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Supply Chain Risk Management

for
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- Avoid shortages
and disruption
- Comply with new
laws and regulations
- Identify emerging
supply chain risks

riskmethods
2nd Special Edition

Daniel Stanton

Welcome!

Thank you for your interest in our second edition of this book about supply chain risk management. We hope it will help you quickly understand where threats exist in your supply chain, and that the advice is useful to you.

Nearly a decade ago, we recognized that companies who were depending on the performance of their global supply networks were in trouble. Supply chain risk management became a business imperative, but it was impossible using spreadsheets. So, our idea was to make supply chains more resilient through the use of technology, while keeping things simple, pragmatic, and actionable. Now it's possible for every company to become risk aware and avoid threats.

Indeed, the need for supply chain risk management is greater than ever. Our aim is to support you as you focus on building resilience, while driving sustainability and compliance in your supply networks, and that you even have fun while doing it!

Heiko Schwarz, Chief Executive Officer and Founder of riskmethods

About riskmethods

riskmethods empowers businesses to monitor, identify, assess, and mitigate supply chain risk. By using artificial intelligence, we help you automate and accelerate threat detection, enabling you to gain competitive advantage with a well-managed approach to meeting customer demands, protecting reputation, and reducing total cost of risk.

riskmethods serves companies worldwide, protecting hundreds of brands and trillions in annual revenue by giving you the ability to prevent and mitigate risk. Harnessing big data and machine-learning AI technology, riskmethods identifies the real threats to a supply network, and then gives you the tools you need to assess the impact of that risk and take proactive steps to collaboratively prevent or mitigate it.

riskmethods.net



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Foreword

As supply chains have become front-page news, at no other time in recent history have consumers and businesses alike experienced the importance supply chains play in their daily lives.

From commodity and mineral shortages resulting from war in Ukraine, to the bullwhip effect of the no-COVID policy in China, as well as the emergence of inflation at 40-year highs, supply chains remain fragile now and into the foreseeable future. Yet beyond these challenges, organizations and governments continue to push for visibility and accountability in supply chains in the form of new regulations demanding ethical standards, such as the Uyghur Forced Labor Prevention Act in the United States, Germany's Supply Chain Act, and the EU Corporate Sustainability Due Diligence Directive.

Due to such increased pressures, procurement and supply chain professionals have become inundated and at times overwhelmed with unforeseeable disruptions that have created new challenges for meeting supply chain demand and financial targets.

While our first edition of *Supply Chain Risk Management For Dummies* remains as relevant as ever, this next edition two years later gives more attention to supply chain issues and trends that have increased in importance relative to emerging supply chain risks and the rapidly changing business environment. Based on these challenges, this latest edition contains modified sections to update some of these topics addressed throughout the book. Some of the areas highlighted include:

- » An increased focus on aligning demand with supply management
- » The emergence of environmental, social, and governance (ESG) regulations and the attention given to these by investors and consumers
- » Addressing advanced technologies to collect and increase intelligence from supply chain risk data
- » The ability to go beyond Tier 1 suppliers through active collaboration with suppliers

Of course, without proper planning and the use of technology to monitor, identify, assess, and mitigate risks, companies of all sizes leave themselves exposed to the ongoing chaos that takes shape in the variety of risks that remain in our supply chains. Since establishing world-class supply chain risk management will remain a key success driver in the new normal, more organizations will need to redouble their efforts of dedicating the proper mix of people, processes, and technology.

We hope this new edition will become a functional guide to help spearhead new supply chain risk management (SCRM) efforts or improve existing ones in the future.

Sincerely,

Snr. Director of Product & Solutions Marketing, riskmethods

Constantine Limberakis

Introduction

Every product has a supply chain. These supply chains are complex networks of companies from around the world that depend on one another to efficiently create the things that we value, and deliver them when and where those things are needed. You depend on your suppliers. And your customers depend on you!

Unfortunately, the world is full of risks and uncertainty. From natural disasters to pandemics, and from financial crises to cyberattacks, every one of the companies in your supply chain faces a constant threat of disruption. Clearly, a supply chain is only as strong as its weakest link. But how do you find the weak links in your supply chain, and how can you tell when they are in danger of breaking?

A supply chain risk management (SCRM) system provides visibility to the people, products, partners, and places that you depend on to keep your supply chain working smoothly. An SCRM system can help you avoid preventable risks not only by carefully screening and monitoring suppliers but also by identifying all threats along the supply chain and providing the means to collaborate with your business partners to mitigate risk. And an automated SCRM system can help you respond quickly to unavoidable threats such as natural disasters by giving you instant access to the data and information you need to make good decisions.

In this book, you learn the basics of supply chain risk management, and how companies are using SCRM systems to create more resilient supply networks.

About This Book

Supply Chain Risk Management For Dummies, riskmethods 2nd Special Edition, consists of six chapters that explore

- » Managing risk in the supply chain (Chapter 1)
- » Building a supply chain risk management process (Chapter 2)
- » Deciding which risks to monitor (Chapter 3)

- » Automating supply chain risk management (Chapter 4)
- » Making the business case for supply chain risk management (Chapter 5)
- » Ten keys to creating a risk-aware enterprise (Chapter 6)

Icons Used in This Book

Icons emphasize a point to remember, or information that you may find helpful.



TIP

The Tip icon marks tips (duh!) and shortcuts that you can use to make SCRM implementations easier.



REMEMBER

The knotted string highlights information that's especially important to know. To siphon off the most important information in each chapter, skim the paragraphs that have these icons.

Where to Go from Here

You can read this book in different ways, depending on why you're reading it. You can certainly start at the beginning and skip the things you already know, but I've written the book so that you can start reading anywhere that catches your eye and then hunt for additional bits that look interesting.



TIP

No matter how you go through the book, you'll eventually want to read all the chapters. Each chapter is useful on its own, but the whole book helps you understand why supply chain risk management is important, as well as how to implement your own SCRM system successfully.

IN THIS CHAPTER

- » Addressing the growing frequency of supply chain disruption
- » Defining the role of supply chain risk management
- » Recognizing gaps in supply chain visibility

Chapter 1

Managing Risk in the Supply Chain

Supply chains are complex systems made up of people, processes, and technology that deliver something of value to a customer. You depend on your suppliers to deliver the products and services you need when you need them. And your customers are counting on you to meet their needs, too. Throughout the supply chain, risk management helps to ensure that each company can deliver valuable products and services to their customers, even when things don't go as planned.

Getting Started with Supply Chain Risk Management

Supply chain disruptions are becoming more common in virtually every industry. There are many reasons for this, but here are some of the primary issues:

- » **Globalization.** Companies choose to do business with partners around the world, taking advantage of differences in price, access to expertise, and availability of resources.

Continuous improvements in logistics and high-speed communications have made it easier than ever to do business globally. This also exposes companies to risks all around the world.

- » **Outsourcing.** Companies often choose to focus resources on their areas of core competency and outsource other business functions to suppliers who specialize in those areas. As a result, companies become extremely reliant on their suppliers for all of their non-core functions.
- » **Lean.** Companies aim to streamline their supply chain operations by increasing the speed of their processes and reducing inventory. Examples of this include JIT (just-in-time) inventory strategies that deliver products exactly when they're needed. A disadvantage of Lean is that less inventory is available to act as a buffer against disruption.
- » **Customer expectations.** Customers are becoming accustomed to the convenience of making online purchases, and having products delivered to them quickly and cheaply. When companies fail to meet customer expectations, they're at risk of suffering reputational damage from negative online reviews and posts on social media sites.
- » **Climate change.** Changes in the earth's climate are leading to an increased frequency and intensity of storms, floods, and wildfires. It also means the emergence of new supply chain regulations around the world, and new ways of assessing how businesses are managing risks from an operational perspective; for instance, the emergence of carbon footprint management.

Threats to supply chains are evolving all the time. Pandemics, geopolitical risks, natural disasters, strikes, sanctions, fires, or insolvencies are all examples of risks that can cause disruption. Such disruptions can trigger contractual penalties, production standstills, drops in sales, and reputational damage. In a world of increasing pressures and threats, supply chain risk management (SCRM) is clearly becoming more important.



REMEMBER

SCRM is not just about avoiding problems. It can drive direct and measurable value for procurement and supply chain organizations by improving business continuity, supply chain visibility, corporate social responsibility (CSR), environmental, social, and

governance (ESG) performance, regulatory compliance, and supplier relationship management.

A comprehensive approach to supply chain risk management involves visibility into all types of risk, for all tiers of supply, and for all members and nodes of the supply network (more about these “risk objects” in the next chapter). When done well, SCRM can protect a business from harm and enable higher levels of performance.



REMEMBER

Supply chain risk management is the process of monitoring, identifying, assessing, and mitigating risk in your company’s supply network — in collaboration with your supply base.

Avoiding Common Mistakes

Most procurement and supply chain organizations understand the principles of risk management and have plans in place to address risk. But their approach to risk management is often based on unreliable assumptions. Here are five common mistakes that can lead to expensive problems.

Focusing risk efforts solely on top suppliers

Some companies look at their top suppliers by value, or perhaps the suppliers that make up 80 percent of their spend and focus risk efforts on those. Such risk management efforts focus on the suppliers where the chance of a disruption is greatest, and where the revenue impact would be most severe. However, risk management really needs to consider all your active suppliers. It is through this process that you determine the likelihood of disruption and impact. A major vulnerability in many supply chains are suppliers who provide a small amount of specialized materials or number of components. Even though the purchase volumes are small, disruption of these supplies can result in major manufacturing delays or even plant shutdowns.

Assessing new suppliers only during onboarding

Evaluating suppliers during onboarding is great, but things change. Suppliers can get into financial trouble, and labor disputes can arise from seemingly trivial issues. Even the likelihood of a natural disaster affecting a plant might increase because of changing weather conditions. Or the supplier's own internal strategy might increase the risk for the buyer.

Relying on strong supplier relationships for insights

Every supplier has a responsibility to do what is in their company's best interest, and this sometimes prevents them from sharing important information about risk. Or your contact, such as the supplier's salesperson, may not even be aware of significant risks. Too many buyers have been unpleasantly surprised by receiving a bankruptcy notice from one of their suppliers.

Relying on past experience

Long-term supplier relationships may have a lower risk, but they're not risk-free. If the chance of a major risk event is 1 in 20 in any given year, then you might go 20 years without anything happening. Yet the risk is there, even if you haven't experienced it. It's also important to realize that suppliers open new factories, move their distribution centers, and negotiate new contracts over time. Every change to a supplier's business introduces new risks to your supply chain.

Knowing only first-tier suppliers

Companies may know who delivers directly to them, their Tier 1 suppliers, but they often don't know their Tier 2 — their suppliers' suppliers. Or the Tier 3 suppliers who deliver to the Tier 2s. In some cases, multiple Tier 1 suppliers all buy from the same Tier 2 company. Should a disruption occur in this second tier, then all of the Tier 1 suppliers will be affected. Changing suppliers can be complex, time-consuming, and expensive. Even finding other supply sources doesn't mean that those suppliers have enough

capacity to meet your demand. Timing and capacity are critical when you're counting on a backup supplier to protect your supply chain from disruption.

Responding to the Growth of Supply Chain Risk

Supply chain risks are a serious problem. That's why companies need to implement a comprehensive supply chain risk management program to secure supplier relationships, prevent supply bottlenecks, and ensure that supply chains are operating both legally and ethically.

Many large companies have already invested in custom-built supply chain risk management programs. These systems can be complex and expensive, and often require teams of experts to maintain. But emerging technologies such as artificial intelligence, machine learning, and easy-to-use flexible modern interfaces are quickly changing the way that companies think about supply chain risk management. Such solutions combine analytics with early warning signals so you can react faster to threats. With the right technology solution, a comprehensive SCRM program is now available to meet the needs of organizations of any size.

MANAGING RISK DURING THE CORONAVIRUS CRISIS

The outbreak of a new coronavirus originating in China has had an enormous global impact. As factories shut down and entire regions were locked down in China in early 2020, the pandemic had already begun spreading to countries around the world. Companies that used automated supply chain risk management were able to quickly identify the effects that the virus was having on their suppliers, as well as the potential impacts on the transportation industry. By monitoring key performance indicators (KPIs) and evaluating risks as they emerged, these companies were able to anticipate disruptions, implement risk responses, and minimize the negative financial impacts. Some companies even used this information to identify market opportunities and gain a competitive advantage.

Aligning Demand with Supply Management

Supply chain risk management is useful for any business that relies on external resources for value creation, because their suppliers and vendors also face risks. One example is the microchip shortage and its impact on upstream supply chains. The global microchip shortage in 2021 has continued to wreak havoc on car manufacturing in 2022. Dealer lots are seemingly empty due to supply chain issues where millions of cars have never gone into production.

To be truly valuable, an SCRM solution needs to identify and highlight the specific risks that are most important to the suppliers and the categories that are most relevant to a particular supply chain. By providing relevant insights and early warnings to the correct decision-makers, SCRM makes it possible to respond more quickly and minimize the impact of disruptions that affect downstream decisions for production and delivery.

IN THIS CHAPTER

- » Exploring the structure of your supply chain
- » Defining and analyzing supply chain risk
- » Developing action plans to respond to risk

Chapter 2

Building a Supply Chain Risk Management Process

Supply chain risk management involves monitoring complex global business relationships. Companies rely on a smooth flow of money, products, and information through factories, distribution centers, ports, and vehicles on every continent. If any of these flows are interrupted, the result is a cascading series of expensive problems. To effectively protect your supply chain from disruption, you need to identify the points of vulnerability, analyze the risks that could occur, and develop action plans.

Establishing Your Priorities

The first step in building a risk management process is to determine which parts of your supply chain will be included. Ideally, your supply chain risk management process should cover all the products and services that your company purchases, and all of the suppliers from which you buy them. This gives you a more complete view of potential disruption and impact. But to get started,

many companies initially prioritize a subset of their total supply base, and then add the rest of their suppliers to the risk management system as quickly as possible and feasible.

You can prioritize which suppliers to start with by evaluating several factors, such as:

- » **Purchasing volume.** Many companies use the Pareto Principle to identify the 20 percent of suppliers that make up most (80 percent) of their purchasing volume. This approach ensures that the suppliers from which you buy the most will be included.
- » **Geography.** Supply chain risk management is often needed in regions that are unstable because of infrastructure, economic, or political threats.
- » **Impact on sales.** Evaluating impact on sales can help you identify suppliers that may have low purchasing volumes yet have a substantial influence on whether one of your products or services can be delivered.
- » **Customer specifications.** Suppliers that are chosen based on customer specifications may have a higher risk for insolvency, performance risks, and quality issues.
- » **Indirect materials and services.** Lack of availability of indirect materials and services, such as logistics services, machinery, sales materials, or IT can disrupt critical supply chain processes.
- » **Technology and patents.** Dependency on technological expertise and patents can lead to risky single-source procurement relationships.
- » **Ownership structures.** Companies are sometimes an owner of a supplier because of a joint venture or acquisition. These supplier relationships may require a higher level of risk monitoring.

All of these factors can be useful in determining which supply chain relationships to monitor first. Many companies use a combination of these factors when deciding which suppliers to include as they start to develop a supply chain risk management process. Yet only by including the entire supply base and further elements such as logistics hubs, can companies get a total view of risk.

Mapping Your Supply Chain



TIP

Supply chain risk management begins with defining and mapping out what your supply chain really looks like. A good place to start is by creating a list of *risk objects*. For example, your company's offices, factories, and distribution centers are all supply chain risk objects. You can also build a list of your suppliers along with their physical locations. Other common risk objects, or nodes, include transportation infrastructure such as highways, ports, canals, and airports.

The companies from which you purchase materials and services are your Tier 1 suppliers. About half of all supply chain disruptions directly affect a company facility, or affect a Tier 1 supplier. The other half of supply chain disruptions occur beyond, or "below," the Tier 1 suppliers. In other words, those disruptions affect the suppliers' suppliers. Ideally, an effective supply chain risk management process should identify risks objects at all of the tiers in a supply chain.

There are two ways to gather information about the companies in a supply chain. The first approach is *collaborative supply chain mapping*, where each company shares their own information voluntarily. The second approach is *synthetic supply chain mapping*, where information about companies is collected by scanning internet databases using artificial intelligence. Here are some of the most common techniques used for collaborative supply chain mapping:

- »» Survey your Tier 1 suppliers
- »» Request a list of risk objects in RFIs (requests for information) and RFQs (requests for quotation)
- »» Request a list of risk objects during supplier evaluation
- »» Request information on risk objects during supplier reviews
- »» Request information on risk objects during supplier audits



TIP

In many cases, suppliers may be reluctant to share information about their own supply chains. One way to overcome this resistance is to be transparent about why you need the information and how it will be used. Another approach is to share risk information with your suppliers, helping them get early warnings of

potential threats. In other words, by sharing information, you're able to help suppliers do a better job of managing their own supply chain risks.

Identifying Your Risks

When you have listed the risk objects that you need to monitor in your supply chain, the next step is to identify the risks that could impact each one by creating a *risk profile*.

Risk identification involves research, creativity, and judgment. Some of the risks that you need to consider are common sense. For example, suppliers around the Gulf of Mexico are at risk of hurricanes, and suppliers in Japan may be vulnerable to earthquakes. Other risks may not be as obvious, such as whether a supplier has a good record for worker safety or compliance with environmental regulations.

Creating a cross-functional team to identify items that should be added to the risk profile is useful. Buyers, transportation managers, engineers, supply chain managers, finance specialists, lawyers, IT managers, and corporate security professionals can all provide inputs about risks that could cause problems in your supply chain.

In many cases, it helps to start with a list of risk categories, and then identify how those categories apply to each supplier's risk profile. A few of the common risk categories include:

- »» Natural disasters
- »» Accidents or explosions
- »» Sabotage, terrorism, crime, or cyberattacks
- »» Civil unrest, political uncertainty, and wars
- »» Labor unavailability and shortage of skills
- »» Sustainability, compliance issues



TIP

Consider all types of risk, whether external, internal enterprise, supplier, or distribution risks. High-level categories include financial, reputational, natural hazard, geopolitical, cyber, and man-made risks.

Assessing Your Risks



REMEMBER

The simplest way to determine how important a risk is to your supply chain is to look at two factors:

- » **Probability:** How likely is it that the risk will occur?
- » **Impact:** How severely would the risk event affect your supply chain?

No one can predict the future, so it is impossible to calculate precise values for either. But you can develop a logical process for estimating each value, and then use this process consistently when evaluating every risk.

Probabilities can often be estimated using historical data. For example, the probability of a flood occurring in a particular location can be determined by analyzing floods from the past.

Impacts can be estimated in many different ways. In most cases, a small number of parameters can provide a good overview of critical dependencies in the supply chain. For example, you can estimate the impact of a risk using the following parameters:

- » Total time to recover (TTR)
- » Degree of substitutability or relocation time
- » Impact on corporate image
- » Availability of qualified alternative suppliers
- » Number of customers affected
- » Costs for corrective marketing and sales activities
- » Impact on sales, margins, or earnings



TIP

There may not be a correlation between the level of purchasing volume and the level of damage that would be caused by the disruption of a single supplier. That's why it's helpful to use lost sales or lost profit estimates for assessing the financial impact, instead of just relying on purchasing volume. Putting a value on such losses is key to establishing the cost of risk. Yet you needn't get lost worrying about precision. Calculating the exact number is not what's important: it's the magnitude that matters.

Risk assessment data can be used to create *risk scorecards*. Put simply, scorecards assign values for each risk area based on the likelihood that such events will happen. Scorecards are useful for integrating risk assessments into other business processes. For example, a risk scorecard can be used in procurement processes such as contract award decisions or supplier onboarding. You can read more about risk scorecards in Chapter 4.



TIP

Impact assessment is quite complicated, but supply chain risk management software automates the process and makes it much easier to understand where your supply network is most vulnerable.

Mitigating Your Risks

Monitoring and assessing supply chain risks gives you the visibility you need to develop action plans. When you take action to reduce the probability or impact of a risk, it is called *risk mitigation*. Risk mitigation is the key to becoming proactive about risk management.

A key component of proactive risk management is collaboration between your supply chain managers and your suppliers. Ideally, you're also connected to their supply base. In this way, you're more likely to find out when trouble is brewing within your supply network.

Action plans are generally constructed around preventive or reactive measures. Both types should have an owner: a person responsible for executing the plan. A preventive plan aims to keep events from happening. Reactive plans ensure fast response in case of a risk event. Each action plan should describe the procedure to be followed for each type of event. Many action plans include information for the people to contact in a crisis situation. When a risk event occurs, action plans allow your whole team to respond more quickly, and more effectively.

CASE STUDY: AN EARTHQUAKE ACTION PLAN

While implementing a supply chain risk management process, a global telecommunications provider discovered that a key supplier's production plant was located in an area with a high earthquake risk. The enterprise's executives decided to mitigate the risk of disruption by establishing an alternative source and taking out contingent business interruption insurance. The company also developed an action plan that would be implemented by the lead buyer if an earthquake occurred. The plan included the names and phone numbers of the people who should be contacted to assess any damage and who would determine how the situation would impact the supplier's ability to continue operating. The plan also provided contact information for the alternative supplier, and, if needed, the buyer could secure capacity and place substitute orders.

Many companies create a catalog of proactive and reactive action plans, grouped according to risk factors. Some of the common categories for action plans include:

- »» Natural hazards
- »» Political situations
- »» Sanctions
- »» Labor disputes and strikes

Mitigating supply chain risks generally requires investment and integration with other business processes, so it is important to have the support of top-level management. Many companies benefit from integrating risk-reduction practices into their supplier evaluation and development programs. As a result, they're able to automate user workflows, assign tasks, and keep a record of activities for compliance authorities.

Visualizing Threat and Impact

A useful tool in supply chain risk management is to visualize or plot data on an easy-to-understand graph or chart. Figure 2-1 shows risks plotted based on their potential impact (the vertical axis) and the probability that they will occur (the horizontal axis).

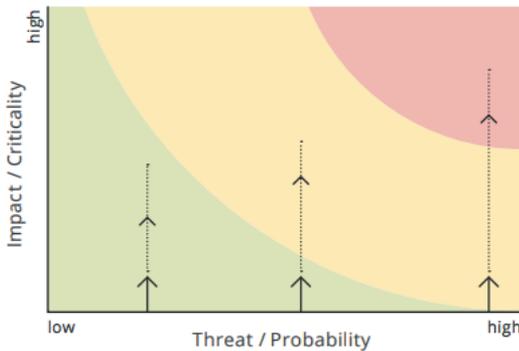


FIGURE 2-1: Risk management graph.



TIP

Add colors to represent the level of risk and impact. In the graph in Figure 2-1, the risks in the darker area will be given priority. Symbols add even more data to the visualization. For example, different shapes represent risks to different parts of the supply chain, and you can change the size of an object to illustrate the potential cost of a disruption.

A graph makes it easy to pinpoint the critical risks that have both a high probability and a high potential impact. Such graphs summarize the risks associated with one part of a supply chain, such as a supplier or category. Or combine that data to create a risk visualization for your entire supply chain.

IN THIS CHAPTER

- » Understanding the need for supply chain visibility
- » Prioritizing supply chain risks
- » Planning your responses to supply chain risks

Chapter 3

Deciding Which Risks to Monitor

You can't fix a problem if you can't see the problem. To be able to determine whether your supply chain is safe or at risk, you need current, accurate information about what's happening at your own facilities, and at your suppliers' locations. Having data about key points along the supply chain is also helpful, such as highways, ports, and airports. Beyond monitoring physical sites, you also need to track the status of information systems, and watch for threats that could affect people, too. Supply chain visibility helps you respond to threats quickly, and makes your supply chain more resilient.

Improving Supply Chain Visibility

Supply chain visibility comes from having real-time information about the condition of a supply chain, including the people, equipment, facilities, information systems, orders, and inventory. Before you can manage risks effectively, you need to have a structured approach to collecting, analyzing, and communicating information about what's happening in your supply chain.

Rather than jumping straight into data collection, it often helps to start by creating categories that describe how a risk could affect your supply chain. For example, here's a list of risk categories that many companies monitor:

- » **Financial risk.** The possibility that suppliers will experience a business scenario that threatens their financial health.
- » **Operational risk.** The risk of a supplier not having the capacity or capability to meet your requirements.
- » **Reputational risk.** A supplier might engage in an activity that negatively affects your brand perception.
- » **Market risk.** The possibility that changes in market dynamics or economics could disrupt your supply chain relationships.
- » **Natural disaster risk.** Your supply chain might be disrupted by a hurricane, earthquake, or other natural hazard.
- » **Man-made risk.** Your supply chain could be disrupted by events including oil spills, fires, or explosions.
- » **Logistical risk.** Shipments could be delayed, lost, or damaged while being transported to your facility.
- » **Geopolitical risk.** Global political events such as wars, trade barriers, sanctions, or civil unrest might disrupt your supply chain.
- » **Cyber risk.** Your suppliers could be harmed by a breach of their information technology systems.

Under these high-level risk categories, you can add more detailed risk subcategories. For example, the operational risk category could include subcategories for supplier performance and quality risks. The decision as to which risks should be included in a risk scorecard is based on criteria such as:

- » Corporate and procurement strategy
- » Relevance and criticality of risks
- » Availability of risk data

Supply chain visibility should extend beyond monitoring the performance of your Tier 1 suppliers. Disruptions such as natural disasters, strikes, and accidents can affect critical supply chain

infrastructure, and might affect several suppliers at once. Additionally, risks such as wars and economic disruptions can affect entire regions. As the coronavirus demonstrated, disruption caused by pandemics can also spread across several risk categories, and disrupt global markets over a long period of time.

Selecting Key Performance Indicators

Once the risks are categorized, the next step is to select the key performance indicators (KPIs) that allow you to monitor those risks. KPIs can be quantitative (such as a “current ratio”) or qualitative (such as “labor issues”). In many cases, it is more important to track changes and trends in a KPI than it is to measure the KPI value precisely. For example, if the current ratio (a company’s current assets divided by their liabilities) trends lower for several months in a row, it could indicate that a supplier is approaching bankruptcy. Following are some KPIs that companies might include in their risk scorecards:

- » Financial risk
 - Ownership structure
 - Current ratio
 - Credit rating
 - Bankruptcy
 - Key employee stability
- » Operational risk
 - Delivery reliability
 - Disasters at supplier site
 - Labor negotiations and disputes
 - Quality
 - Health and safety
- » Market risk
 - Patents and intellectual property rights
 - Low-cost supplier threat
 - Currency exchange rates

- » Image and compliance risk
 - Labor practices
 - Environmental sustainability
 - Hazardous substances
 - Supplier corruption or bribery
 - Cyberattacks



REMEMBER

Selecting the right KPIs can provide visibility about whether a supply chain is adhering to chosen metrics, and ensure that people are quickly alerted to risks that could lead to a supply chain disruption.

Tailoring Your Risk Responses

Once the KPIs are selected, the next step is to decide how to use them to trigger action. Start by defining a range of values that are considered normal for each KPI. The upper and lower acceptable values for a KPI are called the *control limits* or *tolerances*. If a KPI changes, but the value is still within this normal range, then no action is required. But if the KPI falls above or below this range, then there should be a response to the risk. For example, if a supplier's credit score drops below a certain tolerance level, the response may be to build up safety stock inventory or identify an alternative supplier.



TIP

Sometimes it is useful to set several triggers for a KPI so that actions can be tailored to occur at different levels. For example, a small drop in a supplier's credit score might trigger a small increase in safety stock inventory. But a large drop in that supplier's credit score could trigger a complete review of their contracts and a requirement to source backup suppliers. Setting multiple triggers ensures that responses are proportional to the severity of a risk.

Control limits can be used to automate parts of the risk response process. For example, when a KPI moves out of its tolerances, this can automatically trigger a response and send a message to the employees responsible. A major benefit to this approach is that thresholds and responses are established in advance, so everyone understands what to do when problems appear. These automated notifications can increase supply chain resilience by allowing companies to respond to risks more quickly, and more efficiently.

IN THIS CHAPTER

- » Defining your risk management data requirements
- » Understanding the need for technology and automation
- » Communicating risk information with scorecards

Chapter 4

Automating Supply Chain Risk Management

Supply chain risk management involves collecting and analyzing data efficiently and accurately so that the people involved can understand the potential impacts and respond quickly. Monitoring all the risks that have been identified requires the analysis of such large quantities of data that it would be impossible to perform manually. Automating this process using artificial intelligence helps connect the right people with the information they need, when they need it, so that they can work together to protect your supply chain.

Monitoring Dynamic Supply Chains

Once you understand the risks that could affect your supply chain, you need to implement an active monitoring process to keep the risk profiles up to date. And, of course, you need a way to detect risks quickly and accurately. Three main challenges exist when it comes to capturing risk data: volume, relevance, and standardization.

Supply chain risk information includes numerous third-party sources, such as government lists, social media, and news outlets. This data needs to be analyzed for relevance by using logic to filter “noise” from true risk signals. It must be standardized so that it is easier to interpret, communicate, and integrate into other supply chain processes. Examples of important risk data from various sources, along with their ranking formats include:

- » Credit ratings are reported as AAA, AA, BB, and so on
- » Earthquake data is often based on the Mercalli scale of MM I (hardly felt) to XII (total destruction)
- » Conflict and security are reported on a Global Peace Index Score on a scale from 1 to 5 (most to least peaceful)

Data can be standardized by converting the reported values to categories such as no risk, low, medium, or high risk.

Automating data collection, filtering data using logic, and standardizing formats make it easier to create a comprehensive risk scorecard that gives a clear, easy-to-understand picture of all of the risks that are being monitored in a supply chain.



TIP

One of the clearest ways to communicate critical information is with a risk scorecard. Scorecards are designed to summarize information on an established numerical scale, and that makes it easier to interpret the data.

riskmethods solves the three key data capture challenges — volume, relevance, and standardization — with a technology-driven service called Risk Intelligence that uses big data monitoring and artificial intelligence to create scorecards automatically. Risk Intelligence also automates the inclusion and normalization of third-party data sources, internal data sources, and supplier-provided data.

Using Technology to Collect Risk Data

Many companies start their supply chain risk management process by recording risk information in a spreadsheet. This approach is labor-intensive and time-consuming because it may be necessary to monitor up to 100 data points for every risk object in

a supply chain. Many of those data points need to be tracked in real time.

Technology offers many ways to automate the collection of supply chain risk data. So, you might try internet-based services such as Google Alerts that provide notification of news stories affecting your suppliers and facilities. Credit agencies can provide updated information about suppliers' financial status. However, many enterprises start their security chain risk management journey using such sub-optimal approaches. They quickly learn that if they want to scale their programs, they need to collect risk data better, faster, and more efficiently. This helps get buy-in from a community that may be reluctant to change their ways and adopt a risk-aware approach to their decision-making and supplier management practices.

Automating supply chain risk management accelerates the collection of risk data, and helps ensure that information is current, complete, and accurate.



REMEMBER

Because of the volume of data and the speed with which this data needs to be processed, it makes sense to automate as much of the supply chain risk process as possible. Automation can reduce the cost of risk monitoring and alerting, while also increasing the speed at which critical information is received and processed.

Implemented properly, automation can help ensure that you use a consistent process for collecting large volumes of data, analyzing relevance, and monitoring risk at a scale and in real time. Advanced systems combine analytics, artificial intelligence, and machine learning that can inform you of risk events before they hit or the relevancy of a supply chain disruption to your supply chain.

Some companies start by monitoring risks for their most critical suppliers, or in a specific segment of their supply chain. However, most quickly find this approach unsatisfactory, because it can't be scaled to address all of the important risks that a large company needs to monitor to protect its supply chain.



TIP

Because supplier risk data comes from a variety of sources, it is fragmented. To see the big picture, companies need a centralized, master view of suppliers, supply, and supply chain risk. This requires flexible solutions that can push or pull dozens of

potential data sources across different risk types into existing enterprise IT-systems. Such solutions standardize data and integrate it into risk profiles.

Choosing a Digital Solution

Companies that begin their SCRM journey with spreadsheets or a homegrown database often recognize that such approaches have limited functionality and can actually introduce new risks. For example, who is responsible for documenting the system, training users, and keeping the software up to date?

The better option for companies that need a robust SCRM solution is to purchase commercial software that has the required features, and will be supported by a dedicated vendor. Some of the questions to ask when evaluating SCRM solutions include:

- » Does it use artificial intelligence such as machine learning to automate risk monitoring, data collection, and relevance?
- » Are risk objects monitored in real time across a broad set of risk topics at the site level?
- » Does it include tools for creating impact assessments and planning mitigation activities?
- » Does it include supplier data collection tools such as automated surveys?
- » Does it provide visibility to multiple tiers in the supply chain?
- » Does it integrate with your current supply chain information systems and external data providers?
- » Is it hosted in a secure cloud environment and accessible remotely including on mobile devices?

Optimizing Risk Assessment

Much of the information that's required for supply chain risk management is collected directly from suppliers. This could include information about facility locations, financial performance, and regulatory compliance. Collecting this risk data manually is time

consuming and labor intensive. Adopting automated risk surveys can improve the efficiency of this process.

Automated surveys make it easier to collect risk information at scale. Surveys can be sent to as many suppliers as needed, as often as needed, to provide an accurate assessment of the current risks in the supply chain. A well-designed survey is easy for suppliers to complete, which means they're more likely to provide the data requested. In many cases, surveys help to standardize the risk information that's collected.

Surveys can also be flexible and customized, which makes it possible to gather different kinds of information from each supplier. During normal periods, supply chain risk data might only require annual updates. But during a crisis, surveys can be used to collect daily or weekly updates. When survey responses are integrated into an SCRM solution, they can provide a detailed picture of the risks throughout the supply chain.

Understanding Your Sub-Tiers

A company depends on its suppliers to deliver the products it needs, when and where they're needed. Likewise, those suppliers depend on their suppliers, and so on. While it's important to have visibility to the first-tier suppliers, this is still an incomplete picture. The companies that supply the Tier 1 suppliers are called Tier 2 suppliers, and so on. In some cases, analyzing suppliers at Tier 2 (or beyond) will reveal critical component suppliers. Multi-tier analysis can also reveal situations where two or more Tier 1 suppliers rely on the same Tier 2 supplier for components. The Tier 1 suppliers are often not aware that they share common customers and suppliers, so finding and managing these risks requires collaboration between many different companies.



TIP

Supply chain relationships can be very complex. For example, a Tier 1 supplier might also sell materials to a Tier 2 supplier. It's sometimes easier to talk about *Tier-N suppliers* when referring to all the layers in a supply chain.

Using Collaboration to Manage Risk

In a perfect SCRM world, every company would voluntarily share risk information with their customers and suppliers. In reality, there are significant barriers to information sharing:

- » Lack of trust, as well as fear that information will be misused
- » Legal concerns about confidentiality and/or anti-trust practices
- » Lack of data exchange standards or interfaces
- » Difficulty or cost of sharing and updating data

Overcoming these barriers is important, but for suppliers to actively participate in an SCRM process, they also need to understand how it will benefit them. One way to provide an incentive for suppliers to share SCRM information is to create a supply risk network. A supply risk network is a group of companies that collaborate on understanding and responding to supply chain risks. When the companies adopt a common system and processes for updating and retrieving their risk information, it strengthens the risk awareness and resilience of all members in the network.

IN THIS CHAPTER

- » Estimating the potential cost of a supply chain disruption
- » Exploring ways that supply chain risk management can create value
- » Developing a supply chain risk management investment strategy

Chapter 5

Creating the Business Case for Supply Chain Risk Management

Implementing a technology-based solution for supply chain risk management is a business decision that needs to be framed in terms of costs and benefits. This chapter will help you determine the value that effective risk management can provide to your organization's stakeholders, as well as to your customers and suppliers.

Understanding the Challenge of Building a Business Case

Making a business case for a project that will increase sales or generate new products by performing a return-on-investment calculation is a straightforward way to convince stakeholders. But risk management is different because it is usually about handling bad things that *might* happen. In some ways, it's a lot like deciding whether to buy insurance. That's why creating a compelling

business case for automating your SCRM system requires a different approach than most other business decisions.

1. Start by highlighting any weaknesses in the current situation and identifying the potential implications of supply chain risk events.
2. Then lay out the vision for an improved situation.
3. Finally, propose a plan, and analyze the costs and benefits.

Once the benefits of a high-performance SCRM program are laid out, it becomes clear that they are wide-ranging, varied, and substantial. A business case that combines as much rigor and as many hard numbers as possible, along with examples from real-world experiences, can easily justify the needed investment.



TIP

You can download a free supply chain risk management brainstorming template from riskmethods at www.riskmethods.net/resources/brainstorming-template.

Demonstrating the Benefits of Supply Chain Risk Management

In terms of procurement and how an organization looks at its suppliers and supply chain, value comes from capitalizing on opportunities while minimizing risks.

There are many opportunities for suppliers to help generate value that ultimately leads to competitive advantage. For example, suppliers can contribute to cost reduction strategies, such as cost avoidance and efficiency improvements. Suppliers can also support revenue growth by offering new, innovative products and services.

The other side of the value equation is risk management. Opportunities are important, but so is managing the risk that comes with any supply chain. What happens if a supplier cannot deliver an order, or if a shipment is significantly delayed? Both risk and opportunity management are critical to sustainable success. When companies embrace opportunities such as an acquisition, a new product, or a technical innovation, they also need to consider supply chain risks.



REMEMBER

Many companies choose to initially focus on three categories when assessing the benefits of supply chain risk management:

- » **Supply chain visibility.** Having an SCRM program in place makes understanding suppliers' risk exposure easier, and shortens the time it takes to react to disruptions.
- » **Corporate social responsibility and compliance.** To protect a company's brand, it's vital that everyone associated with the brand adheres to standards and regulations. An SCRM solution can provide alerts about compliance issues for all suppliers, including the long tail.
- » **Supplier relationship management.** Incorporating SCRM into supplier relationships allows for better, risk-aware decisions.

Structuring the Business Case for Supply Chain Risk Management

Creating the business case for a technology-based supply chain risk management solution is a five-step process:

- 1. Point out the supply chain risks facing an organization.** The goal of this step is to make sure that stakeholders understand exactly what supply chain risk is. This involves asking some key questions to highlight where the risks are. Many companies experienced risk incidents during the Coronavirus pandemic that can be used as examples.
- 2. Explain the implications and the cost of supply chain risks facing the organization.** The goal of this step is to make sure that stakeholders understand the need for supply chain risk management. This creates the burning platform that justifies the investment.
- 3. Describe what automated supply chain risk management should look like.** The goal of this step is to describe the potential of supply chain risk understanding: up-to-date market knowledge, rapid information and alerts, and planned preventive actions.

4. **Present the plan.** Describe how to achieve the supply chain risk management vision. The goal of this step is to explain the proposed solution and what is required to establish it (a high-level adoption plan).
5. **Clarify the costs and benefits.** The goal of this step is to explain the investment and the return on investment, with financial and non-financial costs and benefits included, along with a plan for tracking those benefits.

Quantifying the benefits of supply chain risk management often involves looking across many different functions in a company. The value of the benefits varies from one organization to another, and can change over time. Here are some of the important categories to consider when assessing the benefits:

- » **Lowering inventory costs.** Supply chain risk management can enable companies to lower inventory levels, which translates into working capital and return on capital improvements.
- » **Reducing insurance costs.** Insurance firms often offer reduced premiums to clients with effective SCRM programs.
- » **Saving on labor costs.** A technology-based SCRM solution can save time spent gathering information, contacting suppliers, and managing data.
- » **Improving efficiency.** Better risk management means more factory up-time and productivity, and lowers the chances of stoppages or slowdowns.
- » **Accelerating response time.** Through early warnings, an automated SCRM system enables proactive action, and can ensure a coordinated response to a risk event. This can reduce costs for overtime and expedited transportation.
- » **Getting ahead of price increases.** Early knowledge of a risk event enables faster action, allowing buyers to get ahead of price increases in the market.
- » **Providing first-mover advantage.** Companies that have advanced SCRM monitoring and mitigation can move faster than competitors to secure critical supplies/inventory or save capital equipment following a natural disaster or supplier insolvency.
- » **Growing market share.** Customers are more likely to buy from companies that have products available. During a

supply chain disruption, companies with a resilient supply are able to draw customers away from less resilient competitors.

» **Advancing brand reputation.** Supply chain risk management can reduce the risk of reputational damage caused by product shortages. It can also reduce the cost of product recalls or advertising aimed at reassuring customers.



TIP

For help with measuring the return on investment of a supply chain risk management program, check out the SCRM ROI calculator at <https://go.riskmethods.net/resources/scrm-roi-calculator>.

In addition to describing what the benefits are, explaining how to track them is also important. The business case should identify the key performance indicators (KPIs) or metrics that will help to identify the outcome from the investment and track whether it has met its goals.

When calculating the cost of risk, use hard numbers when possible. In some areas (such as avoidance of catastrophic risk events or consequences), estimating the value of something that did *not* happen is common. In other cases, there will be numbers available to support both specific and ongoing investment in risk management capability and tools.

RECENT CHANGES IN SUPPLY CHAIN LAWS

In 2022, the US implemented the “Uyghur Forced Labor Prevention Act” which requires companies to prove that goods they import from China were not made using slave labor. Starting in 2023, Germany’s “Act on Corporate Due Diligence in Supply Chains” requires businesses operating in Germany to provide evidence of ethical standards of conduct. Companies must implement supply chain risk management and document their efforts to minimize or prevent human rights violations in their direct and indirect supply chains. Under the EU Supply Chain Law, mid- to large-sized companies that do business within the European Union will be required to audit suppliers all along their global supply chains for violations of human rights and environmental conventions.

Managing Compliance Risk

Governments around the world are implementing new regulations that affect the supply chains. Increasingly, regulations in the areas of environmental, social, and governance (ESG) prohibit violations of human rights, health and safety, and labor laws. Violating these regulations can result in costly fines, and worse.

Some compliance risks are unique to specific industries. For example, electric vehicles (EVs) are growing in popularity because they don't emit harmful gases into the atmosphere. As the technology develops, automotive manufacturers may need to find whole new sets of suppliers. Enterprises must make sure that these businesses also comply to existing and evolving regulations.

To manage compliance risk, every company must do three things. First, the company needs to have a complete picture of its supply chain, including what materials are bought, where those materials come from, and how they're used. Second, the company needs to be aware of the current and future regulations in each market, and how those regulations apply to all products in the company's supply chain. Once these steps have been completed, the company can proceed to the third step: evaluating options and developing an effective compliance strategy. Throughout these steps, it's important for the company to document its processes and maintain a record of the results. Here, automating compliance reporting reduces the time and effort needed.

IN THIS CHAPTER

- » Deciding which supply chain risks to monitor
- » Implementing an effective supply chain risk management solution
- » Ensuring that an enterprise is truly risk aware

Chapter 6

Ten Keys to Creating a Risk-Aware Enterprise

Every company depends on having a reliable supply chain. To survive and thrive in the current environment, businesses need to collaborate with customers and suppliers to implement effective supply chain risk management. Automated SCRM systems can help an organization turn risk into a competitive advantage, gain customer trust and market share, and protect its brand. This chapter explains ten keys to assessing a company's approach to SCRM and determining which actions to take next to become a proactive risk-aware enterprise.

Selecting Relevant Supply Chains

To make sure they have an accurate understanding of risk impact on their organization, some companies monitor their entire supply chain. Others begin their supply chain risk management efforts by focusing on specific segments, such as:

- » Direct or indirect material suppliers
- » Suppliers with a high purchasing volume

- » Suppliers with a large impact on revenue
- » Suppliers with unique technology and patents
- » Suppliers with specific ownership structures
- » Suppliers tied to customer specifications
- » Suppliers in specific regions

Ideally, companies quickly expand monitoring to include all segments. For a total view of risk, also consider other supply chain elements:

- » Direct suppliers
- » Sub-tier suppliers
- » Your own facilities
- » Logistic hubs
- » Customers
- » Countries

Chapter 2 explores how to map your supply chain.

Coverage Across all Risk Areas

Be clear about which risks are being monitored and which metrics are used to measure them. Some of the risks that might need to be monitored include:

- » Company risk (financial stability, key employee stability)
- » Supply disruption risk
- » Market and cost risk
- » Environmental, social, and governance (ESG), as well as compliance risk
- » Performance and quality risk
- » Individual and industry-specific risk
- » Location risk (natural hazards, strikes, fires, explosions)
- » Country risk (political unrest, sanctions, corruption)

Chapter 4 delves deeper into creating risk graphs and scorecards.

Monitoring Risks

Risk monitoring provides the information you need to make good decisions more quickly. An early warning system is important because the sooner you identify risk, the more options you have to respond to it. A proactive approach to risk identification will also include structured contingency planning, along with notifications and updates. You need to evaluate the risk information required against what is available, along with its importance. Some of the aspects to consider when evaluating a risk identification process include:

- » Automating data capture to reduce manual effort
- » Adopting artificial intelligence technologies to analyze big data
- » Ensuring timeliness for acute risk response
- » Filtering out irrelevant data or “noise”
- » Ensuring that data is accurate and avoiding unvalidated commentary
- » Building a risk taxonomy and scoring system for immediate understanding of high, medium, and low risk
- » Providing easy data access, ideally via mobile apps for employees
- » Utilizing credible, trusted data sources

Read Chapter 3 for much more on monitoring risks.

Assessing Impact and Criticality

There are many ways you can determine the impact that a disruption could have on a supply chain. A good place to start is to assess suppliers using the following parameters:

- » Total time to recovery (TTR)
- » Degree of substitutability
- » Time required to switch to an alternative source

Other parameters that can be useful when evaluating how to respond to a supply chain disruption include:

- » Number of affected customers
- » Technical complexity of material procured
- » Amount of inventory in stock and in transit

To learn more about how to predict the impact of a disruption using graphs and scorecards, head to Chapter 2.

Creating Action Plans

Having action plans in place makes it easier to respond quickly when a threat is identified. Some action plans are proactive, anticipating or preparing for a situation, and others are reactive, with specific tasks for responding to adverse events. Ideally, risk action plans will be tailored to situations or conditions that are based on different risk indicators. Some of the things to consider when creating an action plan include:

- » Mapping the action plan process, including status and notifications
- » Assigning responsibilities for each action plan
- » Integrating cross-functional responsibilities
- » Determining how the risk will be treated: avoidance, transfer, mitigation, or acceptance
- » Using technology to automate action steps
- » Setting up reporting that includes changes in risk profile, risk events, and actions taken

Chapter 2 has more about mitigating risk with action plans.

Integrating Processes

Supply chain decisions are often spread throughout an organization. When you integrate supply chain risk management into other organizational processes, you maximize the value it can provide. Processes that can be integrated with SCRM include:

- » Spend analytics
- » Sourcing
- » Supplier evaluation qualification / management
- » Purchasing dashboards and reporting
- » Category / commodity management
- » Compliance and corporate social responsibility
- » Supply chain planning
- » Enterprise risk management
- » Transportation management

Chapter 2 has the lowdown on building a supply chain risk management process.

Managing Change

Incorporating supply chain risk management into an enterprise usually involves making significant changes to how a business operates and how important decisions are made. To implement these changes successfully, you need to address issues such as:

- » Ensuring management and executive level awareness
- » Involving cross-functional partners such as logistics, compliance, insurance, and sales
- » Including risk management in performance goals
- » Resolving conflicting goals
- » Identifying success factors such as training, FAQ-sessions, process documentation, videos, webinars, and workshops

Read Chapter 5 for more tips on getting executive buy-in for supply chain risk management.

Securing Supply

One of the keys to building a resilient enterprise is to ensure that the supply chain does not interfere with a company's ability to meet customer commitments. A proactive strategy can be used to prepare for risks by securing supply based on predictive insight. For example, if a company can anticipate what its customers are going to buy, then procurement and supply chain managers can purchase safety stock inventory to provide a buffer against possible shortages, or secure capacity from suppliers in advance. Such preparedness is a requirement for ensuring the continuity of business operations despite supply chain disruption.

Evolving the Sourcing Paradigm

Supply chain risk management can allow a sourcing program to expand and better manage supplier relationships. All aspects of supplier relationship management should prioritize risk, especially when awarding business to new suppliers.

As companies evolve, the supply base tends to grow and the composition changes. As new threats emerge and pressures evolve, the sourcing process must continue to seek approaches to proactively master supply risks in areas including:

- » **Sourcing.** Based on price, quality, prequalification scoring, and risk assessment
- » **Financial stability.** Based on company reports, credit ratings, and media stories that provide insights about how a supplier is performing
- » **Logistics.** Based on a supplier's location and the likelihood of natural disasters, trade disruptions, and delivery performance
- » **Costs.** Based on actual or projected changes in materials prices, labor costs, and currency exchange rates

- » **Image/Compliance.** Based on violations of environmental regulations, labor laws, or anti-corruption rules
- » **Quality.** Based on the process maturity and product quality of a supplier

Enhancing Supply Network Management

A risk-aware enterprise is able to understand vulnerabilities while collaborating with supply chain partners. In other words, the goal is end-to-end visibility and flexibility across all the tiers in a supply network.

Enhanced supply network management includes having easy access to current, accurate information about suppliers. This requires having a master file covering all suppliers, including key data, that's regularly updated and verified.

When integrated into a supplier relationship management process, these tools can be valuable for sourcing new suppliers. They can also help to develop better relationships with strategic suppliers, which is especially important during a disruption or when capacities are limited.

For more on the business case for automating supply chain risk management, head to Chapter 5.



REMEMBER

Risk awareness and effective supply chain risk management rest on having supply chain visibility. When companies can identify potential threats, they can proactively assess the impact of disruption, then apply prepared risk mitigation plans to begin immediate recovery. Automated systems accelerate threat detection and warning. And not all supply chain risk management is enlisted to avoid disruption. Such programs also serve to ensure compliance or avoid brand damage. These factors, taken together, result in greater supply chain resilience and business continuity.

WHY MANAGING RISK IS ESSENTIAL FOR SUPPLY CHAIN RESILIENCE

Supply chain resilience is the ability of a supply chain to withstand negative impacts and recover quickly from disruptions. Now, more than ever, companies are realizing the need for resilient supply chains, and are acting on this demand.

Traditional approaches to supply chain design focus on efficiency and cost savings, and rely on forecasts and assumptions about the future. Such supply chains may be efficient under a narrow set of circumstances, but are often fragile and vulnerable to disruptions.

Today, efficiency is not the only metric that matters for success. Supply chains also need to be resilient, so that they can continue to function even when surprises occur. Lots of strategies can make supply chains more resilient, such as reducing single points of failure, holding buffer inventory, and shortening lead times. While some of these strategies might add cost to the supply chain, they create value by reducing the probability or impact of disruptions.

One essential step in any SCRM program is implementing processes to identify and respond to risks quickly and effectively. Considering the number of risk objects in a global supply chain, and the various types of risk that could affect each one, this part of SCRM can seem overwhelming. Artificial intelligence is playing an increasingly important role in SCRM because it can monitor risk across the supply network in real time, process data faster than humans, and enable proactive risk management. This means that procurement and supply chain professionals can react to threats before these become critical, which serves to strengthen resilience.

The world has clearly become more unpredictable in the past few years, and this has created unprecedented challenges for supply chains. Fortunately, advances in SCRM technology are providing us with better tools so that we can manage all of our current and future risks more effectively.

Glossary

Active monitoring: A process that constantly assesses the status of a supply chain, watching for risk and disruption.

Artificial intelligence: The ability of a computer to collect data, analyze patterns, and make decisions.

Big data: Refers to huge volumes of information that are challenging to store, process, and analyze.

Collaborative supply chain mapping: Creating a supply chain map using information that suppliers have shared with you.

Corporate social responsibility (CSR): The expectation that a business will behave ethically and try to make a positive impact.

Digital transformation: Making major changes to a supply chain to take advantage of digital technologies.

Disruption: An event that interrupts the flow of money, products, or information in a supply chain.

Environment, social, and governance (ESG): Three non-financial ways that supply chains impact people and the planet.

Just in time (JIT): A supply chain management strategy that minimizes inventory by delivering products exactly when they are needed.

Key performance indicator (KPI): A metric that tracks the results of a business process.

Lean: A supply chain management strategy created by Toyota that minimizes inventory and reduces waste.

Machine learning: A branch of artificial intelligence (AI) and computer science that focuses on the use of data and algorithms to imitate the way humans learn, and to gradually improve accuracy.

Qualitative metrics: Measurements of the opinions or perceptions of supply chain stakeholders.

Quantitative metrics: Measurements of supply chain performance characteristics such as time, speed, or cost.

Resilience: The ability of a supply chain to function properly during and after a disruption.

Risk: The potential for an unwanted outcome resulting from an event.

Risk-aware enterprise: A company that has an effective supply chain risk management solution in place.

Risk identification: Determining events or objects that could disrupt part of a supply chain, and result in losses.

Risk mitigation: Actions that reduce the probability or impact of risk.

Risk object: Any location in a supply chain, such as a factory or warehouse, that could be affected by a risk.

Risk profile: A prioritized list of the risks that could disrupt part of a supply chain.

Scorecard: A document that provides a summary of business information at a specific point in time to simplify analysis and communication.

Supply chain: A complex system made up of people, processes, and technology that is engineered and managed to deliver something of value to a customer.

Supply chain risk management (SCRM): The process of identifying, assessing, mitigating, monitoring, and responding to the risks that could disrupt a company's supply chain.

Synthetic supply chain mapping: Creating a supply chain map using information that has been gathered on the internet and collected using artificial intelligence.

Threat: Natural or man-made event that has the potential to cause negative outcomes.

Tier: A company's position in a supply chain. Tier 1 suppliers sell products directly to your company. Tier 2 suppliers sell products to Tier 1 suppliers. Tier-N refers to all of the suppliers in a supply chain.

Transparency: Sharing visibility information with supply chain partners.

Visibility: Real-time data about the condition of a supply chain, ideally across all sub-tiers, or Tier-N.



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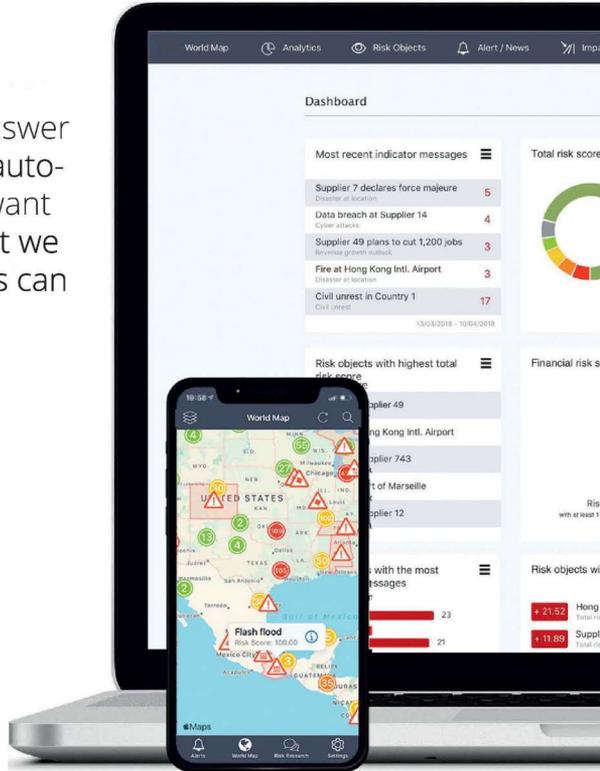
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Protect your supply chain against disruption and threat

Supply chains are complex systems made up of people, processes, and technology. Yet they are vulnerable to disruption. In *Supply Chain Risk Management For Dummies*, find out how you can secure your supply chain against risks as diverse as cyberattacks and insolvencies through to disease outbreaks, environmental disasters, and geopolitical conflicts. Dive in to discover all about how technological advances in risk management can protect your supply chain – along with your business reputation – and ensure that your organization remains resilient and robust.

Inside...

- Embrace artificial intelligence to proactively manage supply chain risk
- Gain sub-tier insights through active collaboration with your suppliers
- Tackle the risks of managing sustainability and compliance
- Improve due diligence of suppliers through automated assessments
- Quantify the benefits of automated supply chain risk management



Daniel Stanton has developed supply chain strategies, coached executives, and led supply chain projects for companies including Caterpillar, APICS, and MHI. He now devotes his time to teaching, conducting research, serving on boards, and helping startups. He holds a master of engineering in logistics from MIT and is a doctoral researcher at Cranfield University. www.danielstanton.com

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