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Kearney, New York

Supply chain vulnerability in a time of crisis

KEARNEY

A trifecta of unexpected disruptions in Australia has revealed the need for a pivoting supply chain.

In the first half of 2020, Australia faced a perfect storm of severe events that put a spotlight on supply chain vulnerabilities. From bushfires and ransomware attacks to the COVID-19 pandemic, Australian companies and their supply chains have been inundated with a growing number of disruptions, fuelled by mega trends such as globalisation, technological advancements and climate change. Future prosperity will require finding new ways to manage these major unexpected disturbances.

In this paper, we take a look at the country's most recent challenges. Then, we discuss what it takes to build supply chains that can sense a potential disruption and pivot in response to the new environment, and we offer a new tool for identifying and classifying risks to make supply chains more resilient.

A triple threat

The Australian Food and Grocery Council (AFGC) and Kearney have identified six mega trends that companies will continue to experience (see figure 1 on page 2). Three recent examples reveal the significant impact on Australia:

Bushfires

The country's 2019–2020 bushfire season was unprecedented, with economic losses estimated to exceed \$110 billion. Key infrastructure was closed, including some highways and ports. Production lines were damaged, and consumer spending took a major hit. Several key freight routes were closed, which impacted the supply of goods and forced companies to find alternate routes. For example, during the 12-day closure of Western Australia's 1,600-kilometre Eyre Highway in early January, which left more than 400 trucks and cars stuck on either side of the border, grocers such as Woolworths and Coles faced delayed or lost revenues of up to \$10 million a day.¹

The bushfires also damaged the upstream food production and farming supply, and milk production dropped by about 5.5 per cent in the first part of the bushfire season. Because of road restrictions and infrastructure problems, Bega Cheese was forced to write off 0.9 million litres of output at its dairy processing facilities.² And amid a lack of consumer confidence and low demand, major retailers have reported that their earnings had dropped. For example, Super Retail Group reported a drop in sales of up to 9 per cent in December 2019 compared with the previous year. Regional stores—where access was limited—took the biggest hit on sales.³

¹ "Eyre highway reopens after bushfire threat blocks road," ABC News, 10 January 2020

² "Drought, then bushfires take a lick from national milk pool," *Australian Financial Review*, 12 January 2020

³ "Super retail profits hit by bushfires, more downgrades to come," *Australian Financial Review*, 20 January 2020

Figure 1

Six major trends are impacting Australia's supply chains

Mega trends and issues

- 1 Corporate social responsibility and sustainability**
Effects of climate change and public health issues (pandemics)
- 2 The Fourth Industrial Revolution and tech adoption**
Cybersecurity breaches, artificial intelligence and data (readiness, loss and control)
- 3 Consumer centricity**
Channel proliferation, customer fragmentation and shorter product life cycle
- 4 Geopolitical instability**
Disruption to fuel supply lines and escalation of trade wars
- 5 Demographic shifts**
Ageing population and tightening labour market
- 6 Urbanisation**
Higher land costs and increasing road traffic congestion

Recent events in Australia

Bushfires¹

- Australia's worst bushfire season on record was fuelled by extreme heat and record-breaking temperatures.
- More than 18 million hectares of land were burned.
- More than 9,000 buildings were destroyed.
- Damages and losses are estimated to be up to \$100 billion.

COVID-19

- The World Health Organization declared a global pandemic.
- Millions of cases were identified in more than 200 countries.
- Global stock markets experienced a 15% drop in value, the lowest one-week drop since the 2008 global financial crisis.

Toll ransomware attack

- Ransomware and the MailTo attack impacted Toll's IT systems (MyToll online portal).
- The attack severed Toll customers' ability to order and track shipments online.
- Reports indicate lost deliveries and delays of up to three weeks.

¹ "Unprecedented Bushfires in Australia Impact Infrastructure and Local Supply Chains," DHL Resilience 360

Sources: Australian Food and Grocery Council; Kearney analysis

Ransomware attacks

Australian transportation and logistics company Toll Group weathered a crippling cyber attack in January that debilitated its operations and dealt a major blow in terms of lost revenue and delays. In addition, some small to medium-size customers such as Accent Group reported delays of two to three weeks in delivering stock to customers as order fulfilment, usually done digitally, had to be handled manually.⁴ And in February, a ransomware attack on Talman, a provider of IT solutions such as delivery, order and auction systems to the wool industry, forced the cancellation of all wool auctions and prevented \$70 million worth of wool from entering the market.⁵

In May, Toll suffered a second attack that used a new form of ransomware to infiltrate the system by exploiting remote desktop connections.⁶ Staff members' personal details were stolen, and, importantly for its customers' supply chains, IT systems and the MyToll service were shutdown.⁷

The COVID-19 pandemic

The coronavirus pandemic triggered severe challenges to manufacturing output and freight capacity as well as irregular consumer behaviours. Many global supply chains rely on materials from China's factories, which contribute about 28 per cent of the world's manufacturing output. As early as mid-February, 938 of the Fortune 1000 companies had tier 1 and tier 2 suppliers in China that had been affected by the virus.⁸

In addition to the impact on inputs to production, supply chains were affected by peripheral issues such as a lack of personal protective equipment, border closures and requirements to work from home.

⁴ "Toll cyber hack puts pressure on government," *Australian Financial Review*, 18 February 2020

⁵ "Wool Growers reeling after cyber attack shuts auctions," *Australian Financial Review*, 2 March 2020

⁶ "Toll Group's operations shut down by yet another ransomware attack," *CPO Magazine*, 14 May 2020

⁷ "Toll customer data stolen in its second cyber attack of 2020," *Inside Retail*, 13 May 2020

⁸ "Coronavirus is disrupting global value chains. Here's how companies can respond," World Economic Forum, 27 February 2020

Then, the impact of COVID-19 went far beyond manufacturing. In March, airlines reduced their international and domestic passenger flight capacities between 5 and 20 per cent depending on the region, resulting in a drop of air freight capacity and a dramatic spike in demand for cargo freighters. Some routes reported dramatic rate fluctuations. For example, amid a plethora of suspended passenger flights, rates to ship cargo from Frankfurt to Shanghai rose 193 per cent from 80¢ per kg in the middle of February to \$2.78 per kg just one week later.⁹ Unless freight was contracted, companies had to pay a premium on spot markets to get time-sensitive goods in and out of China. Fast forward to June: Qantas announced that it would halt international flights until October—further decreasing air freight capacity.¹⁰ Prior to this, the Australian government established the International Freight Assistance Mechanism and partially funded flights out of and into Australia to help suppliers of specific product classes reach international markets.

In Australia, consumer panic resulted in frequent stockouts for what people deem to be essential goods, such as toilet paper and flour. Grocery stores in Australia hired security guards, and in early March, *The Northern Territory News* printed blank pages of its newspaper for people to use as emergency toilet paper. Because of the spike in demand and despite efforts to curb panic buying, ABC Tissue and Kimberly Clark were forced to pull in more resources to run factories 24 hours to meet demand.¹¹

In search of an answer

At the heart of these crises is one common theme: most supply chains are not designed to deal with these major unexpected events. Leading companies are identifying and understanding the risks they are exposed to and putting in place structured processes to mitigate these risks. However, as recent events have revealed, this is insufficient to build resilience for unforeseen events. Companies are not always able to rapidly respond to an unpredictable and changing environment—business as usual requires the supply chain to be cost-efficient, which may in turn challenge resilience. Investors may fail to reward supply chain resilience and in turn penalise it for perceived inefficiencies.

In light of the recent “black-swan” events and associated volatility, companies will increasingly need to strike a balance between supply chain cost efficiency and resilience, which Kearney benchmarks along eight dimensions:

- **Geographic makeup.** How close is supply to demand? How diverse are the sources of supply and demand? Can multiple locations provide key inputs?
- **Planning capabilities.** How advanced is demand-sensing technology? Can the supply chain react quickly to any changes in demand?
- **Supplier landscape.** Is there visibility into suppliers? Is the supply base diversified? Are suppliers overly reliant on a few customers?
- **Inbound transportation.** How much control and visibility is there? Is more than one mode of transport possible?
- **Manufacturing footprint.** Is spare capacity required? Is it possible to repurpose to increase core product manufacturing? How vertically integrated are core products or inputs?
- **Product platform.** Is there a high level of interchangeability among product inputs? Is there enough capability to substitute custom inputs for generic ones on an as-needed basis?
- **Outbound logistics.** Is there diversity among carriers? Are alternate modes or suppliers easily substituted?
- **Financial health.** Is there a healthy volume of safety stock inventory for core products? Is there rapid access to capital if needed to ramp up incremental production?

Building flexibility and agility into the supply chain creates resilience and can put companies in an ideal position to respond to unplanned disruptions. The most effective way to create resilience and prepare for shocks is to build pivoting supply chains.

⁹ “Airfreight rates spike as China factories restart production,” *Nikkei Asia News*, 20 February 2020

¹⁰ “Travel situation ‘can’t get much worse’ as Qantas scraps international flights until late October,” *Nine News*, 18 June 2020

¹¹ “Supermarket curbs aren’t slowing toilet paper panic buying,” *Australian Financial Review*, 12 March 2020

Building a pivoting supply chain

In the face of uncertainty, Kearney proposes that supply chains need to quickly react and adapt to any changes and disruptions—they need to be pivoting supply chains. Two powerful elements—an ability to **sense** a changing operating environment and then **pivot** by using digitalisation and technology to improve the organisation's capacity to respond—are at the heart of Kearney's pivoting supply chain framework (see figure 2 on page 5). This framework reveals some of the possible scenarios when it comes to investing in technology and being able to respond to the external environment. The leaders are investing in digitalisation and automation to improve their ability to sense and pivot.

Australia's trifecta of recent challenges reveals the world is filled with unexpected challenges. Many companies are working to **digitise and automate** their supply chains so they perform more reliably and efficiently. However, that won't create the flexibility needed to allow the supply chain to adapt in real time. Companies that prepare their supply chains to **sense and pivot** in response to changing conditions and unforeseeable variables will have a powerful competitive advantage. Next, we take a closer look at each of these two areas:

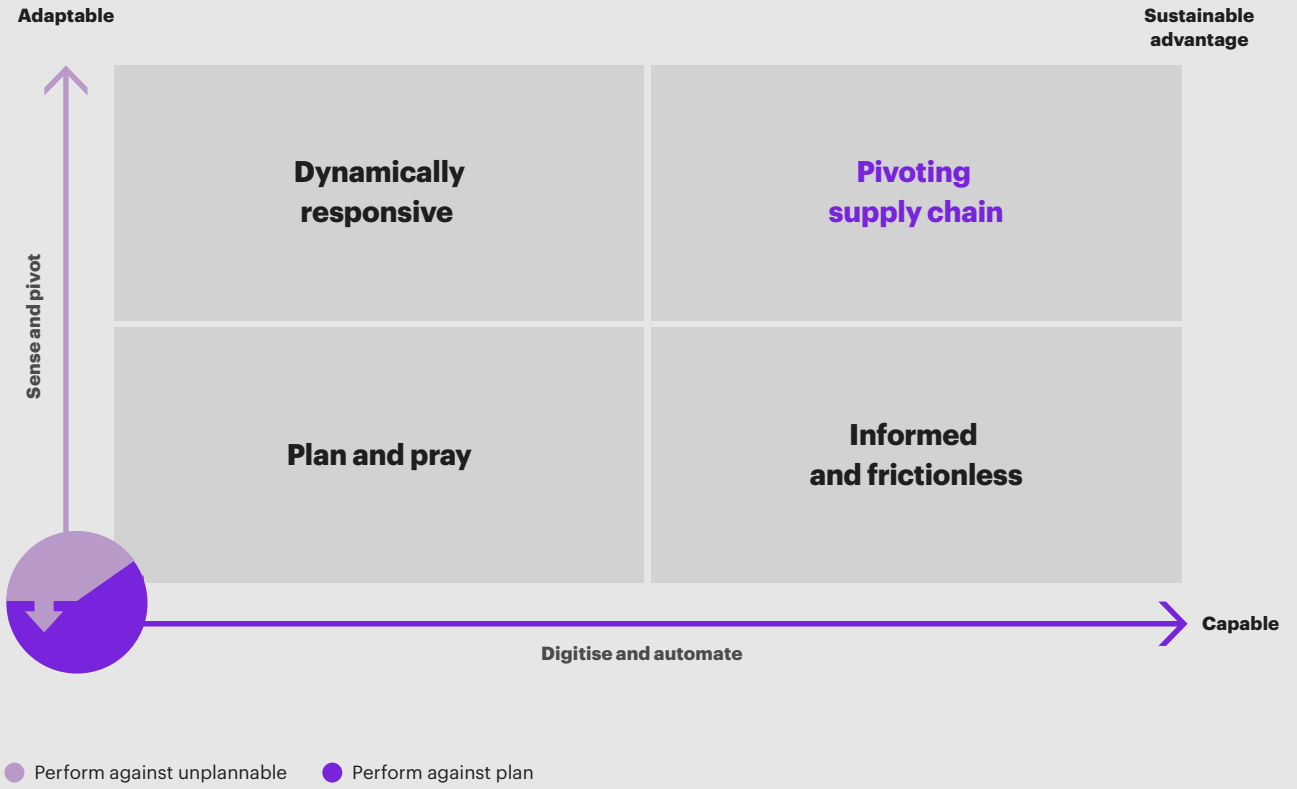
The leaders are investing in digitalisation and automation to improve their ability to sense and pivot.

Digitise and automate. Investing in technologies can make your supply chain more digitally capable. For example, efforts to digitise and automate might include installing sensors to track product quality, packaging and equipment status and environmental indicators, such as temperature and humidity. In addition, robotics can be used to automate picking, packing and loading and unloading to increase output and improve efficiency. And predictive analytics and connected devices can help improve demand and capacity planning as well as supply chain monitoring.

Sense and pivot. Apply emerging technologies to improve your ability to adapt. Although investing in enabling a supply chain to sense and pivot may use the same backbone hardware and software, the ideal approach is to apply those tools so they can sense any changes and disruptions, and then the supply chain can pivot in response. Emerging technologies can generate an array of benefits (see figure 3 on page 6). Essentially, greater visibility and granularity over the supply chain via access to real-time data to sense and track risk indicators enables supply chains to be less reactive and more proactive and can remove bottlenecks when they are identified.

Figure 2

Armed with a pivoting supply chain, companies can respond to unexpected changes



Variations of non-pivoting supply chains

1 Plan and pray
Prepared for the foreseen but unable to react to unforeseen or underestimated events

2 Informed and frictionless
Tech-enabled but lack distinct set of solutions to sense and pivot

3 Dynamically responsive
Built-in operating agility to respond but slow and manual to detect change

Key characteristics

- Static but detailed risk management process and framework buried deep in the organisation
- Insufficient level of technology enablement, automated processes or teams to sense when things go wrong or change or pivot in the face of change or disruption
- Investments made in latest technology, such as sensors, artificial intelligence or robotic process automation, that bring about a range of benefits: economy, reliability, accuracy and process speed
- Lack of a distinct suite of tech solutions that enable flexibility to respond fast enough in real time
- Adaptability and agility built into teams, ways of working and processes to enable swift and responsive decision-making
- Lack of technological capabilities suited to act faster and smarter, such as the power of analytics to detect abrupt changes in key indicators when they occur, including temperature, time to delivery and supplier disposals

Source: Kearney analysis

Figure 3

Emerging technologies can help the supply chain sense any upcoming disruptions

<p>Build end-to-end supply chain transparency.</p>	<p>Apply digital tools to gain complete transparency over all aspects of the supply chain in more granular detail—from production to consumption.</p>	<p>Examples</p> <ul style="list-style-type: none"> — Use predictive analytics and robotic process automation to do a deep supplier scan and understand or predict where the supply shortages will occur. — Make use of digital contact agents and data, at the point of consumption, to detect and plan for gradual or abrupt changes in consumer sentiment.
<p>Get the most out of tech-enabled external partnerships.</p>	<p>Real-time sensing of deeper parts of a supply network can help inform and support collaboration to fight disruption and remove bottlenecks downstream.</p>	<p>Examples</p> <ul style="list-style-type: none"> — Sense disruption (through shared connected IoT devices and platforms) to key componentry inputs to an end product can give a company, its customers and its suppliers the time to find alternative sources of supply.
<p>Accelerate intelligent business planning.</p>	<p>Make use of advanced and predictive analytics to elevate ability to pivot by enabling richer, more accurate scenario planning.</p>	<p>Examples</p> <ul style="list-style-type: none"> — Use predictive analytics to inform intelligently accepting varying levels of risk versus spending the money required to build in resilience and mitigation. — Run machine-learning algorithms on real-time point-of-sale data to develop a more granular view on precise SKU volumes to inform accurate forecasts of demand.

Note: IoT is the Internet of Things.

Source: Kearney analysis

Adopting data and core operating principles can also improve your supply chain’s ability to pivot. Data is essential to agile cross-functional teams. To operate in unpredictable environments, these teams need to be empowered to make informed decisions in real time. The team should also represent each step of the value chain in order to own end-to-end risk identification and mitigation as well as assign responsibilities and actions. This empowers a tech-enabled, rapid, coordinated whole-company response when disruptions inevitably strike.

In addition, five core elements of an operating model can enable agile processes and ways of working:

- Optimal structure and a clear RACI responsibility matrix across all supply chain functions¹²
- Improved governance that enables faster risk identification and understanding, mitigation planning and decision-making
- Clear accountabilities and ownership that delivers process speed
- Frequent capability-building to train members to be agile and tech-enabled
- Guiding principles that shape mindsets and behaviours (for example, proactive and simulation-first cultures rather than reactive cultures)

¹² RACI is responsible, accountable, consulted and informed.

Given the requirements for supply chains to sense and pivot, it is now more important than ever to understand and plan for risks. There are three ways to improve pivoting capabilities, backboned by technology and core operating principles (see figure 4).

The supply chain risk register

Having the tools to identify the potential risks—keeping in mind that unforeseeable events will inevitably occur that must be responded to in real time—is central to the operating model of a pivoting supply chain. Kearney and the AFGC have co-developed a launching point to identify and systemically classify key supply chain risks within an organisation.

The **supply chain risk register** offers a comprehensive view of the risks that could impact supply chains (figure 5 on page 8). This structured tool captures the risks, their level of impact, their potential time horizon and their likelihood across the six mega trends. During the development of this tool, AFGC member companies identified more than 40 issues. The risk register will be periodically updated and shared by the AFGC’s Supply Chain Committee.

As supply chain owners review these risks within their unique contexts, they can assess risks along two dimensions: **the level of impact** and **the likelihood of the risk occurring**. Then, each risk can be classified into a risk archetype to be used to develop initial mitigation initiatives. The level of impact and the probability of occurrence will be updated periodically at the industry level based on ongoing input from companies and supply chain owners along with established research and extensive modelling. Individual companies will then be able to review these risks through the lens of their own supply chain.

Figure 4

Three moves can prepare supply chains to pivot when a crisis occurs

<p>Build tech-enabled agile teams and decision-making.</p>	<p>Give more people across the supply chain the power to pivot to avoid delays in decision-making and an inability to respond swiftly.</p>	<p>Examples</p> <ul style="list-style-type: none"> — Use real-time data and feedback to empower in-the-field line managers to make key mitigation decisions.
<p>Run regular reviews of risk and pivot tactics.</p>	<p>Regularly review the top supply chain risks, and make frequent recommendations to improve the supply chain’s agility and resilience, and then delegate authority throughout the organisation.</p>	<p>Examples</p> <ul style="list-style-type: none"> — Inject appropriate levels of flexibility into contracts and partnerships, such as allowing for contingent suppliers in alternate geographies if production must stop in the primary geography. — Seek pre-approved access to finance if consumer demand dries up and customers don’t have enough cash to buy finished goods.
<p>Create a simulation-first culture.</p>	<p>Practising protocols to simulate scenarios to identify and remove bottlenecks ensures key actions are understood and supports building the case for required investments.</p>	<p>Examples</p> <ul style="list-style-type: none"> — Use a digital twin to stress-test actions and simulate consequences in a risk-free environment—all in effort to improve decision-making, responsiveness and adaptability.

Source: Kearney analysis

Figure 5

The supply chain risk register captures the risk categories, likelihood and impact of a potential disruption

Risk register structure

Example

Megatrends and themes	Issues	Consequences	Impact, timing and likelihood	Megatrend and themes	Issues	Consequences	Timing	Impact	Likelihood
[Grey box]	[Grey box]	AAA	[Gauge icon]	Corporate social responsibility and sustainability	Decarbonised supply chain	Investment required; increased operating costs	Long-term	Moderate	Likely
	[Grey box]	BBB			Provenance (supply chain transparency)	Increased cost, complexity; network design review	Mid-term	Minor	Likely
	[Grey box]	CCC			Responsible sourcing	Increased operating costs	Long-term	Significant	Likely
	[Grey box]				
[Grey box]	[Grey box]	AAA	[Gauge icon]						
	[Grey box]	BBB							
	[Grey box]	CCC							
	[Grey box]	...							

Sources: Australian Food and Grocery Council; Kearney analysis

Embedding the risk register into your pivoting journey

The supply chain risk register can be used for the following purposes:

- Start a structured dialogue about the impact of the disruptions and the likelihood of the risks.
- Facilitate simulation or wargaming exercises to help build and test resilience in supply chains.
- Formulate and document industry and company positions on key issues.
- Engage with regulators, suppliers and customers on co-efforts to mitigate key risks.
- Provide a starting point to access relevant expertise.

At an organisational level, the supply chain risk register can be incorporated into regular decision-making processes, strategic resilience and risk-review sessions, and capital planning. Embedding the risk register into regular business decision-making processes is essential to developing the right level of risk awareness and is required to begin the journey to a pivoting supply chain.

The next level of maturity in supply chain risk management is to conduct a resilience test to understand which elements of your supply chain are most at risk to some of these externalities and develop action plans to address core vulnerabilities.

Start early to future proof your supply chain for the next big challenge

The Australian bushfires, coronavirus and ransomware attacks highlight how vulnerable supply chains can be—even the best of them. From breached and disabled IT logistic systems that caused massive delivery disruptions to closure of essential freight routes and manufacturing facilities, these “black swan” events have huge business impacts, and they are happening more frequently. In fact, they can no longer be considered out of the norm. Forward-thinking companies will mitigate risk in their supply chains by remaining agile and flexible during these events. More importantly, they will look beyond the past and present to the unforeseen risks that may be coming over the horizon.

Many advanced businesses have well-planned risk management frameworks and digitised supply chains—at least on paper—that achieve great improvements in speed, efficiency and reliability. But they are still not able to respond swiftly and flexibly enough when major unpredictable events occur. Truly flexible and agile supply chains use digital tools to sense conditions, monitor risk levels and embed transparency. They use technological capabilities to support cross-functional teams, new ways of working and processes to become more agile and accelerate the speed at which their supply chain can pivot in response to disruptions.

What makes pivoting supply chains so successful is that when a disruption hits, they can make strategic shifts to meet their commitments—quickly overcoming any obstacles. The first step is to use the supply chain risk register to identify and plan for any potential risks. Plan for the expected and start the dialogue about what might be beyond the horizon. Then, build the capabilities with technology and the operating model to sense and pivot for the unplanned and the unforeseeable. Build response mechanisms for risks that are not yet identified. All companies will need to embrace digital tools to enhance flexibility and agility in teaming, processes and ways of working to create the ability to pivot. This can be a huge advantage against both the ever-changing competitive landscape and, more importantly, the unknown.

Kearney is committed to helping companies build resilient, agile and sustainable supply chains so they can weather any storm—whether it be setting up the foundation to identify these risks, designing the target risk operating model, or building the right digital capabilities to ensure supply chains are ready to face any uncertainty.

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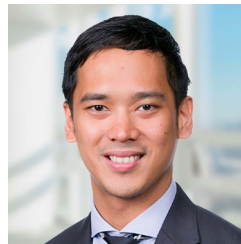
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