

Identifying and Addressing Losses in the Supply Chain: A Comprehensive Guide

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Abstract: Supply chain risk management (SCRM) is the process of identifying, assessing and reducing risks associated with an organization's supplies. The application of global supply chain risk management strategies contributes to more efficient enterprise operations, cost reduction and improved customer service.

As the globality and complexity of supply chains increase, so do the risks. The increased complexity of the supply chain entails "more potential points of failure and higher levels of risk," McKinsey said in the article.

The Supply Chain Sustainability Report for 2021, published by the Business Continuity Institute (BCI), reports more supply chain failures in 2020 than in any other year in the history of the report. COVID-19, of course, was a key factor, but many other current problems have caused and will continue to cause disruptions in the supply chains of organizations operating domestically and around the world. The strategies that organizations develop to identify, measure, and manage risks in the supply chain must be robust enough to counter these potential threats.

In this connection, the purpose of considering this work was to study the causes of losses in supply chains and the possibilities for minimizing and eliminating losses in this area.

The methodological basis was scientific works, special literature and opinions of experts in this field.

Keywords: supply chains, losses in supply chains, opportunities to eliminate losses in supply chains.

Introduction

Supply chain disruption is the disruption of a technological process involving organizations involved in the production, sale and distribution of goods or services. An optimized supply chain is critical to maintaining product quality from start to finish of production and ensures the use of high-quality resources.

Bottlenecks and overloads in the production system often cause delays and increased costs. The Covid-19 pandemic has led to many problems, including disruption of supply chains. China's strict "zero-level Covid" policy, introduced to control the spread of the virus, has affected global supply chains. Although this has helped China's economy by easing local restrictions and ensuring growth in 2020, a new version of Omicron with high infectivity may change the current situation.

According to a recent CNBC article, economists warn that such policies could create additional threats to global supply chains and put pressure on consumer demand and economic growth. While other countries are adapting and making their supply chains more resilient to disruptions, China continues to adhere to a "zero tolerance" policy. This may negatively affect shipments around the world due to the large number of manufacturers located in China [1].

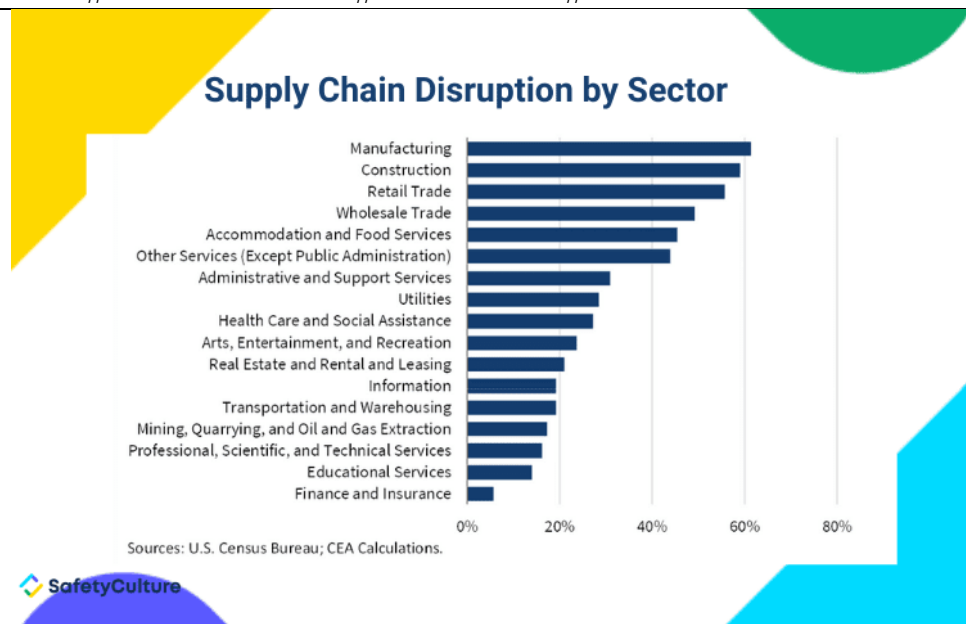


Figure 1. Example of supply chain failures by sector

The causes, consequences and severity of supply chain disruption are key aspects in the socio-economic industry. Disruptions in the supply chain can be caused by both internal and external factors. Cyberattacks, financial instability, transportation problems, human errors, geopolitical instability and natural disasters - all these factors can lead to violations.

The consequences of supply chain disruptions can be devastating. Lack of products due to lack of materials, rising demand and, as a result, inflation, closure of enterprises and increased unemployment are all the results of failures in the supply chain. These consequences can pose a threat to national security, and according to a survey conducted by Ernest & Young LLP, most companies were not ready for such challenges [2].

Effective supply chain management is becoming critical, and companies must be prepared to respond quickly to changing conditions in order to minimize potential risks and ensure stability in production processes.

The severity levels of supply chain disruption represent important aspects in business. Failures in the supply chain can occur for different reasons and have different consequences, but they can be divided into two main categories: the probability of occurrence and the severity of the consequences.

The first level of severity - low level - refers to short-term failures that can be quickly fixed after solving a specific problem. An example is temporary logistical problems or delays in the transportation of goods.

The second level - the middle level - is characterized by destructive events that can affect production for several weeks or months. An example is any incident in the production shop that will suspend work and lead to significant losses that require inclusion in the company's financial report.

The third level - serious failures - have long-term and significant consequences for time, money and the entire supply chain. The ongoing pandemic and its economic consequences are a prime example of such failures [3].

1. Risk management in supply chains

Supply chains are moving to a new, more global level, opening up unique opportunities for companies and causing new difficulties. The Chartered Institute of Procurement and Supply identifies several key advantages and risks associated with the globalization of goods [4].

Risk management in supply chains is a complex task that requires careful planning and a systematic approach. The development of an effective risk management plan in the supply chain begins with key steps that will help identify, understand and eliminate potential hazards.

Current Risk assessment: The first step is to analyze the current risks in the supply chain. This makes it possible to identify priority areas for further action. Drawing up an action plan, taking into account these risks, allows for optimized use of resources and maximized impact.

Expanding supply sources: Increasing the number of suppliers reduces the risk of supply disruptions. Research shows that companies that have alternative sources of supply are better able to cope with challenges such as a pandemic. Analyzing the status of current and potential suppliers helps determine where to strengthen

the supply chain. A comprehensive vulnerability check ensures that new partnerships meet your risk reduction criteria.

The use of automation: The introduction of automated risk management systems increases the speed and accuracy of decision-making. Automation technologies help to effectively reduce risks in the supply chain. Automation implementation planning is a key step for companies seeking to improve their risk management processes.

A systematic approach and effective planning will help the company successfully cope with the challenges of risk management in the supply chain.

Introducing Innovation and Digital Tools: The 2020 World Economic Forum Report clearly highlights the importance of rapid innovation and the use of digital tools to overcome the COVID-19 crisis. Automation plays a key role in supply chain management, providing transparency and control over operations.

Supplier Partnerships: Supplier relationships should be based on trust and transparency. Collaborating with them to identify and mitigate supply chain risks is an important step. Ensuring consistency of business continuity plans between you and suppliers ensures reliable risk management. Honesty in relationships, even in difficult situations, contributes to the construction of long-term and successful risk management strategies.

Measurement and Reporting standards: A key aspect of risk management is the use of high measurement and reporting standards. Reliable data and confidence in the coverage of the entire supply chain by technological means ensure transparency and reliability in risk management. Technological tools for analyzing supply chain failures and creating reports improve the efficiency and accuracy of risk management.

Regular review of the risk management plan: Risk management in the supply chain is an ongoing process. Regular revision of the plan is the key to successful risk reduction. Developing risks require constant analysis and updating of strategies. Periodic updating of the risk management approach ensures adaptation to changing conditions and sustainability in the long term [5].

Innovative companies such as Diligent offer reliable solutions to improve risk management. 57% of large Fortune 100 manufacturing organizations already trust Diligent to improve energy efficiency, increase productivity and stimulate innovation.

By applying advanced technologies and solutions to manage complex supply chains, modern companies are becoming an example in effective risk management. Their experience can serve as a lesson and inspiration for other sectors [6].

2. Building sustainable supply chains

In the face of unexpected disasters and shocks, the question of who will be the weak link in the supply chain becomes especially relevant. Now it's time not just to identify potential weaknesses, but also to engage key segments of the entire product ecosystem, including regional partners in the supply chain.

The experience of recent events has highlighted the importance of diversity in the supply chain, and 89% of managers making strategic decisions in the field of supply support the idea of diversification. At the same time, it is important to develop strategies that take into account flexibility and portability in extreme situations.

Thorough analysis and testing of multiple suppliers and duplication of complex processes guarantee the reliability of the supply chain. Getting assurances from critical vendors that the intended processes are viable is key.

It is critical to implement supply security strategies from the very beginning, including design and inventory management. Supplier guarantees may not always provide reliability after emergency events. Therefore, cooperation with reliable suppliers and the creation of sustainable relationships at the global, regional and local levels are the key to creating a sustainable supply chain. The degree of these relationships should correspond to the established risk threshold of the supplier in order to ensure stability even in the face of unexpected shocks [7].

Following risk reduction strategies in the supply chain, the company develops a unique plan similar to the books "Choose your Own Adventure". This plan, like the scenarios in the book, has different scenarios: if event X happens, go to page 24; if event Y causes global urgent measures, go to page 43. Like the hero of an adventure, the company is ready to move and adapt, minimizing possible losses in the supply chain.

The Factory of the Future plays a key role in this digital ecosystem. By unifying value chains for all suppliers and customers, the company creates unified platforms that manage all aspects, including supplier qualifications, product quality control, and shipment and delivery details. This digital integration not only increases the level of risk management, but also provides outstanding customer service.

As people adjust to new realities after the pandemic, it is important to understand that not all supply chains are the same. The unique requirements of each industry form unique processes and standards in the supply chain. However, the overall goal remains the same: to provide flexibility with minimal risks. Our

experience suggests that active risk management in the supply chain is not only a necessity, but also the key to business continuity.

Shifting the focus from the assumptions about the "gold standard" of supply chains that existed before COVID-19, we are developing a new approach — risk management. Our willingness to change testifies to our ability to develop and adapt. Sustainability is what will ensure a successful future for us [8].

Modern risks and challenges in the world of supply chains require companies not only to adapt, but also to excel in managing complex solutions. Fundamental changes in consumer behavior, market trends and supply chains are taking companies out of their comfort zone. These dynamic changes require immediate reaction and flexibility in actions. Industry leaders should be armed with powerful analytical tools and highly efficient data processing systems. These capabilities become the key to understanding the complexity of the situation, predicting potential failures and promptly deploying responses.

The challenges associated with supply chains are incredibly complex. Global volatility underscores the importance of creating sustainable, reliable supply chains that can withstand unforeseen disruptions in multiple countries. At the same time, rising supply chain costs are becoming the number one problem. Companies face high costs in maintaining and optimizing their operations. This highlights the need for a more effective and sustainable approach.

IT systems, which play a key role in modern supply chains, also pose a serious problem. Expensive to maintain, they are often limited by outdated technologies, making supply chains more vulnerable. Real superiority in supply chain management is possible only through innovative solutions that can challenge current trends and ensure reliability in today's rapidly changing business world [9].

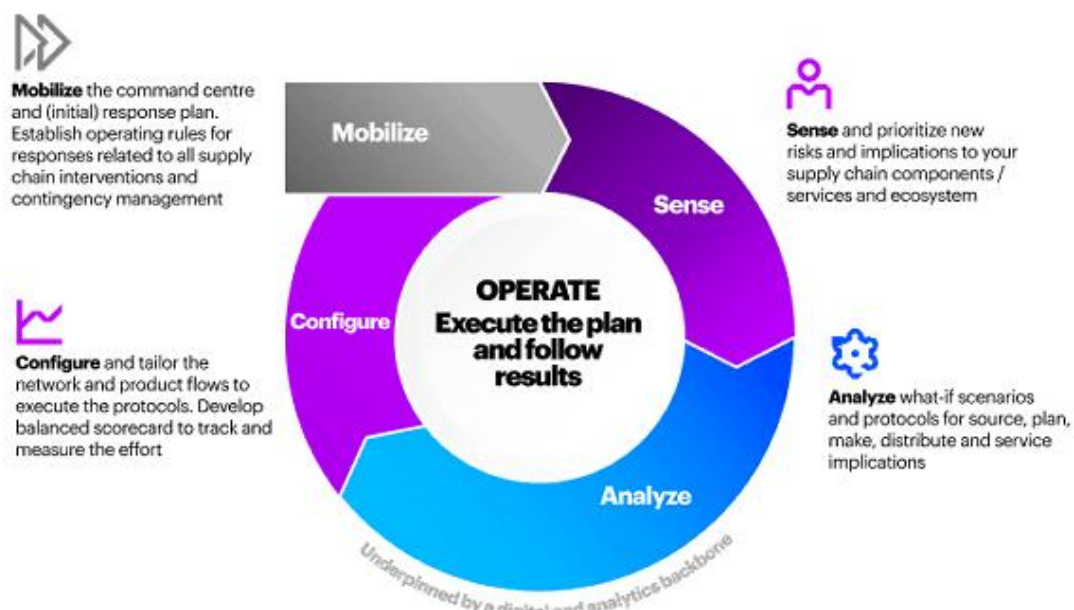


Figure 2. Optimization of supply chain planning

Planners face several critical issues that require instant and precise solutions:

- Volatile demand: Consumer demand is unpredictable, fluctuations of which can be a serious test for the supply chain.
- Shortage of supplies: The absence of key components or goods can paralyze production processes.
- Inventory Management Problems: Effective inventory management is the key to smooth operation, but even a small mistake can lead to serious losses.
- Performance degradation: Technical failures or abnormal situations can dramatically reduce performance.

Standard models and methods are no longer suitable for supply chain planners. They must quickly adapt to the changing situation and make decisions based on real-time data. Their role becomes key - they become the "nerve center", processing and analyzing data, ensuring continuity of processes and minimizing risks. Supply chain planning now requires not only strategic thinking, but also operational readiness to respond to any challenges faced by modern business [10].

3. Examples of companies using different tools in the field of supply chains

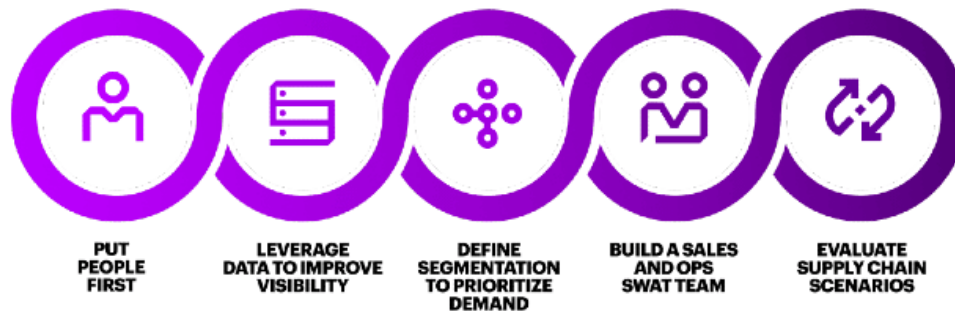


Figure 3. Five supply chain priorities for immediate action

Effective risk management in the supply chain requires the use of a variety of tools and technologies. One of the key methods is to compare relationships with suppliers. Creating detailed maps of supplier relationships is an integral part of the risk management program. However, when it comes to analyzing high-level and low-level suppliers, standard methods may not be effective enough.

Technology companies such as IBM and Achilles provide innovative AI-based solutions to create maps of global supply chains. Their technologies automatically identify potential risks, making the analysis process more accurate and faster. In addition, there are also risks in digital supply chains that require special attention. The use of external data and modern cartographic solutions makes it possible to identify connections at the fourth and fifth levels, as well as points of failure that can significantly increase the risk in the supply chain [11].

To manage environmental risks, organizations are increasingly turning to artificial intelligence and big data analysis. The integration of weather forecasts, real-time infrastructure data and historical data makes it possible to more accurately assess the risks associated with adverse weather conditions. For example, solutions such as Riskpulse provide quantitative risk assessments based on continuously updated data, which helps users make decisions in real time and predict possible delays in deliveries due to adverse weather conditions [12].

The use of advanced technologies and tools, such as artificial intelligence and big data analysis, not only increases the accuracy of risk analysis in the supply chain, but also allows you to quickly respond to changing conditions, minimizing possible losses and ensuring the reliability of supplies.

Checking the code for vulnerabilities is an important step in ensuring software security. Vulnerabilities introduced by third-party vendors pose a serious risk to digital supply chains. These vulnerabilities can be exploited by cybercriminals to organize attacks before they become known to the public. Therefore, it is important to actively search for and eliminate potential weaknesses in the code before they are used for malicious purposes.

There is a wide range of tools available for risk management from third-party vendors. These solutions provide the ability to automate risk assessment and allow you to manage all aspects of third-party risk management (TPRM). Many of them offer ready-made risk assessment templates or the ability to create your own survey forms. Risk assessments are consistent with popular cybersecurity, which allows you to track risk metrics and identify gaps in compliance.

In addition, some risk management solutions can predict security improvements based on vulnerability remediation efforts, which allows you to prioritize vulnerabilities [13].

Geopolitical risks can significantly affect the security and continuity of supply chains. However, the complexities of the political realities of different countries require special knowledge. That is why it is worth turning to solutions for managing geopolitical risks that will help track geopolitical data and identify potential threats in the availability of raw materials or security. These solutions can also take preventive measures and maintain the stability of operations in the supply chain [14,15].

4. Supply strategies

The goal of the supply chain strategy is to maximize the use of the company's resources while reducing warehousing costs and minimizing waste. Effective supply chain management requires clear definition and careful monitoring. It should be based on an analysis of the company's current operations in the supply chain and its long-term goals. The supply chain strategy plan includes the design, implementation and maintenance of the company's supply chain processes and systems.

An effective supply chain strategy takes into account the needs of customers, suppliers and competitors of the company. It analyzes customer preferences and the competitive environment in which the company

operates. This strategy also takes into account the resources and opportunities available to the company and is aimed at their optimal use.

The key types of supply chain strategies consist of:

- **Lean Strategy:** It aims to reduce waste in the supply chain by optimizing processes and reducing inventory levels.
- **Flexible strategy:** This strategy emphasizes the flexibility and speed of the supply chain to respond quickly to market changes and customer needs.
- **Effective Strategy:** The focus is on achieving maximum efficiency in the supply chain to reduce costs and increase clarity in management.
- **Adaptive strategy:** It involves taking into account customer feedback and forecasting demand to adapt supply chain operations to the specific needs of customers.
- **Continuous improvement strategies:** This strategy involves systematic efforts to identify and implement improvements in the supply chain in order to increase efficiency and reduce costs [7].

Conclusion

In conclusion, it can be emphasized that the identification and elimination of losses in the supply chain are critical aspects of the successful functioning of any business. This process not only ensures the optimization of resources and materials, but also contributes to improving the quality of products or services, increasing customer satisfaction and, ultimately, increasing the competitiveness of the company.

A comprehensive guide to identifying and eliminating losses in the supply chain implies a systematic approach to evaluating and optimizing all stages of the business process. It includes analyzing current operations, identifying weaknesses, developing and implementing effective risk management strategies, and taking measures to improve productivity.

Effective use of risk management tools, adaptive strategies and continuous improvement of processes allows not only to minimize losses associated with data leaks, downtime or low-quality products, but also to create a flexible, responsive and sustainable supply chain. This approach provides the company with a competitive advantage, improves its reputation in the market and contributes to long-term success. As a result, investments in identifying and eliminating losses in the supply chain justify themselves, turning into a strategic decision that contributes to the stable development and prosperity of business in today's dynamic market environment.

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