

# **CREATING SUPPLY CHAIN EXCELLENCE DURING CORONA PANDEMIC**

Swisstec Sourcing Vietnam Ltd.

## Abstract

Author(s) Dang, Nguyen Minh An	Type of publication Bachelor's Thesis	Published Autumn 2020
	Number of pages 54 pages	
Title of publication CREATING SUPPLY CHAIN EXCELLENCE DURING CORONA PANDEMIC Swisstec Sourcing Vietnam Ltd.		
Name of Degree Bachelor of Business Administration		
<p>Abstract</p> <p>Throughout history, the supply chain has always faced inevitable risks, for example, Japanese's earthquake and tsunami, volcano eruption in Iceland, Thailand's floods, hurricanes in the United States. However, the impact of these disasters on the supply chain is incomparable to the Corona pandemic, with the lock-down situations in many Asian countries, they have created global supply chain disruption. Many companies found themselves unprepared for the pandemic. External risks are inevitable, however, with excellent internal management, these risks can be mini-mized. Many researches were conducted and many concepts related to supply chain management were introduced to help companies give a better performance of their whole supply chain.</p> <p>The aim of this thesis is to detect the infection of Covid-19 pandemic on the global supply chain network, to understand the supply chain excellence concept and to apply it into businesses in order to adapt to the pandemic disruption and be prepared for a similar situation in future. The final goal is to analyze the difficulties which the case company faced during the pandemic and give suggestions of how to move its supply network to an excellent supply chain during the Corona pandemic.</p> <p>The thesis is written using a deductive reasoning approach, using only qualitative methods of research. Qualitative methods are used to interpret interview responses. Primary data was collected from the interviews of three representatives. The secondary information is collected from various reliable sources, for example, books, articles, and internet sources in order to support the primary data.</p> <p>The study results of the analysis show that Swisstec Sourcing is managing their supply chain in a excellent way, with all commitments under the 4R's concept. However, they needs to improve their supply chain risk management and be more proactive in handling the risks.</p>		
<p>Keywords</p> <p>Supply chain excellence, supply chain risk management, mitigating Corona pandemic impaction, improvement.</p>		

## CONTENTS

1	INTRODUCTION .....	1
1.1	Thesis background .....	1
1.2	Thesis objectives, research questions and limitations .....	2
1.3	Theoretical framework .....	3
1.4	Research methodology and data collection.....	4
1.5	Thesis structure .....	6
2	SUPPLY CHAIN EXCELLENCE .....	9
2.1	Supply chain management .....	9
2.1.1	Competitive advantages .....	10
2.1.2	Value chain.....	12
2.1.3	Integrated supply chain.....	14
2.1.4	The 4'Rs concept.....	16
2.2	Responsiveness in supply chain .....	17
2.2.1	The synchronous supply chain.....	17
2.2.2	The agile supply chain .....	18
2.2.3	Complexity in supply chain .....	20
2.2.4	Route map to responsive supply chain .....	21
2.3	Improving reliability and relationships .....	22
2.3.1	Collaboration and trust in the supply chain.....	22
2.3.2	Managing the supply chain as a network .....	23
3	MITIGATE CORONAVIRUS PANDEMIC.....	25
3.1	Supply chain risk management .....	25
3.1.1	Understanding the supply chain risk profile.....	25
3.1.2	Achieving supply chain resilience .....	26
3.2	Coronavirus impact on supply chain.....	27
4	CASE COMPANY – SWISSTEC SOURCING.....	31
4.1	Company background.....	31
4.1.1	History .....	31
4.1.2	Company services .....	31
4.1.3	Company's warehouse and packaging facility.....	33
4.2	Company vision, mission and values .....	33
4.3	Supply chain network.....	34
4.3.1	Supply chain model .....	34
4.3.2	Safety and healthcare during the pandemic .....	34
5	EMPIRICAL RESEARCH AND DATA ANALYSIS.....	36

5.1	Design and formulation of the empirical research .....	36
5.2	Data collection .....	37
5.3	Data analysis .....	38
5.3.1	Case company interview analysis .....	38
5.3.2	Valio interview analysis.....	39
5.3.3	SKF interview analysis.....	40
5.3.4	Conclusion on global supply chain.....	41
6	RECOMMENDATION .....	42
7	CONCLUSION.....	45
7.1	Answers to research questions .....	45
7.2	Validity and reliability .....	47
7.3	Suggestions on further research .....	48
8	SUMMARY .....	49
	LIST OF REFERENCES .....	50
	APPENDIX .....	55

# 1 INTRODUCTION

## 1.1 Thesis background

The first case of coronavirus infection was found in Wuhan, China. On December 31st, there were dozens of cases confirmed by the health authorities in Wuhan. Days later, the corona pandemic spread across Asian countries. At the same time, there was no evidence to show that the virus could be spread by humans. However, that information was proven wrong. The pandemic spread out at a fast pace across the globe as did the fear of many people. (Taylor 2020.) At the start of May 2020, there were more than four million affected cases, and more than 250,000 deaths worldwide (Worldometer 2020).

Concerning the risks of spread, most of the countries locked down borders and enacted the quarantine policy. Thus the global supply chain networks were severely interrupted due to this policy. Especially the lock down of China brought many difficulties for businesses around the world. This was because China is the biggest exporter which provides materials and commodities around the globe. Supply disruption forced the production chain to stagnate. (Lin & Lanng 2020.)

Furthermore, when the coronavirus was declared to be a global health emergency, people rushed to buy foodstuffs and especially hand sanitizers and toilet paper. This created uncertainty in the demand and disturbed supply chain operations. The consumer experienced the pain of empty aisles and suffering due to the shortage of supply; retailers lost their potential sales, distributors competed against each other to gain the shortage of products from suppliers and manufacturers were overwhelmed with sudden and unpredictable spikes in demand. (Reese 2020.)

Businesses which only hope for the pandemic to end soon and do not have any actions to overcome the situations, they will cope with many difficulties in the present and future. On the other hand, for those businesses who are trying their best to adapt to the new situation and improve their supply network, they will be fully prepared in the future and stay stable when the crisis happens again. Therefore, businesses have to take disruption as a new normal and take it into account when mapping their supply chain networks. Creating a supply chain excellence not only to cope with the pandemic situation but also to be prepared for inevitable risks in the future. (Choi, Rogers & Vakil 2020.)

The motivation for writing this thesis is to satisfy the curiosity about how the supply chain operates during the Coronavirus pandemic and the impact of the pandemic on the global supply. Moreover, the author also wanted a deeper understanding about the urgent need to

design a smarter, stronger and more flexible supply chains during this crisis. Furthermore, finding a solution to help businesses overcome this crisis is also important.

The case company in this thesis is a sourcing supplier called Swisstec Sourcing Viet Nam Co. Ltd. Swisstec Sourcing acts as distributor in the supply chain network system, which means they receive the orders from customers, then send the order to the suppliers and deliver products or materials to the customers. The research aims to help the company develop its supply chain networks and to be more resilient to risks.

## 1.2 Thesis objectives, research questions and limitations

The objectives of the study are viewed as proof of the meaning and intent of the researcher for the research. The research goals are used to illustrate to the reader how and through what steps the research questions are answered. Research is carried out for a number of reasons, which in turn depends on the goals of any specific research problem. (Adams 2007, 19-20.) While problem formulation serves to explain the intent of the study, the objectives provide an accurate description of the concrete actions that must be taken to achieve this goal. As with the formulation of problems, the ultimate purpose should be presented in one sentence. (Better Thesis 2020.)

The aim of the thesis is to introduce the concept of supply chain excellence and its possibilities to the readers. The necessity of creating a 4Rs – responsiveness, reliability, resilient and relationships in the supply chain is also presented. The impact of Coronavirus pandemic on the global supply chain and how the company dealt with it is mentioned. The author does not aim to find solutions for businesses during the pandemic but to help businesses be better prepared for the possibility of risks in the future. Applying from all researches, the suggestions are made for the case company.

A development plan relating to supply chain excellence for the case firm is made as a result of the report. The main aim of this is to provide ideas and recommendations to the case company on how to develop their supply chain networks to optimize its supply system.

Sufficient research questions would create a solid foundation for the study, which is essential for unraveling queries and providing insight into the problem. Research question describes the problem and directs the approach to methodology. A strong research question supports a oriented arguable concept and a rational argument building. Therefore, the formulation of a good research question is one of the first crucial steps in the research process. (Anand & Ratan 2019.)

The main research question in the thesis is:

How should the case company develop a resilient supply chain to mitigate the impact of Coronavirus pandemic and be prepared for inevitable risks in the future?

Sub-questions are rather narrower issues. They are relevant because they provide the 'skeleton' in which information can be sought to address the key research question. (Urbræ AHS Research Project B 2020.) The sub-questions for the thesis are:

What are the steps for creating a supply chain excellence in business?

What influences will excellent supply chains have in order to mitigate the pandemic's impact?

How does Coronavirus pandemic reshape the supply chain?

Limitations in research is important because it identifies a clearer goal and minimizes the range of scope during the research process. The awareness of limitations helps the reader acknowledge the scope of the author's work and avoid overthinking the situation. (Business Research Methodology 2020.)

This research was conducted based on the case company Swisstec Sourcing Ltd. All profiles and information used in this research are provided by the case company. Therefore, recommendations or conclusions which are given may be not be suitable to apply to other companies. Moreover, the world is developing at a fast pace and the market is always in constant volatility, consequently, the results of this study may not be relevant after a few years. However, the research provides relevant information for the case company and should help them overcome the Corona pandemic by creating a resilient supply chain.

### 1.3 Theoretical framework

The thesis helps Swisstec Sourcing Viet Nam Co. Ltd have a better risk management system in their supply chain by improving the resilience in the supply networks. The research is based on supply chain management theories, which will set a strong foundation and a clearer vision of the topic.

The theories framework is assembled from two chapters; together, all these chapters form a coherent framework underpinning the subject of the thesis and give readers a better understanding about the concept of the thesis.

The first theory chapter shows all of the requirements of what an excellent supply chain should have. The four pillars of supply chain excellence are also mentioned: responsiveness, reliability, resilient and relationships (4 Rs). Mitigating Coronavirus pandemic impact and improving resilience in supply chain are mentioned in the second

theory. This theory presents the risk management in the supply chain and the necessity of resilience for quickly recovering after the strike.

#### 1.4 Research methodology and data collection

There are two main types of research approach: deductive reasoning and inductive reasoning. The first foundation when starting to write a thesis is to determine what approach should be used. This is an important step because depending on the thesis's design, the author will raise relative questions about the author's understanding towards the chosen theories. Deductive approach starts with a general statement or hypothesis and explores the possibilities of reaching a particular, logical conclusion. Inductive approach generalizes wide from particular observations. After the data are collected, then conclusions are drawn from the data analysis. (Saunders & Lewis & Thornhill 2009, 124.) As Figure 1 reveals, in this thesis the author applies a deductive approach in the thesis, because this study was conducted based on existing researches and sources.

After the research approach has been chosen, the next step is to determine which research methods should be used to collect and analyse the data. There are two main types of research methods: qualitative and quantitative research method. The effectiveness and overall quality of study can be determined by selecting the appropriate research methodology. Therefore, it is essential to understand the difference between these two methods. (Thattamparambil 2020.) One way to distinguish between the two is through the emphasis on numeric data (numbers) or non-numeric data (words) (Saunders et al. 2009, 151).

Quantitative methods are research techniques used in the collection of quantitative data which can be classifiable and observable (MacDonald & Headlam 2011, 9). Quantitative is mainly used as a synonym for any method of data collection or process of data analysis that generates or uses numerical data. The data to be used for this method can be through questionnaire, survey, graphs or statistics from a sample of the interested population. (Saunders et al. 2009, 151.)

Qualitative approaches are concerned with evaluating socio-dimensional which give typically rich and comprehensive results and offer ideas and concepts for the research (MacDonald & Headlam 2011, 35). In contrast to quantitative method, qualitative approach conducted data collection or data analysis through non-numeric data such as: interview or categorizing data (Saunders et al. 2009, 151.)



As the goal of understanding the case company's reaction before the Covid-19 pandemic, their strategy for reducing its impact and creating a completely resilient system in the company, only a qualitative approach is chosen for this research. The data collection methods used are interviews and observations.

After the research approach and research method have been decided, the final step is to collect data. Data can be valuable sources for research. However, too much information in the wrong direction will be useless. The appropriate method of collecting data can mean the difference between valuable observations and time-wasting misdirection. (Ainsworth 2020.)

Primary sources represent the original thinking and reports on new discoveries or events which are regarded as authoritative. These sources are mostly created at the time the events happened, but they may also be developed later. Typically they are the first formal appearance of original studies. Secondary sources are interpretations and analyses which often attempt to support the primary sources. (UNSW 2020.)

In the research, the primary source is collected through the interviews with three people: representative from Swisstec Sourcing Ltd- the office manager Ms. Nga Nguyen, representative from Valio (Mrs. Kirsti Rautio), and representative from SKF Sweden (Mr. Vesa Alatalo). The interviews were conducted through Messenger and Zoom. Questions to interview are open-ended so interviewees can answer freely. The first interview with Swisstec's representative is to understand the difficulty of sourcing companies during the pandemic and their strategy to overcome unpredictable risk. The second interview is to stand from the outsider aspect, what they think about the pandemic's situation and what companies can do to mitigate its impact. Therefore, through the three interviews, the author can identify the problem from the two aspects and give a comprehensive recommendation. The next data collection is secondary data, which is gathered from articles, literature and from Internet-based sources.

The Figure 1 below is presented as the research methodology and data collection in the thesis.

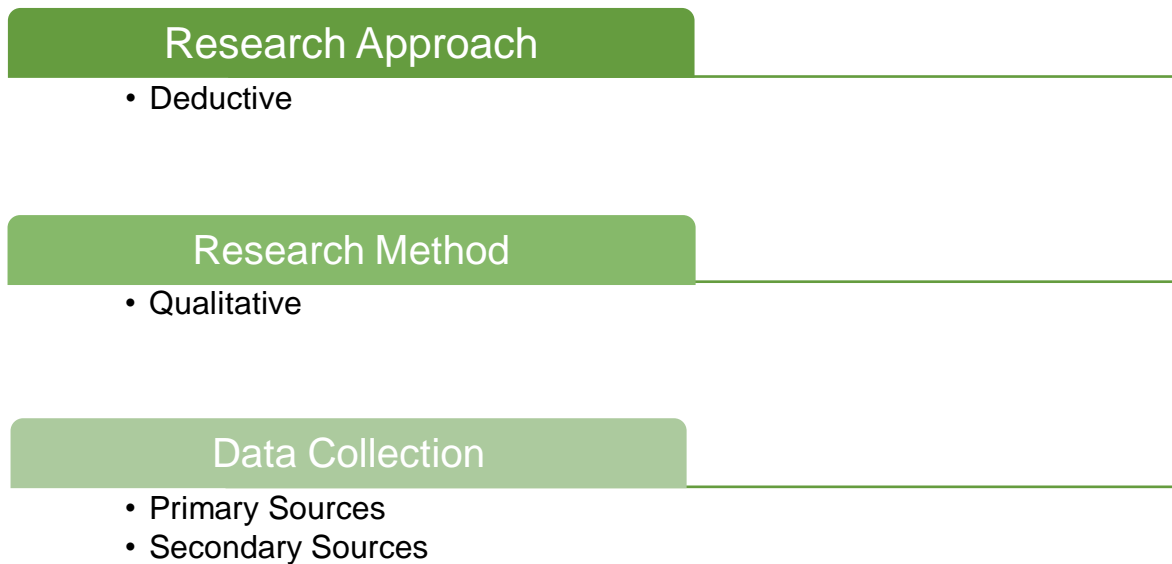


Figure 1 Research methodology and data collection

The thesis is written using a deductive reasoning approach, using only qualitative methods of research. Primary data was collected from the interview of the office manager. The secondary information is collected from various reliable sources, for example, books, articles, and internet sources to support the primary data.

### 1.5 Thesis structure

The thesis is divided into two main parts: the theoretical section and the empirical section. The theory of supply chain excellence and mitigate coronavirus pandemic impaction and develop resilience in supply chain are introduced first, then the empirical findings and data analysis which support the theory are mentioned. After that, recommendations for the case company are given based on the findings. Finally, the last two chapters are the conclusion and summary for this research. The structure of this thesis is presented in Figure 2 below.

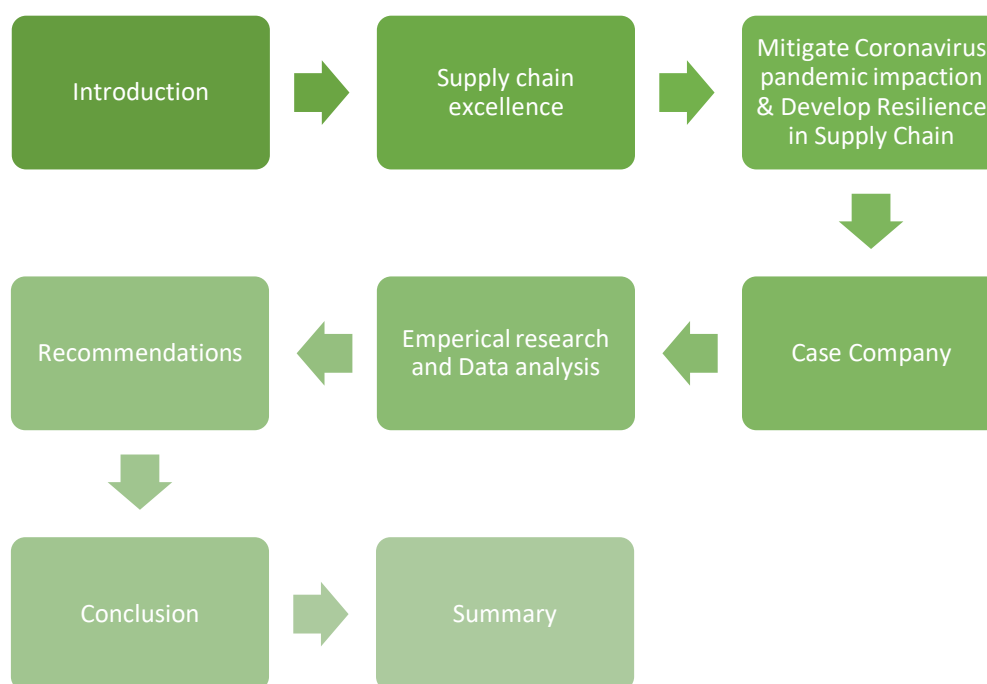


Figure 2 Thesis structure

In the first chapter, an introduction chapter aims to create a mind map about the idea of the thesis, help the reader gain an overview of the examined topic and get general information about it. It presents the background of the thesis, research objectives and research questions, the limitations, theoretical framework, methodology and data collection methods and finally is the thesis's structure in detail.

Second chapter presents the first theory in the thesis – supply chain excellence, which consists of four pillars: responsiveness, reliability, resilient and relationships (4 R's). In the third chapter, an explanation of applying the 4R's into the company to create a resilient supply chain and mitigate the impact of the pandemic.

Chapter four introduces the background, current supply chain network and activities of the case company Swisstec Sourcing Ltd, in order to give basic information about the company to the reader. This is followed by chapter five, which is the empirical research and data analysis chapter. Three interviews with the office manager of Swisstec Sourcing Ltd, representatives from Valio and SKF Sweden are conducted to collect information. By applying all the findings from the empirical research, in chapter six, recommendations are given to the case company of mitigating the impact of the pandemic and creating a stronger supply chain network.

Conclusion is presented in chapter seven which would give the answer to the main research question and other sub-questions. Validity and reliability of this research is also mentioned in case of further research. Finally, the thesis closes with a brief summary of all chapters.

## 2 SUPPLY CHAIN EXCELLENCE

### 2.1 Supply chain management

Since the business world continues to evolve, the market place is becoming more competitive and product life cycles are getting shorter. Moreover, customers are also setting their expectations higher for suppliers about costs and services including ethical, environmental and sustainability. All these challenges have put pressure on the supply chain network. Companies not only need to find a way to deal with the new flow of demand but also use their supply chains as a source of competitive advantage. Therefore, implying excellent strategies to the end-to-end supply chain is crucial. This chapter introduces supply chain excellence which aims to get readers familiarized with the concept and understand the importance of it.

The Council of Supply Chain Management Professionals (CSCMP) defines supply chain management as:

*"Encompassing the planning and management including sourcing and procurement operations, integration and all logistics management activities. It also involves cooperation and communication with channel partners, which may be suppliers, intermediaries, third-party service providers and consumers."*

Supply chain management aims to satisfy the end-customer's requirements through improving the interactions and collaboration of suppliers and customers from the upstream activities. All supply chain operations should be conducted with the customer's needs in mind. (Drake 2011, 3.)

Logistics management is one aspect of supply chain management which schedules, executes and manages the reliable, effective forward and reverses the distribution and storage of goods, services and related information between the point of origin and the point of consumption to fulfill the requirements of the customers. (CSCMP 2020.) Logistics is all about the movement of materials from suppliers to customers. While the supply chain includes all the processes and information of transforming raw materials into products and delivering it to end customers. Supply chain management builds on this structure and helps to integrate and coordinate all the processes of other entities in the pipeline and the company itself. (Christopher 2016, 3.)

The flow in the supply chain is complex because it includes all parties activities, involved directly or indirectly in satisfying customer requirements. Therefore, the main focus of supply chain management is managing the relationships from end suppliers to end customers. The

aim is to achieve a more profitable outcome for all the parties in the chain and a faster production cycle. (Christopher 2016, 3.)

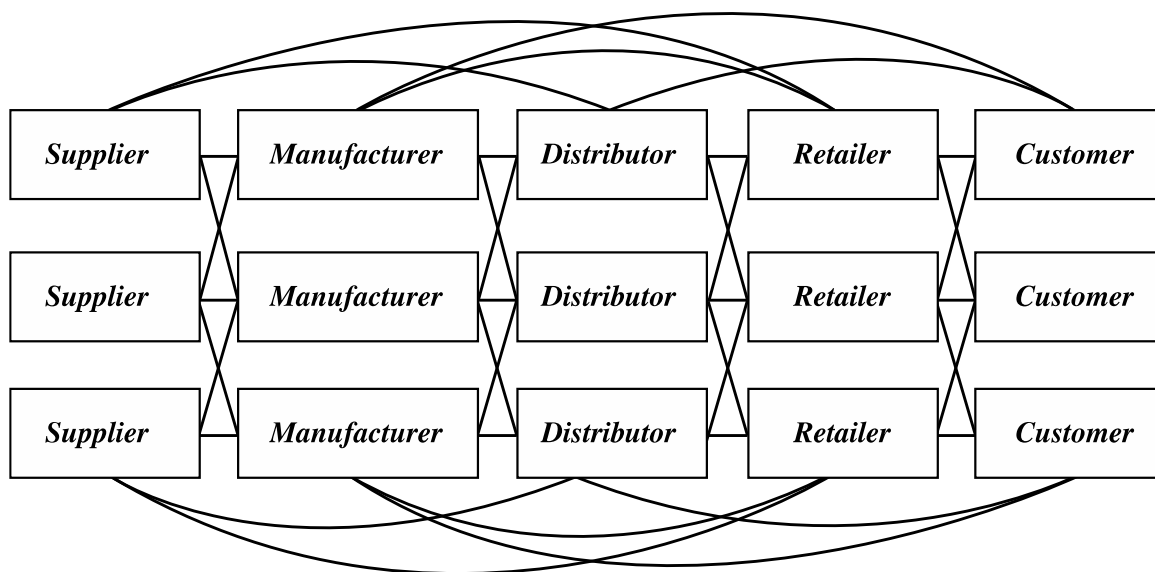


Figure 3 Supply chain stages (Chopra & Meindl 2007)

Figure 3 illustrates different stages in the supply chain which involves the constant flow of information, products and funds. For instance, retailer supplies products as well as pricing and providing available information to consumers. The consumers transfer funds back to the retailer. Retailer looks through sales data and then sends replenishment orders to wholesaler or distributor. After the order has been delivered to the store, the retailer transfers funds to the distributor. The distributor also provides the retailer with pricing information and sends delivery schedules. Similar information materials and fund flows occur throughout the whole supply chain. Moreover, it is crucial to imply that in the supply chain, a manufacturer can purchase material from multiple suppliers and then supply it to several distribution companies. Therefore, most supply chains are connected. Using the word supply network or supply web could be more accurate in describing the structure of most supply chains. (Chopra & Meindl 2007, 3-5.)

### 2.1.1 Competitive advantages

Every business has competitors, no matter how unique the company is. There is no such thing as a market without competition- and if one does, it will not exist for long. Therefore, in order to maintain the company's position in the market share, competitive advantage over other competitors needs to be created. There are two ways to create competitive advantage: cutting the cost of production or providing customers with attractive value. (Christopher

2016, 4-10.) These two advantages can be achieved through an effective logistics and supply chain management:

- **Cost advantage:** the main route to cost reduction is by achieving greater volume of sales which leads to improve the company's position in the market share. This goal can be obtained by effective logistics and supply chain management. (Christopher 2016, 5.)
- **Value advantage:** the first step to create value advantage is to segment different groups of customers. This step is important because it helps company define the value stream, target the group of customers that the company wants to deliver the value and create suitable value adding to satisfy them. The value adding services in supply chain can be delivery service, after-sales services, financial packages, technical support and so forth. (Christopher 2016, 6-7.)

There are numerous foundations for success in the market share. However, a simple model (the "Three Cs") which is based on the triangular linkage of the company, its customers and its competitors illustrates the three-way relationship. (Christopher 2016, 4.)

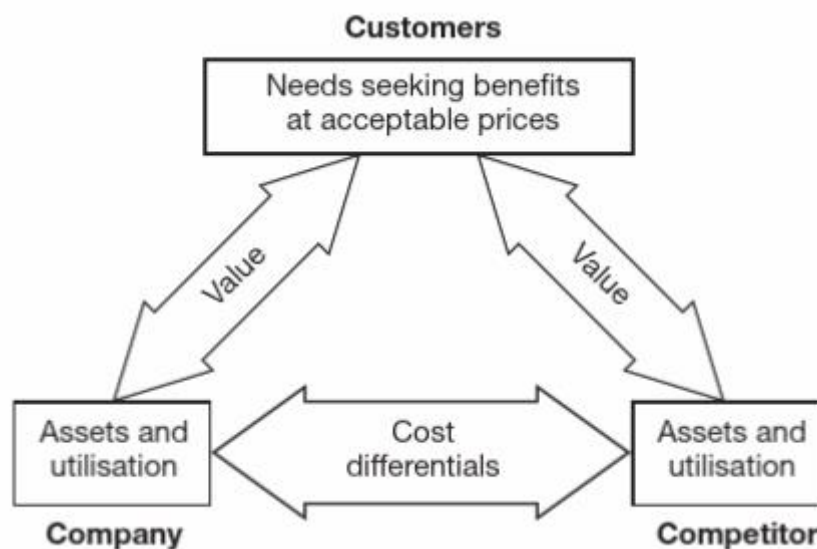


Figure 4 Competitive advantage and the "Three Cs" (Ohmae 1991)

In Figure 4, the strategy is executed by optimizing the relationship between players (company, competitors and customers) to satisfy the customers better. The source of competitive advantage is found primarily in the organization's ability to distinguish itself from its competitors in the eyes of the customers, and secondly by operating at a lower cost and thus at a higher profit. (Christopher 2016, 4-5.)

For Ohmae, customer-based strategies are the most important because he believed that when the customers are satisfied, investors and shareholders are also satisfied. Defining the customers is an important step to have a basic understanding about their unmet needs and offer a value proposition in response to customers' real unmet needs. Moreover, a research about competitor's strengths, capabilities, product portfolios and value propositions is necessary. Because it helps companies to identify the patterns of similarity and look for opportunities to differentiate themselves from competitors in the eyes of customers. Customers mostly focus on the price of the products (or services) or the value which they received from the company. Therefore, cost reduction or service enhancement are the two ways to gain more benefits from the market. (Novosedlik 2020.)

### 2.1.2 Value chain

While a supply chain involves all parties to satisfy customer's needs, a value chain comprises all business activities to enhance a competitive advantage. The term value chain refers to the process by increasing the value of a product or service through production, manufacturing and other processes to create value differences. (Tarver 2020.) The idea of the concept was introduced by Michael Porter to help companies give a better performance than its competitors. Value chain activities (shown in Figure 5) can be classified generally as either primary activities (inbound logistics, operations, outbound logistics, marketing and sales, and service) or support activities (infrastructure, human resource management, technology development and procurement). By optimizing these activities, it allows a company to gain competitive advantage over its rivals. One implication of Porter's thesis is that businesses need to analyze each activity in their value chains to decide whether they have a real competitive advantage in the activity or not. If they do not, it is suggested that they should consider outsourcing that activity to a partner who can provide that cost or value advantage. One effect of this is that increasingly outsourcing activities that are not a source of real competitive advantage produces more virtual supply chain architectures. (Christopher 2016, 10-11.)



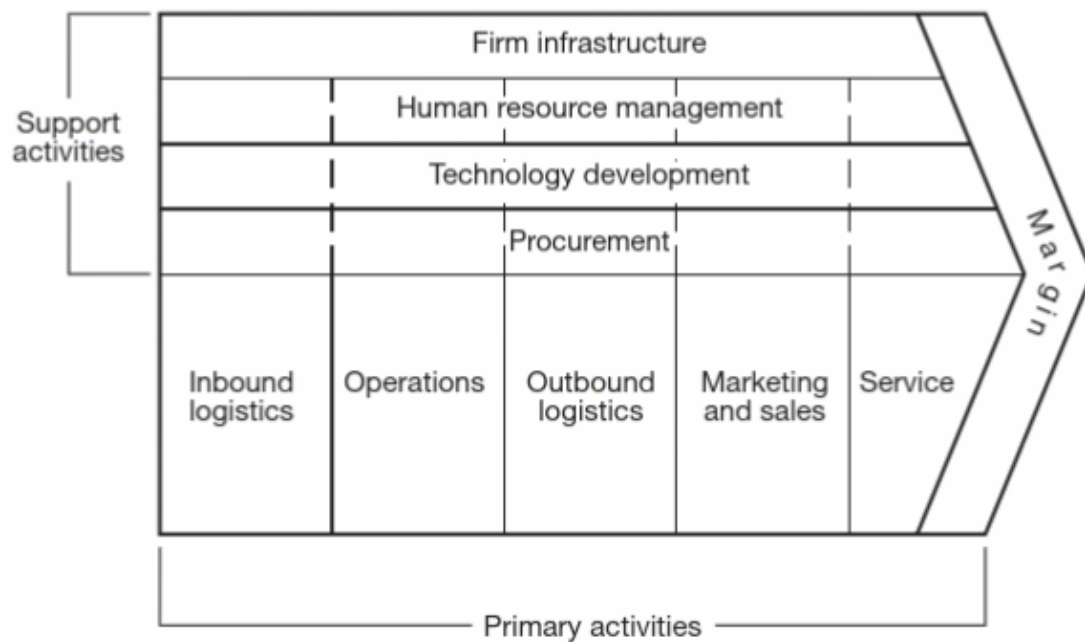


Figure 5 The value chain (Porter 1985)

According to Porter (1985), the primary activities include inbound logistics, operation, outbound logistics, marketing and sales and service. Each activity is explained below.

- Inbound logistics: all the processes related to receiving, storing and distributing raw materials (inputs). The relationships with suppliers are a key factor in creating value.
- Operations: the activities that transform raw materials (inputs) into final products or services (outputs).
- Outbound logistics: all activities related to delivery to customers such as collecting, storing and distributing.
- Marketing and Sales: the process of informing and persuading clients to purchase for the company's products or services.
- Service: activities of enhancing or maintaining the value of the product after sales.

Support activities aim to coordinate and assist primary activities by optimizing sub-activities such as: purchased inputs, technology, human resources and numerous firms wide managing functions. (B2U 2018.)

- Procurement: refers to the role of purchasing inputs used in the value chain of the company, including raw materials, supplies and company's assets (machinery and equipment). Therefore, procurement can support multiple value chain activities, not just limit in inbound logistics. (B2U 2018.)

- Technology development: relates to the management and processing of information, as well as protecting the knowledge base of a company. Minimizing the costs of information technology, updating technological developments and ensuring technical quality are sources of added value. Technology development practices aim to give efforts to enhance the product and the operation. (B2U 2018.)
- Human resource management: involved in recruiting, hiring (and firing), training. Developing and compensating personnel. A high-performing team is important to deliver excellent products or services. (B2U 2018.)
- Firm infrastructure: the functions which maintain daily operations such as: general (strategic) management, planning, finance, accounting, legal, government affairs and quality management. Infrastructure generally supports the whole value chain, rather than individual activities. (B2U 2018.)

### 2.1.3 Integrated supply chain

As the business world is developing day by day, new challenges and complexity are added to the supply chain which has raised concerns for management. For the purpose of facilitating awareness and empowering companies to leverage their supply chain management as part of a cohesive (integrated) organization. In 1989, Stevens introduced the supply chain integration theory during the time when the supply chain management concept was still new to practitioners and academics. To achieve the "integration" model, it required a firm to advance through several specified stages of growth which is illustrated in figure 6. (Stevens & Johnson 2016.)

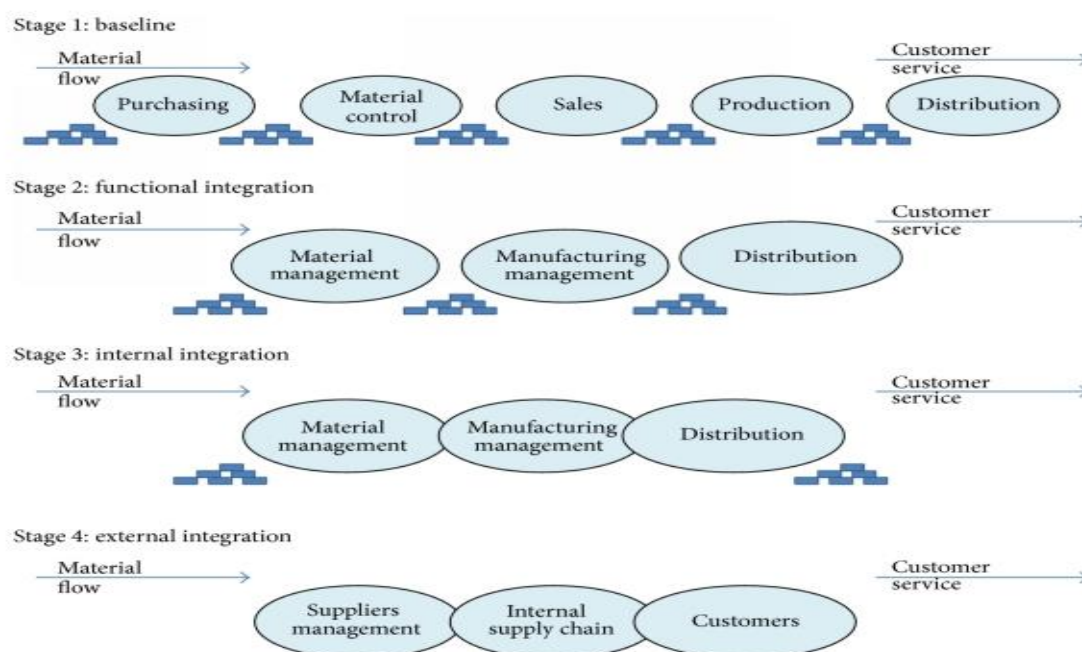


Figure 6 Achieving an integrated supply chain (Stevens 1989)

The figure shows that supply chain management started from a baseline (independent) model, then it developed to the first integration level which was across all functions. The next stage was fully internal integration which involved a seamless flow across the internal supply chain. The final stage was external integration which also took suppliers and customers into account. The benefit of the model was to improve the efficiency of the supply chain, including cut off inventory and operating cost and improve customer service. (Stevens & John 2016.)

**Stage 1 – Baseline:** each department operates independently which is regarded as an entrenched organization. This model of supply chain focuses on cost rather than value leading to short-term planning. Moreover, it is easy to be vulnerable due to the market changes and cause waste during the operating process. (Stevens 1989.)

**Stage 2 – Functional Integration:** the focus of functional integration is on cost reduction rather than performance improvement, but it has paid more attention to goods inward. Few integrations of product and information flows have been created so the operating processes are more efficient. However, the visibility to demand is not improving because the chain is still discrete and the “wall” between manufacturing and distribution is still existing. (Stevens 1989.)

**Stage 3 – Internal Integration:** all internal operating processes in the organization are integrated and the flows throughout the chain are improved. Synchronized demand management is created which increases efficiency and visibility from distribution to purchasing. The

company focuses on tactical rather than strategic issues and moves to medium-term planning. Instead of managing the customers, the company reacts to them and uses extensive electronic data interchange to improve customer service. (Stevens 1989.)

Stage 4 – External Integration: the integration also includes suppliers and customers to the supply chain to increase trust and visibility in demand and form a seamless supply chain. Therefore, it creates synchronized material flows and accelerated cash flows which leads to balance the capacities throughout the chain. External integration emphasizes shared values and concentrates on customers rather than product. (Stevens 1989.)

#### 2.1.4 The 4'Rs concept

There are a number of principles introduced to guide the supply chain manager during the era of supply chain competition. All the principles can be summarized as the “4Rs” of responsiveness, reliability, resilience and relationships which is illustrated by figure 7. These four themes are the four pillars for successful logistics and supply chain management. (Christopher 2016, 23-24.)

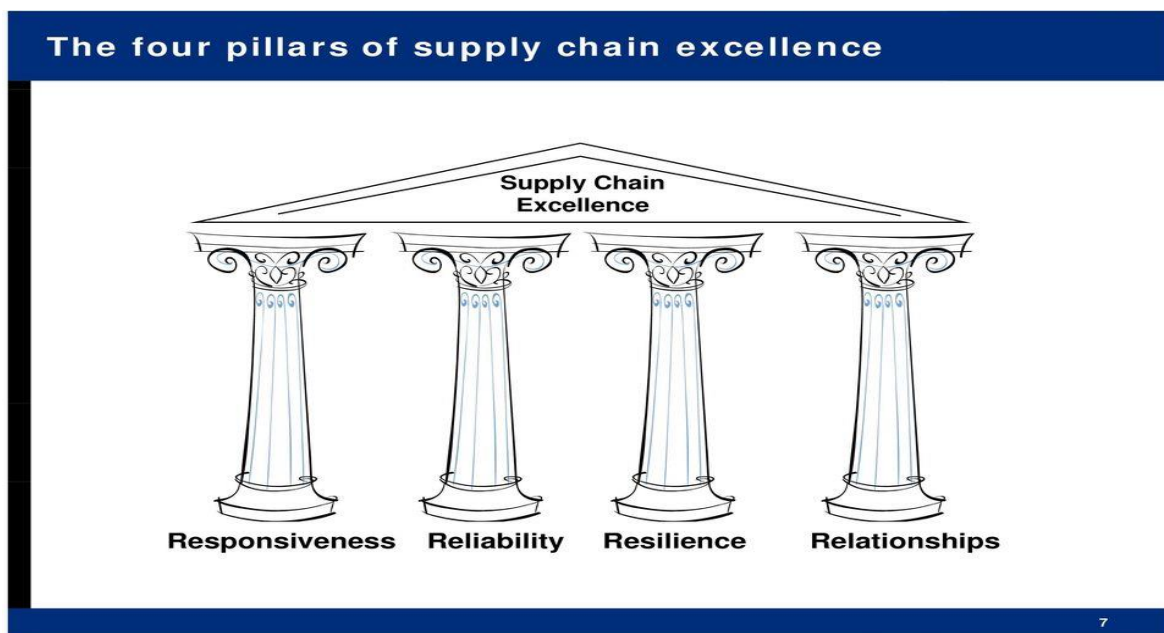


Figure 7 The four pillars of supply chain excellence (Christopher 2016)

**Responsiveness:** In today's just-in-time world, customers require a shorter time frame in delivery. Customers not only want shorter lead times, but they also look for flexibility and increasingly customized solutions. This leads to the transferring from forecast-driven to demand-driven of organizations and creates a new environment in supply chain called agility. Responsiveness means that companies keep close relationships with the customers, listen to their requirements and quickly interpret the demand signals. (Christopher 2016, 23.)

**Reliability:** Unreliable processes create uncertainty and variability. Improving the reliability throughout the supply chain will increase the visibility from end supplier to end customer to reduce the inventory cost. One of the keys to improving supply chain reliability is through reducing process variability. A methodology called “Six-Sigma” has been considered for using in recent years. (Christopher 2016, 24.)

**Resilience:** Today’s, the high levels of turbulence and volatility in the markets require supply chains to be capable of dealing with the unexpected shocks and the unknown risks. Resilience refers to the supply chain's ability to deal with unforeseen disturbances. Resilient supply chain has several characteristics. One is the recognition of a bottleneck in a process and the other is the recognition of the value of strategic inventory and the selective use of the surplus ability to cope with “surge” effects. (Christopher 2016, 24.)

**Relationships:** The need for relationship management grows as supply chains become more dynamic and as out-sourcing increases reliance on suppliers. Seeking mutually beneficial and long-term relationships with suppliers can bring up many benefits such as: improved quality, innovation sharing, reduced costs and scheduling of production and deliveries. The more the processes are connected between the supplier and the customer the more the mutual dependencies increase, therefore, rivals will have less chance to break in. (Christopher 2016, 24.)

## 2.2 Responsiveness in supply chain

### 2.2.1 The synchronous supply chain

In conventional supply chains, a company tends to separate functions in operating to optimise the performance of each stage. Consequently, functionally based organizations need more stocks for inventory or require a longer lead-time gap. This will lead to low responsiveness, high operating costs and long end-to-end pipeline times. Therefore, the theory of synchronised networks was introduced to connect every stage in the chains to improve the efficiency of the supply chain. The method which makes this idea successfully is to increase information flow between supply chain partners. The shared information includes demand data and forecasts, operation schedules, details about new products and bill of material changes. Synchronisation requires a high level of process coordination to enable visibility and transparency throughout the chain. (Christopher 2016, 155.)

Today’s business implies the idea of extended enterprise which means no barriers between functional stages internally and no separation between vendors, distributors, customers and company externally. The foundation of this idea is based on the shared information to

enable cross functional teams and horizontal process management. The supply chain thus becomes a confederation of organizations that agree on mutual objectives and add more value to the end-to-end pipeline. (Christopher 2016, 156.)

The fundamental concept of synchronization is to ensure that all elements of the chain act as one and the management of in-bound materials flow becomes important. Shipping and replenishment requirements must be defined at an early stage and the planning discipline must be at the highest level. In every supply chain, companies seek economies of scale through larger batch quantities. This can also be succeeded through combining all orders from a number of suppliers into a single delivery. As a result, the synchronous supply chain has coincided with the growth of third-party distribution and logistics firms specializing in delivering an in-bound consolidation operation. (Christopher 2016, 161-162.)

Bottlenecks are one of the barriers for creating synchronization in the supply chain, the presence of them will impede the smooth flow of the processes. The bottlenecks can only be managed, and can not be eliminated completely, because if one bottleneck is removed, another one will appear by definition. A significant way to manage bottlenecks is using the method Optimised Production Technology (OPT). By definition, all the activities in the chain can be categorised as "bottlenecks" and "non-bottlenecks". The production of non-bottlenecks that feed bottlenecks must be controlled by the bottleneck requirements that they represent. The idea of this method is to reshape the process systems to improve throughout lead time and reduce total inventory cost. (Christopher 2016, 167-168.)

### 2.2.2 The agile supply chain

The world is developing at a fast pace and the living standard is improving day by day, therefore, levels of volatility in demand are increasing: customers require greater variety and more competitors join in the market share. To overcome these challenges, organizations need to combine agility into the supply chain. (Christopher 2016, 111.)

Agile supply chains are designed to be highly flexible and receptive so it can rapidly respond to changes in demand in shorter time-frames. It is used to tackle unpredictability in the market through "postponement". Instead of forecasting, agile supply chains respond directly to demand. (Redwood Logistics 2020.) Agility has a different meaning from leanness. Lean supply chain focuses on efficient and streamlined operations by producing high volume at low cost. The goal is to create more value for the company by reducing the cost structure and waste as much as possible. In certain circumstances, leanness can be considered to be an element of agility, however, it will not enable a company to quickly adapt to customer's requirements. Generally, lean supply chain is more suitable to low variety and predictable

markets which require high volume in demand. On contrast, agility is best used in less predictable and high variety environments which the demand for volume is low. (Christopher 2016, 111-112.)

According to Christopher (2016, 126-130), the concept of agility has an important influence on connecting every organization within the supply chain through the basis of shared information. There are a number of principles that need to be identified in order to execute this strategy.

Synchronise activities through shared information:

It is important to imply synchronization throughout the entire supply chain. It means that all parties in the supply chain share the same information and process alignment. As a result, the demand becomes more visible which enables just-in-time deliveries without needing inventory buffers. (Christopher 2016, 126.)

Work smarter, not harder:

There is a large number of activities within the supply chain which are considered as non-value adding activities. These activities consume enormous amounts of time and create a huge amount of cost but they do not generate any benefit for customers. Many processes in the supply chain extend the time-frames because they work as series (linear) instead of performing in parallel (simultaneously). Therefore, organizations require to identify, formalize and reshape all the processes. Non-value adding activities need to be eliminated to speed up the supply chain and reduce cost. (Christopher 2016, 126-127.)

Partner with suppliers to reduce in-bound lead-times:

Increasing the relationship with key suppliers can improve agility in the supply chain. For example, when connection, interaction and communication traffic between company and supplier improve, they will share the same information and planning systems such as SAP to increase the visibility and reduce in-bound lead-time. (Christopher 2016, 127.)

Seek to reduce complexity:

Complexity in certain circumstances will increase operating cost to the company. For example, a company produces a variety of products to satisfy every kind of customer's need, however, only some products generate the most sales for the company and some products do not add any value to the company's profit. Moreover, complexity can also happen through cumbersome procedures which involve many different stages and hand-offs. Therefore, companies need to seek a way to simplify these matters if it is possible. (Christopher 2016, 128.)

Postpone the final configuration/assembly/distribution of products:

Postponement of the final configuration until an order is received if possible will reduce stocks in inventory and make sure that customers get what they want. The longer that products can remain as separated units, the more flexibility there will be to ensure the "right product at the right place in the right time". (Christopher 2016, 128.)

Manage processes not just functions:

Functionally based organizations such as: companies with cumbersome, multi-level decision making processes tend to be slower to respond to the market changes compared to cross-functional companies. The critical business processes that cut across the organisation would include innovation, customer and supplier relationship management. (Christopher 2016, 129.)

Utilise appropriate performance metrics:

In functionally based organizations, performance metrics are based upon department budgets and are underpinned by minimizing cost, utilizing assets and enhancing productivity. Although these objectives seem to be beneficial, they are not necessary for agile supply chain practices because it would lead to a loss of flexibility. Utilizing appropriate performance metrics but not restricting to cost structure will encourage agile practices. (Christopher 2016, 129-130.)

### 2.2.3 Complexity in supply chain

The definition of a chain implies a set of one-to-one linear relationships, while the fact is that the focal company is at the centre of a dynamic network of interconnected and interrelated yet separate entities. As the trend of outsourcing or offshoring activities to reduce cost, complexity is added to companies' operation networks. Complexity does not mean complication, it describes a higher level of interdependency across a network instead. This increases the volatility and vulnerability because if one part in the network goes wrong, it can possibly affect the whole chain. (Christopher 2016 173-174.) For example, in 2011, Japan faced one of the most powerful natural disasters - the Great Tohoku Earthquake and Tsunami. Affected locations included a number of manufacturing facilities which are providing parts and components of vehicles for the global automotive industry. Therefore, most motor vehicle supply chains got affected and had to slow down their operation. (Every CRS Report 2011.)

Supply chain complexity has 8 sources in total: network, process, range, product, customer, supplier, organization and information. The cost of complexity should be managed under



the Pareto Law (80:20 rule), it means the company should focus more on 20% of the chain which generates 80% of the company's sales revenue. If there are no strategic reasons for maintaining a high level of variety, that "long-tail" which gives low performance should be removed through product rationalization. (Christopher 2016, 174-180.)

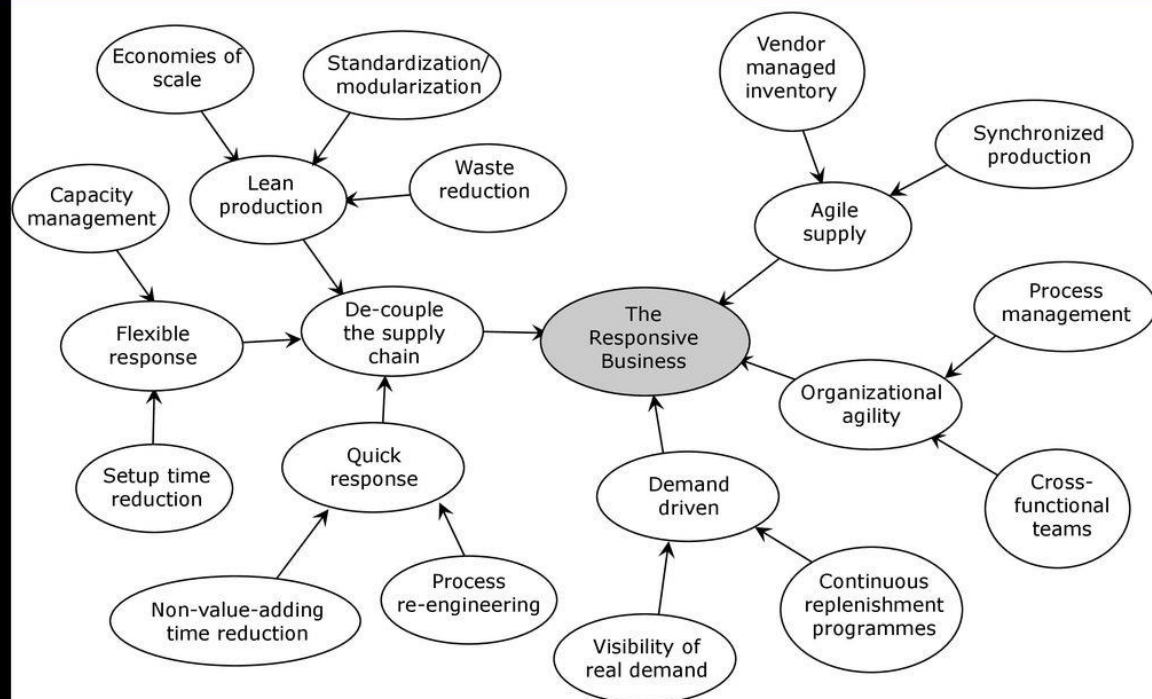
Complexity brings many benefits to the supply chain such as: protecting against supply chain risk, increasing customer satisfaction and differentiating company from competitors. However, it increases the total end-to-end pipeline cost and inhibits flexibility and responsiveness of the chain. Therefore, non-value adding complexity needs to be reduced to enhance profitability and efficiency. Complexity management has to be planned carefully and be able to compromise between over-simplification and an emphasis on cost and efficiency. (Christopher 2016, 181-183.)

#### 2.2.4 Route map to responsive supply chain

It is argued that there are three factors of a customer for purchasing a product: cost, service/responsive and specific solutions. For cost-driven customers, the idea of a lean supply chain can satisfy them. An agile supply chain is best practices for service-driven customers and for customers who seek specific solutions that can be solved by customised supply chain. All of these supply chains are driven by the market. They often share similar facilities and processes, but they are designed in various ways. For any supply chain strategy, there are three dimensions that provide the platform and are all replaceable to an extent: time, inventory and throughput capacity. For instance, lean supply chain is used in predictable environment which requires a long planning horizons, so that low-cost sourcing can be applied and the use of production and transport assets can be maximised. In contrast, an agile supply chain may require local suppliers with access to additional capacity if necessary. Customised supply chain is suitable when there is a large group of customers which is able to support an investment in dedicated facilities or resources. A responsive business is an organization which can combine all these three types of supply chain in order to satisfy every kind of customer needs. (Christopher 2016, 130-131.)

There are several conditions for a company to fully become a responsive business and figure 8 summarises all the key elements.

## Route map to the responsive business



18

Figure 8 Route map to the responsive business (Christopher 2016,132)

Agile supply chain is a part of responsive business where suppliers and customers have close relationships with the company. They share the same information and process alignment to capture the real demand from customers and improve the visibility across the supply chain. Internally, the business will concentrate on organizational agility by breaking through functional silos, managing processes and building up a cross-functional team. The responsive business will aim to combine the lean and agile model in terms of its manufacturing and sourcing strategy. By de-coupling its upstream and downstream processes, maximizing the use of principles of postponement and eliminating non-value adding activities whenever possible, the company will become more responsive to the market needs. (Christopher 2016, 131.)

## 2.3 Improving reliability and relationships

### 2.3.1 Collaboration and trust in the supply chain

With the increase of volatility in the market, businesses are forced to be more responsive, provide innovative solutions to customers and improve the flexibility in delivery. Stand-alone businesses have no chance to compete against "network organization", therefore,

organizations which can better structure, coordinate and manage the relationships with their partners in a network will be able to deliver a superior value to the marketplace. (Christopher 2016, 239.) The most efficient way for creating collaboration and sharing information between each party and department is through a virtual supply chain. In many ways the Internet has transformed the ways in which members of the supply chain can connect. It offers a great platform for virtual supply chain setting-up. (Christopher 2016, 158.) The key to success in the cooperation network between all partners is to achieve mutual benefits. After a successful network has been created, information from downstream demand will be visible to upstream organizations, visibility among the end-to-end pipeline will be implied. Consequently, all businesses in the chain will be driven by real demand rather than forecast which brings lots of benefits: minimise inventory level, inventory cost and lead time through just-in-time delivery, reduce out-of-stock level, improve customer service metrics through end-to-end supply visibility. Mutual trust between suppliers and customers will create a "win-win" situation for both parties. (Christopher 2016, 240-243.)

There are three different costs that can be reduced or eliminated through collaborative networks: transaction costs, process costs and uncertainty costs. Transaction costs are costs for placing orders, progress chasing, raising invoices, verifying distribution plans, managing queries and various operations involved while doing business with each other. These costs will be reduced since the barriers between each member have been removed. Process costs occur because the procedures of manufacturers and clients do not comply in the same form. For example, each party has different product codes and different unitisation requirements. These differences will apply additional cost for transferring them into the same standard. The cost of uncertainty exists because there is always a lack of confidence in forecasting and a lack of understanding of the particular requirements of customers, so it will result in buffering the inventory holding. There are many companies that use the collaboration network and mutual trust for mainly cutting costs or generating profit. These companies would find themselves in the position of lacking competitive advantages. Smart business instead aim to combine the supply chain as a whole to be more competitive by the value it produces and the overall cost it reduces. (Christopher 2016, 243-245.)

### 2.3.2 Managing the supply chain as a network

An emphasis on network management as well as internal processes is crucial to attain market leadership worldwide of network competition. According to Christopher (2016, 246-247), there are three principles that a company needs to be noticed to make a successful transition to the new competitive environment.

Collective strategy development: traditionally, supply chain members have never considered themselves to share the same marketing framework and so have not discussed their strategic thinking with each other. A substantially higher level of joint strategy creation is needed for network competition to be truly successful. This implies that members of the network must mutually agree on strategic objectives and aim to achieve them. (Christopher 2016, 246-247.)

Win-win thinking: the concept of achieving a "win-win" situation for both buyer and supplier has been a trend for every company. Win-win does not mean 50/50, but as a result of collaboration, at least both partners can have some benefits. This concept is also used in outsourcing which is known as "vested outsourcing". This framework illustrates the success of achieving the most effective and long lasting outsourcing agreements between organization and its service provider through working collaboratively. (Christopher 2016, 247.)

Open communication: one of the best ways to succeed in a collaboration network and imply mutual trust is to increase the communication traffic. The availability of the Internet provides a seamless platform to enable end-to-end pipeline visibility to become a reality. (Christopher 2016, 247.)

### 3 MITIGATE CORONAVIRUS PANDEMIC

#### 3.1 Supply chain risk management

As the market place is becoming more dynamic, consumers have higher levels of expectation for businesses, companies have more competitors including local and international rivals. Thus there are several changes of business strategy to cope with the situation. Companies look for ways to lower the operation cost as well as transportation cost. The application of lean practices enables cost efficiency. Outsourcing helps manufacturers to obtain the best materials and process them at a low cost. (L. Olson 2011, 1-5.) However, it will extend the lead-times and lead to increased inventory stock and cannot adapt quickly to market needs. Moreover, taking the advantage from "single market" policy from organizations like the European Union or ASEAN, businesses choose to "focus" their factories. In other words, instead of manufacturing the full range of products at each plant, fewer products are manufactured exclusively at a single plant. As a result, potential risks increase and the supply chain becomes more vulnerable. (Christopher 2016, 215-218.)

There are two sources of supply chain risks: external and internal. External risks arise from nature such as: natural disasters (equake in Japan and China), epidemics (Covid-19); or from political issues like: wars and terrorism (Iraq ISIS), labour disputes (Europe) and government-imposed regulations. Internal risks arise from how the supply chain is operated and managed which include available capacity, internal operation and information system. Organizations have the responsibility to create a supply chain risk management strategy to protect their businesses. (Olson 2011, 7-8.)

##### 3.1.1 Understanding the supply chain risk profile

External risks have inevitable impacts on the supply chain which company hardly can avoid and forecast with a high level of reliability. However, it can be mitigated by having excellent internal managing systems. (Beers 2020.) In meanwhile, internal risk can be foreseen and circumvented by the influence of managerial actions. Internal risks can be categorized into four sources: supply, demand, product and information. (Olson 2011, 15-19.)

Supply Management: creating sufficient supply networks, it involves many factors and activities such as network design and relationships, sources selection, orders allocation and planning. Supplier evaluation makes an important contribution to operational decisions. The growing of outsourcing and electronic business has made the management become more complex. Operational risks in supply chain order allocation include uncertainties in demands, supply yields, lead times, and costs. Specific suppliers need to be determined and

the amounts purchased from them need to be calculated on a recurring basis. Eliminating risks throughout the supply chain is considered to be impossible. Optimum decisions for one member of the supply chain often have detrimental consequences on the profitability of the entire supply chain. (Olson 2011, 15-17.)

**Demand Management:** means using data and models to define strategies such as using price to adjust demand over time, across markets, or across products. This can be succeeded through advertising and promotional activities; however, it barely gives an absolute result. (Olson 2011, 17-18.)

**Product Management:** some of the risks encountered by producers involve changes in demand for various reasons. The food industry has higher predictable metrics compared to other industries, but they still face changes in the demand for specific circumstances. These risks can be solved by product variety, which can be used to increase market share to serve distinct segments of a market. Nevertheless, though this will be expected to boost profitability and market share, it could lead to higher operating costs. (Olson 2011, 18.)

**Information Management:** e-business has created an entirely new business climate, most service organizations and retail outlets generate masses of data. With the invention of barcode and RFID, it allows customers to get closer to the product's origin. No information sharing and independent inventory control policies will lead to the "bullwhip" phenomenon. Therefore, it has been suggested to increase information sharing across the supply chain, improve forecasting and production planning. (Olson 2011, 18-19.)

### 3.1.2 Achieving supply chain resilience

As the market is becoming more turbulent due to outsourcing, more competitors, more demands, etc; it is essential that resilience is implied into supply chain management to be prepared in advance for unexpected strikes. Resilience implies flexibility and agility into the system which help it return to its initial or desired state after being disrupted rapidly. Nowadays, businesses consider not only velocity but also acceleration or the ability to rapidly ramp up or down that matters in terms of resilience. Resilience of the supply chain often includes 'slack' at certain crucial points that constitute the limiting factors for changes in flow rate. (Christopher 2016, 232.)

There are two key components when building supply chain resilience: resistance and recovery. Resistance refers to the robustness of the supply chain that helps it to avoid the shocks that eventually affect it. Recovery relates to the supply chain's ability to rapidly get back on its origin after a disruptive incident happens. There are four key elements that

businesses need to consider for successfully enhancing supply chain resilience. (Christopher 2016, 232-235.)

Supply chain restructure: most of the supply chain risk is systematic – the risk is there because of the design of the supply chain. In the past, many companies made decisions to centralize production or to consolidate local warehouses into bigger RDCs because they believed it would reduce the overall costs. These decisions help to decrease the cost of resources, however, companies will be more vulnerable and associated risk costs will rise. Research has shown that a supply chain with too high a level of centralization would have a higher total cost compared to decentralized models. The same principle would apply to decisions concerning the numbers of suppliers or the level of commonality at the bill of materials level in a product family. Organizations which want to develop a more resilient supply chain need to ensure the design of existing supply / demand network is understood. Mapping out supply chain networks from end customer to tier N-suppliers in order to have a better view about the supply chain and develop a suitable risk management plan. (Christopher 2016, 232-234.)

Supply chain collaboration: creating a collaborative network throughout the supply chain can increase the end-to-end visibility of supply and demand which reduce the “bullwhip” effect. Ideally, to periodically review risk profiles and agree on risk mitigation plans, the organization should create a 'Supply Chain Council' comprising key upstream and downstream entities in the network. (Christopher 2016, 234.)

Make supply chain risk management as organization's culture: it is important that top management understand the need to provide leadership in supply chain risk management because of the potentially massive harm that can be caused to the organization by supply chain failures and disruption. The company's board should involve all employees in risk mitigation plans and continually develop supply chain risk management profile. These actions help to transform risk management as company's culture and all employees would take the risk reduction as their responsibility. (Christopher 2016, 235.)

Investing in agility: since the principle of resilience is to be able to bounce back quickly when things go wrong, it would be clear that the more agile the supply chain is, the easier it is likely to recover. (Christopher 2016, 235.)

### 3.2 Coronavirus impaction on supply chain

After the outbreak of the Corona pandemic, the globe suffered hard time dealing with the sudden new situation. In 2020, global growth is estimated at -4.9 percent, 1.9 percentage points below the World Economic Outlook (WEO) forecast for April 2020. At the start of the

pandemic, the world was overwhelmed with the shock but then gradually recovered at the end of 2020. (World Economic Outlook 2020.)

As the COVID 19 pandemic disrupts normal economic activity and life across the globe, world trade is predicted to decrease by between 13 percent and 32 percent in 2020. With the exception of 'other regions' (comprising Africa, the Middle East and the Commonwealth of Independent States (CIS), including associated and former Member States), all regions will experience double-digit declines in exports and imports in 2020. This relatively small projected decline in exports stems from the fact that the countries from these regions are heavily dependent on exports of energy products for which fluctuating prices did not affect demand. By enforcing restrictions on transport and travel and by closing several retail and hospitality establishments, services trade is severely affected. Different from goods, there are no inventories of services to be drawn down today and re-stocked at a later date. As a consequence, decreases in services trade could be lost forever during the pandemic. Other trades which combine complex value chain linkages such as electronics and automotive products were also affected due to social distance and lock-down. (WTO 2020.)

Because of the lock-down in China during the last few months, it has lead to a shortage of goods for countries around the world (as China is one of the biggest manufacturing and exporting countries of the world). In order to overcome the situation and mitigate the risk in the future, companies have changed their channel strategies and have started decoupling some long-term supply chain dependencies from the China-centric supply chain network. They are looking for more alternatives for the sources of supply, not only based on one supplier and one country. For example, Japan's Prime Minister Shinzo Abe has encouraged businesses to withdraw their manufacturing activities from China back to Japan or to other Southeast Asian countries. This decision was announced because the supply of machinery parts from China reduced half in number in February, led to the shortage of necessary accessories for manufacturing plants and had to close down the factories. Japan has spent more than 2.2 billion for business to bring production which is high value-added back to Japan and shift other production to Southeast Asia (Dong 2020).

McKinsey (2020) has conducted several researches about the disruption in supply chain during March 2020 which is shown in Figure 9.



## Supply chains are being disrupted around the world, but the full impacts have not yet been felt

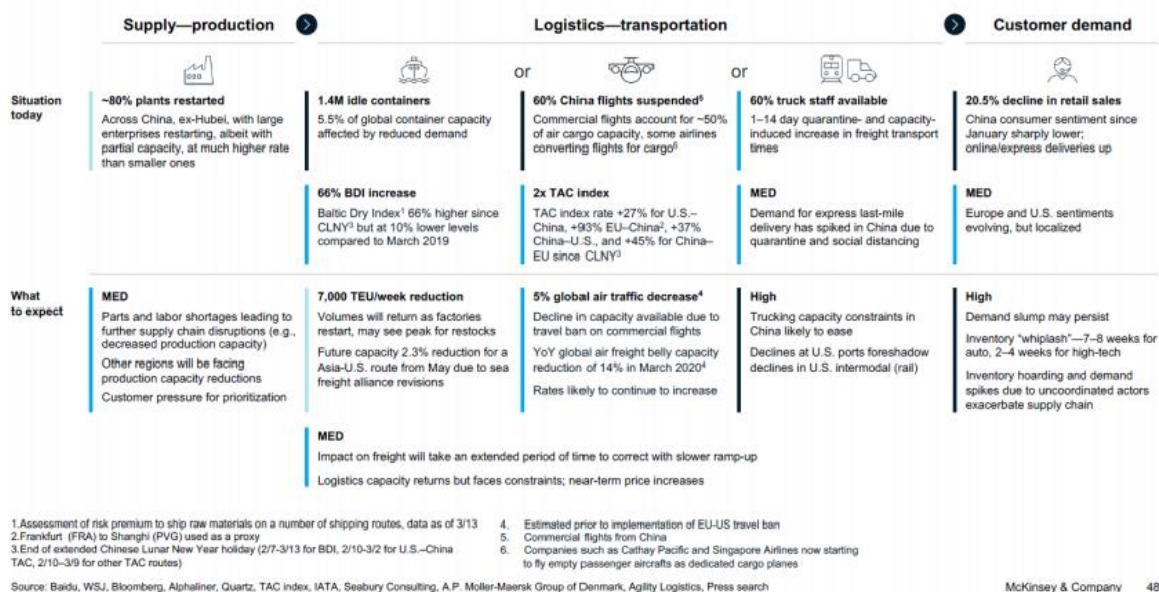


Figure 9 Supply chains disruption in March 2020 (McKinsey 2020)

When the Covid-19 pandemic happened and the quarantine rule was enacted, people rushed to buy foodstuffs and especially hand sanitizer and toilet paper. During the first two weeks of quarantine, toilet paper and hand sanitizer were completely sold out in every store and shelf. This situation caused the end-to-end visibility hard to predict, because it was not real-time demand. Therefore, there was the enormous and potential costly challenge of dealing with the bullwhip effect for many logistics providers. The customer suffered the shortage of supply, retailers lost their potential sales, distributors competed against each other to gain the shortage of product supply and manufacturers were overwhelmed with sudden and unpredictable spikes in demand. For example, in Australia, there were 192,000 rolls of toilet paper sold in 30 minutes, retailers in this country could not maintain a steady inventory, manufacturers and distributors associated hours and hours of working overtime (Reese 2020).

There are many risks due to the cause of pandemic: the shortage of supply and unpredictable demand. Furthermore, the lead-time gap from the time the order is placed until the delivery increased, due to no resources and delayed shipment (full capacity is not allowed during the social distance period). The lock-down of China created disruption in the world supply chain, many businesses in Western countries did not receive the supply of materials and products in time due to supply disruption. In order to overcome these risks, the whole supply chain including manufacturers, distributors and retailers have to increase the stock level of holding in the inventory. This situation leads to increasing cost for inventory. No

visibility in the end-to-end supply network also raises the inventory level. Businesses should update their information about the current demand, the underlying drivers and lock-down countries through the media and government to have a clear vision about the demand and supply. Increasing the visibility in the end-to-end supply chain helps companies understand better the real-time demand and supply, forecast more accurately and reduce stock holding level. (Deloitte 2020.)

According to Vyas (2020), an expert on global trade, COVID-19 forces businesses to redesign their supply chains. There will be a lot of motivations to bring the supply chain close to customer demand with on-shore or near-shore. For Western companies, instead of choosing China, Mexico will likely play a more significant role than it has in the past if its government can stabilize and settle down its drug violence and political corruption problems. Businesses would put more efforts in improving supply chain resilience and risk reduction and managing global supply chain in international settings. There is also a put to go for more diversification. If the global supply chain was more diversified, there would be no impact of disruption. These longer-term goals will take a few years at least. After the pandemic, businesses learn that cost should not be the only consideration when establishing a company's supply chain. Resilience, responsibility and reliability should also be considered. Companies need to be proactive instead of reactive.

## 4 CASE COMPANY – SWISSTEC SOURCING

### 4.1 Company background

Swisstec Sourcing Ltd., the case company acts as distributor in the supply chain network system. This means that they receive orders from customers, then send the orders to the suppliers and deliver the products or materials to the customers. Swisstec Sourcing specializes in the acquisition of hand and power tools, as well as machinery and hardware for do-it-yourself stores, retailer and wholesales. Their large supply networks in Asia bring the advantage of being able to provide their customers a variety of products. The company is trusted by leading retailers around the world for their comprehensive acquisition solutions from production and logistics to marketing and sales support. Swisstec Sourcing currently employ 48 employees and 130 warehouse personnel collaborating with subsidiary companies in Europe and Asia for packaging solutions. (Swisstec Sourcing 2020a.) The company is mainly responsible for hardware and hand tool products such as screws, bolts, pliers, etc (Swisstec Sourcing 2020e).

#### 4.1.1 History

Swisstec Sourcing Ltd. at the start was just a sourcing office which was founded in 2009 under DKSH China, Technology in Shanghai. With the dream of expanding their business, they put non-stop effort into researching the possibility of manufacturing in other Asian countries. Finally, in 2011, they chose Vietnam to locate their packaging facility under DKSH Vietnam in Ho Chi Minh City. In 2013, Swisstec Sourcing Ltd was established in three countries: Hong Kong, China and Vietnam; and all the branches are under the ownership of DKSH Ltd. Switzerland. The company reached their first biggest achievement in 2015, when they were trusted to be fully responsible for the activity in Asia for Kesko Oy. (Swisstec Sourcing 2020b.)

#### 4.1.2 Company services

Swisstec Sourcing is responsible for the sourcing activity of 16 companies and other smaller vendors. Their customers are mainly from Europe, especially Germany. Swisstec offers four kinds of services for their customers: custom packaging, planning and logistics, marketing and export consolidation. (Swisstec Sourcing 2020c.)

- Custom packaging:

With a large number of labour in the packaging team, Swisstec creates flexibility in packaging and assembling according to particular promotional requirements. Customers

can also design their own individual packaging and assembly which is suitable for their needs. In order to provide customers with the best quality of the packaging, Swisstec has their in-house engineers who are responsible for material testing, monitoring the production process and checking all products on-site. Random sampling will be tested in modern testing facilities to secure the packaging quality. All of the tests are followed by the international standards. Moreover, Swisstec ensures long-standing cooperations with all the manufacturers in China, Taiwan and Vietnam to increase the reliability, quality and flexibility in their packaging process. (Swisstec Sourcing 2020d.)

- Planning and logistics:

Swisstec offers flexibility in order and demand which means that as soon as the customers have placed an order, Swisstec will deliver it on the date required with the shortest possible lead time. This allows customers to create a just-in-time inventory which reduces the safety stocks. Furthermore, with numerous warehouses and consolidation facilities across Asia and global network, Swisstec is able to provide customers different choices of transport mode to customers's logistics centers and offer highly attractive shipping solutions. (Swisstec Sourcing 2020d.)

- Marketing:

Swisstec can assist in the preparation and implementation of communication and marketing programmes. Whether customers have their own brand or they are using the model designed from Swisstec – named PXtools, Swisstec will create a suitable packaging in local languages and deliver innovative point of sale ideas. With additional marketing activities such as creating pricing models, limited promotional pricing or new ways to preserve and boost the consumer base, Swisstec also offers assistance according to customer's request. (Swisstec Sourcing 2020d.)

- Export Consolidation:

Besides providing logistics solutions for packaging, transporting and marketing, Swisstec also sells some products from industrial fasteners and related categories such as: screws, bolts, nuts, etc. In order to create convenience and lower the cost of transport for these products, the standard of 20 or 40 foot containers is used for delivery. Customers can package a range of fastener specifications into one or many containers to save cost. (Swisstec Sourcing 2020d.)

### 4.1.3 Company's warehouse and packaging facility

Swisstec Sourcing's warehouse provides a friendly working environment for their labour. In order to achieve economies of scale, the logistics facilities and processes in the warehouse are customized to particular client requirements. As the stock will be stored in the one warehouse, customers benefit from the sharing of infrastructure and services as well as greater flexibility in terms of seasonal volume fluctuations. The service range also covers value-added services in addition to warehousing, such as packaging, product labelling and POS materials. (Swisstec Sourcing 2020f.)

### 4.2 Company vision, mission and values

The company philosophy is to create a protection and wealth accumulation plan which is appropriate for customers. They aim to provide all clients with clear financial direction and support each client by giving the very best advice. By considering clients as the heart of the company, Swisstec desires to offer truly creative solutions that build tangible value and make real difference for their customers with the most optimal advice. The company's mission is to ensure on-time delivery for clients and imply trust throughout the end-to-end supply chain network. (Swisstec Sourcing 2020a.)



Figure 10 Company's mission (Swisstec Sourcing 2020a)

### 4.3 Supply chain network

#### 4.3.1 Supply chain model

Swisstec Sourcing has approximately 40 suppliers and 10 of them are strategic suppliers which are mainly responsible for the company's activity to ensure the source of stocks for the company. There are three suppliers which are responsible for the supply of hardware and hand tools, while more than 30 suppliers are responsible for the packaging supplies. (Nguyen 2020.)

Swisstec Sourcing maintains close relationships with main suppliers. A share information network was created between the company and suppliers. Swisstec Sourcing shares customer information, company's sales to suppliers. On the other hand, suppliers also share their company's situations, raw materials and market situations to Swisstec Sourcing. Every quarter, Swisstec Sourcing and suppliers always organize meetings to discuss further about the market's needs, price and company's situation. (Nguyen 2020.)

In order to create convenience for customers, every customer which provides Swisstec Sourcing with the sales forecast, Swisstec Sourcing commits to deliver the products with the lead time of 60 days. When there is an unexpected order from a customer, the delivery will be under supplier's commitment with the lead time of 120 days. (Nguyen 2020.)

#### 4.3.2 Safety and healthcare during the pandemic

By observing the outbreak of the mysterious new pneumonia from Wuhan at a fast pace, Vietnamese government started the prevention early on a massive scale. Despite its long shared border with China and 97 million inhabitants, Vietnam has reported less than 400 cases of Covid-19 on its soil, and not a single death until August 2020. Although there was no nationwide lockdown, some restrictive physical distancing measures were implemented across the country. A national two-week physical distancing order was issued by the Prime Minister on 1 April 2020, which was extended by a week in major cities and hotspots: people were advised to remain at home, non-essential businesses were requested to close, and public transport was restricted. Therefore, the pandemic was quickly controlled by the start of May with determined policies from the government. Everybody went back to their daily routine, students went back to school and businesses resumed their operations. (UN News 2020.)

The Corona infection reached the peak in Vietnam in March and April. Because there was no national lockdown, only restrictions for unessential activities. Therefore, Swisstec warehouse labour came to work normally. To ensure safety and healthcare for labour,

before entering the warehouse, each worker needed to measure their body temperatures. Swisstec provided two masks a day for labour, one in the morning and one in the afternoon. Hand sanitizers are installed everywhere inside the warehouse. Each worker needed to stand two meters apart from each other to ensure social distancing. Moreover, Swisstec followed the government's policy, when there are any workers who traveled back from another province, they had to stay at home for quarantine in 14 days and were not allowed to go to work. After April, because Vietnam government was able to control the pandemic, Swisstec's production operations came back to normal. No more two meters distance, however, workers are still needed to measure body temperatures before entering the warehouse and a free mask is given by the company every day. (Nguyen 2020.)

## 5 EMPIRICAL RESEARCH AND DATA ANALYSIS

### 5.1 Design and formulation of the empirical research

Empirical research is based on researcher's personal observation and evaluation of a phenomena. The data gathered (primary sources) may be compared against a theory or hypothesis (secondary sources), but the results are still based on real case information. Empirical study is essential when there is desired proof that certain variables in some way influence other variables. Evidence gathered from observation or experiments is seen as the most sufficient information for forming hypotheses. (Emerald 2020.)

As mentioned in the introduction chapter, the research is conducted by qualitative method. Qualitative analysis focuses on non-numeric data and provides in-depth information of the issues (Saunders et al. 2009, 151). Qualitative method was applied through interviews with the office manager from the case company and two other representatives from Valio Ltd and SKF Ab. The goals of the thesis was to find ways for the case company to mitigate the impacts of Corona pandemic on its supply chain and imply resilience into its supply chain networks.

An analysis of the case company's web page was done as primary data to find out the case company's current situation and supply chain's model. The interview with the Swisstec Sourcing office manager was done through an online meeting via Facebook and was recorded as an audio file. The purpose was to understand better the case company's difficulties during the pandemic and how it has dealt with the risks so far. The next two interviews were done via Google Form and were distributed to representative from Valio Ltd, and representative from SKF Ab. Interview questions are displayed in Appendix 1. The aim of these two interviews was to figure out how other companies did to cope with the Covid-19 situation and may be there are some ideas which the case company could apply to its supply chain.

The interview form included nine questions which every question allowed the respondent to answer freely. There are two questions to identify the respondent. English was chosen to be the language for the interview.

The interviewee's backgrounds are shown as in Table 1. Three interviewees work in the management field in the companies, while two of them are specialized in the sourcing field. All of the interviewee companies act as providers in the supply chain.



Table 1 Backgrounds of the interviewees

Interviewee	Country	Comapny	Position
<b>Nga Nguyen</b>	Vietnam	Swisstec Sourcing	Office Manager
<b>Kirsti Rautio</b>	Finland	Valio	SVP, Sourcing
<b>Vesa Alatalo</b>	Finland	SKF	Director

Because Swisstec Sourcing is responsible for the sourcing activities of European customers, two interviews with two representatives from different European countries would give a deeper understanding about how they improvised during the pandemic and their opinions for sourcing the raw materials from Asia in the future.

## 5.2 Data collection

The Figure 11 shows the different phases of the data collection and when each phase was done.

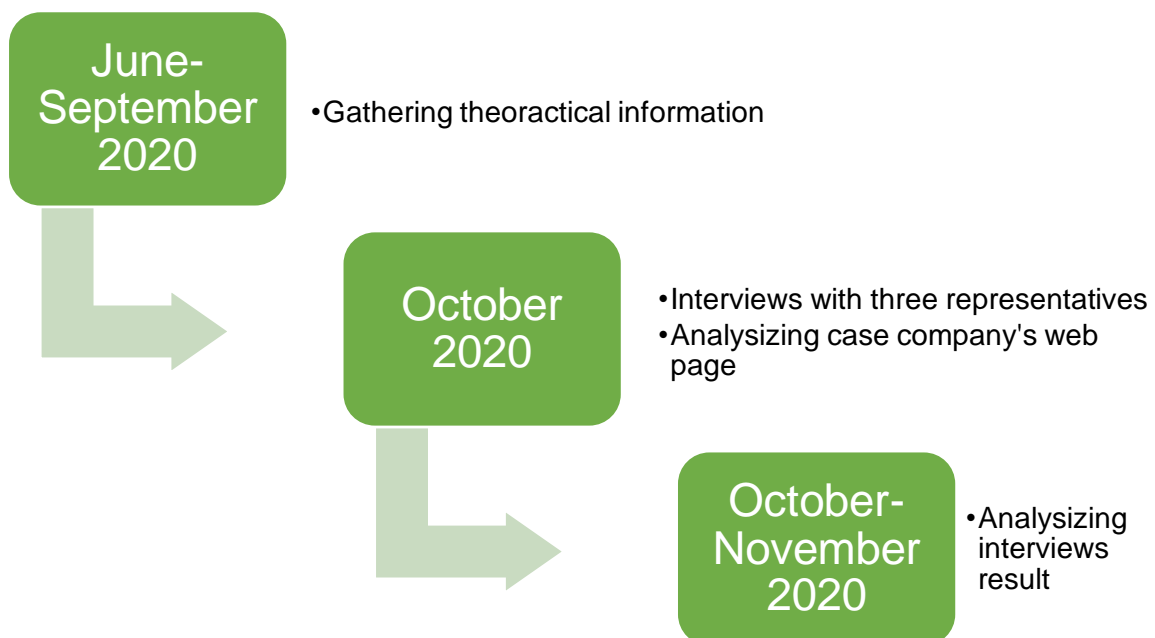


Figure 11 Data collection process

Author started the process of writing thesis in June 2020. The first steps were to define the research questions and find the case company for the thesis, then the introduction was

written. Theories about supply chain excellence and supply chain risk management, and information about the impact of Corona pandemic on global supply chain were collected.

After the theoretical information was gathered, the author continued to design interview questions for three representatives, and the three interviews were done in October 2020. The interview with a Swisstec Sourcing representative was in Vietnamese, the interview was done via Facebook and was recorded as an audio file. At the same time, the interview questions form was formulated and distributed. The answers were received after one week of distribution. The interview was created with Google Form and a link to it was sent to the two representatives by email.

### 5.3 Data analysis

#### 5.3.1 Case company interview analysis

The interviewee is Ms. Nga Nguyen, an office manager from Swisstec Sourcing. The interview was done via Facebook and was recorded. The language usage during the interview is Vietnamese. The audio was transcribed into text and was translated into English.

- Corona pandemic impact on the company

Ms. Nguyen stated that Corona pandemic only affected from 10% to 20% on Swisstec Sourcing in 2020. Because of the lock down, people stayed at home and started spending time to maintain their furniture or their gardens. Therefore, the orders from European's customers increased during the pandemic. Before the pandemic crisis, companies which provided freight services operated the shippings frequently between Vietnam and Europe. However, during the pandemic, the needs for other markets (garment industry, electric industry, etc) decreased and the frequency of shipments reduced. This leads to the result that Swisstec Sourcing still has to face inevitable risks during the freight such as delay shipments, lack of empty containers, component price and transportation price increased, etc.

The biggest risk is that the company got into trouble for lacking product supplies in 2021. China imports the steels from Vietnam expanded 19 times to 2.07 million tons between January and August due to the rising demand in recovering its economy, Swisstec Sourcing's suppliers could not access raw materials. According to prediction, the price for next year will be increased up to 7%, which would create a big challenge to Swisstec Sourcing, especially during the Corona pandemic.

- Company risk management plan

After being overwhelmed with a sudden big amount of orders from Europe during the lockdown, Swisstec Sourcing immediately hired more workers (who were unemployed because of the downsizing from other industries) to ensure enough labour to work in the warehouse. The company also sent more orders to suppliers and set a higher stock level in the warehouse.

According to Ms. Nguyen, Swisstec Sourcing is a small company which is owned by one person – Marcel Baumgartner, with 48 employees and 130 workers. Therefore, the company did not have any specific risk management plan. Swisstec Sourcing looked for Consultant company's opinions, and discussed with the bank to reduce the interest rate and extend lead time for refund capital, VAT tax, etc. Moreover, Swisstec Sourcing also bought risk insurance from insurance company, if company faced any risks, the insurance company would give Swisstec Sourcing financial support.

Ms. Nguyen believed that Swisstec Sourcing is able to overcome the pandemic crisis because the company provides customers with essential tools for them to take care of their houses. As long as there are still orders from European's customers, they will give Swisstec Sourcing enough sources and finance to operate.

### 5.3.2 Valio interview analysis

The interviewee is Ms. Kirsti Rautio, a senior vice president who is responsible for sourcing the field in Valio Group. The interview was done through Google Forms questions and was distributed to the interviewee by email.

- Corona pandemic impact on the company

According to Ms. Rautio, the pandemic had a strong impact on the Horeca sector. Therefore, Valio had to adjust their distribution channels – less distribution via Horeca sector and more distribution via retail. Valio also had some challenges with their suppliers, since there was the rising demand for retail packages in the beginning of the pandemic.

- Company risk management plan

In order to overcome the crisis, Valio started a special weekly risk-assessment by organizing meetings via all their supply chain. However, there is a possibility that Valio will switch back to their daily routine after everything has been settled down. Moreover, Valio has all possible preventive measures in use at the factories, for example, special calculations for employees possible quarantines. Valio also agreed to increase stock levels for critical raw materials or machinery parts.

Valio learned that they need to take a better control over operative procurement especially at challenging times. Therefore, Valio continues enhancing operative excellence and starts a development project for better control and change management in this area. The most important note for all supply chains is to keep control on suppliers, their ability to supply on time and communicate well with production if there are any delays or challenges.

Ms. Rautio believed that Valio has done a great job to mitigate the pandemic impact on the company. Valio re-arranged immediately when the pandemic started, a new crisis management system was in use and there is possibility to relaunch it depending on the current stage of pandemic or crisis. For stock level increases, Valio had to agree to the financial impact beforehand. After this crisis, Valio's supply chain is more transparent and even more flexible.

Ms. Rautio also stated that Valio's business model is resilient enough to recover from unexpected crises. Because people continue eating and consumption of the food is not changing dramatically. Of course consumer's price sensitivity is increasing due to hard times in the economy and that might change the market situation and demand.

### 5.3.3 SKF interview analysis

The interviewee is Mr. Vesa Alatalo, a director from SKF company. The same as the representative from Valio, the interview also was done by Google Forms and was distributed through email.

- Corona pandemic impact on the company

At the beginning it was quite a big shock and some problems occurred. However, the current situation is much better and no big problems are left. There are two kinds of supply chains at SKF: local and long distance. Local supply chains have been working well all the time during the pandemic. Main problems have been in long distance sourcing from Asia.

- Company risk management plan

Every business has their own ways to identify and mitigate risks. So no exact model in place. In case the Corona pandemic would not be solved in short-term, Mr. Alatalo stated that there is a possibility that SKF would go more for local to local manufacturings and supply models, and reduce the long distance sourcing.

SKF dealt with the new situation quite well. Normally, it takes some time to find suitable and cost competitive suppliers from every region, but until now, SKF has overcome the difficult

time. One of SKF's cornerstones for keeping up the reliable supply to their customers is the long term collaboration with the main suppliers, dual sourcing and buffer stocks.

#### 5.3.4 Conclusion on global supply chain

All three interviewees agreed that companies need to put more efforts in developing their supply chain. Full transparency throughout the whole value chain is very important. Visibility for the demand fluctuations is getting harder and planning cycles are shorter. Therefore, the whole value chain must share the same view of demand in order to build enough flexibility and create end-to-end visibility throughout the supply chains. Mapping the whole supply chain is an essential step to have a better vision and management. Mr. Alatalo stated that there might be some changes in goods consumption and there is possibility that local trends will become stronger.

## 6 RECOMMENDATION

After researching information and theories related to the concepts of supply chain excellence and supply chain risk management, moreover, the empirical research is also completed, it is time to make some recommendations for the case company. The recommendations are based on the case company's situation after the analysis from empirical research, theories and the author's perspective.

From the author's point of view, Swisstec Sourcing has done a fairly good job in managing their supply chains. Table 2 shows the evaluation to have a better view about what has been done well and what can be improved further.

The practice of supply chain management theories      Swisstec Sourcing	
<b>Relationships with suppliers and customers</b>	Long-term partnerships
<b>Reliability throughout the supply chain</b>	Trust is ensured across the supply chain
<b>Resilience in the supply chain</b>	The impacts have been well-controlled in 2020
<b>Responsiveness of the supply chain</b>	Quickly improvise with sudden big amount of orders from Europe during the lock-down period
<b>Risks management</b>	Need to be concentrated and developed

Table 2 Evaluation of Swisstec Sourcing's supply chain management

Swisstec sourcing seems to well apply the 4Rs concept in order to create just-in-time inventory, bring convenience to customers and reduce the inventory cost for the company. Swisstec values the long term relationships with customers and suppliers. Trust is ensured

across the supply chain. The impacts of Corona pandemic on the company's supply chain have been well-managed by increasing workers in the warehouse, discussing with suppliers more frequently and raising the stock holding level.

However, Swisstec Sourcing should put more effort in developing a risk management plan, not just only rely on banks and insurance companies. Of course, there is nothing that Swisstec Sourcing can do to solve the problems related to freight such as less shipping schedules, expensive transport price, delayed shipments, etc. Because these issues are related to companies which provide freight services. However, some changes in the Swisstec Sourcing's operation would reduce the operating cost and mitigate the risks. External risks are inevitable and they also can not be forecasted with a high accuracy, but they could be mitigated with an excellent internal management (Beers 2020).

According to Christopher (2016, 126-130), to increase agility, companies should map out their whole supply chain networks, identify non-value activities and eliminate them, and seek to reduce complexity. These methods would help Swisstec Sourcing operate more smoothly, have a clearer vision of their networks, reduce operation cost and enhance company's resilience.

Swisstec Sourcing should learn from Valio, instead of wanting help from banks and insurance companies, they immediately restructure their supply chain, develop a project for better control and change management. During the pandemic, Valio's supply chain has been enhanced to be more transparent and more flexible.

Beside the risk management plan, Swisstec Sourcing has done a great job in managing their supply chain. Moreover, their products are also preferable during the lock-down time in Europe. Therefore, the company is well-prepared if the Corona pandemic is going on long-term and can not be solved in a short period.

- Suggestions for the case company in 2021

Due to the demand of recovering the country's economy, China has increased the import level for steel from Vietnam and offered Vietnamese businesses with a high price. Therefore, Swisstec Sourcing would face an increase of 7% of the price for the products in 2021.

Swisstec Sourcing can find more suppliers for supplying products, in case the other three suppliers are not able to meet the order's quantity needs due to scarcity of raw material. Through the interview, it is known that Swisstec Sourcing has more than 30 suppliers for packaging, but only has 3 suppliers for hardware and hand tool products.

There are two kinds of competitive advantages: cost and value differentials (Christopher 2016, 4-7). Taking this theory and the idea of win-win thinking in mind, Swisstec Sourcing can try to give suppliers more value advantages instead of price increase. This way both companies and suppliers can benefit from the cooperation. The same idea can also be used for customers. The price of products may get more expensive but customers can receive more value differentials. Communication traffic between company and customer, and between company and suppliers should be enhanced to ensure solid cooperation.

- Suggestions for future risks

According to Mr. Alatalo, there is a possibility that European would prefer local supplies instead of choosing the sourcing from Asia. If this happens, Swisstec Sourcing will be in an extremely difficult situation, because Swisstec Sourcing activity is providing supplies from Vietnam to European customers. The concept of competitive advantages will also be helpful for the company. By creating cost advantages and providing value differential at the same time to customers, European customers would still prefer the cooperation with Swisstec Sourcing despite long-distance disadvantage.



## 7 CONCLUSION

### 7.1 Answers to research questions

The research has been conducted and evaluated supply chain excellence during the Corona pandemic. To gain a deep insight into the topic, three sub-questions were created to support the main question. The answers to research sub-questions are given first and the main research question is finalized later.

Sub-questions:

What are the steps for creating a supply chain excellence in business?

There are a number of principles introduced to guide the supply chain manager during the era of supply chain competition such as: integrated supply chain, supply chain optimization, SCOR model, etc. All the principles can be summarized as the "4Rs". To create a supply chain excellence in business, a company must be able to imply the 4R's concept into the supply chain networks: responsiveness, reliability, resilience and relationships.

Responsiveness means the flexibility of one business and shows how quick it is to adapt to market demands. Reliability relates to improving the visibility throughout the whole supply chain to reduce operational cost. Resilience refers to the capacity of the supply chain to cope with unexpected disruptions and quickly recover after the strikes. Companies are seeking for long-term relationships with suppliers to create competitive advantages. (Christopher 2016, 23-24.)

The implementation of the 4R's concept was described in chapter 2 and chapter 3. There are some activities which companies need to conduct to create excellent supply chain management, such as mapping out end-to-end supply chain, restructuring the whole supply chain, seeking to reduce complexity, defining non-activities and eliminating them, creating shared information networks with suppliers and customers, and applying agility into the supply chain.

What influences will excellent supply chains have in order to mitigate the pandemic's impaction?

The analyses of the influences of excellent supply chains on companies were given in chapter 2. A supply chain which trust, collaboration, flexibility and transparency are implied throughout the chain is called an excellent supply chain. Businesses seek to improve the visibility throughout end-to-end supply which will give them a clearer vision about customer

demand and supply situation from suppliers. As a result, businesses can avoid the “bullwhip” effect, reduce stock holding level, cut down inventory cost. Moreover, through excellent supply chains, the resistance ability and the recovery ability of the chain are improved, which help businesses to be more proactive, quickly respond to the pandemic’s impact and recover immediately.

According to the interview with representative from Valio, the company learnt that having an excellent supply chain management is extremely important, especially during the challenging times. Valio therefore continues to enhance operational excellence and start a development project to improve control and change management in the procurement area.

How does Coronavirus pandemic reshape the supply chain?

To give the answer for this question, the author analyzed some research articles and studies. As it was explained in chapter 3, Corona pandemic caused supply chain disruption due to the lock-down in China, which led to many Western businesses not having access to the supply of raw materials and products. Therefore, the clearest change can be observed is that businesses start decoupling from some long-term supply chain dependencies from the China-centric supply chain network to other Asian countries, such as Vietnam, Indonesia, India, or American countries like Mexico. There is a push for more diversification in the global supply chain. Cost is no longer the only concern when setting the node in the supply chain, transparency and flexibility are considered instead.

According to the interviews, there is a possibility that Western businesses will bring the supply chain close to customer demand and go for local trends to ensure the supply of materials. After the pandemic, a better global supply chain network which is more resilient, agile and reliable will be established.

Main research question:

How should the case company develop a resilient supply chain to mitigate the impact of Coronavirus pandemic and be prepared for inevitable risks in the future?

The case company should be more proactive in managing risks instead of just asking help from banks and insurance companies. Even though their supply chain connection seems to be strong with relationships and cooperation with customers and suppliers, Swisstec Sourcing should put more efforts in developing a risk management plan to make their supply chain more resilient. Therefore, some actions such as mapping out the whole supply chain networks, identifying and eliminating non-value activities, and seeking to reduce complexity

have been suggested to the case company. These techniques will allow Swisstec Sourcing to run more smoothly, have a better view of their networks, reduce operational costs and boost the resilience of the company.

According to the interview with the representative from Swisstec Sourcing, it is known that the company may have to face the situation of shortage supplies and a possibility of losing customers due to local trends in the future, a suggestion of using competitive advantages concept is given. By creating cost advantages and providing value differentials to customers and suppliers, a stronger cooperation will be built and it helps the case company to mitigate the future risk's impacts.

## 7.2 Validity and reliability

Reliability and validity are concepts that are used to determine research quality. Reliability is about the consistency of a measure, and validity is about the accuracy of a measure. Reliability extends to how consistent a method is in measuring. If, in the same conditions, the same outcome can be reliably obtained by using the same methods, the measurement is considered accurate. Validity relates to how correctly a methodology measures what it is supposed to measure. If research is highly valid, that implies that it produces outcomes that correspond to real properties, characteristics, and physical or social world variations. The higher reliability of one indicator will give a more valid measurement. If a method is not reliable, it probably isn't valid. (Middleton 2020.)

The primary objective of this analysis was to give answers to all the research questions. The goals were met in the analysis, with answers to the research questions described. Information was obtained from secondary and primary sources for this study. Primary data was obtained during the empirical research process by the assistance of the interviews. There were three interviews in total with three representatives from three different logistics companies. One interview was conducted via Facebook in Vietnamese, it was recorded and was translated to English. Two others were done through Google Form questions in English and were distributed to the interviewees via email. All interview questions are open-ended questions which bring a better understanding of the company's current situation as well as limit the possibility of subjectivity or prejudice. Secondary sources were collected from literature sources such as books, articles in journal or periodical and conference proceedings which clarified the relevant topic to research questions. According to the statements mentioned above, the research is valid and reliable.

### 7.3 Suggestions on further research

As mentioned at the beginning of the thesis, the research focused on the case company, thus only covering the field of products provider in the supply chain. To get a broader application of supply chain excellence into practice, further research could be expanded to different types of supply chain companies such as logistics providers, suppliers, etc. Moreover, since this study only covered a company that provides hardware and hand tools for fixing stuffs, further studies on other forms of supply chain, such as foodstuffs supply, services supply and automotive supply would be interesting. A broader research would be appealing and provide valuable information for the case company.

## 8 SUMMARY

The aim of the thesis is to provide an insight into the company's process in managing its supply chain networks, creating excellent management and building a resilient supply chain. The information also included the impact of Corona pandemic on the global supply chain because the main activity of the case company is sourcing products from Asia and distributing them across Europe. The final goal was to give recommendations for the case company and address the main research question about how the case company could enhance resilience in its supply chain in order to mitigate the impact of Corona pandemic and be prepared for inevitable future risks.

The thesis was written using a deductive reasoning approach. At the beginning, the author introduced the fundamental concept of supply chain excellence and its 4R's – responsiveness, reliability, relationship and resilience. The basics of supply chain risk management, the concept of achieving resilience supply chain and the impact of Corona pandemic on the global supply chain were presented.

Following the two theoretical parts, an introduction to the case company was presented. An overview of the case company was given about the company's history, mission, vision, values and its services which it offers for customers. The company's current supply chain networks situation and the impact of Corona pandemic on its supply chain were also analysed. An empirical research and its analysis were discussed. In order to collect data for the research, interviews with three representatives from Swisstec Sourcing, Valio and SKF were conducted. The interview with representatives from Swisstec Sourcing was to find out how the case company dealt with the new situation and what it did to mitigate the risks. The other interviews were to know how the other companies dealt with Corona pandemic, therefore, the case company maybe could take it as an example.

The next chapter Interpreted the empirical research results and provided recommendations for possible methods and supply chain models that the case company could apply resilience into its supply chain during the pandemic. The recommendations were using both theoretical and empirical data. The main research question and all the sub-questions that came up in the introduction were to be addressed at the final part of the thesis. Validity and reliability were discussed, and how further study could be extended was stated.

## LIST OF REFERENCES

### Written References

Adams, J. 2007. Research Methods for Graduate Business and Social Science Students. New Delhi: Sage Publications Pvt. Ltd. 2007.

Christopher, M. 2016. Logistics & Supply Chain Management. Fifth Edition. Harlow: Pearson Education Limited.

Chopra, S. & Meindl, P. 2007. Supply Chain Management: Strategy, Planning and Operation. Third Edition. New Jersey: Pearson Prentice Hall.

Drake, M. 2011. Global Supply Chain Management. New York: Business Expert Press, LLC.

MacDonald, S. & Headlam, N. 2011. Research Methods Handbook. Manchester: Centre for Local Economic Strategies.

Olson, D. 2011. Supply Chain Risk Management: Tools for Analysis. First Edition. New York: Business Expert Press.

Ohmae, K. 1991. The Mind of the Strategist. Second edition. New York: McGraw-Hill Education.

Porter, M. E. 1985. Competitive Advantage: Creating and Sustaining Superior Performance. New York: Free Press.

Saunders, M. & Lewis, P. & Thornhill, A. 2009. Research Methods for Business Students. Fifth Edition. Essex: Pearson Education Limited.

Stevens, G. C. 1989. Integrating the Supply Chain. International Journal of Physical Distribution & Materials Management. MCB UP Limited.

Stevens, G.C. & Johnson, M. 2016. Integrating the Supply Chain... 25 Years On. International Journal of Physical Distribution & Materials Management. MCB UP Limited.

### Electronic References

Ainsworth, Q. 2020. Data Collection Methods. Jot Form [accessed 18 August 2020]. Available at: <https://www.jotform.com/data-collection-methods/#:~:text=Qualitative%20vs%20>

quantitative%20data%20collection%20methods&text=In%20general%2C%20questionnaires%2C%20surveys%2C,and%20oral%20histories%20are%20qualitative.

B. Taylor, D. 2020. How the Coronavirus Pandemic Unfolded: A Timeline. The New York Times [accessed 9 May 2020]. Available at: <https://www.nytimes.com/article/coronavirus-timeline.html>

Better Thesis. 2020. Research objectives [accessed 10 May 2020]. Available at: <https://betterthesis.dk/getting-started/short-synopsis>

Business Research Methodology. 2020. Research Limitations [accessed 1 August 2020]. Available at: <https://research-methodology.net/research-methods/research-limitations/>

B2U. 2018. Value Chain Analysis: An Internal Assessment of Competitive Advantage. Business to you [accessed 9 September 2020]. Available at: <https://www.business-to-you.com/value-chain/>

Beers, B. 2020. How Companies Can Reduce Internal and External Business Risk. Investopedia [accessed 3 October 2020]. Available at: <https://www.investopedia.com/ask/answers/050115/how-can-companies-reduce-internal-and-external-business-risk.asp>

CSCMP. 2020. Supply Chain Management Definitions and Glossary [accessed 29 August 2020]. Available at: [https://cscmp.org/CSCMP/Educate/SCM\\_Definitions\\_and\\_Glossary\\_of\\_Terms.aspx](https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx)

Deloitte. 2020. Managing supply chain risk and disruption. Deloitte [accessed 27 October 2020]. Available at: [https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/finance/Supply-Chain\\_POV\\_EN\\_FINAL-AODA.pdf](https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/finance/Supply-Chain_POV_EN_FINAL-AODA.pdf)

Dong, P. 2020. Ông Abe muốn công ty Nhật rời Trung Quốc, Bắc Kinh lo lắng đối phó. Zingnews [accessed 7 May, 2020]. Available at: <https://zingnews.vn/ong-abe-muon-cong-ty-nhat-roi-trung-quoc-bac-kinh-lo-lang-doi-pho-post1074075.html>

Every CRS Report. 2011. The Motor Vehicle Supply Chain: Effects of the Japanese Earthquake and Tsunami [accessed 29 September 2020]. Available at: <https://www.everycrsreport.com/reports/R41831.html>

Emerald. 2020. How to... conduct empirical research. Emerald Publishing [accessed 28 October 2020]. Available at: <https://www.emeraldgrouppublishing.com/archived/research/guides/methods/empirical.ht>

m#:~:text=Empirical%20research%20is%20research%20that,based%20on%20real%20lif e%20experience.

K. Ratan, S. & Anand, T. & Ratan J. 2019. Formulation of Research Question – Stepwise Approach. Journal of Indian Association of Pediatric Surgeons [accessed 11 May 2020]. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6322175/>

Lin, Jesse & Lanng C. 2020. Here's how global supply chains will change after COVID-19. World Economic Forum [access 10 May 2020]. Available at: <https://www.weforum.org/agenda/2020/05/this-is-what-global-supply-chains-will-look-like-after-covid-19/>

McKinsey. 2020. COVID-19: Briefing Note. OESA [accessed 27 October 2020]. Available at: [https://www.oesa.org/sites/default/files/20200315\\_COVID-19%20Response\\_vSHARED%20%281%29.pdf](https://www.oesa.org/sites/default/files/20200315_COVID-19%20Response_vSHARED%20%281%29.pdf)

Middleton, F. 2020. Reliability vs validity: what's the difference. Scribbr [accessed 2 November 2020]. Available at: <https://www.scribbr.com/methodology/reliability-vs-validity/#:~:text=They%20indicate%20how%20well%20a,the%20accuracy%20of%20a%20measure.&text=The%20extent%20to%20which%20the%20results%20really,they%20are%20supposed%20to%20measure.>

Novosedlik, W. 2020. The 3 Cs of Brand Development: Customer, Company, and Competitors. MaRS Startup Toolkit [accessed 9 September 2020]. Available at: <https://learn.marsdd.com/article/the-3-cs-of-brand-development-customer-company-and-competitors/>

Reese, J. 2020. Preparing for Covid-19 and the bullwhip effect: What happens to the supply chain when you buy 100 rolls of toilet paper? Kinaxis [accessed at 7 May 2020]. Available at: <https://www.kinaxis.com/en/blog/preparing-covid-19-and-bullwhip-effect-what-happens-supply-chain-when-you-buy-100-rolls-toilet>

Redwood Logistics. 2020. Should You Use a Lean or Agile Supply Chain [accessed 20 September 2020]. Available at: <https://www.redwoodlogistics.com/use-lean-agile-supply-chain/#:~:text=The%20difference%20between%20lean%20and,smaller%2C%20customizable%20batches%20of%20items.>

Swisstec Sourcing. 2020a. Our Company [accessed 11 August 2020]. Available at: <https://swisstecsourcing.com/our-company/?v=ef622adbe931>

Swisstec Sourcing. 2020b. Our history [accessed 20 August 2020]. Available at: <https://swisstecsourcing.com/our-history/?v=ef622adbe931>



Swisstec Sourcing. 2020c. Our customer [accessed 20 August 2020]. Available at: <https://swisstecsourcing.com/our-customers/?v=ef622adbe931>

Swisstec Sourcing. 2020d. Our services [accessed 20 August 2020]. Available at: <https://swisstecsourcing.com/service/?v=ef622adbe931>

Swisstec Sourcing. 2020e. Vietnam Shop [accessed 5 November 2020]. Available at: <https://swisstecsourcing.com/shop/?v=ef622adbe931>

Swisstec Sourcing. 2020f. Our Warehouse and Office [accessed 5 November 2020]. Available at: <https://swisstecsourcing.com/our-warehouse-office/?v=ef622adbe931>

Thattamparambil, N. 2020. How to chose the research methodology best suited for your study. Editage [accessed 16 August 2020]. Available at: <https://www.editage.com/insights/how-to-choose-the-research-methodology-best-suited-for-your-study>

Tarver, E. 2020. Value Chain vs Supply Chain: What's the Difference. Investopedia [accessed 9 September 2020]. Available at: <https://www.investopedia.com/ask/answers/043015/what-difference-between-value-chain-and-supply-chain.asp#:~:text=Key%20Takeaways,the%20product%20to%20the%20customer.>

Urrbrae AHS Research Project B. 2020. Planning your Research Sub-Questions. Urrbraeresearch [accessed 11 May 2020]. Available at: <https://urrbraeresearch.weebly.com/planning-your-research-sub-questions.html#>

UNSW. 2020. Primary and Secondary Sources. UNSW Library [accessed 7 September 2020]. Available at: <https://www.library.unsw.edu.au/study/information-resources/primary-and-secondary-sources>

Un News. 2020. The key to Viet Nam's successful COVID-19 response: A UN Resident Coordinator blog. United Nations [accessed 2 November 2020]. Available at: <https://news.un.org/en/story/2020/08/1070852>

Vyas, N. 2020. Five questions on how coronavirus will impact the global supply chain. USC News [accessed 11 November 2020]. Available at: <https://news.usc.edu/166804/coronavirus-global-supply-chain-economy-nick-vyas-usc-marshall/>

Worldometer. 2020. Covid-19 Coronavirus Pandemic [accessed 9 May 2020]. Available at: <https://www.worldometers.info/coronavirus/>

World Economic Outlook. 2020. A Crisis Like No Other, An Uncertain Recovery. International Monetary Fund [accessed 27 October 2020]. Available at: [https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEUpdateJune2020#:~:text=Global%20growth%20is%20projected%20at,Economic%20Outlook%20\(WEO\)%20forecast.&text=In%202021%20global%20growth%20is,19%20projections%20of%20January%202020.](https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEUpdateJune2020#:~:text=Global%20growth%20is%20projected%20at,Economic%20Outlook%20(WEO)%20forecast.&text=In%202021%20global%20growth%20is,19%20projections%20of%20January%202020.)

WTO. 2020. Trade set to plunge as COVID-19 pandemic upends global economy. World Trade Organization [accessed 27 October 2020]. Available at: [https://www.wto.org/english/news\\_e/pres20\\_e/pr855\\_e.htm](https://www.wto.org/english/news_e/pres20_e/pr855_e.htm)

Y. Choi, T. & Rogers, D. & Vakil B. 2020. Coronavirus Is a Wake-Up Call for Supply Chain Management. Harvard Business Review [accessed 9 May 2020]. Available at: <https://hbr.org/2020/03/coronavirus-is-a-wake-up-call-for-supply-chain-management>

**Oral source:**

Nguyen, N. 2020. Office Manager. Swisstec Sourcing Ltd. Interview 25th October 2020.

Rautio, K. 2020. SVP, Sourcing. Valio Ltd. Interview 28 October 2020.

Alatalo, V. 2020. Director. SKF Ab. Interview 28 October 2020.

## APPENDIX

### Appendix 1. Interview questions

1. What is your company?
2. What is your position in your company?
3. What is the impact of Corona pandemic on the supply chain of the company?
4. What model does the company have in place to assess potential risks and define responses in the event of a crisis?
5. There is a chance that Corona pandemic will not be solved in short-term. What are the strategies from the company to deal with this new situation?
6. How do the company able to apply those strategies into practice?
7. How do the new decisions reshape the company supply chain network?
8. Is the business model resilient enough to recover from the impact of a crisis and manage potential crises in the future?
9. What is your opinion about current situation of global supply chain?