the reality that SCRM programs take time to mature, ROI should be calculated over a three-year period (see example below). Other best practices that will enhance a business case's credibility:

- Acknowledge those risk mitigation and resiliency measures that are already in place and include only new revenue and savings anticipated with new SCRM measures
- Anticipate and answer objections
- Collaborate with stakeholders in finance, sales, manufacturing, etc., to ensure functional leaders understand how SCRM can advance their interests

## Better, Faster, More Accurate Decisions = ROI Realized

Team efficiencies	Near term (1st year)	10-15%	Ongoing
Raw material premium savings	Medium term (2nd year)	15-20%	Event Related
Reduction in Freight expediting	Medium term (3rd year)	5%	Event Related
Reduced inventory levels	Long term (3rd year)	10-20%	Ongoing
Protected revenue	Longterm (3rd year)		Event Related
Revenue upside opportunity			

It's important to frame the program in strategic terms and to ensure that decision-makers understand the linkages between the tactical objectives of the SCRM and key metrics such as revenue, earnings, brand and shareholder value. The chart below provides an example of how to line up strategic objectives with tactical SCRM objectives.

As mentioned above, the business case should anticipate and handle likely objections from internal stakeholders. Here are three common types of objections that should be anticipated:

**Lack of incentives.** Few executives are incentivized to rigorously manage supply chain risk, so they focus on urgent short-term issues, leaving little time to work on SCRM capabilities. The business case should include recommendations for compensation incentives.

Sample Strategic Objectives	Sample Tactical Objectives
Achieve competitive advantage (turn business disruption threats into opportunities)	Identify threats faster and collaborate quickly with affected suppliers
Protect brand value and customer satisfaction (improve customer service levels)	Improve delivery/order fulfillment performance (on-time, variability)
De-risk revenue and time to market goals	Minimize unplanned supply chain costs (e.g. component risk buys, emergency, second sourcing, expedited freight, etc.)
Decrease operational costs	Improve supply chain asset utilization and inventory turns
Protect shareholder value	Improve lead time accuracy and reduce supply variability, reduce allocations and lines down
Ensure continuity of supply through a controlled, predictable response	Facilitate supplier collaboration and information sharing
Manage regulatory/compliance exposures	Reduce incident response times and time-to-recover for the highest priority supply chain activities, products, and services

**Perceived high costs and conflicting objectives.** Stakeholders often balk at supporting supply chain risk mitigations, such as building buffer inventory and engaging secondary suppliers, because they fear these will add costs and undermine efficiency goals. The business case should demonstrate how SCRM can strengthen lean and just-in-time initiatives.

**Difficulty in valuing risk management.** A rigorous and credible ROI analysis is essential to convincing senior leaders to support the change management required to create a mature SCRM capability.

## Coronavirus = new perspective on risk management in supply chains

In the first half of 2020, Resilinc supported its customers in responding proactively to the massive global supply chain disruptions that were occurring. While the disruptions were truly unprecedented in scale and geography, companies that had already built mature SCRM programs did not have to frantically hunt for information like their less-prepared peers and competitors. They could start mitigating their disruptions immediately.

Over the coming months, company reports, case studies, and media coverage will reveal how robust SCRM programs helped some manufacturers respond to the COVID-19 crisis proactively, safeguarding revenue, achieving competitive advantages in their markets and likely enhancing customer relations and brand reputation.

By May 2020, it was already obvious that the crisis would change supply chain management profoundly. As Jesse Lin with the World Economic Forum (WEF) and Christian Lannig with Tradeshift wrote on WEF's website, "The current crisis is an opportunity to reset a system that has relied on outdated processes. Creating smart and nimble supply chains is the key to building a global trade and investment network that's capable of weathering future storms."

This shift in perspective—along with a strong business case—can be used to convince C-level leaders that now is the time to design, fund and implement an SCRM program that can position their company to take maximum advantage of supply chain digitization, visibility and intelligence.



## Guest Perspectives

24 Curtis Lancaster, VP of Supply Chain at Dartmouth-Hitchcock Health

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## Enhancing Collaboration with Suppliers for Greater Supply Chain Resiliency



Curtis Lancaster, Vice President, Supply Chain Division, Dartmouth-Hitchcock

Curtis Lancaster is responsible for the strategic direction and tactical execution of all aspects of supply chain management at Dartmouth-Hitchcock Health (D-HH). He has built a solid foundation for D-HH's supply chain system while innovating in the areas of demand planning, supplier resiliency, diversity and inclusion, non-traditional trading partner relationships and sustainability.

A customer of Resilinc's since 2018, we asked Lancaster to talk about what D-HH is doing to build resiliency into its supply chain.

### Resilinc: What are some of the key trends you're seeing in supply chain risk management, coming out of COVID?

**A: Lancaster:** Number one, we're moving our supply chain closer to the manufacturers so that we can have greater transparency, hence control, over our supply chain. Related to this is greater awareness of the need for end-to-end visibility which allows us to know the interdependencies in our supply chain, down to the raw materials and parts that go into the products we purchase.

We're also moving towards a greater awareness of supplier vulnerabilities—starting with raw materials—so that we can understand if material issues will impact supply. And we're becoming better at communicating multiple messages to multiple audiences—emergency response teams, internal customers, board of trustees, the press, governments and the communities we serve.

It's also likely that we'll be using new metrics for measuring our suppliers' performance. At one time, it seemed that cost was all that mattered, but COVID has heightened our awareness that we need greater resiliency.

### Resilinc: How important are collaboration capabilities with your manufacturers and suppliers?

**A: Lancaster:** These capabilities are increasingly important as we continue to build resiliency into our supply chain. In particular, the pandemic laid bare the need for greater transparency between our organization and our suppliers and manufacturers.

Prior to the pandemic, we were too hands-off with our supply chain, relying on intermediaries to assist us. Now we know we must collaborate with suppliers on a deeper level to have a wider view on topics ranging from inventory availability and shipment status to payment terms

### Resilinc: How should an organization provide proper demand signal to its suppliers and manufacturers to optimize inventory?

**A: Lancaster:** First, work closely with manufacturers to understand the demand signal they need to provide you with what you need.

Second, reach back as far into the demand signal as possible to capture as much information as you can to make that signal informative, i.e., the procedure schedule.

Third, automate the demand signal for timeliness and efficiency.

Fourth, build in checks to ensure that the demand signal created aligns with products that are contracted for at the price negotiated.

Fifth, tie speed and accuracy to payment to the vendor.

### Resilinc: How are you currently managing the supply requirements for PPE and other critical health provider products?

**A: Lancaster:** We built a dynamic demand and supply model, integrating forecasts from key service lines and departments. We added sensitivity to the model to account for different surge levels. And we built in not only pandemic demand, but recovery demand as well. We were publishing the model's output every day but have since scaled back to three times a week.

We are also connecting directly with manufacturers to understand their raw material shortages and production capabilities in order to better plan.

### Resilinc: What process or systems are you using to understand the impact of vaccine raw materials shortages?

**A: Lancaster:** Frankly, we are in the very nascent stages of this endeavor, but one thing we have learned is to not only track the products and raw materials, but the distribution requirements as well, i.e., vials and storage. This is where we as a supply chain team need to treat resiliency as a strategic component and dedicate resources to build capability. This is the new area that 'keeps me up at night.'

### Resilinc: What are the technologies you use to understand the threats and risks to the continuity of your supply chain?

**A: Lancaster:** Resilinc's solutions have become a key piece of our continuity planning. As stated above, our demand/supply model has become critical for understanding our stock levels, although it's built on a very simple Excel spreadsheet. We believe that we don't need to have all our solutions be terribly advanced to assist in decision-making as sometimes accurate inputs and outputs provide the most straightforward information.

Also, we are implementing a single item master through a technology that will automate much of the item-naming conventions. This will provide us with a level of standardization that leads to more accurate information for what we buy, what's contracted for and how it's utilized—all key criteria for understanding continuity.

This is not a core competency of healthcare supply chains, and we have chosen to partner deeply with Resilinc and use their artificial intelligence and deep machine learning to inform us of vulnerabilities.

**1,800**  
providers, across all areas of medicine

**1.9 MILLION**  
patients across northern New England

**#1 HOSPITAL**  
in New Hampshire per U.S. News & World Report

# Improving Supply Chain Visibility & Lessons Learned From COVID-19



Chaun Powell, Group Vice President of Strategic Supplier Engagement at Premier Inc.

Chaun Powell is responsible for the supplier relationships fueling \$960 million in revenue and \$67 billion in healthcare spend across 4,100 hospitals and health systems, and 200,000 alternate sites (e.g., physician offices, imaging centers, etc.) across the United States. He also leads the disaster preparedness and response program and the product disruption team including Premier's efforts through the COVID-19 pandemic.

A partner of Resilinc's since 2018, we asked Powell to talk about what the healthcare industry can do to achieve better supply chain visibility as well as lessons learned from COVID-19.

**Resilinc: How do you define supply chain resiliency? Is there a common definition by your members?**

**A: Powell:** Before the pandemic, supply chain resiliency in healthcare hadn't been seriously tested, at least not to the extent that it has been over the last seven months. Today the definition has morphed dramatically to include geographic diversification, visibility and surplus capacity for everything from raw materials to sub-assemblies to finished goods.

That said, we still need to consider the balance between costs and resiliency. And when looking at geographic diversification, that means a careful mix of onshore, nearshore and offshore suppliers to design supply chains that balance resiliency and inventory sustainability with relevant pricing.

**Resilinc: What can a GPO (Group Purchasing Organization) do to help its members be more proactive and predictive when it comes to understanding supply chain risk?**

**A: Powell:** There are several things I'd highlight, starting with the fact that studies suggest 68% of product disruptions originate from poor demand signals. As a GPO, we need to improve the signaling that we provide to suppliers to anticipate increases in demand. Solutions may include contracts with longer terms to promote the longevity of demand signals and provide manufacturers reason to build out more capacity. It could also include committed contracts for subsets of members that are interested in exchanging their committed volumes for guaranteed supply.

Premier is also employing innovative, predictive modeling using AI, machine learning, and natural language processing to become more quickly aware of lead indicators for potential disruptions and increases in demand. We're using those same tools to anticipate new COVID-19 hotspots helping to predict case surge, prioritize vital products and supplies, and adjust therapies for patients. Technology allows for the effective deployment of resources, while saving lives, time, and money.

Finally, we're using Resilinc's capabilities to better map our upstream supply chains and build in resiliency and risks scores with our suppliers. We're doing this by product category, by supplier in each category, and with overall scores for suppliers regardless of the category. We're using this

information to identify where there may be gaps or geographic concentrations and that empowers us to make more educated sourcing decisions to prevent disruptions long term.

**Resilinc: What steps should healthcare providers take to understand the concentration of risk in certain countries? For example, following COVID we became aware of our dependency on China, specifically for PPE and other raw materials.**

**A: Powell:** Premier has been vocal on our view that we must develop a better balance of onshore, nearshore and offshore suppliers.

There's currently a big push to bring everything back onshore, but that alone won't be the solution. If we relocated all of the PPE or other healthcare goods now manufactured in China to Iowa, for example, we'd still have issues with geographic concentration that would make the supply chain vulnerable to disruptions.

One should also remember that domestic supply chains would still be dependent on overseas suppliers for raw materials, including rubber. Another challenge that would come with reshoring are the regulatory requirements that manufacturers would have to meet—not just the FDA, but also EPA.

**Resilinc: Improving healthcare supply chain transparency has been a growing concern arising out of earlier disruptions, such as the 2017 hurricanes. What's your view on this?**

**A: Powell:** It's critically important to increase visibility into all the tiers of healthcare supply chains. Healthcare providers should be working closely with their trade associations, their GPOs, and federal agencies to push for increased visibility and transparency into where materials and products are sourced and produced.

For example, a large manufacturer could have 10 FDA-certified factories across the globe manufacturing syringes—In any given month, that manufacturer may produce everything in one factory or in any combination of all 10. In many cases, the only one who would know the origin and location of manufacturing is the supplier. If we had better visibility across the totality of the supply chain, that would have helped us understand the risks of relying on China for 80% of SMS—the raw material that goes into some 43,000 unique items—including N95 masks, gowns, and other critical PPE. If we'd known that, we would have made different sourcing decisions by introducing new suppliers, and U.S. healthcare systems likely wouldn't have experienced the widespread cancellations of elective procedures that started in March.

It's important to mention that while pharmaceutical companies are obligated by regulation to disclose when there are potential disruptions to medications, there's no such regulation for producers of medical-surgical products. Typically, we get notifications well after a disruption has occurred, leaving hospital systems with no options.

In this area of transparency, COVID-19 has provided a compelling case on the need for the Healthcare Transparency Initiative established by Resilinc and various providers. Transparency is no longer a concern of just those in supply chain—it has moved up to both the C-suite and more broadly across the healthcare industry—and should be a focal point into perpetuity.



**4,100**  
member hospitals & health systems

**200,000**  
providers & organizations

**MISSION:**  
to improve the health of communities

## Improving Supply Chain Visibility & Lessons Learned From COVID-19

### Resilinc: What other key lessons have you learned from the pandemic?

**A: Powell:** Just-in-time inventory practices have been the focus of our cost reduction strategies in healthcare for over a decade and they have proven to be effective during a steady state. During pandemics, however, we have learned that the lack of adequate flex capacity presents significant challenges. Experience shows that for products needed in an emergency, a hybrid approach is likely necessary: buyers carry in-house inventory on a just-in-time basis, while manufacturers and direct sourcing companies take a just-in-case approach, reserving capacity for surge, retaining safety stock, and building rapid replenishment channels for restock.

This pivot could incur a modest price increase, but it will also prevent the challenges we experienced over the past several months. It will also become a sourcing strategy that will encourage higher levels of sophistication and more strategic commitments between providers, GPOs, and suppliers. Ultimately, this is one concrete benefit and is a silver lining to the clouded chaos imposed by COVID.

### Resilinc: What are your thoughts on how health systems can prepare for cold supply chain vaccine distribution?

**A: Powell:** The answers to this question are changing dramatically as we speak. As HHS Secretary Alex Azar tweeted in September, "it's incredible that we not only have one vaccine in phase three trials; we have four."

The distribution challenges will be different depending on which candidate vaccines are approved. According to the manufacturers, two of the four would require ultracold chain storage distribution with Pfizer's candidate vaccine requiring storage at -80 Celsius. Pfizer has announced that it will self-distribute using self-manufactured dry ice. Their commitment to dry ice manufacturing has relieved distributors, pharmacies and physicians of the anxiety over whether to buy ultracold freezers. We must continue to anticipate downstream needs, however, which has led us to double down on our contracts for dry ice with our suppliers and our distributors who are proactively preparing for an increase in production

Other challenges that we anticipate and are planning for originate with the presentation of the vaccination(s). Unanswered questions include if the first approved vaccinations are shipped in vials or prefilled syringes and whether they will be single or dual injection treatments. As an example, Pfizer and Moderna both have dual injection vaccinations while J&J's candidate is a single injection.

All of these complexities are evolving rapidly and it's important for healthcare providers and everyone in healthcare supply chains to proactively work with their GPO's, distributors, and state governments to understand the decisions being made so we can all be better prepared once a vaccination becomes available.

**"It's critically important to increase visibility into all the tiers of healthcare supply chains.**

**Healthcare providers should be working closely with their trade associations, their GPOs, and federal agencies to push for increased visibility and transparency into where materials and products are sourced and produced."**

**CHAUN POWELL**

*Group Vice President of  
Strategic Supplier Engagement  
Premier Inc.*



## 2020 Mid-Year Review

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# Early COVID-19 Timeline:

Supplier viability and visibility was incredibly important during the COVID-19 supply chain disruption, specifically around the epicenter: Hubei. In early January, Resilinc put together a Pandemic Readiness Assessment for 1200 suppliers across the province. When the government shutdown was ordered across Hubei, Resilinc was already monitoring 280 sites across 202 suppliers and isolating which had gone down. Suppliers were communicating – in real time – about the disruption; most reported that they would be down anywhere from two to six weeks. As more closures occurred beyond Hubei, Resilinc was ahead of the curve: reporting on data, intelligence, and insights for its customers.

By being able to tap into this real-time reporting our customers were able to quickly assess and shift operations, and ultimately recover, relatively unscathed.

## Early COVID-19 Timeline: Value of Detection, Early Action, Information At your Fingertips

This slide covers the timeline - between late Dec and March 11 when the WHO declared CV a pandemic - in which we alerted and communicated to customers.

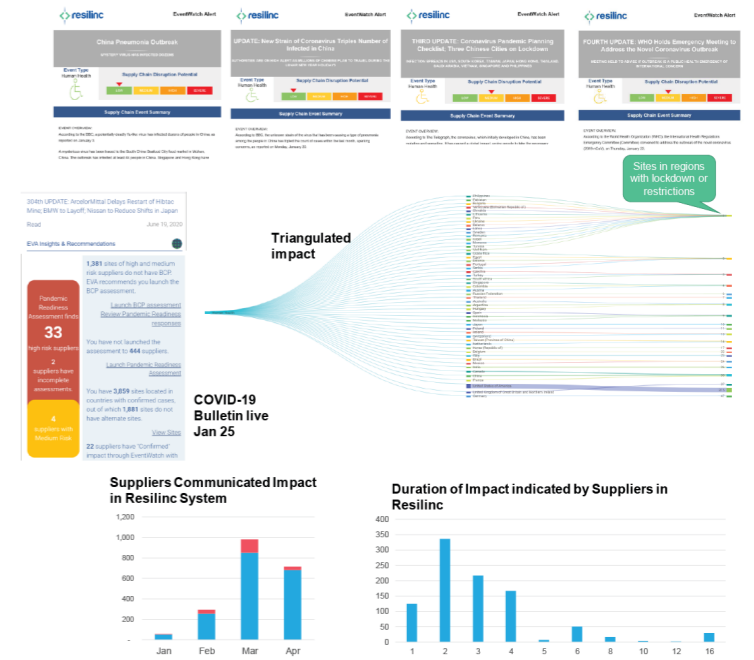
DEC 27	Wuhan health commission notifies hospitals of a pneumonia of unclear cause and orders them to track	December 28 Resilinc's social media monitoring feed picks up local language reports of a mysterious pneumonia-like illness
DEC 31	China notifies WHO China office about unknown pneumonia-like illness	
JAN 4	China authorities and media report signs of pneumonia-like outbreak in Wuhan	January 4 Resilinc's first alert to customers. Virtual WarRoom created, with sites in Wuhan geofenced
JAN 9	WHO identifies virus as a coronavirus (similar to SARS)	Resilinc's customers evaluate Wuhan sites, alternate sites available, begin discussions with local suppliers
JAN 20	Person to person transmission confirmed in China	"We drew a huge circle around Wuhan on the 4 <sup>th</sup> of January, and pulled out all suppliers, sites, parts and products in region, as well as material flow, in 3 minutes. Went into WarRoom armed with this, and planning scenarios, and assigned actions to secure inventory!" - Well known medical devices company, mapping since 2014
JAN 22	Wuhan on lockdown: All travel in/out and intraprovince transit is at a standstill. South Korea case detected (Jan 20).	
JAN 30	WHO designates Coronavirus as a Global Public Health Emergency	
FEB 4	South Korea: Hyundai and Kai suspend manufacturing operations	
FEB 11	WHO official names Coronavirus as COVID-19	
FEB 22	South Korea: Samsung, LG Electronics, LG Display, Toray Group and other companies pause manufacturing operations	
FEB 24	South Korea Raises Threat Alert Level; Turkey and Pakistan Close Border with Iran as Covid-19 Continues to Spread	
FEB 27	Japan closes schools	
MAR 2	WHO Calls Coronavirus in South Korea, Italy, Iran and Japan its 'Greatest Concern'	
MAR 11	WHO declares COVID-19 a global pandemic	"Compared to the rest of the functions, we are looking VERY GOOD! We have our act together – our plans are in place, we have already identified and covered all known gaps and planned for worse scenarios in coming weeks..." - Famous consumer electronics company, mapping since 2013

WarRooms created with first cases reported in each region

"We looked at all our suppliers with weak Pandemic plans in their BCP submissions and knew we needed to get those parts covered first."  
- Large High Tech semiconductor company

## How Resilinc helped customers during COVID-19

- **Continuous Monitoring:** EventWatch alerted new cases/fatalities/developments/town closures. **300+ updates sent to date**
- **Mapping suppliers to region:**
  - Our **Multi-Tier Mapping** customers identified their suppliers, sites, and sub-tier supplier sites in each region in minutes
  - Our **Part-Site Mapping** customers triangulated down to parts originating or moving through the region in minutes.
- **Supplier Impact confirmation: 2200 Suppliers** communicated and confirmed impact directly in Resilinc by March 31.
- **COVID-19 Bulletin Center:** Cognitive solution that reads all the relevant insights and summarizes recommendations actions on Home page.
- **Pandemic Readiness Supplier Assessment** created Jan 23 in Resilinc Survey Library with Dashboard



## Resilinc's Pandemic Readiness Assessment

**Created Pandemic Readiness Assessment Jan 23**

**Customers assessed 1200 Suppliers Jan 24-Feb 7**

**Results of Supplier Readiness for a Pandemic (before March 15)**

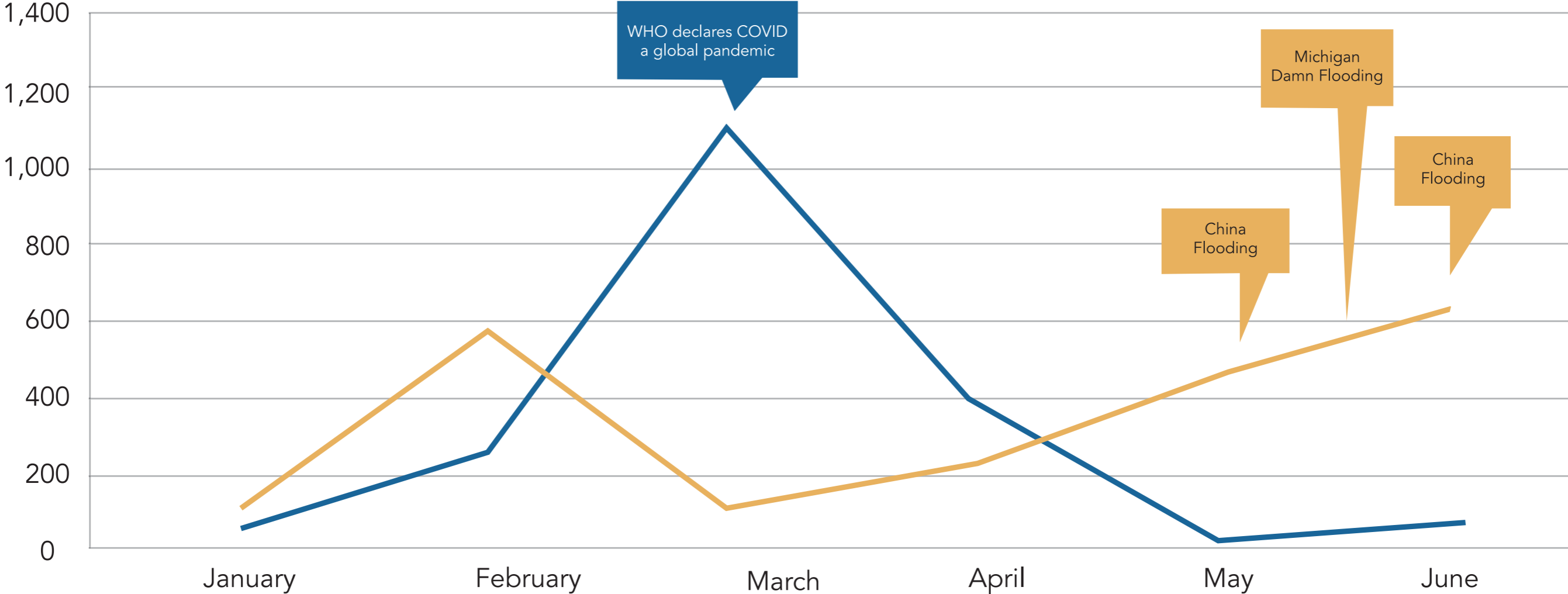
**Assessment Dashboard Jan 31**

**Bi-Weekly Assessment of Impact by Industry (as of May 15)**

# Disruptions through Q2 2020: COVID-19 vs others

A comparison between supplier disruptions due to COVID-19 and others. Though factory fires were the most common event in the first half of 2020, COVID-19 caused the most supplier disruptions.

Distinct Suppliers Disrupted **COVID-19** vs **non-COVID-19**





# The Top 20 Events through Q2 2020



1: Factory Fire (342)



2: Human Health (324)



3: Merger & Acquisition (210)



4: Leadership Transition (181)



5: Business Sale (181)

6: Recall (178)

11: Cyber Attack (63)

16: FDA/EMA/OSHA Action (39)

7: Factory Disruption (142)

12: Extreme Weather (62)

17: Regulatory Change (37)

8: Earthquake (84)

13: Port Disruption (57)

18: Supply Shortage (34)

9: Compliance (64)

14: Chemical Spill (46)

19: Hurricane/Typhoon (30)

10: Legal Action (63)

15: Labor Disruption (44)

20: Fine (30)

## CASE STUDY

# How a Global Electronics Manufacturer Navigated the Pandemic With No Supply Chain Disruptions

COVID-19 challenged and disrupted global supply chains more severely than any event in history. Many large manufacturers discovered—painfully—that there were hidden weaknesses in their supply chains. In contrast, companies that invested in supply chain risk management tools, particularly mapping their supplier networks, had a different experience.

The following case study highlights one of these success stories.

### PROBLEM

Referred to in this study as “Global Electronics,” a U.S.-based electronics manufacturer with more than 30,000 employees worldwide. Global Electronics sells high-performance components globally to original equipment manufacturers in a wide range of industries. It operates its own manufacturing plants in the U.S. and other countries and also relies on hundreds of suppliers and manufacturing sub-contractors worldwide. On January 4, 2020, the manufacturer was alerted by Resilinc’s EventWatch about the potential supply chain impacts of a “flu-like illness” that had infected dozens of people in the Wuhan region; Wuhan is a major manufacturing hub for NAND flash memory, optical electronics, semiconductors, active pharmaceutical ingredients, and other high-performance parts and materials.

Global Electronics, aware that worsening conditions could mean inventory shortages for supplies, needed to act quickly to secure inventory fast.

### SOLUTION

Having worked with and leveraged Resilinc’s Multi-Tier Mapping service since 2014, Global Electronics had successfully mapped the manufacturing and logistics locations of its tier 1 and critical tier 2 suppliers.\* As part of this process, the firm expanded its mapping initiative from about 100 of its largest suppliers, prioritized by spend, to about 650 suppliers ranked by strategic factors, including:

- whether a supplier was the sole source of a part or material
- a co-developer of such a part
- revenue impacts of a delay or loss of parts or materials produced at specific sites

With this capability, the supply chain team had precise knowledge of the sites where more than 7,500 parts and materials were produced.

\*Prior mapping its supply chain, Global’s supply chain risk group would respond to developing hurricanes or typhoons by asking category managers and regional purchasing staff to query suppliers about what sites they had that were potentially in the storm’s track. This approach was time-consuming, inefficient and not very effective.

Aware that disruption was likely, the team logged into its Resilinc EventWatch platform and - within five minutes - was able to identify the specific Wuhan-area sites where its parts and materials were produced. What’s more, Resilinc’s system had automatically queried Wuhan suppliers about their status to determine:

- If they were impacted and if so, how severe
- If they had shut down or cut back on their output
- The estimated time to recovery

With Resilinc’s automated tools, the team didn’t have to scramble for the data it needed but quickly generated a list of critical suppliers in the disrupted areas and ascertained whether they were impacted and how seriously. Procurement staff concentrated on communicating with the most critical suppliers, especially those that had reported impacts.

As COVID spread across the world, Resilinc continued to provide detailed insights for Global Electronics related to likely disruptions due to border closures, travel restrictions and other COVID-19 containment policies.

When California implemented its shelter-in-place order, Global Electronics identified - within minutes - one particular site that was storing a significant quantity of parts and supplies. With the duration of California’s lockdown unknown, the supply chain team worked with the supplier to ship 12 months worth of supplies from the California site to a site in another state with less stringent restrictions.

### LEARNINGS

By leveraging Resilinc’s supply chain risk monitoring, mapping, and mitigation capabilities, Global Electronics navigated the COVID-19 pandemic smoothly and was able to offset the supply chain disruptions that plagued other companies.

This resiliency was mostly due to the maturity of the supply chain risk management (SCRM) program the company had developed with Resilinc prior to January 2020, and to supply chain risk monitoring and mitigation capabilities provided by Resilinc during the COVID-19 crisis.

**650**  
**SUPPLIERS**

mapped, down  
to tier-2

**5**  
**MINUTES**

to isolate which  
suppliers were  
impacted

**12**  
**MONTHS**

of supplies shipped  
prior to shutdown



 **resilinc**