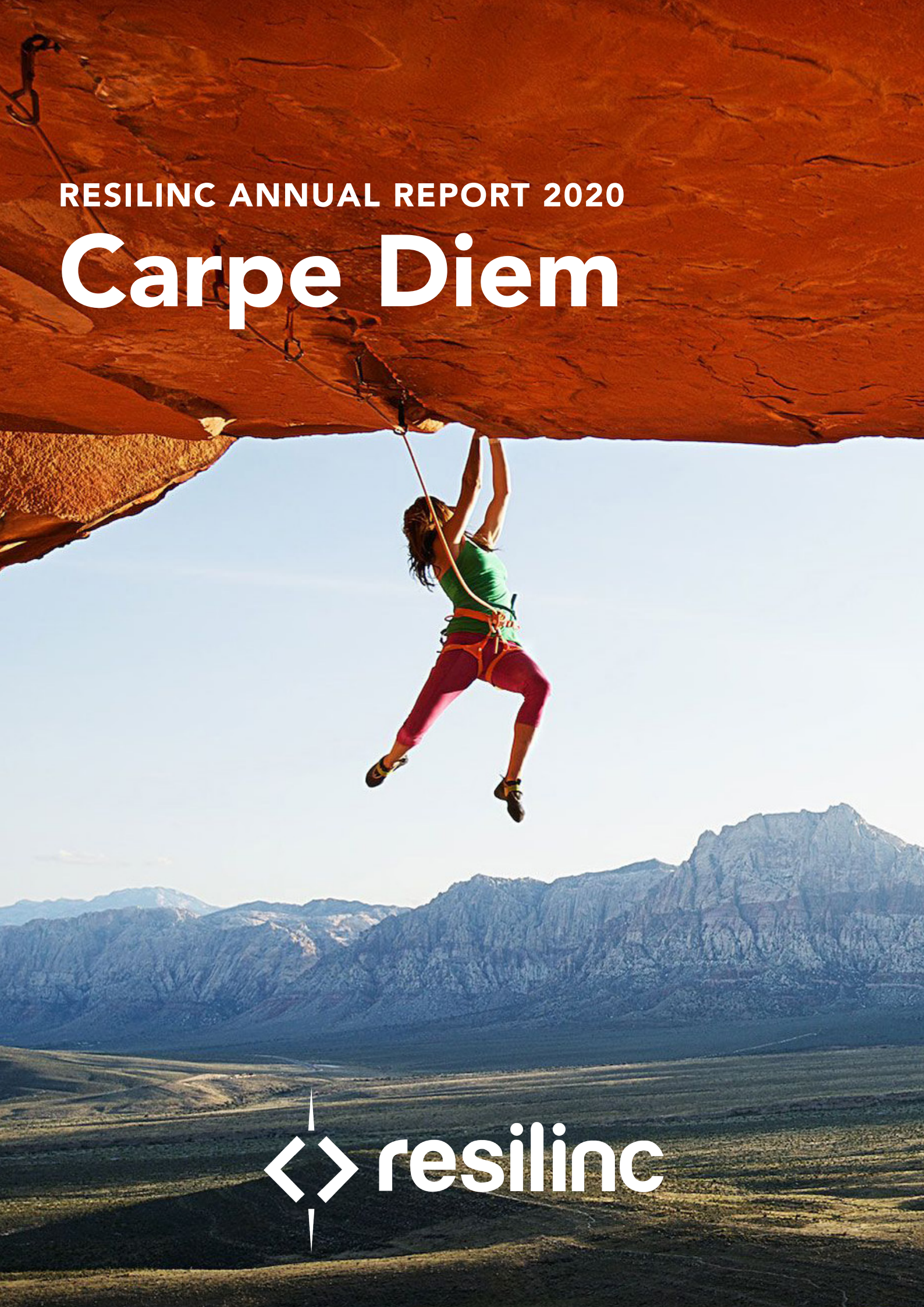
RESILINC ANNUAL REPORT 2020

Carpe Diem



resilinc

Introduction

For years to come, 2020 will give us much to reflect back on. It goes without saying we were all dealt with the challenge of a lifetime: socially, emotionally, and professionally.

The word "resilience" was referenced a lot in 2020. In particular, the topic of supply chain resiliency was written about daily. Gartner reported that 87% of organizations are investing to make their supply chains more resilient over the next two years and 66% are investing now in supply chain visibility programs including multi-tier mapping. It's no surprise given 97% of global enterprises experienced a major disruption to their supply chain this year, as reported by Supply Chain Quarterly. On our end, Resilinc's EventWatch platform saw a 67% increase in supply chain disruptions reported over last year and a nearly 800% increase in supplier confirmations.

This year has tested all of us and brought new discussions to the table, including reshoring supply chains. That said, many companies - now doing the analysis - are realizing that relocating supply chains can cost billions of dollars and increasing inventory can negatively affect balance sheets to the tune of hundreds of millions. Accordingly, in the latter half of 2020, supply chain mapping emerged as another big topic, particularly the importance of mapping supply networks down multiple tiers of suppliers. Multi-tier Mapping - as part of a supply chain risk management program - has emerged as the most cost-effective path to controlling and managing supply chain risk.

In 2020, Resilinc welcomed many new customers; we saw a 35% increase in supplier engagement and a 115% increase in supplier assessments activity. As more companies join the ecosystem, it builds momentum and drives further innovation.

We established Resilinc as the gold standard for risk and today we are harnessing advanced AI technologies to bring predictive, prescriptive, and cognitive solutions to market, to help you achieve your resiliency objectives in the most cost- effective manner. In 2020, we were pleased to launch the following key product innovations:

- Supplier Assessment Builder & Library
- Workflows with Collaboration Center
- Purchase Order Delay Predictive AI

The pandemic put the supply chain and supply chain practitioners under a microscope; it also confirmed what many of us have known all along: supply chain makes the world go round. We've named the 2020 Annual Report "Carpe Diem" which means seize the day. This is in reference to the mindset we - and our customers - had in the early days of the pandemic. The ability to assess and act quickly meant less disruption to operations and less disruption to supply making its way to the end user. As we look back on 2020, Resilinc is proud to have done our part to help keep supply chains running, factories operating, and people employed. We're especially proud of our team that volunteered time to quickly build a solution to help hospitals nationwide find and exchange PPE through our platform, called The Exchange for Healthcare.

• • •

Thank you for reading our 2020 Annual Report.

The Resilinc Team

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EventWatch 2020

Data and Insights

While COVID-19 made 2020 an extreme outlier in terms of market turmoil and disruption of supply chains, Resilinc's monitoring of potentially disruptive supply chain events last year reveals that the vast majority of disruptions were not due to the pandemic. In fact, for the third year in a row, the two types of disruptive events that occurred most frequently were factory fires and changes in the ownership or management of supplier firms.

That said, the pandemic, and the government policies enacted in response to it, created deeper and more damaging impacts than any other type of event. In fact, COVID-19's devastating global impacts led Resilinc to designate it as "severe," the first time in our 11-year history we've ranked an event at that level of impact.

As OEMs and supply chains recover from pandemic-related disruption, let's take a closer look at the 2020 supply chain disruption data and what it tells us about the COVID-19 impact, as well as the events that historically have caused the most disruptions to supply chains and had the greatest negative impacts on companies' revenue and profitability.

But first, a quick note on why Resilinc's data matters.

Resilinc's Supply Chain Intelligence Network is the largest, most detailed and comprehensive database on supply chains in the world. We often call it the "LinkedIn for supply chains" because it connects businesses—suppliers and their customers—based on access privileges determined by the supplier. This model was created by our CEO, Bindiya Vakil, in the late-2000s.

As of January 2021, the Network incorporated more than 100,000 suppliers, making up 475,000 sites and more than 3 million parts and materials purchased by Resilinc customers. We have over 95% of the global supply chain mapped.

Applying 24x7 surveillance of risks

EventWatch, Resilinc's global event monitoring, alert and analysis service, uses our supplier network to customize alerts for each Resilinc customer. When a hurricane is forming in the Atlantic, Resilinc customers with suppliers in the potential hurricane track get alerts. When a fire destroys a supplier of materials used by printed circuit board makers, companies that use PCBs in their products get alerted.

In 2020, EventWatch digested more than 1.7 billion news feeds from about 3.5 million sources in more than 100 languages. After Resilinc's Artificial Intelligence translated and screened the raw data and our research team verified it, EventWatch alerted customers to 6,192 potential disruptions in 2020; that's up 67% year over year. Of these, 3,727, or 60%, were impactful enough to trigger the creation of WarRooms—virtual platforms in the Resilinc dashboard where customer teams and their suppliers communicate and collaborate to assess and resolve disruptions. In 2020, WarRoom creation was up 80% year over year due mostly to pandemic-related threats and supply chain teams needing to stay ahead of the curve and have contingency plans in place.

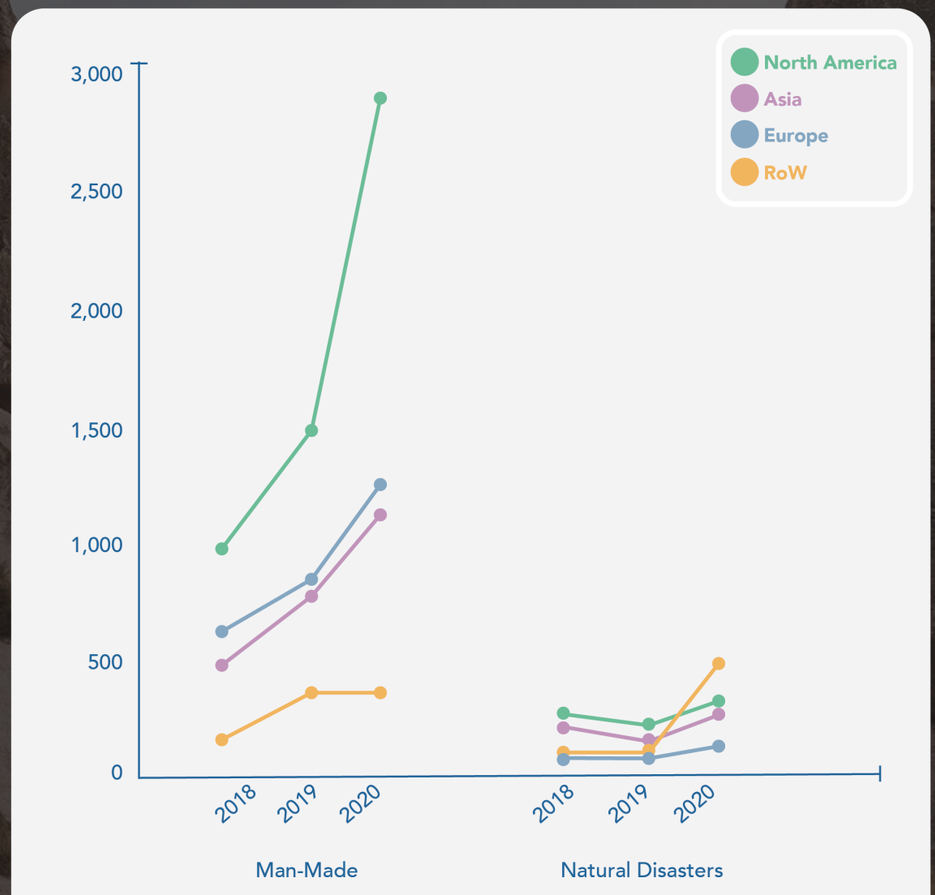
Human-caused events continued to dominate in 2020

When thinking about the state of supply chain in 2020, it's hard not to let the COVID-19 dominate. But other trends in supply chain disruptions have much to tell us.

As highlighted in previous Resilinc annual reports, human-caused events usually create the most disruption in supply chains. While they don't get the media attention that storms, floods and earthquakes do, they can delay or disrupt production and sap revenues even worse than a category 4 hurricane.

Eighty-three percent of disruptive events in 2020 were human caused. They ranged from factory fires to legal and regulatory action, labor disruptions and profit warnings on supplier firms.

Looking at 2020 data, among human-caused events, two types continue to be of greatest concern: 1) Factory Fires and 2) Mergers & Acquisitions



Natural Disasters vs Man-Made Events

Fires spread havoc

EventWatch sent alerts on nearly 1,000 factory fires in 2020, up 67% year-over-year. Of these, about 200 factory fires were impactful enough to trigger creation of a WarRoom.

Of course, some fires and factory disruptions are more impactful than others. A fire in July at a Nittobo plant in Sakurashimo, Fukushima, Japan, disrupted supplies of fiberglass to ABF substrate producers, which in turn caused delays at manufacturers of high-end servers, networking chips, and CPUs. In October, a fire at another Japanese firm, Asahi Kasei, cut into supplies of advanced sensing devices used in automotive and other industries. Both these events intensified the massive shortage of semiconductors that will cost the automotive industry as much as $61 billion in lost sales this year.

Assessing and mitigating fire dangers at supplier firms isn't easy, but there are some best practices that can be deployed, starting with an assessment of where risk factors—like combustible dust, flammable liquids and gases, and "hot work"—are present. Surveys on fire risks can be conducted, and in-house engineering staff can work with at-risk suppliers on prevention strategies. Some Resilinc customers have even funded sprinkler systems at supplier firms.

Top 5 Supply Chain Risks Breakdown by Category (2018-2020)

	2018	2019	2020
Event Type	1 Mergre & Acquisition	1 Factory Fire	1 Factory Fire
	2 Factory Fire	2 Factory Disruption	2 Merger & Acquisition
	3 Leadership Transition	3 Business Sale	3 Business Sale
	4 Factory Disruption	4 Leadership Transition	4 Factory Disruption
	5 Extreme Weather	5 Recall	5 Human Health
Industry	1 Life Sciences	1 Life Sciences	1 Life Sciences
	2 Automotive	2 Automotive	2 Healthcare
	3 High Tech	3 Healthcare	3 Automotive
	4 Aerospace	4 Aerospace & Defence	4 Aerospace & Defense
	5 Consumer Goods	5 Consumer Goods	5 High Tech
Geography	1 North America	1 North America	1 North America
	2 Asia	2 Asia	2 Asia
	3 Europe	3 Europe	3 Europe
	4 RoW	4 Row	4 Row
Disruption Potential	1 Low	1 Low	1 Low
	2 Medium	2 Medium	2 Medium
	3 High	3 High	3 Severe
			4 High
Month	1 October	1 October	1 December
	2 November	2 November	2 October
	3 September	3 December	3 November
	4 December	4 July	4 September
	5 August	5 August	5 August

M&As, divestitures, new leadership call for long-term vigilance

2020 saw a slight decrease in M&A deals from 2019, according to the Bain Global M&A Team. But even with the pandemic—and the constraints on in-person due diligence—28,500 acquisition deals were completed by the end of the year, according to Bain.

COVID-19 shaped what capabilities acquiring firms sought. Along with consumer insights and data, digital marketing and ecommerce, acquirers placed a high priority on supply chain agility, according to the Bain experts. They also tracked a decline in M&A deals between The West and China due to geopolitical tensions. On the other side of that coin, many deals were driven in part by the imperative to bring supply chains closer to home. Bain expects this to accelerate in 2021 and beyond.

M&As as well as business sales and/or changes in leadership at the C-level have great potential to impact supply chains. While they generally don't have immediate impacts, as merged firms implement synergy strategies, an OEM customer can suffer price volatility, declines in service levels, or even complete loss of supply if its supplier exits certain business lines. Resilinc automatically creates war rooms for these types of changes in the ownership or leadership and encourages customers to use our surveys to assess how the changes might affect their most important suppliers, parts, and materials. Despite a drop in M&A deals in 2020, EventWatch data shows a 195% year-over-year increase in M&A events that were picked up and labeled as a potential disruption.

Conclusion

Supply chains are highly complex; there is inherent risk everywhere you look and operate. There is no such thing as a risk-free world and certainly no such thing as a risk-free supply chain. In 2020 we experienced COVID-19, the black swan of black swan events; we also had climate-related disruptions and cybersecurity threats. At the end of 2020, the semiconductor shortage began brewing and has brought the automotive industry to its knees. Knowing 1) when disruptions happen, 2) which suppliers they will impact, and 3) how to react quickly to those disruptions is crucial to a resilient supply chain.

Top 5 Supply Chain Events by Types 2018 - 2020

Global Events 2020

North America

2935 *events*

- **1857 WarRooms** created
- Nearly **700 million** feeds processed
- **2935 NEWS** events reported

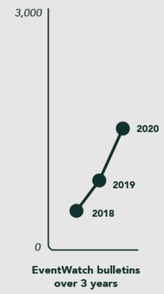
Europe

1210 *events*

- **663 WarRooms** created
- Nearly **350 million** feeds processed
- **1210 NEWS** events reported

Asia

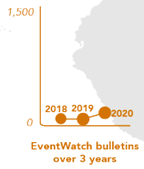
1323 *events*



- **663 WarRooms** created
- Nearly **350 million** feeds processed
- **1210 NEWS** events reported

South America

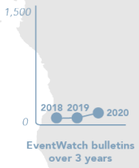
142 *events*



- **64 WarRooms** created
- Nearly **200 million** feeds processed
- **142 NEWS** events reported

Africa

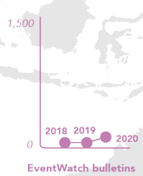
112 *events*



- **43 WarRooms** created
- Nearly **100 million** feeds processed
- **112 NEWS** events reported

Oceania

116 *events*

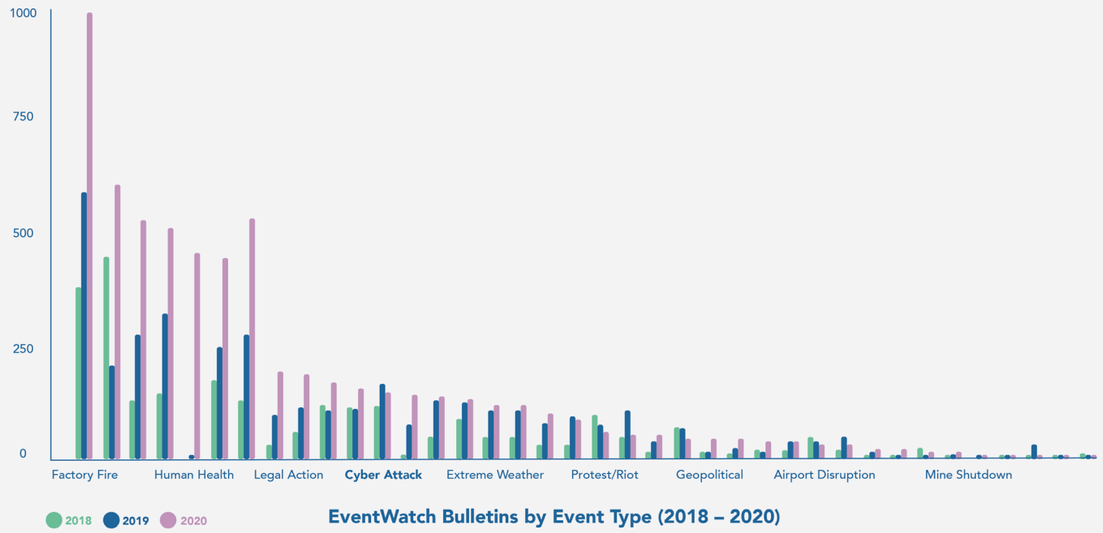


- **49 WarRooms** created
- Nearly **100 million** feeds processed
- **116 NEWS** events reported

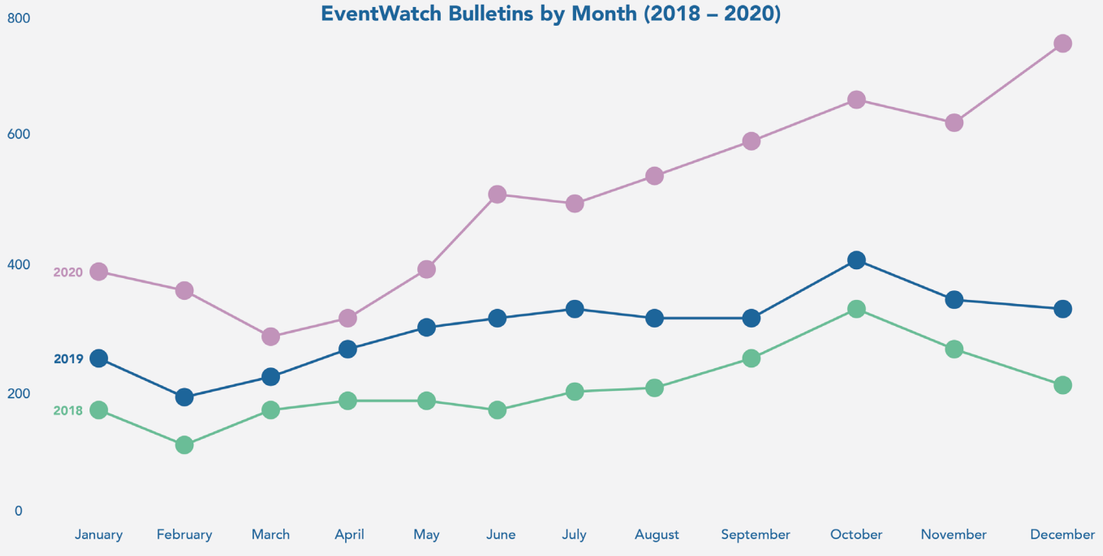
EventWatch 2020

Data

EventWatch, Resilinc's AI-powered monitoring service, alerted customers to 6,192 potential disruptions in 2020; up 67% year over year.



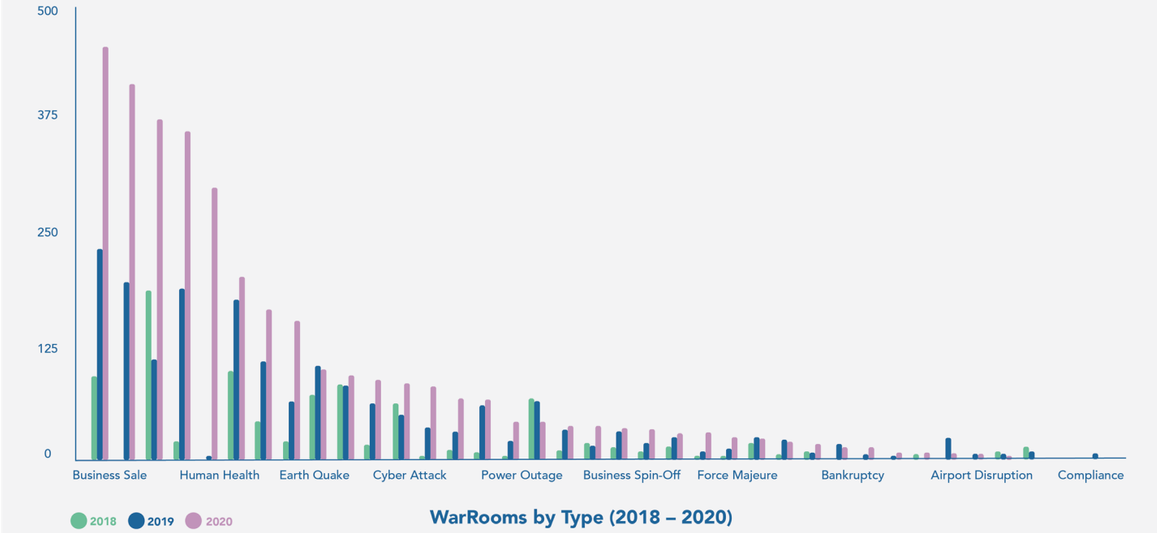
EventWatch Bulletins by Event Type (2018 – 2020)



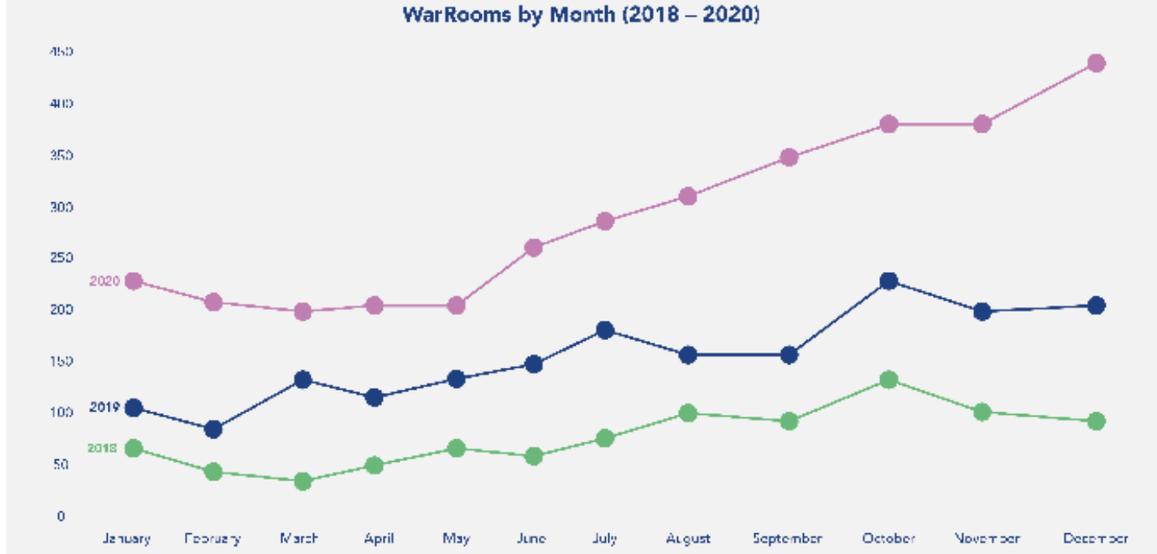
WarRooms 2020

Data

WarRooms are virtual platforms in the Resilinc dashboard where customers and their suppliers communicate and collaborate to assess and resolve disruptions. In 2020, WarRoom creation was up 80% year over year due mostly to pandemic-related threats.



WarRooms by Type (2018 – 2020)



Early Days of COVID-19

16 Navigating COVID: The Challenge of a Lifetime for Supply Chain Pros, a Q&A with Resilinc CEO Bindya Vakil

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Navigating COVID

The Challenge of a Lifetime for Supply Chain Pros

Q&A with Resilinc CEO Bindiya Vakil

The COVID-19 pandemic disrupted supply chains and global markets more severely than any event in modern history. It affected supply chains across every industry, and in the same breath, destroyed and heightened demand for an array of products and services. It also forced companies to rethink their manufacturing dependence on a single country.

In early January 2020, Resilinc began monitoring and assessing the unfolding impacts of the novel coronavirus for our customers. On January 4, 2020 we put together a Pandemic Readiness Assessment for 1200 suppliers across the Hubei province. When the government shutdown was ordered across Hubei, Resilinc was already monitoring 280 sites across 202 suppliers and isolating which had gone down. As more closures occurred beyond Hubei, Resilinc was ahead of the curve: hosting biweekly webinars to report on data, intelligence, and insights for our customers.

As we watched the pandemic impact global supply chains, we saw how companies that had invested in monitoring and mapping their supply networks navigated the disaster more effectively than their less-prepared peers and competitors.

To provide some in-the-trenches insights into what the pandemic revealed about supply chain weaknesses and its take-home lessons for the profession, we sat down with Resilinc CEO and co-founder, Bindiya Vakil.

Resilinc: Thinking about 2020 and how supply chains fared, what are some of your top reflections and insights?

Vakil: 2020 was a year in which the worst-case black swan event actually occurred. For those of us in supply chain risk management, it was only a matter of time; we are always preparing for the worst, albeit hoping for the best. For years prior we'd been diligent in conveying to our customers - and to the supply chain industry - that something of this scale could happen, and they should be prepared for it. And suddenly, when it happened, even we didn't have a perfect label for it. Within a few weeks, though, we knew it was a potential pandemic and it became our first "severe" event.

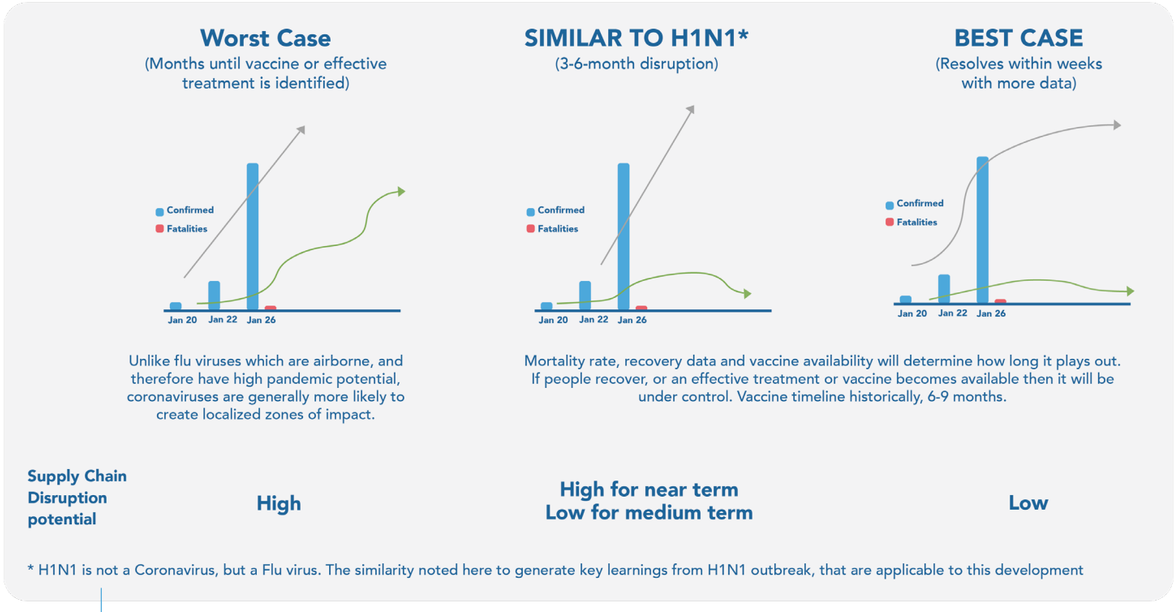
Resilinc: Our first webinar to address the impact of the coronavirus outbreak was on January 24, 2020. The impact was still limited to Wuhan and there had been less than 3,000 cases worldwide, but we recommended supply chain managers prepare for a range of scenarios, including the worst-case pandemic. Why?

Vakil: Wuhan is a high-tech manufacturing and logistics hub. We were already seeing disruptions of supplies of NAND flash memory media, optical electronics, semiconductors, active pharmaceutical ingredients, and many other supplies critical to aerospace, automotive, consumer electronics, healthcare, life sciences, and industrial chemicals. But even the fear of a pandemic is extremely disruptive to global supply chains.

Obviously, we couldn't make any specific predictions nor offer any guidance about the likely progression of the virus at that time, but we had gamed out scenarios based on 10 years of experience and analyses of real-time data from more than 100,000 suppliers. We recommended a disciplined, programmatic approach, conducting table-top drills, monitoring developments, developing pandemic plans.

By the time of the January 24 webinar, we'd already put together and sent out a pandemic readiness assessment of about 1,200 suppliers. That gave customers a lot of good information about how their suppliers would manage in a pandemic: how much of their manufacturing could they keep online; how would they deal with stay-at-home orders and other issues. That assessment also forced suppliers to think about how to prepare.

Our message was: prepare for the worst case; hope for the best case, but you need to act now.



In late January 2020, Resilinc presented this best-worst scenario analysis with recommendations to our customers on how to be ready and plan for the next few weeks and months.

Photo: Jyothy Karat

Resilinc: By March, healthcare supply chains were severely impacted, resulting in shortages of PPE, ventilators and other critical supplies. Resilinc partnered with Stanford Health Care, Premier, a leading GPO, and UPS to create The Exchange through which hospitals with surplus supplies could share them with those in desperate need. Why did Resilinc take the lead on this?

Vakil: The idea came up during phone calls I had with Amanda Chawla, VP of Supply Chain for Stanford Health Care. It was apparent that the shortages, while widespread, weren't evenly distributed. Just like one supermarket might have plenty of toilet paper but no acetaminophen, inventories of critical products at hospitals varied widely.

Hospital supply managers had begun reaching out to their counterparts to trade products, but making phone calls and sending emails was simply too slow and inefficient. We saw that an online trading mechanism was needed to enable sharing of precious medical inventories at unprecedented speed and scale.

We also set it up to receive donations from pharmaceutical and medical product companies and even from semiconductor manufacturers that had extra masks, gowns, and other PPE that they could spare from their clean room operations.

Since launching, I'm happy to say that The Exchange has enabled more than 2,000 hospitals and surgical centers to trade millions of medical supplies and other personal protective equipment (PPE) equipment.

Resilinc: By April, the pandemic was crushing thousands of suppliers, especially small- and medium-sized enterprises, threatening recovery for their OEM customers. What role did Resilinc play in dealing with the cash crisis facing SME suppliers?

Vakil: A handful of us at Resilinc had been through this situation before, during the 2008-2009 financial crisis. We saw how strategic and careful spending—paying invoices early, placing large advance orders, lending or even investing—could keep important suppliers afloat. Resilinc advisor Tom Linton and I co-authored a piece for Harvard Business Review, urging OEMs to reach out to their struggling suppliers—including those in the lower tiers—and offer assistance.

We recommended they prioritize which suppliers to aid based on how losing the parts or materials they provided would impact revenue. And we encouraged readers to look below their first-tier suppliers, even at those providing common items like packaging, sheet metal, hardware. We pointed out that if a supplier of an inexpensive item essential to a top-earning product went under, that loss would disproportionately impact the company's top line, particularly if an alternate source could not be quickly found and scaled up.

Resilinc: What lessons do you hope your peers and colleagues in supply chain management take from the pandemic?

Vakil: I've started calling COVID-19 "The Great Educator." Many of us in supply chain risk management have been talking for years about the need for greater visibility in supply chains. We've been pointing out that supply chains have been designed to take costs out through globalization, but in the process, they've become exposed to greater and greater risks.

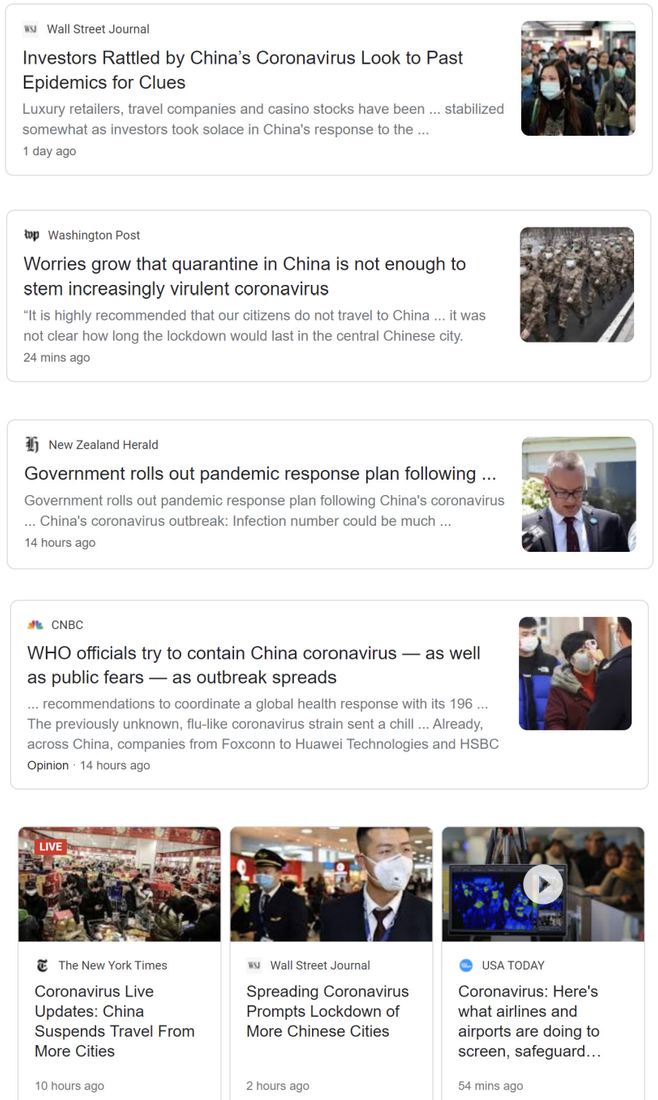
The pandemic of 2020 really exposed that reality and woke people up to the fact that these risks have real consequences, and, in the future, they need to balance cost-savings and inventory reduction with risk and resilience.

I like the old saying, "Whatever doesn't kill you makes you stronger." For supply chain professionals, if your business survived COVID-19 and you took the time to learn from it - what worked, what didn't, and how you can make your supply networks more resilient, then you're going to be a stronger, more resilient company going into the future.

Resilinc: What lessons did YOU learn this past year?

Vakil: I sincerely admire and appreciate those on the front lines daily, risking their health to keep our world functioning. I'm proud the work my team and I did - being on the virtual frontline - made a positive impact in the physical world. In a year where we've had so many lives and livelihoods lost to the global pandemic, Resilinc's tools and intelligence helped keep supply chains running, factories operating, and people employed. I'm especially proud of our team that mobilized and volunteered time to build an online solution to help hospitals nationwide find and exchange supplies.

Even the fear of a Pandemic is very disruptive to global supply chains



Media coverage

- Frequent media reports of new cases, fatalities and spread
- Media coverage of government response measures triggers a chain reaction
- For example, during swine flu pandemic, schools shut down throughout Mexico causing workers to stay home, causing factory downtime

Individual response to news

- Individuals response varies greatly.
- People staying home, avoiding workplaces, curbing essential travel can slow or shut down economic activity
- Hoarding of medication and essential supplies can cause supply chain demand – supply gaps and signification local and global upheaval

Government action

- Large scale and widespread shut down of cities or affected towns can disrupt global supply chains far away from affected areas, cause extended transportation delays, capacity shortages, supply constraints and factory downtime or allocations.

Strong Market reaction

- Stock market investors reacting to concerning news growing in scale can start selling stocks to switch to safer investment options, affecting stock prices in the near-medium term, thereby affecting companies' ability to raise capital. Medium term, this can lead to accelerate profit warnings, bankruptcies, supplier failure.

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 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
DEC 31	China notifies WHO China office about unknown pneumonialike illness
JAN 4	China authorities and media report signs of pneumonialike outbreak in Wuhan
JAN 9	WHO identifies virus as a coronavirus (similar to SARS)
JAN 20	Person to person transmission confirmed in China
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

WarRooms created with first cases reported in each region

December 28
Resilinc's social media monitoring feed picks up local language reports of a mysterious pneumonia-like illness

January 4
Resilinc's first alert to customers. Virtual WarRoom created, with sites in Wuhan geofenced

Resilinc's customers evaluate Wuhan sites, alternate sites available, begin discussions with local suppliers

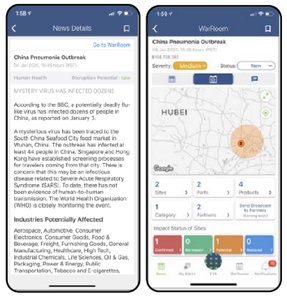
"We drew a huge circle around Wuhan on the 4th of January, and pulled out all suppliers, sites, parts and products in region, as well as material flow, in 3 minutes. Went into WarRoom armed with this, and planning scenarios, and assigned actions to secure inventory!"

- Well known medical devices company, mapping since 2014

"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…"

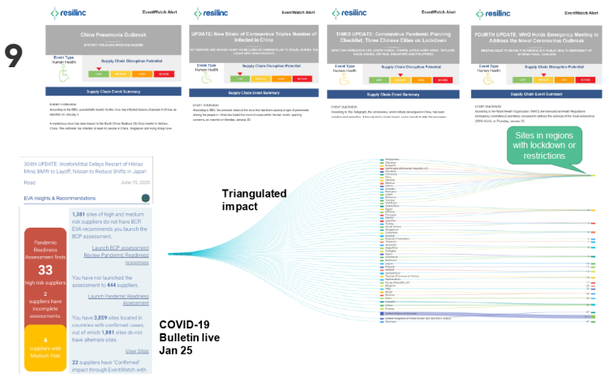
- Famous consumer electronics company, mapping since 2013

"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 semiconductors company



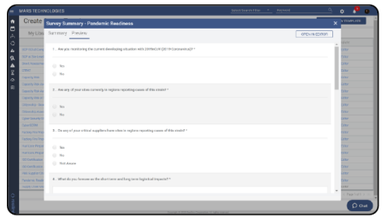
How Resilinc helped customers during COVID-19

- **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

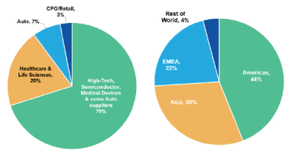


Resilinc's Pandemic Readiness Assessment

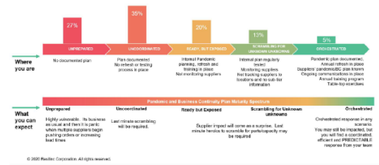
Created Pandemic Readiness Assessment Jan 23



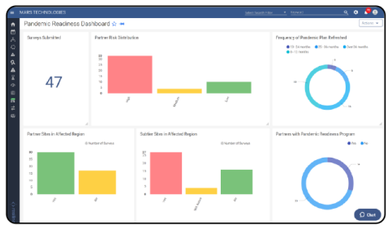
Customers assessed 1200 Suppliers Jan 24-Feb 7



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

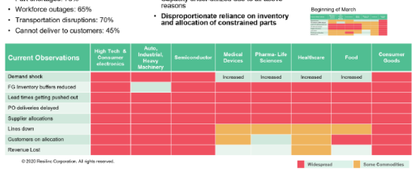


Assessment Dashboard Jan 31



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

- Part shortages: 75%
- Workforce outages: 65%
- Transportation disruptions: 70%
- Cannot deliver to customers: 45%
- Capacity under-utilized due to all above reasons
- **Disproportionate reliance on inventory and allocation of constrained parts**



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Geopolitics, Trade Agreements, & Reshoring

Resilinc Viewpoint

Q&A with Tom Linton, Supply Chain Expert, former CPO at Flex, and advisor to Resilinc

When Tom Linton first went to China on a sourcing trip for IBM, he traveled by boat from Hong Kong to the mainland, then rode in an old van on dirt roads to his destination: Shenzhen. It was 1983, most homes in the sleepy coastal settlement were framed with bamboo poles, almost every resident got around by walking or riding a bike, and only a few buildings rose higher than two stories.

But three years earlier, Shenzhen had been designated as China's first special economic zone, and its transformation to a manufacturing and trading metropolis had begun. Linton would travel to China many more times—as well as Japan, Singapore, Korea and other Asian countries—as he managed supply chains for IBM, LG, Flex and other firms. Over the decades, he has had a close-up view of China's epic rise from a low-wage destination to its current position as the dominant supplier in a huge range of techologically advanced industries.

Today, Linton is formally retired but busy writing his second book (see below), advising McKinsey & Company, serving as executive director of Resilinc's board and performing other advisory and consulting work. One of the main topics about which his perspective is sought is how geopolitics and economic trends are changing China's role in global supply chains—and how large manufacturers can respond. Linton shared his views on these and other topics in a December 2020 Resilinc webinar and January 2020 conversation with Resilinc CEO Bindiya Vakil. A condensed version of Linton's views is presented here.

Resilinc: We're hearing and writing a lot about supply chains "decoupling" from dependency on China. What are your thoughts on this?

Linton: Supply chains can't be changed quickly or easily because there are so many quality analyses, IP agreements, engineering and other assessments that must be done to qualify new suppliers. Also, there are many layers of interdependence between suppliers in multiple countries. You could decide to shift some procurement from a Chinese to a U.S.-based supplier, but chances are that U.S.-based firm sources from suppliers in China, who may source materials from the U.S.

Supply chains are extremely layered and complicated, and any move to re-engineer a supply chain in a major way must begin with a thorough mapping process down through the lowest tiers possible.

What should be driving the conversation are the impacts on a firm's income statement and balance sheet, with an eye to ensuring that supply chains are sustainable over a long period of time. In many cases, supply chains can benefit from proximity, so Mexico is an attractive location, especially for heavier items. But you have to balance that against the economies of scale, industrial ecosystems and technical expertise that Chinese manufacturing can provide.

Resilinc: How about the so-called "China+1" strategy, in which firms build parallel supply chains—one to serve China's huge domestic market and another to serve the US and other nations that view China as a strategic competitor?

Linton: It comes down to how much investment you want to make and how much flexibility you need in your supply chain to meet your customers' requirements. Smaller companies can't make dual bets, they can't do China+1. For larger firms, the location of your end customers should be a driving factor. For most large supply chains, the more balanced and geographically diverse, the better.

Resilinc: How does do these considerations differ by industry?

Linton: Some industries, like consumer electronics, tend to chase low-cost labor because labor is such a high proportion of the bill of materials. Additionally, they tend to procure parts from the same suppliers, so the only way to drive costs down is by focusing on the labor component.

Labor arbitrage was the main reason that manufacturers went to China in the first place. Labor costs have been rising at about 15% per year in China, making other countries more attractive. But China offers so much more than cheap labor now. The transformation I've seen over almost 40 years of doing business with Chinese firms is unprecedented. It was driven by national policies and huge government investments. Will similar transformations happen at a comparable scale in other emerging economies like Eastern Europe or Vietnam? I doubt it.

Resilinc: Mexico is often cited as a favorable destination for near-shoring supply chains, especially with ratification of the USMCA by Mexico and Canada. What are your thoughts on near-shoring supply chains to Mexico?

Linton: It's different for ever company. For industries like automotive and medical equipment, you'll see more investment in Mexico because of the lower shipping costs. For low-cost consumer electronics, shipping costs aren't as large of a factor. Clearly the USMCA brings some new opportunities, but it's important to point out that for about 20 years, Canada, Mexico and China have been the U.S.'s top three trading partners. What's changing is that trade with China is moving down relative to Mexico and Canada.

And there's as much cooperation as competition between suppliers in these countries, as raw materials, components, sub-assemblies and finished goods tend to move extensively between the three countries and the U.S.

Resilinc: What about security concerns, especially in the Mexican border regions?

Linton: There is a crime problem in Mexico, but quite honestly it has been that way in Mexico for generations. Now it's a question of time before the economy picks up. I think when we look back in 20 years, we'll be amazed at how Mexico has transformed into a major economy.

Resilinc: What other geopolitical issues should supply chain managers be paying attention to this year?

Linton: Lately there has been a lot of concern about geopolitical issues and trade, but I recommend paying attention to the fundamentals, which are often overlooked. As Resilinc's annual reports have shown, factory fires continue to be the top risk for supply chains. When I walk the factory floors of supplier firms in developing countries, I look at the housekeeping: is there a lot of corrugated stacked up? Are the docks and warehouses unkempt?

Resilinc: Are you optimistic about the future of global trade and geographically diverse supply chains?

Linton: There's a book that has been a touchstone for me: Nonzero, the Logic of Human Destiny, by Robert Wright. It was published 20 years ago, but it is more relevant than ever. He looks at the progress humankind has made over the centuries, how we've basically evolved from a bunch of warring tribes to a period in which there has been less conflict and more progress for more people. And we have to credit capitalism for lifting hundreds of millions of people out of poverty, especially in Asia.

Of course, there will continue to be fits and starts in progress, taking two steps back before we take four steps forward. But the amount of investment we're seeing now that's driven by sustainability and ESG criteria is very impressive. In terms of climate change, we're seeing automakers back away rapidly from internal combustion engines.

For supply chains, I think there will be certain areas that will become increasingly strategic and competitive because they relate to defense and security. But I don't believe there will be major conflicts on the near horizon. There may be incidents and accidents that cause tensions to rise. But there's a general will for co-prosperity between the U.S. and Asian countries.

Tom Linton co-authored The Living Supply Chain with Rob Handfield and is currently working with Handfield on Flow, which will examine the underlying laws and rules that govern the physics of modern supply chain.

"Supply chains can't be changed quickly or easily because there are so many quality analyses, IP agreements, engineering and other assessments that must be done to qualify new suppliers. Also, there are many layers of interdependence between suppliers in multiple countries.

You could decide to shift some procurement from a Chinese to a U.S.-based supplier, but chances are that this U.S.-based firm sources from suppliers in China. So, indirectly, you're still dependent on China."

TOM LINTON

Supply Chain Expert, former CPO at Flex

Supply Chain Resiliency Starts with Supplier Mapping

Resilinc Viewpoint

By Bindiya Vakil, originally published in *Supply Chain Quarterly*

The COVID-19 pandemic as served as a wake-up call, forcing companies to realize the risk of not knowing who their suppliers' suppliers are.

Last year, the procurement and supply chain management profession was challenged like never before. Despite facing numerous upheavals inflicted by supply chain disruptions in the last decade, most companies still found themselves unprepared for COVID-19. When the outbreak began in China, the disruptions were significant and far reaching but 70% of organizations did not have a clear sense of what parts of their supplier network were affected. Instead, they were still in a "data collection and assessment" mode, manually trying to identify which of their suppliers had a site in the specific locked-down regions of China. The effort was exponentially complicated as countries around the world went into various stages of lockdowns and restrictions and supply chain experts spent several months reacting and responding.

In contrast, companies that invested in supply chain risk management tools, particularly mapping their supplier networks, had a different experience. They were able to conduct what-if analyses for different regions as the first few cases emerged and were able to work with suppliers in these regions preemptively to protect supply lines. These success stories demonstrate why supply chain mapping needs to be a foundational element of any risk management strategy.

Supply chain blind spots

Historically, the structure of a company's supply chain has been largely driven by the imperative to reduce labor costs and improve efficiency. But in prioritizing cost and efficiency, companies have allowed weaknesses and vulnerabilities to emerge in times of unexpected events. The 2011 earthquake, tsunami, and subsequent nuclear disaster in Fukushima, Japan is an example: When disaster struck, most multinational companies had little visibility into the origin of the parts and materials that their tier-one suppliers depended on. Many of the tier-one suppliers had suppliers located in Fukushima, leaving companies scrambling. Flooding in Thailand later that year created the same disruption: Second and third-tier suppliers—unknown to manufacturers—were unable to deliver necessary materials. Subsequently, disruption in the availability of inexpensive parts ended up causing billions of dollars in lost revenue.

Still, only a minority of companies used Fukushima and the Thailand floods as a wake-up call to gain visibility into their supply chain; a critical mistake when COVID struck. Those that set up comprehensive, multi-tier supplier mapping programs came into 2020 more prepared: By having visibility into their supplier networks, companies such as GM, Cisco, IBM, and Amgen were able to quickly ascertain what parts and materials originated in Wuhan and Hubei and fast-track their responses. Those that didn't had to act based on what an August 2020 report McKinsey Global Institute (MGI) report described as "only a murky view beyond their tier-one and perhaps some large tier-two suppliers."

COVID: The ultimate wake-up call

It seems that COVID-19 has done what earlier disasters should have accomplished: It caused a widespread awakening to the vulnerabilities baked into our lean, cost-optimized supply chains. It has brought a greater focus on the need for building supply chain resilience capabilities. Through the pandemic, our profession has been brought to the forefront of urgent debate and discussion. It's up to us to advocate for the supply chain of the future; a truly resilient one. A first step to get there is to build an accurate, detailed, multi-tiered supply chain map.

As the pandemic ramped up, companies that had mapped their supply networks down to the second-and third-tier levels could quickly see a complete picture of how the evolving crisis would affect their supply chains in the weeks or months to come. This identification of specific areas of failure helped companies take action before the disruption hit. COVID-19 highlighted that mapping is essential for building resilient supply chains for the future. As the MGI report authors emphasize, "Creating a comprehensive view of the supply chain through detailed sub tier mapping is a critical step to identifying hidden relationships that invite vulnerability."

Without an accurate and constantly updated map of one's supply chain, strategies that may at first look favorable for increasing supply chain resilience could come with unnecessary cost increases and/or fail to deliver the sought-for resiliency. Let's look at one resilience strategy we were hearing a lot about in the second half of 2020: decoupling from dependency on China.

The term "reshoring" has been spiking in Google search terms and a third of companies have moved or plan to move their supply chains out of China by 2023. The drivers for this move were building long before the pandemic; they include rising labor costs, increasing tariffs, human rights issues, and the uncertainty over China's relations with the West. The disruptions in China-based supply chains—especially for medical supplies and personal protective equipment (PPE)—that arose with the coronavirus outbreak have added urgency to this trend.

But without a thorough supply chain map, it may be impossible to shift away from dependency on China. As reported by the Wall Street Journal, apparel manufacturers that

moved from China to Bangladesh still found their factories disrupted in early 2020 because they were still dependent on Chinese engineers and supervisors, as well as textiles, zippers, fasteners and other components. In similar fashion, manufacturers in industries from automotive to telecom, "rely on China's factories for many intermediate goods, from electrical wiring for cars made in Europe to electronic components for mobile phones made in Brazil," according to the article.

On the other side of the coin, the visibility that mapping provides could allow a company to decouple from China without switching suppliers. Resilinc's database of close to half a million suppliers reveals that about 30 percent of Chinese suppliers have manufacturing sites outside of China. So, a customer wanting to source from countries other than China could conceivably do so without the cost and time of qualifying a new supplier.

Why doesn't every company map its supply chain?

The simple answer is money and time. While historically it's been costly for companies to develop and maintain an accurate map of their supply chain, today, with the right partners, the process can be much more streamlined and efficient. Rapidly evolving technology, cloud adoption, and enterprise networks have made mapping cost effective, scalable, and rapidly achievable. What's more, the new generation of software companies providing mapping capabilities go far beyond what could be accomplished with emails, phone calls, and spreadsheets.

Let's discuss some of the options as not all mapping is created equal.

There are a few types of mapping available; all provide different levels of value depending on a company's needs. The simplest method involves mapping based on publicly available data including news and other information disclosed by large, direct suppliers about their production and logistics sites.

With this research, a manufacturer that is sourcing from large suppliers, such as 3M or Amphenol, can map the countries and regions where those suppliers' operations are located. Then, when an event such as an earthquake, hurricane, or COVID-related government edict happens, the company has visibility into potential delays due to disruptions or closures in that region. While this method has the advantage of not requiring any input from suppliers, it also doesn't allow for much transparency beyond the first supplier tier and may generate irrelevant data—noise—that must be filtered out to find the actionable data. This is because larger suppliers operate across many countries and not all sites may be relevant to a specific manufacturer.

To cut through the noise and increase visibility, companies should engage with suppliers to provide increasing levels of data. This data map can be achieved by starting with the locations of the suppliers' own production and logistics sites and culminating with a comprehensive map detailing the linkages between tier-one, tier-two, and tier-three suppliers. The goal is to be able to trace individual parts to the exact site where they're manufactured.

This ultimate level of "part-site" mapping adds the most value because it enables manufacturers and companies to know exactly what parts or materials may be delayed by an event affecting a specific site. The map should also include information about which activities a primary site performs, the alternate sites the supplier has that could perform the same activity, and how long it would take the supplier to begin shipping from the alternate site.

One of Resilinc's global biotech customers leveraged part-site mapping to avoid supply disruptions after Hurricane Maria devastated Puerto Rico in September 2017. Before Maria made landfall, the firm was able to identify two Puerto Rican sites that supplied 25 to 30 items to its North American manufacturing operations. Assuming these sites would be compromised, the company made several million dollars' worth of forward purchases from alternative suppliers that averted what would have been costly delays in manufacturing.

By contrast, Hurricane Maria left similar companies floundering for weeks trying to analyze which suppliers and materials would be impacted; many subsequently faced allocations and paid large premiums to secure constrained inventory. In the aftermath of Maria, hospitals also struggled for many months to obtain adequate supplies of IV bags.

Whatever technology platform a company uses to map its supply chain, a core best practice is to prioritize mapping those parts and materials that impact high-revenue products. Take this example: a company with $5 billion in revenue discovers that it has a single second-tier supplier for a low-cost connector that goes into its highest-revenue products. Without a mapping system that prioritizes revenue, the company would probably not pay much attention to that vendor because of the relatively low annual spend associated with it. But in reality, this sole-source vulnerability could derail production of a product that brings in hundreds of millions of dollars annually. In this case, it pays to spend several hundred thousand dollars to qualify an additional supplier.

Why Supplier Collaboration is a Win-Win Strategy

Resilinc Viewpoint

By Bindiya Vakil, CEO

Key principles, best practices, and stellar examples of collaborating with suppliers to build more resilient supply chains.

As supply chain managers and procurement professionals integrate the lessons of COVID-19 and look to build more resilient supply chains, one approach that must be taken more seriously is supplier collaboration. According to a December 2020 Gartner survey, 77% of organizations are currently investing in deeper supplier relationships. This includes looking for ways to proactively collaborate with suppliers to reduce risks.

Suppliers are the lifeblood of almost every original equipment manufacturer (OEM). Disruptions in the supply of even the most common and inexpensive commodity—a connector, a valve, a type of plastic bag—can derail production, destroy revenue, reduce profits, and even diminish a brand's reputation. This is especially true the case in the lower tiers of a supply chain where more than 80% of supply chain disruptions occur. The pandemic for example delivered a shocking lesson about the importance of lower-tier suppliers: when shortages in personal protective equipment (PPE) arose, those stemmed largely from constraints on raw materials like filters and polypropylene.

On the other side of the coin, OEMs that collaborate with their suppliers, have a higher likelihood of remaining resilient during disruptions, achieving better quarterly results and enhancing long-term value. For example, we've seen some companies fund retrofits at supplier sites for hurricane preparedness. And, during the early days of the pandemic, large organizations identified the suppliers whose survival was critical to their businesses and offered them assistance.

For more than 10 years, Resilinc has been enabling our OEM customers to collaborate with their suppliers to reduce risks and improve supply chain resiliency. Here is what we recommend to our customers:

Start with risk assessments

Surveys sent to suppliers to assess risk are a must. Here's how it works: once a customer's supplier network is mapped on Resilinc's platform, risk surveys – across 30+ areas including fire safety, hurricane preparedness, business continuity planning, and financial health – are launched to individual suppliers. Surveys should include those in the sub-tiers—whose parts and materials go into your more important products. Time and again, we've seen how low-spend suppliers in the sub-tiers can derail production downstream in product value chains. Last July, a fire at a Japanese firm making fiberglass fabrics disrupted supply chains for ABF substrate producers, which in turn impacted companies that manufacture servers, networking chips and CPUs.

Integrate supplier risk data

Typically, the task of assessing supplier risk is dispersed throughout an organization: one team looks at suppliers' CSR and sustainability performance, while others measure product quality data, fire safety, and cybersecurity. There is no cohesive process when it comes to designing questionnaires, drawing conclusions, and prioritizing - as a company - which supplier risks to tackle first.

A single, integrated platform – like the one Resilinc offers – for all your suppliers and risk types allows you to get the full picture, including detailed supplier risk profiles and visibility into the most significant risks. This way, you can prioritize which to address first.

Prioritize risk areas based on business KPIs

Sustainable sourcing may be a higher priority for your organization than fire safety; financial health might take a backseat to cybersecurity. Be sure to align and weight your supplier risk focus areas with the broader business goals. For example, one of Resilinc's customers, a global technology company, has implemented a unified supplier risk assessment program tied to its KPIs. We also have a consumer products company that measures its suppliers' CSR and sustainability performance—flagging non-compliance and supporting troubled suppliers to improve.

Respect your suppliers' time

Like you and your colleagues, your suppliers and their staff are busy. Look for ways to streamline your surveys and requests for information. At Resilinc, for example, suppliers can often complete one survey for topics such as cybersecurity or fire prevention, and then share those responses with multiple customers.

While many organizations can create a cohesive risk assessment program in house, there are benefits to working with an SCRM solution provider like Resilinc that has the technology built and years of supplier risk intelligence data available. By going this route you'll:

- Immediately increase the number of suppliers assessed and the impact of your data: an established SCRM provider will already have the majority of your suppliers and sites logged into its network. For example, Resilinc's Supplier Network includes more than 100,000 supplier firms and 475,000 sites owned or used by suppliers, covering three million parts and materials.
- Save hundreds of hours or staff time: by using a pre-built, vetted technology platform to assess for all types of risk the time requirement drops significantly. On average a comprehensive risk assessment should take one employee eight weeks to complete, versus two years and multiple employees.

- Gain access to a library of risk surveys: no need to start surveys from scratch! When working with a provider, you'll be able to leverage a library of survey questionnaires, based on industry standards. The surveys should also be translatable to accommodate global supply chains.

While sometimes identified risks are too extreme or costly to mitigate (leaving a customer to seek a new supplier option); in most cases, the best option is to collaborate with suppliers to reduce unacceptable risks. For example, we've seen a customer pay a supplier to install sprinklers at a factory for fire suppression and another fund a retrofit for hurricane preparedness. Some customers have even created standards for suppliers in hurricane zones and agreed to pay more for their raw materials if those suppliers invest in resilience.

During the pandemic, several Resilinc customers faced part shortages or delays because some of their suppliers outside the U.S. had to close because they weren't considered essential. By communicating with local authorities, these customers enabled their suppliers to stay open—avoiding supply disruptions and engendering greater loyalty from those suppliers.

Of course, these kinds of strategic alliances occurred before the pandemic as well. When handled right, they can allow OEMs to creatively use their supply chains for competitive advantages. Short of equity stakes, it's also common for OEMs and critical suppliers to co-develop and co-own intellectual property.

Some of the world's largest and most successful companies are famous for this. For example, Unilever partners with certain enzyme suppliers to develop more environmentally friendly detergents and Ford has used an "aligned business framework" for more than a decade to favor suppliers who commit to fair labor practices and other standards.

Collaboration enables OEMs and their most valuable suppliers to transcend the transactional and sometimes adversarial relationships that characterize negotiations over pricing and terms. In collaborating to reduce risks, both sides can be winners.

Case Studies

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Western Digital Uses Predictive Analytics to Protect Supply Before Disruption

Case Study

Introduction

Western Digital - a leader in technology storage solutions - has been a customer of Resilinc's since 2012. As one of the earliest adopters of Supply Chain Risk Management in the high-tech industry, Western Digital has shaped the adoption, practice, and deployment of supply chain mapping, monitoring, risk analytics and mitigation capabilities for the industry. From the start, Western Digital has been one of Resilinc's most active customers: the input of the Western Digital team over the years helped shape Resilinc's solution, services and capabilities, and helped us develop capabilities far more advanced than anyone else in this space.

Background

Western Digital's Supply Chain Resilience Program was designed and deployed to help ensure supply continuity. Learning from supply chain upheavals inflicted by disasters in the last decade — including the eruption of a volcano in Iceland, the Japanese earthquake and tsunami, Thailand floods, and most recently, the US-China trade restrictions, and COVID-19 – Western Digital recognized the opportunity to transform its Resilience Program into a connected, automated, predict, prepare, protect before disruption model.

Previously, all Western Digital's mitigation efforts were focused after the disruption hit, which is typical (with Resilinc's automated tools, the team never had to scramble for the data it needed and could quickly generate a list of critical suppliers in the disrupted areas, determining whether they were impacted and how seriously). However, Western Digital found that - even with technology-based SCRM solutions in place - there was still an impact in the form of PO delays and lost sales.

With a Predictive Risk model - that forecasts the path of disruption - Western Digital would be able to mitigate risks before it strikes and stay "connected in crisis"

$53 *million*
saved over two quarters

1 *week in advance*
predicted covid lockdowns

93% *accuracy*
with predicted Supply Base disruptions

Solution

In 2019 Western Digital partnered with Resilinc to develop next-generation SCRM analytics, including a predictive engine, called Predictive Risk, that leverages artificial intelligence and historical data to:

- Send alerts about a new, potentially disruptive, event anywhere in the world
- Determine the probable impact
- Predict which suppliers are most at risk of delivering POs late and by how long
- Western Digital Transportation Management System utilizes this data to mitigate risk to impacted lanes/ shipments
- Identify how affected suppliers will perform and propose a risk mitigation action plan

Armed with this advanced intelligence, Western Digital's Procurement Team is able to activate the appropriate playbook and execute a mitigation plan much faster, including; shifting inventory, working with an alternate source, re-routing shipments and managing supplies. This ensures production continues smoothly at manufacturing sites around the world.

When COVID-19 started to spread across the globe, the looming lockdowns and other protective measures put the company's supply chain at risk. The Predictive Risk model was used to predict the path of the pandemic, including when COVID-19 cases might peak and dates when the company could expect COVID cases to start declining. By being able to predict lockdowns in Japan, Malaysia, China, and the Philippines, Western Digital could make critical adjustments to the supply chain and flex the flow of inventories ahead of such restrictions.

Learnings

By partnering with Resilinc to develop and leverage Predictive Risk capabilities, Western Digital has been able to successfully protect goods in multiple countries. Specific to COVID-19, the Predictive Risk engine was able to detect disruptions with 93% accuracy and provided critical data that helped prevent supply from being impacted. Ultimately, this enabled Western Digital to save $53M over two quarters.

Western Digital also extended its prediction capability to its suppliers; this shared approach gave Western Digital a significant competitive advantage. If a supplier was anticipated to be in the predicted impact zone, Western Digital cautioned them so they could adjust and offset disruption.

- Alternate sites could be qualified
- Global Transportation modes and routes can be modified
- Suppliers were advised to move material or place orders before the event of a lockdown

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

Case Study

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