

OnChainRisk

An Online Knowledge Platform for Cross-Company Supply Chain
Risk Management with a Focus on Crisis Situations



User Guide

Version 1.0

Ayman Nagi, M.Sc., MBA

Lukas Tartler, B.Sc.

*A project of the „Institute of Business Logistics and General Management“
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1 The Project and the "OnChainRisk" Website

Over the past two decades, there has been a continued high level of interest in supply chain risk management (SCRM), both in academic and practical settings. Due to the high level of uncertainty and the associated risks in global supply chains, it is of great importance for companies to recognize the range of possible risks and their interconnectedness. In particular, crisis situations such as the current global COVID 19 pandemic clearly demonstrate the vulnerability of companies and their supply chains.

1.1 General Introduction to the Project

The aim of the project "OnChainRisk" is to develop a web-based knowledge platform for the implementation of a cross-company SCRM for crisis situations. This knowledge platform was developed as part of the project "Development of an online knowledge platform for cross-company supply chain risk management in crisis situations", which was funded by the Hamburg Authority for Science, Research, Equality and Districts (BWFG) through the Calls for Transfer (C4T) program.

By using the online knowledge platform, companies have access to methods and approaches as well as detailed guides for implementing cross-company SCRM. User guides and results from the expert interviews will also be incorporated into the online platform so that companies can create an initial SCRM roadmap.

1.2 General Introduction to the Knowledge Platform

The knowledge platform "OnChainRisk" was developed within Work Packages 3 and 4 of the overall projects and followed a comprehensive literature research and interview study.

Based on the results of this research and the requirements identified, the website was successively developed to its current state. The largely HTML-based website is administered via the content management system Drupal, which allows continuous improvement and updating of the website content and contributions without any problems. "OnChainRisk" is also suitable for mobile devices, but for full functionality the use of a conventional desktop browser is recommended. This user manual is written for this use.

2 The Structure of the "OnChainRisk" Knowledge Platform

This user guide is intended to provide detailed instructions on how to use the OnChainRisk website. The website can be accessed under <https://onchainrisk.logu.tuhh.de/en>.

2.1 Basic Navigation

The individual menu items can be found in the navigation ribbon at the top of the screen. They can be accessed by left-clicking and can be found on every page of the knowledge platform. If a menu item has further submenu items, these are displayed in the form of a drop-down menu when the mouse pointer hovers over the respective menu item and can also be called up by left-clicking. This is exemplarily shown for the submenu items of the "Process" menu item in Figure 1. It is important to note that the drop-down menus only remain active as long as the mouse pointer is over the respective menu item or in the drop-down menu.



Figure 1: Function of a Drop-Down Menu

On all pages of the knowledge platform OnChainRisk the user will find various recurring features and functions.

Content structure is created by using so-called accordion elements (see Figure 2), which the user can expand and collapse by left-clicking on a heading. If an accordion element is expanded, other already opened elements are automatically collapsed.

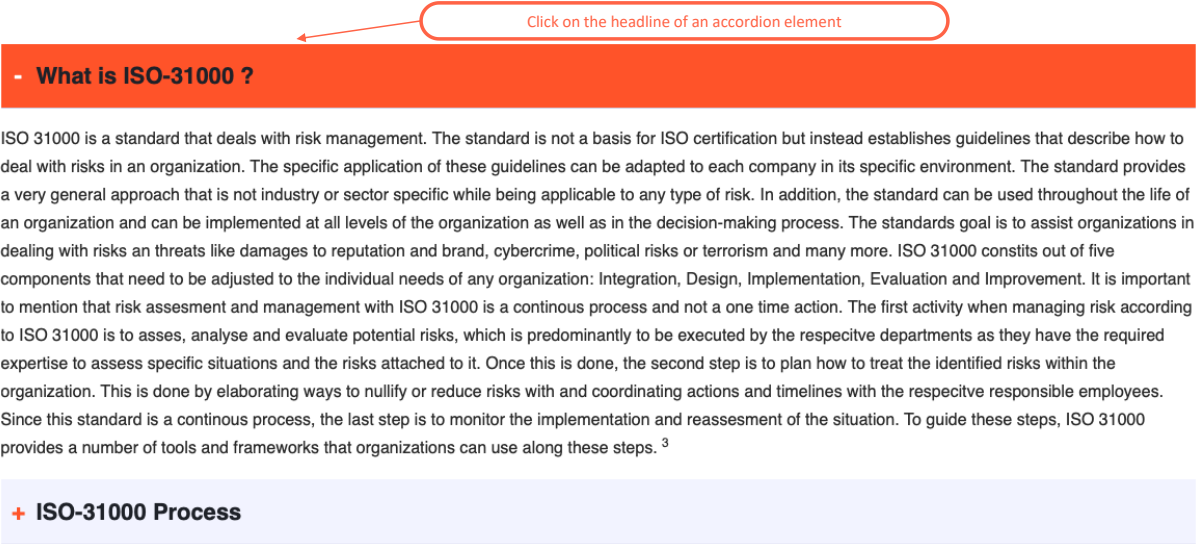


Figure 2: Clicking an accordion element using the example of the ISO 31000

To link to other OnChainRisk pages or external websites, OnChainRisk provides three navigation elements. Simple text linking as shown in Figure 7 under “Sources”, linking via link button (see Figure 3) or linking via content box (see Figure 4). Navigation via link button and content box is done by moving the mouse pointer over the button or box, which are then highlighted in colour. The linked and clickable text is also easily recognizable by a colour change.

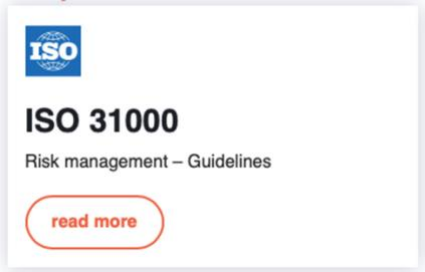


Figure 3: Clickable link button "read more" using the example of ISO 31000



Figure 4: Hovering with mouse pointer over content box using SCRM processes as an example

References to literature and external sources are shown with superscript numbers and, if applicable, page references. The complete references can be found in the "Literature" section (see section 2.12). If available, pages are also indicated with the source number. Multiple sources are separated by ";". In the example in Figure 5 it is page 22 of source 18. OnChainRisk assumes no liability for the content on external websites.

“Resilience implies flexibility and agility.”¹⁸, p.22

Figure 5: Sources and, if applicable, page references using SC Resilience as an example

2.2 Menu Structure and Related Chapters in this User Guide

The structure of this user manual is based on the structure of the OnChainRisk website and is shown in Figure 6 with the corresponding chapter numbers.

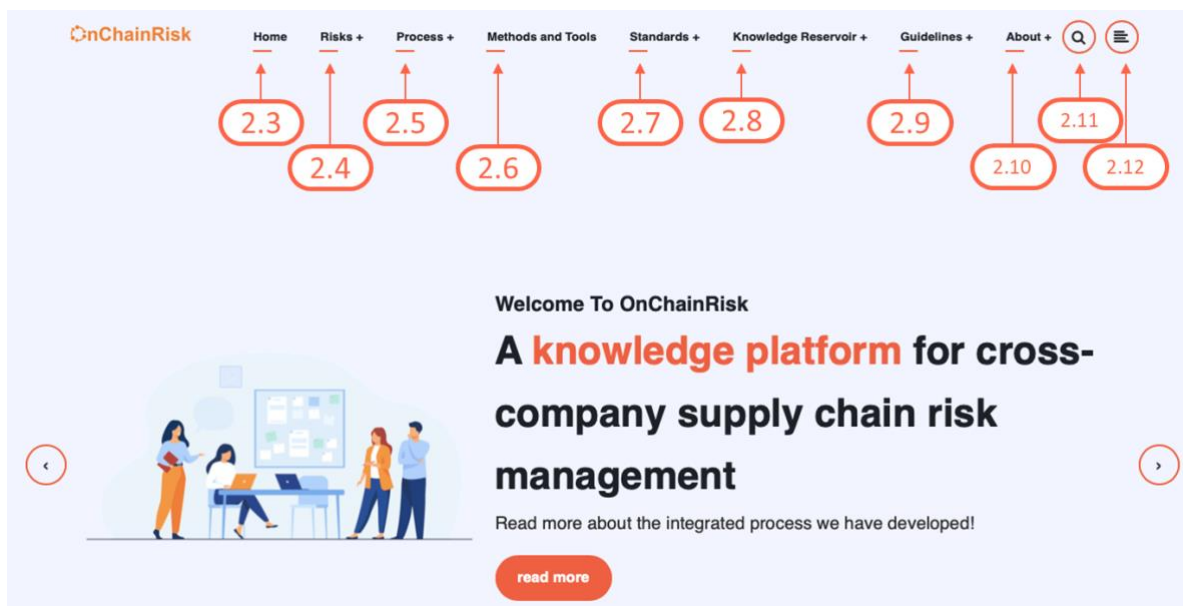


Figure 6: OnChainRisk menu items and corresponding chapters in the user guide

2.3 Home

The homepage as landing page is used for the first contact with interested visitors and presents the basic intention as well as the service of the online knowledge platform. A navigation bar at the top of the page is used for clear navigation, and more detailed drop-down menus are used to find exact content (see Figure 1 and Figure 6).

2.4 Risks

Risks are then presented in general terms. After this introduction, different types of risk, their occurrence, measures for prevention or mitigation and possible effects in the

event of a risk event that companies have to reckon with are presented in more detail. These include supply, process, control, demand, natural and IT risks. In addition, the "Risks" section contains chronologically sorted news reports from the leading risk management information platform "risk.net".

2.5 Process

After introducing the types of risk, various risk management processes are presented. The decisive added value of OnChainRisk lies in the linking of these different processes as well as a detailed description of how the processes influence each other. Users of OnChainRisk can thus follow a holistic risk management process and take preventive action well before a risk event occurs or, in the event of an acute crisis situation, use the same process chain presented to minimize the impact.

2.6 Methods and Tools

To implement these measures for prevention but also for mitigation purposes, the OnChainRisk website provides comprehensive methods and tools from science and practice.

2.7 Standards

Relevant standards in the field of risk management and risk prevention provide a clear framework for any risk management project. Companies that use OnChainRisk to learn about risk management should take note of these standards and follow the principles they contain to the best of their ability. OnChainRisk therefore provides a brief overview of each standard and briefly presents the process contained in the standard. For more detailed information, please refer to the International Standardization Organization (ISO) website.

2.8 Knowledge Reservoir

The Knowledge Reservoir section provides users with an overview of key supply chain risk management measures in crisis situations, real-world examples and related research articles, as well as a supplier database, blogs, and the opportunity to contribute to OnChainRisk content themselves.

2.8.1 Catalogue of Measures

In the catalogue of measures, users are presented with various measures based on risk types (see above) and the consequences of a potentially occurring risk. Filtering with regard to the six risk types presented is offered via a drop-down menu.

2.8.2 Risk Examples

In the risk examples section, users can filter the database by risk type, industry, and maturity of the measures to be taken, and use linked sources to get detailed information about best practices from government agencies and international companies. Figure 7 serves to explain this feature.

Drop-down menu for selecting the risk category according to chapter 3.1

Drop-down menu to select the business sector

Drop-down menu for selecting the type of measure by maturity

Overview table filtered according to the above criteria

#	Risk category	Risk Description	Sector	Approaches/Measures (Description)	Approaches/measures (Type)	Source
1	Natural risks	Thailand flood in 2011	Electronics	Move production to a third factory in Thailand.	Reactive measures	Link
2	Natural risks	Hurricane Isaac	General	1. Selecting potential suppliers 2. Backups in unaffected geographic regions 3. Using information systems for sharing and collaborating across networks of companies	Reactive measures	Source

Figure 7: Function of the "Risk examples" page

2.8.3 Related Research Contributions

The Related Research Papers page lists relevant research conducted at „Institute of Business Logistics and General Management“ at the „Hamburg University of Technology“.

2.8.4 Find a Supplier

The supplier search function is intended to enable companies in acute crisis situations to quickly and easily find a suitable alternative supplier for their industry and geographical location in the event of a supplier failing at short notice. This page can and should benefit significantly from the "Contribute" feature (see section 2.8.5) of the OnChainRisk page.

2.8.5 Contribute

The "Contribute" feature allows users to anonymously share experiences, best practices, or other valuable contributions on demand by specifying an overarching risk category and assessing the contribution type itself.

2.8.6 Blog

In the "Blog" area, relevant and current topics are made available to users in a prepared form and linked. This feature is continuously updated by the OnChainRisk content editors.

2.9 Guidelines

The guidelines section provides users with detailed information on SCRM processes in crisis situations, as well as an interactive six-step guide to implementing a crisis management plan.

2.9.1 SCRM in Crisis Situations

The section SCRM in Crisis Situations is one of the main sections of the OnChainRisk website. It explains how SCRM, digitalization of processes, supply chain resilience and collaboration act together to achieve a desired result (taking action and mitigation) in the event of an acute crisis situation. In addition, the key points that are important when collaborating with supply chain partners are pointed out.

2.9.2 Crisis Management Plan

The interactive crisis management plan presented is an expanded and adapted version of the plan from Crandall et al. (2013). With the help of this "blueprint", companies can take effective measures to manage a crisis situation and thus avert (further) damage to their own supply and value chain. This crisis management plan comprises six steps that can be navigated step-by-step using the "Previous", "Next" and "Reset" buttons. This is shown in Figure 8. Section 3.5 describes the steps for developing and implementing a crisis management plan in detail.



It is important to determine the roles and responsibilities within the CMT:

1. The process owner of the team, and
2. Communication manager to coordinate and communicate the consequences and measures along the supply chain.

< Previous Next > Reset

The crisis management plan is an expanded and adjusted version of the plan authored by Crandall et al. (2013)¹

Navigation buttons in the six-step crisis management plan

Figure 8: Navigation buttons of the crisis management plan using the example of step 3

2.9.3 User Guide

In addition, this user manual is linked in the user guide section.

2.10 About

In the section "About us" the team of Institute of Business Logistics and General Management at the Hamburg University of Technology, who were involved in the project, are introduced, users are given the opportunity to contact us as well as information about the imprint and data protection.

2.11 Search Function

Using the search function, you can search the entire OnChainRisk website by keyword.

2.12 Side Menu

In the side menu you get the possibility to switch between German and English language as well as to get to the bibliography. In addition, the sidebar contains the references for graphics or icons used.

3 The Overall OnChainRisk Process

The overall process of OnChainRisk was developed based on a comprehensive literature review. The results of this research were based on the so-called butterfly model of Sodhi (2012) to form a comprehensive overall process.

3.1 An Integrated Process for Collaborative SCRM in Crisis Situations

At the core of every Risk Management Process lies the possible occurrence of a Risk Event. The Butterfly Model explains the events preceding and subsequent events and efforts of a Risk Event. In order to reduce the chance of a Risk Event occurrence and to mitigate the effects once a Risk Event has occurred, an organization should consider several essential processes and aspects. These six processes are:

- Supply Chain Risk Management
- Supply Chain Risk Governance
- Supply Chain Resilience
- Business Continuity Management
- Crisis Management
- Collaboration

All of these processes are inter-connected and have specific functions and reach within the introduced Butterfly understanding of risk.

3.2 Linking with the Overall Process

The core process is Supply Chain Risk Management with its own six phases ranging from Identification to Communication. SCRM thereby describes the process of minimizing the occurrence of a Risk Event and the effects of a Risk Event in the Supply Chain Context (ISO). Connected with the SCRM is Supply Chain Resilience (SCR), as it requires a functioning SCRM that makes the SC more resilient to various disruptions. SCR is connected to Identification Phase of the SCRM since the last steps of SCR include the consolidation of a list of identified SC risks, whereas this list can only be composed for the entire supply chain if all SC partners ensure proper transparency, efficient communication, and are aware of possible risks that could occur along the value chain.

Additional input-processes for SCRM are Supply Chain Risk Governance (SCRG) and Collaboration. SCRG is a major requirement for functioning SCRM since governance provides a mechanism to periodically review supply chain risks and the corresponding

mitigation measures (i.e. monitoring phase of the SCRM). The SCRG as well as the overall SCRM process additionally require a good Collaboration with participants representing every node of the value chain, so that knowledge transfer as well as data and information sharing can be used for the efficient assessment and treatment of risks. A structured SCRG can be a driving force for a strong Collaboration in a SC.

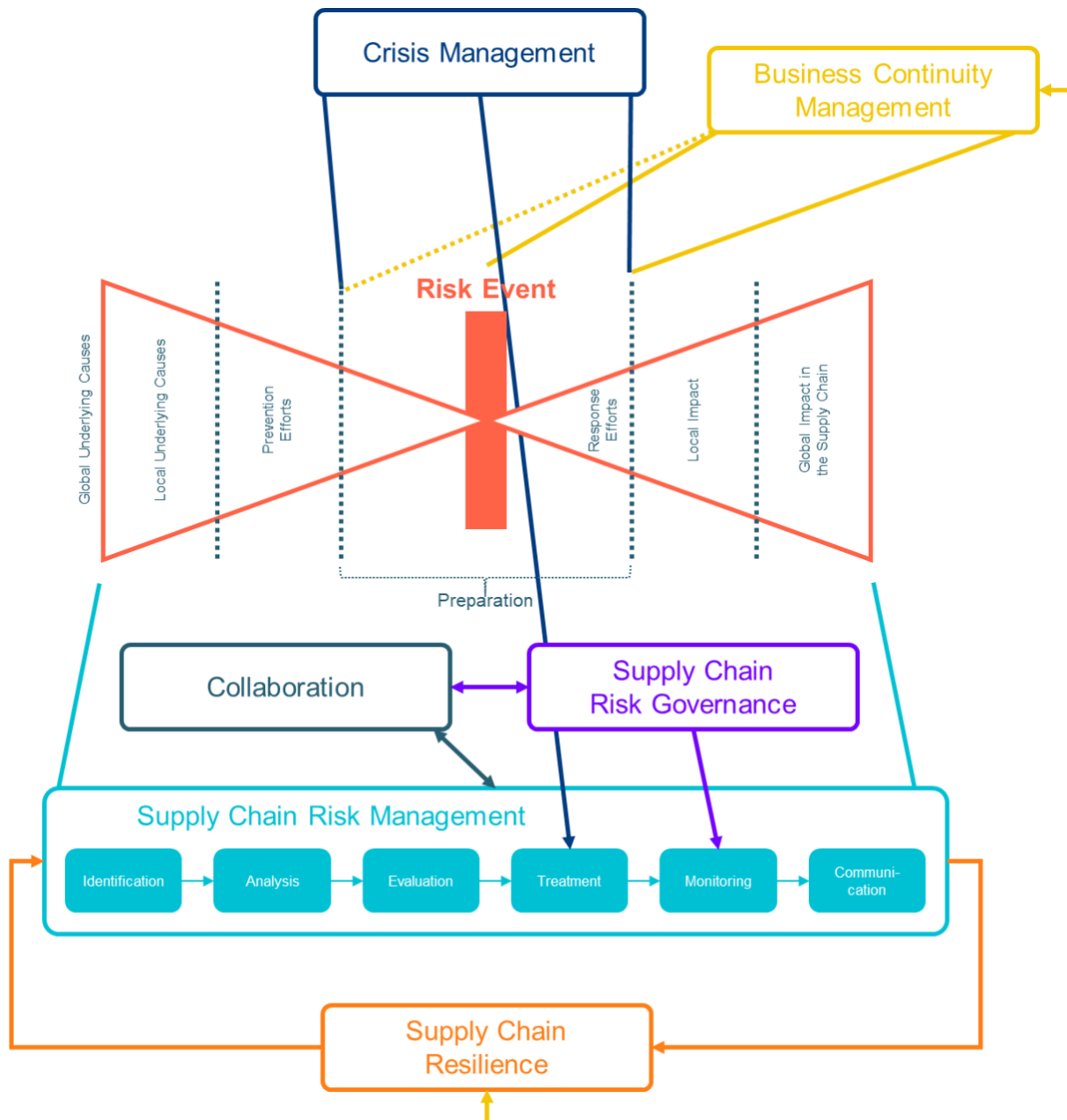


Figure 9: The overall process of OnChainRisk (own representation based on Sodhi (2012))

In contrast to SCRM, Crisis Management (CM) and Business Continuity Management (BCM) are located in the more immediate vicinity of a Risk Event. CM is called into action as soon as the immediate occurrence of a Risk Event with high severity becomes evident, whereas the execution of BCM is entirely reactive only after a Risk

Event has occurred. CM therefore also has a connection to the Treatment Phase of SCRM, as it can be influential to the overall mitigation of a Risk Event. Additionally, BCM, and SCR influence each other, by pre-emptively developing BCM plans.

3.3 Supply Chain Risk Management in Crisis Situations

Supply Chain Risk Management is an essential pillar in the field of Supply Chain Management and identifies, prevents and mitigates internal and external risks that can affect the smooth running or even the basic function of a Supply Chain. Particularly in crisis situations, i.e. when the Supply Chain is already disrupted or when identified risks indicate an immediate disruption, the continuation of SCRM measures is of great importance. The following points are particularly important with regard to SCRM in crisis situations:

- Avoiding crises if possible
- Early identification of crisis situations
- Detailed view of the Supply Chain and its structures (visibility)
- Flexible options for action
- Quick reaction time

The core of the SCRM process in crisis situations is traditional SCRM, which is, however, supported by digital tools in the Pre-Crisis and In-Crisis phases. In the run-up to or at the onset of an acute crisis situation, a resiliently structured Supply Chain is advantageous, which is supported by digital options and benefits greatly from Supply Chain-wide stakeholder collaboration. The better these four factors are coordinated and implemented in a Supply Chain, the faster an adequate response can be made to a crisis situation.

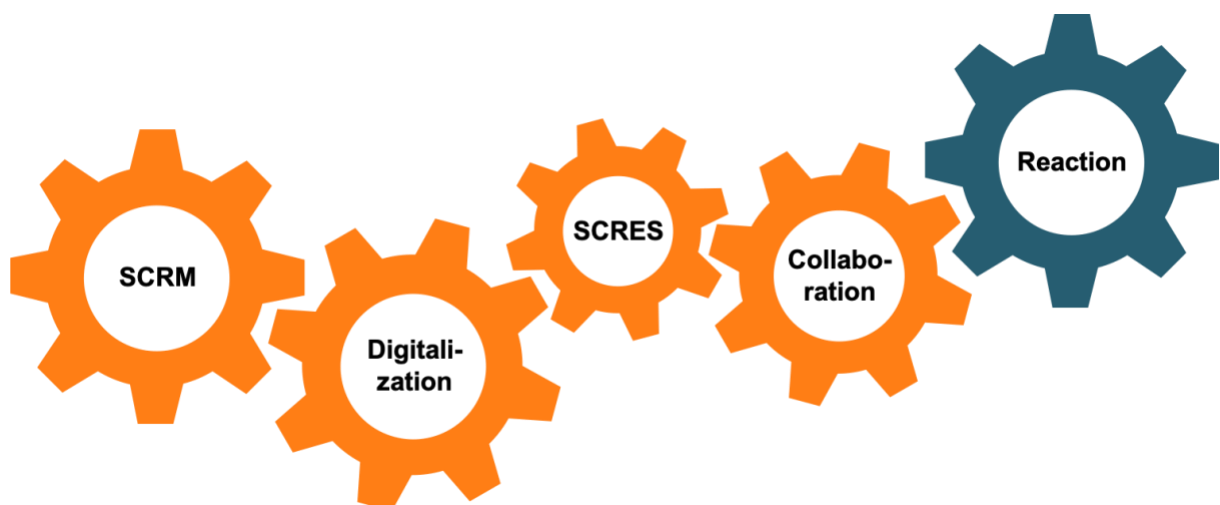


Figure 10: Five steps of SCRM in crisis situations

3.3.1 Supply Chain Risk Management

The basis of the concept is SCRM and its organizational integration. To this end, companies should implement a systematic SCRM process in the specialist departments of the supply chain (e.g. purchasing, logistics, production, quality management, sales, etc.). The information from these processes should be combined across departments in order to exploit synergy effects and possibly implement measures jointly. The goal is to increase the effectiveness and efficiency of the processes by allowing all departments to benefit from a better information situation and to avoid measures with negative effects on other departments of the company. For this purpose, the digital mapping of process steps is advantageous, as this allows all information to be brought together digitally and made accessible to the relevant persons or employees. In this way, the company actively promotes the internal exchange of information and ensures transparent documentation of the risks and measures as well as the underlying processes. With the help of these measures, SCRM and risk management in general should be actively integrated into the structures and decisions of the company in the next step in order to establish a risk-conscious culture among all employees of the company. In the course of this, it is of great importance, particularly with regard to crisis situations, to implement clear decision-making structures and an awareness of the need for rapid decision-making paths in crises within the company.

Good and comprehensive SCRM is to be implemented iteratively in six steps and can be done systematically using standards, guidelines and best practices. For more information, please refer to our SCRM Overview incl. the six steps, to the ISO 31000 Standard, as well as different Methods and Tools for a step-by-step implementation of successful SCRM.

3.3.2 Digitalisation

In the course of digitalization, risk identification can be simplified and made clearer for companies by digitally mapping the supply chain. In addition, AI-supported tools offer the possibility of automatically merging large volumes of data from external sources, making them clearly accessible to employees and updating them regularly. Especially in the case of complex global supply chains, which are to be mapped beyond tier 1 partners, this type of tool offers an enormous simplification of the process and has a strong positive influence on transparency and visibility.

For more information on which digital tools can be used in which capacity to support SCRM, please refer to our overview of Methods and Tools as well as to the section of improving Visibility on the Supply Chain Resilience site.

3.3.3 Supply Chain Resilience

There should also be a focus on strengthening Supply Chain Resilience (SCRES) and explicitly building flexible capacity to limit or reduce the impact of unpredictable risk events. The goal of this is to safeguard potentially vulnerable points in the supply chain. Potential measures in this area include the qualification of personnel for various activities, the establishment of second-source suppliers with contractually defined flexible capacities, short-term contract terms, flexible capacities at logistics service providers, and the differentiation of supplier locations to limit the influence of local risks or crises. In addition, reducing the complexity of supply chain structures can be considered to increase the visibility of the company. Business continuity plans can be developed for specifically defined risk scenarios so that pre-planned measures can be initiated in the event of occurrence. A strategy that aims to build up redundancies can also be implemented, but this must be analyzed and assessed in detail beforehand in terms of its impact on the company's liquidity, particularly with regard to crisis situations. It should also be taken into account that strategies such as the classic increase in coverage through buffer stocks may be subject to a time limit in terms of their effect.

The SCRES processes and the development of business continuity plans as part of business continuity management are closely linked. Achieving a more resilient supply chain consists of four steps with respective tasks that include elements from business continuity management or collaboration. For more details on SCRES, BCM or Collaboration please refer to our detailed explanations on the respective topics.

3.3.4 Collaboration

If the previously described recommendations for action have been successfully implemented and consolidated in the company, an extension of SCRM to the cross-company level can be considered. However, it is necessary to first define the relationship with the respective partner, as companies should assess the type of cooperation with other companies based on the trust placed, the underlying dependency and possibly different business strategies. Companies can and should cooperate with different companies within their supply chain in different ways and with different intensity. Once the type and intensity of collaboration is determined, cross-

company SCRM initiatives can be launched. In the simplest form, this can take place in the context of knowledge exchange, for example in the course of supplier development programs. The goal of this is to benefit from the different expertise in the partner companies in order to increase the profitability of the individual companies. A further step could be the implementation of a formal process of information exchange between the companies in order to improve the information base and thus also the basis for the companies' decision-making. The final step of collaborative SCRM also includes the joint development and implementation of risk treatment measures. The basis for all forms of collaborative SCRM is the general cooperation and mutual trust of the partners.

To successfully implement Supply Chain Wide Collaboration, different types of Collaboration as well as the closely interlinked Supply Chain Risk Governance are to be respected.

3.3.5 Reaction

The basis of all action in such situations is a solid information situation across all departments of the company, as crises can have a wide range of effects on different areas of the company. For example, supply chains and thus supply can be threatened, but at the same time demand can also fluctuate extremely. The effects of the crisis as well as the implemented measures should therefore always be considered with regard to the entire company. In addition, crises can bring about rapid changes in situations and thus also in the requirements for SCRM, so that it may be necessary to shorten the update cycle in order to create risk transparency. In the best case, companies act on the basis of daily updated data, which underlines the advantages of digital tools. Due to the threat to the company's existence associated with the crisis, an assessment of the measures to be implemented in terms of their impact on the company's liquidity is imperative. In addition to rapid decision-making, in the context of crises, the identification of specific crisis impacts and the implementation of specific measures can also influence the speed of the crisis progression for the company. In the course of this, business continuity plans with pre-planned measures can bring about a higher speed. In addition to measures to mitigate the crises, strategies and measures to restore full performance should also be developed at the same time as part of ramp-up plans. These are used to plan the resumption of regular business activities after the crisis has been overcome.

3.3.6 What should be considered when collaborating with Supply Chain partners?

When collaborating with supply chain partners, risk transparency, monitoring the liquidity situation, synchronization of supply and demand, acceleration of decision-making are particularly important and should be taken into account.

3.3.6.1 Risk Transparency

Crises can bring rapid changes in situations and thus also in the requirements for SCRM, so that it may be necessary to shorten the update cycle in order to create risk transparency. In the best case, companies should act on the basis of daily updated data, which underlines the advantages of digital tools.

3.3.6.2 Monitoring the Liquidity Situation

An assessment of the measures to be implemented in terms of their impact on the company's liquidity is imperative in crisis situations.

3.3.6.3 Demand - Supply Synchronization

Um die Liquidität des Unternehmens zu erhalten, sollten Angebot und Nachfrage stets berücksichtigt und aufeinander abgestimmt werden.

3.3.6.4 Decision-Making Acceleration

The short-term changes in the situation during crises also require companies to react quickly. In this case, the installation of a crisis team with the aim of accelerating decision-making can be expedient. Details on the development of a crisis management plan are given in section 3.4.

3.4 Crisis Management Plan

The crisis management plan presented by OnChainRisk is an expanded and adapted version of the plan presented by Crandall et al. (2013).

3.4.1 Purpose

A crisis management plan is initially based on a crisis management team (CMT), which must comply with the following activities:

- Identify crisis threats to which the supply chain may be exposed
- Identify crisis threats to which the supply chain may be exposed
- Identify crisis threats to which the supply chain may be exposed
- Lead post-crisis monitoring and evaluation to identify lessons learned and potential for improvement

3.4.2 CMT Members and Contact Information

For an effective crisis management plan, the names and contact information of all CMT members should be tabulated. This allows responsibilities to be reliably tracked and facilitates quick and targeted communication in the event of a crisis. An example list for recording and displaying CMT members and contact information in Figure 11 can be found at the bottom of the page. The list can be extended to include the relevant data of the CMT members and their contact information.

CMT Members and Contact Information

Name	Communication mean	Online ID	Phone	E-Mail
Example	Example	Example	Example	Example

Figure 11: List for recording and displaying CMT members and contact information.

3.4.3 Role and Responsibilities of the CMT

With the help of the CMT Record, members and their contact information, roles and responsibilities within the CMT can now be defined in the event of a crisis. In particular, the process owner of the team as well as the communication manager for coordinating and communicating the consequences and measures along the supply chain must be defined here. The assignment can also be made, for example, via the list shown in Figure 11.

3.4.4 Location of the SC Risk Center

In order to ensure central and efficient control of all crisis management measures, it is recommended to set up a so-called SC risk center where all decision-makers and other central team members can be gathered. This SC risk center can be set up either physically or virtually. In both cases, the building and room number, or access data or phone numbers for virtual rooms, must be documented and communicated to all relevant stakeholders. In the case of a physical risk center, the room should be equipped with communications technology to communicate with other CMT members from other companies in the supply chain. In the case of a virtual risk center, ensure that all CMT members involved have the appropriate infrastructure.

3.5 Catalogue of Measures

Once all team members have been identified and preparations such as a SC risk center have been made for a possible crisis situation, a list of actions should be developed. The CMT should identify the types of crises that may occur in the supply chain. A PEST analysis can be used to identify crises that may result from the economic environment,

for example. Actions, business continuity plans, and contingency plans can then be assigned to each identified crisis. The template for conducting a PEST analysis can be Figure 12 to be taken from.

PEST Analysis

Crises from political/legal environment	Crises from economic environment	Crises from social environment	Crises from technological environment

Figure 12: Template for performing a PEST analysis

3.6 Activation of the CMT Team

Once these steps have been completed, the preparation of a crisis management plan is complete. In the event of an acute crisis, the following points must be completed in chronological order:

- In the event of a crisis, the CMT is activated by the process owner.
- After the CMT is activated, the other team members are notified.
- The process owner communicates responsibilities and actions based on the nature of the crisis.
- The CMT meets in a virtual session under a designated online ID and password to discuss further mitigation strategies and actions to address the specific crisis.
- CMT members within the organization should meet in a communications center to implement and communicate the actions identified.

4 References

Crandall, W. R., Parnell, J. A. and Spillan, J. E. (2013) *Crisis Management: Leading in the New Strategy Landscape* [Online], SAGE Publications. Available at <https://us.sagepub.com/en-us/nam/book/crisis-management-1>.

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Sodhi, M. S. (2012) *Managing Supply Chain Risk* [Online], Boston, MA, Springer US. Available at <http://swb.ebib.com/patron/FullRecord.aspx?p=884405>.