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BSc in Sciences of Engineering and Industrial Management

TRANSPORTATION RISK MANAGEMENT APPROACH IN A FOOD COMPANY:

A BUSINESS CONTINUITY PLAN

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"If you think you can do a thing or you think you can't do a thing, you're right."
(Henry Ford).

ABSTRACT

Transportation is an essential aspect to fast-moving consumer goods supply chains. The risks associated with transport operations are of great concern when trying to ensure business continuity of a company.

The dissertation is based on the Distribution & Export Business Unit at Kraft Heinz international, which ships to over 25 countries in Eastern Europe, and also to the US and Israel. The complex logistics system that goes into planning transportation for so many countries makes it so that risks within transportation are highly present. The main identified issue at the case study organization was the lack of a structured approach towards transportation risk management. Most of the contingency measures applied by the company to act on these risks are of a reactive nature instead of proactive. The goal of this research is to create such structured approach towards risk management.

To achieve this goal, transportation risks were mapped within the company through semi-structured interviews with employees working in supply chain operations. Additionally, current literature was analyzed and later compared with the interview findings to learn possible strategies and solutions to manage transportation risks. Finally, the gathered knowledge was used to propose a Business Continuity Plan based, which provides insights on how to assess and prepare for current and future transportation risks.

The main findings and proposed guidelines for transportation risk management relied on shifting the company's work culture from cost to consumer oriented, increasing communication flows throughout the supply chain with help of cross-functional integration and standardizing the way the case study organization identifies, evaluates, and acts upon transportation risks, as well as actions that can be integrated into supply chain operations, such as assessing risk key performance indicators, determining ownership of tasks and spreading awareness of transportation risks throughout the supply chain.

Keywords: Business continuity, Transportation risk management, Business continuity plan, Transportation risks.

RESUMO

Os transportes são um aspeto essencial nas cadeias de abastecimento de bens de consumo rápido. Os riscos associados às suas operações são de grande preocupação para as empresas que querem garantir continuidade de negócio.

O estudo baseia-se na Distribution & Export Business Unit da Kraft Heinz International, que exporta para mais de 25 países na Europa Oriental, e também Estados Unidos e Israel. A complexidade da logística envolvida em exportar para tantos países diferentes leva a que a sua cadeia de abastecimento esteja altamente exposta a riscos de transporte. O principal problema identificado na empresa estudo de caso foi de não terem uma abordagem estruturada para gerir os riscos no transporte dos produtos. A maioria das medidas realizadas pela empresa, para atenuar esses riscos, têm sido de natureza reativa em vez de proativa. O objetivo deste estudo é a criação de um plano estruturado para gestão de riscos, de modo a melhorar a preparação da empresa relativamente a riscos de transporte.

Com este objetivo, foram analisados os riscos de transporte da empresa estudo de caso através de entrevistas semiestruturadas com funcionários que trabalham nas operações da cadeia de abastecimento da empresa. Adicionalmente, foi analisada a literatura existente para ser posteriormente comparada com os resultados das entrevistas e concluir possíveis estratégias e soluções para a gestão de riscos. Os resultados foram utilizados para propor um *Business Continuity Plan*, que revela como a empresa se deve preparar para atuais e futuros riscos.

As principais conclusões e diretrizes propostas para a gestão de risco, referem a necessidade de alterar a cultura da empresa de um foco em custos para um foco no cliente, melhorar as redes de comunicação em toda a cadeia de abastecimento com ajuda de uma equipa multifuncional ou equipa multidepartamental e standardizar a maneira como a empresa identifica, avalia, e age sobre possíveis riscos de transporte, bem como ações que podem ser integradas nas operações da cadeia de abastecimento, como a avaliação através de *key performance indicators* para riscos, definir responsabilidades e espalhar conhecimento sobre riscos de transportação por toda a cadeia de abastecimentos.

Palavras chave: Continuidade de negócio, Gestão de riscos de transporte, Resiliência da cadeia de abastecimentos, *Business continuity plan*, Riscos de transporte.

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ACRONYMS

FMCG	Fast-moving Consumer Goods
BU	Business Unit
CSR	Corporate Social Responsibility
BCP	Business Continuity Plan
LSP	Logistics Service Provider
IT	Information Technology
KHC	The Kraft Heinz Company
D&E	Distribution & Exports
SC	Supply Chain
KPI	Key Performance Indicators

INTRODUCTION

1.1 Contextualization and Motivation

On March 11, 2020, The World Health Organization declared a pandemic that would continuously hold the world in a global crisis for the upcoming years. As cases rose and countries entered forced lockdowns, the pandemic affected global supply chains at all stages, from the supply sources to the final customers (Xu, Sun and Gao 2020). The run on fast-moving consumer goods (FMCG) due to the fear of supermarkets running empty and that products would be missing from shelves for an extensive period made it so that the food FMCG supply chain was one of the most affected (Adams 2021).

Challenges originating from the COVID-19 pandemic are not only present when consumer demand is concerned. They are also relevant when analyzing the distribution of food products (Ramani, Ghosh and Sodhi 2022). The transportation market became more competitive and increasingly scarce. In terms of the labor market, the pandemic affected the availability of logistics workers. Unfortunately, workers who fall ill or even decease might not always be easy to replace, especially considering the lack of experienced operational professionals within the field in some areas (Barman, Das and De 2021). Moreover, because logistics activities have increased in the past years due to the pandemic, operating companies have struggled to find available workforce and trucks in some areas of the world, generating issues for transport operators (Hobbs 2021).

Every FMCG supply chain will inevitably face multiple events that disrupt the normal flow of goods and materials (Christopher, Johnny and Robert 2007). Transportation disruptions can be defined as an interruption in the transit of goods from one node of the supply chain to another (Zhen et al. 2016). While other types of disruption in a supply chain directly affect or

stop production, transportation disruptions halt the flow of products between any two points of the supply chain (Hishamuddin, Sarker and Essam 2013). These originate risks for the supply chain, which can be missed delivery deadlines, lost sales, and loss of customer relationships (Sun et al. 2020, Sharifkhani, Khazaei and Asian 2016).

Based on the studies of Cao et al. (2019), Pellegrino, Constantino and Tauro (2021), Wang et al. (2021) and Liu et al. (2013) and input from the logistics team, this study divides the risks associated with disruptions into capacity, performance, or contracting related. Within those three scopes, specific risk areas were researched, such as truck and workforce capacity and availability, low transport performance, outsourcing partnerships, digitalization, as well as environmental and societal impacts. Managing risks increases the supply chain's resilience (Asamoah, Agyei-Owusu and Ashun 2020, Elwood 2021). Pettit, Croxton and Fiksel (2019) concluded that supply chain resilience is not only an essential competitive advantage but a necessary means for Business continuity and higher financial gains.

In the face of uncertain external factors, risk management practices have been increasingly relevant for higher management positions within FMCG organizations (Rinaldi, et al. 2022). Due to increased competitiveness within the food FMCG industry, organizations are pushed to act quickly upon disruptions (Alikhani, Torabi and Altay 2021). What was once seen as a mere reactive task toward timely disruptions within operations is now regarded as one of the most critical discussion topics regarding decision-making (Saglam, Cankaya and Sezen 2021, Kirilmaz and Eron 2017). Organizations achieve better results in proactive management if cross-functional integration is enabled within the supply chain. Besides increasing the supply chain's preparedness towards risks, research in supply chain integration has found it to be profoundly connected with supply chain performance (Frankel and Mollenkopf 2015, Munir, et al. 2020).

The efforts to minimize the risks associated to disruptions (even without a structured guideline) are often backed up by practical (and theoretical, to a lesser extent) knowledge. This approach, although minimizing some of the risks, does not apply to all situations, especially when practical knowledge is insufficient when new risks materialize. Therefore, a structured approach toward risk management has become a necessity for the case study organization to increase their performance when it comes to transportation.

1.2 Problem and Study Goals

Business units of Kraft Heinz International are separate departments which develop and implement their own processes independently but share the same company goals and culture. These departments are generally responsible for a certain region or market. Because of the individualities of each region or market, it becomes difficult for those entities to share knowledge in a formalized manner.

Because of their short-term collaboration strategy to increase flexibility in logistics operations, Business Units (BUs) within Kraft Heinz International work with short-term contracting for their logistics and transport operations. This makes it so the company has to create new contracts every year but ensures that the contracts meet consumer demand and current market specificities. This brings an additional challenge in restructuring its supply chain whenever needed (Grahl and Hartmann 2011). In March 2022, a new contract was made between Kraft Heinz and its carriers to re-negotiate prices, routes, and transportation modes used by the company to deliver their products to the customers. Political and economic factors such as the war in Ukraine, which has brought difficulty for road travel in Eastern Europe, or environmental factors to help reduce the company's carbon footprint led to switching multiple routes from road to intermodal means. All the aforementioned factors make the supply chain more prone to disruptions and helped build up the urgency for a structured risk management approach.

Risk management within Kraft Heinz International is mainly based on a case-to-case approach and inferring the best probable solution through practical knowledge gained from previous disruptions. Therefore, in order to improve the risk management approach of Kraft Heinz, a Business Continuity plan (BCP) is developed with the guidelines for a structured risk management plan. By establishing this plan, the case study company will be better prepared for possible transportation risks and therefore improve its supply chain resilience.

Based on the case study company's problem, the central focus question of this research is "How can Kraft Heinz International improve their supply chain's preparedness towards transportation risks through creating a risk management approach?". This inquiry leads to two research sub-questions, which are also approached by this research:

- i. What are the impacts of transportation risks for Kraft Heinz?
- ii. How can Kraft Heinz improve their transportation risk management?

1.3 Study and Methodology

The study methodology for this work was conducted via an abductive reasoning design, which is the inference of the most probable explanation to a problem given the information at hand (Coghlan and Shani 2021). Initially, the main relevant topics for this study were mapped and identified within the studied organization. Additionally, a literature review was conducted to revisit essential concepts related to the supply chain of an FMCG food company, transportation capacity, performance, and contracting-related risks, and concepts such as supply chain resilience, business continuity and risk management practices. The literature study was carried out by mapping the available knowledge on transportation risk management practices within academia. The applicability of this knowledge for Kraft Heinz was later validated by conducting semi-structured interviews with employees working within Kraft Heinz's supply chain. The semi-structured interviews were used to specify the business problem of the organization and provide guidance on how to solve it with a strategic supply chain perspective.

Afterwards, a second round of literature review was performed to help consolidate and validate the initial findings. Based on the research findings, a Business Continuity Plan based on Zsidisin, Ragatz and Melnyk (2003)'s work was proposed to improve the way the case study company approaches risk management within transportation. The final recommendations involve a new way of dealing with transportation risks and an adequate supply chain design to implement organizational change.

1.4 Dissertation Structure

The dissertation is divided into six distinct chapters: "Introduction", "Theoretical Background", "Case Study", "Findings and Discussion", "Business Continuity Plan" and "Conclusion".

The first chapter, "Introduction", contains the Contextualization and Motivation, the Problem and Study Goals, the Study Methodology and dissertation structure.

The second chapter of the dissertation, "Theoretical Background", is divided into six sub-chapters. The first one is the Supply chain of a food FMCG company. The second sub-chapter provides information on transportation challenges, risks and disruptions. The third, fourth and fifth sub-chapters are about capacity, performance, and contracting-related risks, respectively. Finally, the last sub-chapter provides theoretical knowledge on supply chain resilience, business continuity and risk management.

The third chapter, "Case Study", is divided into five sub-chapters. The first is a general introduction to the organization that will be studied in this work. Afterwards, a detailed explanation on the Research Strategy and Design that was used during the dissertation. The third and fourth sub-chapters are, respectively, the reasoning and justifications for the Data collection and Data analysis conducted in this research. Finally, the last sub-chapter gives insights on the Credibility of the Research Findings.

The fourth chapter, "Findings and Discussions", is divided into two sub-chapters. The first one contains a detailed analysis of the semi-structured interviews conducted at the studied company. Furthermore, this sub-chapter is divided to analyze each topic identified through thematic coding of the interviews. The second sub-chapter answers the two research sub-questions by comparing the initial literature study and the findings obtained through the semi-structured interview analysis, as well as a second literature study to cyclically improve the quality and credibility of the research findings.

The fifth chapter, "Business Continuity Plan", proposes a plan with the guidelines for effective transportation risk management within Kraft Heinz's supply chain. This chapter gives practical solutions towards managing transportation risks and through the BCP framework proposed by Zsidisin, Ragatz and Melnyk (2003). This is divided into four sub-chapters, which englobe the four steps of risk management proposed by the BCP: Awareness, Prevention, Remediation and Knowledge Management.

The sixth and final chapter, "Conclusion", gives insight on the final thoughts and results of the study, as well as its limitations and future research possibilities.

THEORETICAL BACKGROUND

2.1 The supply chain of an FMCG food company

An FMCG food company is an organization that manufactures and distributes goods that are sourced from vegetables or animal products. The FMCG food supply chain market is usually a fast-paced environment in which packaged goods are sold at a higher rate than in other industries. It is possible to separate those supply chains into two categories: those that provide fresh agricultural products (also known as agricultural commodities) and those that provide processed food products. Typically, processed food products have a higher added value due to their higher cost of manufacturing (Manders, Caniëls and Ghijzen 2016). Even though the latter category has a more extended shelf and trade life, which is explained by the addition of chemical substances in the finished good's formula, these goods are still considered perishable products. Perishable foods are likely to rot, decay or become unsafe to consume if not conserved properly, which can cause losses to the supply chain (Vorst 2000).

Supply chain refers to all the stages from the supply of raw materials and manufacturing process of goods to the distribution and sales process until it reaches the final customer (Sampouw and Hartono 2019). With the evolution and integration of Industry 4.0 tools and the Internet of Things, supply chain networks are becoming increasingly more complex and dynamic (Ivanov and Dolgui 2020). However, the base structure of a supply chain for FMCG food companies remains the same. A typical supply chain is illustrated in Figure 1 (Brintrup and Ledwoch 2018).

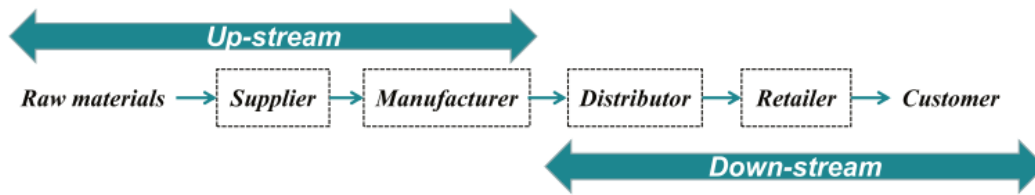


Figure 2.1 - Up-Downstream Supply Chain (Brintrup and Ledwoch, 2018)

Supply chain flexibility is essential for food FMCGs. For customers, it refers to the capability of the manufacturer to have a solid line of communication and transportation with other supply chain entities, which shortens the lead time from the manufacturer to the retailers' stock. This enables products to spend more time of their shelf lives within food retailers' shelves rather than sitting at the manufacturer's warehouse facility, avoiding supply chain losses (Manders, Caniëls and Ghijssen 2016). However, shelf and trade lives are not the only factors influencing the need for a more flexible and resilient supply chain. In the FMCG environment, factors such as globalisation, technological advances, and overall market uncertainty enhance the need for flexibility (Manders, Caniëls and Ghijssen 2016). Flexibility in general structures and processes is increasingly relevant to better adapt to a fast-paced, changing environment. Moreover, FMCG manufacturers, distributors, and retailers (direct customers) constantly collaborate to cope with the end customers' (overall population) growing or changing demand patterns. As a result, companies opt to strengthen their supply chain integration to respond faster to their customer requirements (Mathu and Phetla 2018, Manders, Caniëls and Ghijssen 2016).

2.2 Transportation Challenges, Risks and Disruptions

Within transport operations, the risks are usually related to the lack of workforce and trucks, as well as low performance or contracting-related issues (Cao, et al. 2019, Pellegrino, Constantino and Tauro 2021, Wang, et al. 2021, Liu, et al. 2013).

Heckman et al. (2015) defines risk in a supply chain context as follows: "supply chain risk is the potential loss for a supply chain in terms of its target values of efficiency and effectiveness evoked by uncertain developments of supply chain characteristics whose changes were caused by the occurrence of triggering events. These triggering events adopt many names, with disturbances or disruptions being the most common." For a supply chain to be efficient, organizations must act on managing supply chain risks and disruptions (Lu et al. 2018). Even minor

disruptions can create a snowball effect and quickly cripple the entire supply chain (Wang, Zhou and Zhao, 2022). Risks that arise from transportation disruptions can be, for example, delayed deliveries, flexibility loss in supply chain operations, loss of sales and reduction in a company's reputation and customer relationship (van den Adel, de Vries and van Donk 2022, Woldt and Prasad 2022). Additionally, they can also induce the shutdown of operations within the supply chain (Sun, et al. 2020) and partially or totally compromise the condition of the products (Camargo, et al. 2018).

Literature on managing freight transportation disruptions focuses mainly on strategic measures to guarantee on-time delivery (Ivanov, Dolgui and Sokolov, et al. 2017, Woodburn 2019), as these can directly translate to lost sales and loss of trust between the manufacturer and the customer (Sun, et al. 2020). Even though freight transportation's biggest challenge is managing the pressure to achieve on-time deliveries, companies are forced to continuously lower their environmental impact, such as the EU targets for transport emissions (Comission 2011). In order to achieve the goals, set by the European Commission, many companies are shifting from road transport to more environmentally friendly modes, such as intermodal or train transport. Although more friendly to the environment, these options are less flexible and more time-consuming than road transport (Hasan, Zhang and Shi 2021).

Finally, because international sourcing has been on the rise, companies are expanding their options of suppliers and buyers to other countries. This trend creates pressure in the logistical field, demanding an upgrade in technology to connect geographically distant companies (Tang, Huang and Wang 2018). Digitalization is one way to deal with market and environmental challenges modern organizations face. However, digitalization has its challenges. The first challenge of supply chain digitalization is the investments to tackle interoperability issues, which refer to handling and visualizing the same dataset by different stakeholders. In fewer words, interoperability is standardization, infrastructure, and in-house knowledge. Creating standard processes, information flows, and data-operating modules are the focus points of an integrated IT implementation. Within transportation, those assist with planning tasks and visibility on truck (Stajniak and Koliński 2016).

2.3 Capacity-related risks

Capacity within a company's transportation scope usually refers to the number of trucks that the company must outbound to fulfil its customers' needs (Cécile and Nirmal-Kumar C 2021). Although companies utilize demand forecasts to predict needed logistical capacity,

unforeseen events may impact the demand for specific products. In the transportation industry, uncertain demand poses a significant threat to both shippers and carriers (Ito, et al. 2022) as it can lead to sudden changes to already placed orders, submission of late orders and fluctuations in order volume. This makes it difficult to predict how much logistical capacity a company will need and when and where that capacity will be needed (Chu, et al. 2017).

Companies that outsource their goods' transportation commonly engage in long-term contracts with one or multiple carriers, named "main carriers" (Pellegrino, Constantino and Tauro 2021). If the company's main carrier is unable to move the totality of the ordered shipments, the shipper is faced with a transportation capacity shortage. If this scenario prolongs itself, the customer will eventually run out of stock, which might damage customer relations and lead to financial penalties (Eduardo, et al. 2022). The most common alternative to the usage of main carriers is to purchase transportation on the spot market, where carriers can offer their services for transportation of a single order with their own proposed rates, which are potentially much higher than the corresponding pricing from the company's main carriers (Haughton, Rostami and Espahbod 2022, Xu, et al. 2015). The service level for spot market contracted capacity (usually measured in equipment availability, punctual performance and extent of damage inflicted to the goods) is also highly unpredictable in comparison to carriers with accumulated knowledge and experience for a specific lane of transportation (Pellegrino, Constantino and Tauro 2021, Inderfurth and P. 2011).

Research literature by Chu et al. (2017), Pellegrino, Constantino and Tauro (2021) and Tsai, Saphores and Regan (2011) has focused on flexible transportation procurement contracts to deal with unexpected transportation capacity shortages. Chu et al. (2017) proposed a mechanism allowing both manufacturers and outside logistic carriers to outsource transportation options. In this case, if the company's main carrier cannot cope with the extra demand, they will be responsible for searching for a new carrier for the shipments. As an alternative strategy, Pellegrino, Constantino and Tauro (2021) investigate the value of the flexibility created through buying transportation options from an alternative carrier or network of carriers (Safety Net Carrier). These allow the shipper to buy transportation options for a pre-agreed price without legally binding the main organisation to do so. They can then compare the current spot market prices to their safety net carriers and choose the most profitable option (Tsai, Saphores and Regan 2011). Table 1 summarizes some of the capacity-related disruptions and their associated risks in transportation:

Table 2.1 - Capacity-related disruptions and associated risks in transportation

Capacity-related disruptions	Risk	Source
Demand uncertainty	Hard to predict logistical capacity needed to arrange transportation	(Chu, et al. 2017)
Carrier capacity shortage	Delayed deliveries. Customer might run out of stock, which damages customer-relationship and brand reputation (Customer-relationships)	(Eduardo, et al. 2022)
	Arranging transportation on the spot market with higher price (Financial)	(Haughton, Rostami, & Espahbod, 2022)
	Arranging transportation on the spot market with possibly lower service-level (Service-level)	(Xu, et al. 2015)

2.4 Performance-related risks

Performance issues are usually more difficult to predict, as these depend on the logistics team and carriers performing their day-to-day operations without any impairments that could impact the normal transportation process of goods (Wang, et al. 2021). Performance issues in transport operations affect the supply chain by causing delayed deliveries (Khan 2021). Although some shipments may not be directly affected by delays due to time buffers included in the planning, for just-in-time deliveries, all setbacks directly affect the reputation among customers (Eltantawy and Giunipero 2004, Senthilkumar and Nallusamy 2021). Furthermore, in the case of multimodal transportation, where the goods are transferred from one mode of transportation to another, a delay may mean that the shipment misses its next connection in the transportation chain. This makes it so that the company will have to pay waiting costs until the goods are loaded on the next available transportation option (Verga, Silva and Yamakami 2017).

Another factor that can influence the performance of transport operations is planning. When the manufacturer is unable to supply its customers' demand because of poor order fulfilment, which is the task of arranging transportation for an order and shipping it to the customer, this will later translate into service level and financial impacts to the organization (Lam, et al. 2015, Cao, et al. 2019, Popescu 2019). Additionally, if the stock cannot be moved on time and expires before being sold, this will cause supply chain losses (Lindsey and Mahmassani

2017, Muha, Škerlič and Erčulj 2020). Supply chain losses also play an essential role in corporate social responsibility (CSR), which refers to a company integrating social and environmental concerns into their operations, as food waste might enhance social challenges related to food poverty and social inequality (Sánchez-Teba, Gemar and Soler 2021). Not only is food sustainability an aspect that can potentially cause damage to an organisation’s financial scope, but it may also affect the consumer perception of the brand (Pullman and Wu 2021, Surucu-Baci and Tuna 2021).

Another significant risk in transportation due to performance is the loss in product quantity, generally due to damage during the distribution of the goods (Chen, Sohal and Prajogo 2013). This can happen, for example, due to poor safety measures or placement of the order inside the vehicles or harsh roads between the company’s warehouse and the customer. In this scenario, an amount ranging from 100 to 0 per cent will be delivered to the customer (Camargo, et al. 2018). This affects production schedules, especially for just-in-time delivery (Pool, et al. 2017). Table 2 summarizes some of the performance-related disruptions and their associated risks in transportation:

Table 2.2 - Performance-related disruptions and associated risks in transportation

Performance-related disruptions	Risk	Source
Poor order fulfillment	Service-level impacts for late deliveries	(Lam, et al. 2015)
	Supply chain losses and food waste	(Lindsey and Mahmassani, 2017; Muha, Škerlič, and Erčulj, 2020)
	Financial impacts	(Cao, et al., 2019; Popescu, 2019)
	Damages to customer-relationship	(Cao, et al., 2019; Popescu, 2019)
Food waste or damaged goods during transportation	Company might not comply to their social responsibility	(Sánchez-Teba, Gemar, and Soler, 2021)
	Loss in product quantity	(Chen, Sohal, and Prajogo, 2013)
	Financial impacts due to wasted goods	(Pullman and Wu, 2021)
	Impact on Consumer perception of the brand	(Surucu-Baci and Tuna, 2021)

Table 2.2 - Performance-related disruptions and associated risks in transportation (cont.)

Performance-related disruptions	Risk	Source
	Reputation among customers	(Giunipero and Eltantawy, 2004; Senthilkumar and Nallusamy, 2021)
Delayed deliveries or transportation	Missing connection in an intermodal freight transportation model. Financial impacts from waiting costs	(Verga, Silva and Yamakami, 2017)

2.5 Contracting-related risks

Contracting-related risks are directly related to capacity and performance issues within logistics operations because contracts define the minimal service level and volume of workforce that the carrier has to provide to the manufacturer (Liu, et al. 2021). Usually, a logistics procurement team is set up to organise and arrange all the necessary contractual details related to their carriers, such as pricing, contracted capacity per lane and establishment of the overall process that will be used between the organisations (Richards 2018). Contracts of this nature usually entail contract fees and penalties when the minimum agreed capacity is not provided by either side (Presser, Cafaro and Cafaro 2021). At this stage, being efficient in procurement helps to determine overall responsibilities, desired operations standards, and agreed service levels, which will guide performance indicators in the future. Moreover, risks that can originate from poor contract management can be in terms of transport and the sustainability impact of the operations (Rudd 2020).

Risks originating from poor contracting could be enhanced due to the supply chain strategy of the core organisation of outsourcing parts (or the entirety) of its operations to 3PL or 4PL (Chen, et al. 2018, Lynch 2004). Contracting involves building a partnership between two entities with trust as its primary success factor. Trust must be achieved between parties to ensure that information is shared openly among supply chain associates before cooperation between companies can be sustainable and produce long-term results (Bastiaansen, et al. 2020). This happens because companies usually see information as one of their most valuable strengths related to sovereignty and security (Faertes 2015, Ryciuk and Nazarko 2020). Moreover, trust is also a matter of one stakeholder's belief in the others' capabilities (and vice-versa). For a supply chain to function correctly, each organisation must perform according to the other's specific requirements. Digitalisation is one way of building trust between supply chain

partners (Lynn, et al. 2021, Mathauer and Hofmann 2019, Nyamrunda and Freeman 2021). The uprising trend of digitalisation is creating pressure on companies to improve their communication networks with outsourcing companies and reduce the number of contracting issues that may occur (Tang, Huang and Wang 2018, Wilding 2020).

Although it is possible to assume that an efficient logistics procurement process would reduce the occurrence of the above-described situations, it is not recommendable that organisational leaders overlook such risks but rather develop a proactive approach to correctly manage them (Liang, et al. 2020, Wilding 2020).

2.6 Business Continuity and Risk Management

When it comes to transportation risks, large enterprises often set up Business Continuity Plans (BCPs) to better deal with supply chain disruptions. Strategically speaking, those plans are a crucial part of a contingency planning for dealing with crises (Fani and Subriadi 2019, Stoenoiu and Ciplea 2018). BCPs are primarily used as a strategic model to ensure the maintenance of processes, customer perception of the brand and, in more general terms, the resilience of a supply chain, which builds up solidness and reduces the impact of crises (Rezaei Soufi, Torabi and Sahebjamnia 2019). Furthermore, with the popularization of Business outsourcing and offshoring practices, having a risk management policy in place is not only a competitive advantage but a necessity for the Business' longevity in both commercial and financial terms (Niemimaa, et al. 2019, Pettit, Croxton and Fiksel 2019).

Authors such as Kliem and Richie (2015) describe Business continuity as the ability to quickly respond to unforeseen events of significant organizational impact, which relates to the firm's capability and its supply chain to be resilient. Being able to adapt continuously is a crucial element of Business continuity. Therefore, in a supply chain, it is preferable to have enough flexibility to work around possible risks (Lindstedt, Armour and Noakes-Fry 2017).

Within the literature, the most advanced Business Continuity Plans consider factors related to Information Technology (IT) (Ali, Nasir and Dweiri 2020). Those tools are often applied to generate a higher supply chain visibility that strengthens the integration between the involved organizations, which is essential for the effectiveness of such kinds of frameworks (Chen, et al. 2021, Hussain, et al. 2021, Zsidisin, Ragatz and Melnyk 2003). Nevertheless, supply chain integration and visibility are not the only aspects related to IT relevant to Business continuity. A firm's IT capability is vital in reducing the recovery period from disruptions and quickly acting when a possible risk is identified (Bajgorić, et al. 2021, Ricks and Boswell 2019).

The idea is to build up a consistent network through its structure so that all stakeholders, both internal and external to the company have access to the necessary data in a homogeneous manner (Cisneros-Cabrera, et al. 2021). Nevertheless, such a task is complex and involves multiple trade-offs for the involved parties (Mincuzzi, et al. 2019, Porter 1996). Standardizing aids system interoperability by lessening the chances of data being left out or miss-counted, either because it is ambiguous or cannot be read. This is done by creating standard processes and data-operating modules, which facilitate the implementation and further handling of the system (Basaure, Vesselkov and Töyli 2020, Stajniak and Koliński 2016). By aligning objectives, organizations generate a network of knowledge and information, leading to insights in terms of increasing the supply chain's performance (Ambrose, Matthews and Rutherford 2018).

BCPs need to be detailed and contain relevant information about real-life events and what can go differently in reality than what is expected. It is crucial that the plan also focuses on its deficiencies to achieve a better approach to future disruptions and risks (Margherita and Heikkilä 2021). Constantly receiving feedback about risk management is a vital feature to adapt and quickly learn about what can be improved. Therefore, it is possible to assume that an agile design for the proposed BCP is of great interest if the organization does not want it to become obsolete when the subsequent risks need to be identified or the future disruptions occur (Ivanov, Dolgui and Sokolov, et al. 2017, Lindstedt 2020, Margherita and Heikkilä 2021, Romig 2021, Zawada and Perry 2020).

Carter and Rogers (2008) define sustainability through the "triple bottom line", which can be seen in Figure 2.2 and consists of three main forces: the natural environment, society, and economic performance. A sustainable management policy within a supply chain consists of positively affecting the natural environment and complying with social responsibilities, such as health and safety practices and social fairness towards everyone affected by a firm's actions, while simultaneously achieving beneficial long-term economic results for the company.

Business continuity is also a matter of having a sustainable risk management policy. Businesses often struggle with correctly assessing the risks that derive from operations, and the lack of an approach toward possible supply chain disruptions can lead businesses to bankruptcy (Kaur, Kumar and Luthra 2021). Business continuity plans also affect the profit of a supply chain based on its assets. Since disruptions within a supply chain might potentially affect finances, it is reasonable to claim that investing time and money in developing risk management practices can bring higher turnovers for the supply chain associates (Azadegan, et al. 2020, Hopkin and Thompson 2021). Therefore, not only the resources invested are of essential importance, but also timing. Proactivity in terms of risk management is essential to minimize

the impacts derived from possible supply chain disruptions and accelerate the recovery from such situations. Identifying and responding to disruptions quickly will also minimize the impacts they might bring to the supply chain (Can Saglam, Yildiz Cankaya and Sezen 2021, Choi, Chiu and Chan 2016, Kirilmaz and Erol 2017).

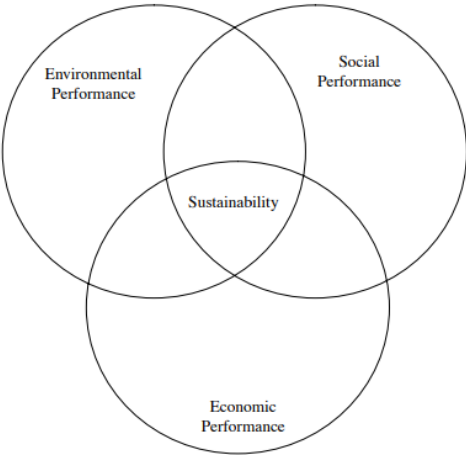


Figure 2.2 - Sustainability: the triple bottom line (Carter & Rogers, 2008)

CASE STUDY

3.1 The studied organization

The Kraft Heinz Company is an FMCG food organization that supplies processed agricultural products, such as sauces, canned goods, spices, sweets, and condiments. Regarding Kraft Heinz, goods produced by the company have a shelf-life of usually one to three years, with some expiry dates being up to five years. Kraft Heinz's brands include Kraft, Oscar Mayer, Heinz, Philadelphia, Lunchables, Velveeta, Planters, Maxwell House, De Ruijter, Karvan Cévitam, Capri Sun, Ore-Ida, Kool-Aid, Jell-O, Primal Kitchen, and Classico, among others.

Kraft Heinz is owned by 3G Capital, a Brazilian-American private equity group focused on long-term added value. The 3G's emphasis is on maximizing the potential of brands and Businesses by increasing profitability. When looking at Kraft Heinz as an organization, it is initially observed elements of a cost-oriented strategy based on the disciplined lean methodology. The overall strategy of the international branch is based on a cost-effective and cost-efficient approach towards flexible processes (including the supply chain) with a focus on servicing the customers in the best possible way. Furthermore, the company has a strong ownership and meritocracy culture, which gives employees full responsibility (and recognition) for their projects while also granting higher rewards to the best performing employees, BUs and regions.

BUs within Kraft Heinz are separate departments that establish their own operations and processes independently from other BUs. These departments usually work independently and autonomously and have separate targets to fulfil and different markets to serve. Moreover, those units usually work as silos with individual contracts with their providers, although some of them might share the same providers. As a result, BUs within Kraft Heinz have the autonomy

to decide how they produce, operate, and serve the markets in which they are responsible for the brand. Nevertheless, most of them have at least four main functions: operations (which is composed by customer service, logistics and demand planning), sales, marketing and finance.

The D&E (Distribution & Export) BU, where the study is developed, is in the East region and currently englobes around 25 countries, primarily Eastern European countries, Malta, Israel, and the USA import hub. The BU is responsible for over 50 million dollars in yearly revenue. It comprises 25 people, distributed in Marketing, Sales, Finance, Logistics, Customer Service and demand planning. The role of the logistics team is to ensure that there will be no disruptions in warehouse and transportation management.

While mitigating capacity, performance, and contracting-related transportation risks, the BCP requires considering other aspects of the organization (Zsidisin, Ragatz and Melnyk 2003). Therefore, according to the case study company's priorities, the study will approach finance, service level, and CSR, which are the main impact areas of transportation risks. Additionally, the research will address how the company can improve its IT capabilities. These topics will be used to develop the BCP:

1. **Financial scope:** the theory available on Business Continuity proposes to achieve a sustainable strategy for the longer term. Such a sustainable strategy must rely upon maintaining customer relationships to ensure liquidity in the future without harming the company's financial assets from a short-term perspective (Haughton, Rostami and Espahbod 2022, Xu et al. 2015, Cao et al. 2019).
2. **Service level:** the theory available on transportation disruptions englobes specifics for customer-oriented practices to support organizations in serving their clients' demands during operational interruptions. The focus of service level studies is on the outbound activities, which is when the stock is ready to be shipped to the client, and communication and visibility towards all involved parties of the operations (Pellegrino, Constantino and Tauro 2021, Inderfurth and P. 2011, Lam, et al. 2015).
3. **Corporate Social Responsibility (CSR):** The proposed BCP will also consider elements of CSR, such as the environmental impact of the supply chain's operations and the brand reputation. Those perspectives will aid in understanding the interests in maintaining the overall brand recognition within the market and end customer. Such perceptions derived from the market and its consumers are essential in maintaining engagement with the brand and maintaining and possibly gaining market share, which will be crucial for continuing the Business (Faertes 2015, Sundaresan 2017). Additionally, the environmental impact of a supply chain is directly related to resilience capabilities and could affect Business continuity

management (Corrales-Estrada, et al. 2021, Kaur, Kumar and Luthra 2021, Settembre-Blundo, et al. 2021).

4. **IT capabilities:** IT capabilities need to be researched to understand how IT-related tools can aid the implementation of the BCP and enable effective supply chain integration and visibility. This is due to the relevance of digitalization capabilities within modern food FMCG supply chains (Bajgorić, et al. 2021, Ricks and Boswell 2019).

3.2 Research Strategy and Design

The methodology in the master thesis was carried out by qualitative research based on an abductive reasoning approach. Abductive reasoning is a logical inference of the most logical explanation based on observations and it provides fertile ground for questioning and inquiring, besides assessing what can be related or not to what the practical research proposes (Coghlan and Shani 2021). Through abductive reasoning, action research is structured to englobe first- and second-person inquiries in a search for practical knowledge that can revisit, validate, or even question what the theory proposes (Aronsson and Kovács 2005, Coghlan and Shani 2021, Kirkeby 1990).

By undertaking the abductive reasoning approach, the intention is to try to explain a phenomenon (disruption) by its cause (operational risks) to develop an approach that aims to mitigate the root causes through a Business Continuity Plan. Furthermore, abductive reasoning plays a role in looking for the most probable explanation through inferences to expand current knowledge and build a model that can later explain what is observed within the conducted empirical research (Hwang, et al. 2019, zu Belzen, Engenschalt and Krüger 2021).

The existing knowledge and the collected primary data must be cyclically compared to build up additional knowledge on findings that previous research may not have approached.

The research design is divided into three steps: the first performed Literature Study, research through semi-structured interviews and an analysis and discussion of the obtained results from the first and second step, which compares the found results within literature and practical semi-structured interviews.

3.2.1 Research Design Step 1 - Literature Study

The theoretical background of this research is strongly related to first-person inquiries (Coghlan and Shani 2021). First-person inquiries usually involve knowing how knowledge is

constructed and applied to the empirical world. For a successful first-person inquiry, the researcher must absorb, interpret, understand, and reasonably judge what the practical knowledge proposes and how it correlates to the theoretical field. Such inquiry must also be conducted by questioning the obtained results and the knowledge generated through theoretical research. Therefore, there must be an effort to self-inquiry the propositions derived from the carried research to bring additional robustness to itself (Argyris 2004, Coghlan and Shani 2021).

Within the first-person inquiries, the research's first step is identifying critical aspects of the available literature. Those concepts are then defined and analyzed to develop a personalized approach to transportation risks within Kraft Heinz International. Initially, a supply chain analysis of FMCG food supply chains was performed. The background information identifies the transport-related risks for such industries and how they are divided within the literature between the capacity, performance, and contracting scopes. Such division brings reference pillars to the research that were used in the development of the interview questionnaires. After the findings have been compared and questioned, another literature study was proposed to understand how transportation risks can be identified, mitigated, and proactively handled through a BCP.

3.2.2 Research Design Step 2 - Semi-structured Interviews

The second research step relates to second-person inquiries (Coghlan and Shani 2021). Second-person inquiries were conducted through semi-structured interviews with employees that work within the operational scope of Kraft Heinz. Rather than limiting the interviewees to logistics, which is the function responsible for transportation, the scope of interviewees was specifically made to incorporate all parts of the supply chain, including customer service, demand planning, and managerial positions. This is to give insight on how transportation risks affect the rest of the supply chain as well. The concerned interviewees can be found in section 3.3.1 of this chapter. The decision to proceed with semi-structured rather than structured interviews was made based on the fit with the chosen abductive reasoning approach. Semi-structured interviews give the interviewer greater control over the topics discussed and provide the interviewee space for broader answers through open-ended questions (Alvesson 2011, Badenhorst-Weiss and Waugh 2015, Brinkmann and Kvale 2014, King and Horrocks 2010). Due to the open-ended nature of the research question, it was decided that conducting semi-structured interviews was preferable to structured interviews (Coghlan and Shani 2021). The benefit of conducting semi-structured interviews as a research method is the possibility of expanding

the discussion, which might proportionate unusual or unexpected insights that can provide helpful information for the research.

3.2.3 Research Design Step 3 - Discussion of the obtained results

This step of the research design can be found in chapter 4.2 of the dissertation and was done after the first round of literature review and conducting the semi-structured interviews. A second round of literature study was performed to cyclically refer to the previously collected data and determine the best approach to the research sub-questions of the study.

Since there is enough literature available on topics concerning the research so that key concepts can be mapped and identified within Kraft Heinz's routine, empirical observations can later revisit the available theoretical knowledge. Moreover, the second-person inquiries help validate the applicability of the concepts identified within the academia in a real-life Business situation and propose possible causes to the problem statement.

Abductive reasoning brings additional questioning to the research results (Hwang, et al. 2019). Such questioning is essential to understand the cyclical character of the proposed Business Continuity Plan based on the one from (Zsidisin, Ragatz and Melnyk 2003). The Business Continuity plan aims to be constantly updated by Kraft Heinz through feedback from stakeholders to increase the readiness to manage transportation risks in the future. Therefore, the chosen research approach and design fit the overall objectives of this research by providing a continuous improvement cycle to the proposed plan.

3.3 Data collection

A practical research approach for Kraft Heinz's Business problem relies on data provided by the organization for the research and the literature study. In a change management situation in which processes and structures are modified, it is crucial to constantly validate the decision-making with the support of the involved stakeholders and the appropriate dataset (Vrontis, et al. 2018). One of the highly complex features of big companies' datasets is the cross-functional (or cross-departmental) element. Strategic data (necessary to this research) depends on different departments providing the correct information to the operational team. Data privacy and confidentiality concerns must also be considered when handling data from the case study company.

3.3.1 Primary Data Source - Semi-structured Interviews

Regarding the semi-structured interviews (primary data), the questionnaires are composed by 14 questions to be answered by each interviewee and can be found in Appendix 1 of this work. These were divided into three main categories which aim to give knowledge on Kraft Heinz' current transportation strategy, risks associated to transport operations and current risk management practices of each studied BU. Nevertheless, some questions were modified, substituted, or asked differently according to each interviewee's answers and background. As a result, a few questions were either irrelevant or difficult to answer for some participants. Furthermore, questions were made with an open-ended perspective and interviewees were encouraged to express themselves freely. Although the question book had a fixed order for each question, in some cases, the order was deliberately changed to give the interviewees a better possibility of structuring their thoughts (Elmohaiman 2019).

Interviews were collected between January and July of 2022 in an online manner through Microsoft Teams. The Interviews were later analyzed and transcribed, but due to the sensibility of the data, the actual transcription cannot be posted In the present dissertation. The interviews took from 28 to 63 minutes. Below (in Table 3) is the list of interview participants and respective function and Business Unit.

Table 1.1 - Interview Participants

Participant	Function	BU	Years in the company
1	Logistics Controller	Italy and Spain	3
2	Logistics Manager	Germany, Austria & Switzerland	3
3	Demand Planning & Customer Service	Czech & Slovakia	1
4	Customer Service Manager	D&E	4
5	Logistics Manager	D&E	7
6	Customer Service & Logistics Analyst	D&E	2
7	Head of S&OP and Logistics	D&E	6

3.3.2 Secondary Data Source - Literature Study and Stakeholder Meetings

The necessary dataset for the research was initially collected from secondary data sources based on the existing knowledge via literature review within the relevant knowledge fields. Information acquired during the research was narrowed down to keep relevance to achieve the assignment's primary goals. After the first literature review was conducted, the

findings were compared with the analysis of the semi-structured interviews. The final step before the BCP proposed by this work was conducting another literature study to revisit the combined findings of primary and secondary data sources into the available academic knowledge. The aim of revisiting literature once again is to fit the cyclical aspect of the BCP and add to the robustness of the research findings.

Furthermore, fieldwork notes from stakeholder meetings involving employees within operations and upper management, customers and logistics service providers, were used by the researcher to validate the knowledge obtained from the primary and secondary data sources. The stakeholder meetings were conducted between January and July 2022. After each focus group meeting or individual stakeholder session, the researcher elaborated a report and later sent it to all participants to ensure that the results of those discussions would be as accurate as possible according to what each member had as input to those sessions. Such unstructured meetings were not recorded on video and will not be added to the dissertation due to the sensibility of the data that was being shared.

3.4 Data Analysis

3.4.1 Primary Data Analysis

Within the research, primary data (semi-structured interviews) was analyzed to correctly identify the critical elements of Kraft Heinz's supply chain and propose the most effective implementation plan for the organization.

The recorded semi-structured interviews were transcribed with the help of a software called "Otter.ai". The chosen transcription strategy was Intelligent Verbatim Transcription. Such a strategy was employed to facilitate the readability of the interview transcripts, which assists in data validation (Kawahara 2007, McMullin 2021). The transcriptions were later simplified (removing colloquialism and onomatopoeias) and thematically coded to understand the interview concept pattern. The thematic coding was conducted following Ryan and Bernard (2003)'s technique to identify themes:

1. Identify recurrent topics (to establish the Initial background for the thematic analysis).
2. Select expressions that are culturally specific (as those might need extra care in translation to its actual meaning in English - If any).

3. Identify metaphors and analogies (to draw possible parallels with more concrete concepts).
4. Identify topic transitions (to separate the codes).
5. Search for similarities and differences among topics.
6. Find linguistic connectors.
7. Look for missing data (what Interviewees might have omitted from their answers); and
8. Find theory-related Information.

The choice to follow such steps was made based on highlighting the most relevant aspects of each interview without compromising the interviewees' overall ideas. The thematic coding strategy was inductive coding (open descriptive coding), in which the researcher did not pre-determine the codes of each semi-structured individual interview. Coding was instead a process of letting data emerge within the transcriptions and creatively grouping small pieces of data into more extensive categories of the same information. The choice to proceed with inductive coding was made to avoid possible biases originating from pre-conceptions of the researcher when analyzing the raw dataset (Saldaña 1999).

After the interviews, interviewees were provided full and unrestricted access to the content. The thematic coding resulted in identifying the most relevant topics to facilitate answering the research questions. The interview questions are included in the appendix 1 of this work. The identified thematic codes of the interviews can be seen below and are further approached in the semi-structured interview analysis (Chapter 4.1 of this work):

1. Transportation capacity-related risks
2. Transportation performance-related risks
3. Transportation contracting-related risks
4. Impact of transportation risks on service-level
5. IT capabilities
6. Corporate Social Responsibility
7. Transportation risk management

3.4.2 Secondary Data Analysis

The secondary data analysis was carried out by mapping critical concepts regarding food FMCG supply chains; capacity, performance, and contracting-related transportation risks;

and finally, concepts such as supply chain resilience, business continuity and risk management practices.

Stakeholder meetings, although not directly analyzed in this study, were used to validate, and consolidate the previously established findings and build connections between the results found between primary and secondary data sources.

3.5 Credibility of the expected research findings

The proposed research methodology aimed to combine the inputs from both theoretical and practical realms to cyclically question and validate the knowledge obtained from primary and secondary data sources. Therefore, the strength of the chosen research approach is in making connections between what the theory proposes as an explanation of real-world problems and what can be observed when disruptions occur. This aids by bringing additional questions to the theoretical background around the concerned topics. The sampling method helps validate the empirical findings by selecting individuals with practical knowledge of the subject and people with internal knowledge of the organization and its supply chain operations. Within data collection, all stakeholders and participants were asked to re-validate the summarized findings of the research to bring internal reliability to the claims derived from primary data.

Given the objective of this research, which is to assist the company in mapping and mitigating possible risks in terms of transportation, the interview question guide was elaborated to induce the participants to evaluate whether Kraft Heinz's approach was the most effective or if (and which) points of improvement could be identified. Finally, qualitative research was the selected approach to the study, given the possibility of providing the participants with an open space to analyze the disruptions occurring within transportation from a broader perspective. The researcher understood that comparing numbers in terms of service level and operational costs to previous disruptions was not the best approach to be followed. This decision was made based on the possibility of external factors not being monitored by the researcher, thus making the results less credible or likely (Charmaz and Bryant 2011, Patton 1999).

Although quantitative data might be used as background information for the research design, it did not include quantitative results. Therefore, they were not used to cyclically validate what was found within the literature review, semi-structured interviews, and stakeholder meetings. The ideal scenario to correctly validate transport Business continuity plans would be to compare its results with previous disruptions. Nevertheless, since Kraft Heinz has not had a

transportation disruption policy before, extensive time would be needed to calculate and validate quantitative data. Given the practicality and the lack of time for the research, such a mathematical approach to the problem statement would not be conducted or tested in due time.

The literature review and the semi-structured interviews were applied to findings by mapping what Kraft Heinz's approach to risk management could be lacking and the known best practices within Business theory. The semi-structured individual interviews and the literature study were compared and jointly analyzed to propose a tailored improvement plan and an implementation approach.

Finally, the methodology section aimed to be as descriptive as possible regarding the research proposal, design, strategy, data collection, participant selection, interview transcriptions, fieldwork notes, and data analysis process. This was given the dependability criteria of this work, which aims to be revisited by practitioners and researchers. Especially given the case study design of this research, in which all primary data collected originated from a specific supply chain, having the research process detailed to the reader becomes especially relevant (Davis 1991, Geertz 2008).

FINDINGS AND DISCUSSION

4.1 Semi-structured Interview Analysis

4.1.1 Transportation capacity-related risks

Within the interviews, the significantly low number of available drivers and trucks was often mentioned. When carriers are unable to find trucks, this makes further logistics operations impossible and ultimately, Interviewee 6 describes that If the situation continues for a long time, there is a risk that the clients will eventually run out of stock. Usually, when carriers do not have enough capacity to meet the company's demand, the logistics team will search for options on the spot market. Interviewee 5, the logistics manager for D&E, refers to the spot market as a "last resort" because it was always 30 to 50% more expensive than the agreed rates with the carriers. Additionally, besides the usually much higher prices seen on the spot market, agreeing to these alternative transportation options also poses significant threats to service level, as the performance and information on these service providers are often unknown.

These situations cannot be avoided without full visibility and communication from the carriers and an accurate overview of the state of the transportation market. For the logistics team to efficiently plan the outbounds that will happen within the month, both the logistics team and the carriers need clear visibility of the demand forecasts provided by Kraft Heinz. When the logistics team and its carriers have higher demand than the requested capacity, such an issue implies that some products the customers expect will not be sent out, resulting in a backlog of orders.

As possible causes for capacity issues, we may highlight from the interviews the current crisis that global supply chains are in due to COVID-19 and the war between Russia and

Ukraine. Social and political factors can aggravate transportation capacity by increasing the complexity of the supply chain itself. These factors are the main reason for the current shortage of drivers and lack of truck availability. Truck availability is even more scarce in countries close to Russia, such as Poland and the Baltics (Estonia, Latvia, and Lithuania), which are important countries to the Kraft Heinz D&E BU. Moreover, since the organization does not own a fleet of trucks, the issue will likely be extended over a long period of time.

4.1.2 Transportation performance-related risks

In terms of performance-related risks, we can observe through the interviews that these are present in all Business units. When the transportation performance is low, problems at the customer's end start to appear, such as the risk of delays and wrong estimates of delivery dates. When placed orders are not shipped or have delays, the customer will be disappointed and, depending on the urgency of the order; this might affect the brand's overall reputation among customers. Interviewee 4, the Customer Service Manager for the D&E BU, states what Kraft Heinz can offer is reliability, more than anything else. When the company doesn't supply that to its customers, the company risks losing In brand image.

Many interviewees flag that when a carrier doesn't perform to the expected level, depending on the urgency of the order this can translate into high costs for the manufacturer. This is especially true with promotions and just-in-time deliveries. There is also the risk of goods being damaged during transportation and its associated costs, which are covered mainly by Kraft Heinz, as it is difficult to discover if this occurred due to the driver's poor performance or poor packaging from the warehouse team. Although a carrier not showing up for a load at the expected time (no-show) does not increase transportation costs, it does block a dock at the warehousing facilities, which means that this dock is unable to function until the truck arrives for the stock. Interviewee 6 mentions that the D&E BU is charged by the warehouse for every day that the stock is waiting to be collected.

Not only is it possible to observe that the transportation performance issues bring additional complexity to operations, but also that they are closely related to supply chain losses, food waste, and food loss, given the specific characteristic of the industry in which Kraft Heinz operates. When goods are damaged or contaminated, they cannot be sold through other food service channels. This means that the company not only loses sales but also needs to write off the damaged products, in which a specialized company destroys such units. In those cases, the company risks supply chain losses and costs attached to the destruction process result from performance issues.

4.1.3 Transportation contracting-related risks

Contracting can be related to capacity and performance issues because contracts define the minimum service level and volume of trucks the carrier needs to provide. Moreover, since the organization hires a 3PL or 4PL operator to conduct the transportation process, the contract between the operator and the truck owner might end. This implies that the core organization is indirectly affected, as it is not involved in this contract between the carriers and the truck owners.

Not only might contractual discussions be an issue, but the sole fact that the core organization is not directly controlling its transporting operations could pose a risk. The contracted carriers are independent of Kraft Heinz. As described by Interviewee 2, this creates another risk, which is the carriers not complying to requests when they are not legally obliged to. In addition, because of the lack of ownership over the transport activities, the room to negotiate extra-contractual services is much smaller than when Kraft Heinz is the owner of its fleet of trucks.

When discussing the construction of the actual contracts, firstly, it is crucial to understand that D&E is not contracting the carrier itself, but instead going to Control Towers, which works as a separate Business Unit that is responsible for contracting the pool of carriers that Kraft Heinz BUs are allowed to work with. The contracts between Control Towers and the carriers are not legally binding for the carriers to meet their promised capacity and service level. Interviewee 6 mentions that, as Kraft Heinz, there are no agreements in terms of waiting hours for trucks, extra costs or service level. This makes it so that whenever the contracted performance or capacity is not up to the standards of the company, the logistics team needs to push back its carriers and possibly damage supplier relations.

Contracts usually make sure that responsibilities and duties will be kept. However, an organization as complex as Kraft Heinz must also consider a certain margin for negotiating exceptions during a partnership contract, such as special services or additional capacity. Therefore, a certain level of flexibility to the contract is desired, as it may assist the organization in meeting customers' demands. In contrast, if the contract is elaborated with strict boundaries, it could be prejudicial when negotiating extended performance or capacity. Additionally, the organization must be aware of its relationship with its providers and consider that constantly switching providers could potentially bring additional complexity to operations.

4.1.4 Impact of transportation risks on service-level

Kraft Heinz can face many problems from not meeting the service level for some customers and accounts. Such problems are from being fined when the service level for a more prominent customer is not achieved to damaging the company's brand reputation. Having a good demand forecast accuracy is centric on preparing the logistics team to serve customer demand in the best possible way and avoid risks that can generate, in the worst cases, commercial or sales losses. Within the current COVID-19 pandemic and other social and political factors, the demand planners within Kraft Heinz are having more difficulties achieving high accuracy on their forecasts due to the unstable demand. Interviewee 3, the Demand Planning and Customer Service Manager of Czech & Slovakia, explains that customer relations are very dependent on forecast accuracy, as if there are any major mistakes, the customer needs to be informed accordingly.

Within transport operations and how they are conducted, one of the main risks that threaten service level is lack of order visibility both from Kraft Heinz and the carrier's end. Lack of visibility on the state of the trucks providing transportation for the company can lead to inaccurate or unknown delivery dates, which can potentially damage the ability of the organization to arrange timely transportation and meet the agreed service level with their customers.

Furthermore, communication issues that might occur between Kraft Heinz and its carriers might also impact the service level of Kraft Heinz towards its customers. Interviewee 3 also mentions that if the carrier doesn't communicate the correct delivery dates or doesn't inform of delays, the customer will be expecting their stock at a certain day, and the BU won't be able to explain why the stock is not being delivered. These issues in communication are not exclusively between the carrier and the core organization. They can also arise between the carriers and the designated truck drivers. In this scenario, to guarantee correct information flows to the customer, Kraft Heinz needs to have full visibility on the trucks used for transportation.

4.1.5 IT capabilities

Even when processes are well aligned, and communication lines are established, there could also be a mismatch between Kraft Heinz's and the carrier's operating system. When a load is delayed, or a carrier shows up late for a planned collection, this often translates into a difference between the actual collection and delivery date from the ones agreed upon in the system. This might lead to inaccurate invoicing and statistical data used for research within Kraft Heinz.

As previously described, lack of truck visibility after the transportation process has started poses significant threats to the company regarding service level, customer relationships and possibly financial implications. To minimize the risk and strengthen customer relationships having full visibility on transport operations once they are out of the planning phase is key. Multiple interviewees mentioned that it is common practice in some countries to have GPS tracking on the trucks used for transport. When talking about mapping and overseeing truck routes digitally. Interviewee 2 describes it as something that the company should strive towards, because then the company will be able to catch the issues and inform the customers without having to wait for contact from the carriers.

4.1.6 Corporate Social Responsibility

The main topic of concern within CSR at Kraft Heinz is sustainability. Sustainability within the transport operations of Kraft Heinz is mainly seen as the contracted partner's responsibility in terms of maintaining the correct environmental practices. When hiring such organizations, they are expected by Kraft Heinz to already possess the necessary expertise in putting environmental-friendly practices into use. Nonetheless, since Business units within Kraft Heinz work independently, integrating sustainability practices during carrier tendering is not a standardized procedure. Interviewee 2 explains that the company itself as an organization is doing this (implementing more sustainable transport), but that no actual Implementation measures have been put in place within the D&E BU.

It is noticeable that some BUs have been pushing environmental-friendly changes into their transporting operations, as is the case with the GAS (Germany, Austria and Switzerland) BU. Such practices are implemented in the yearly contracts between the company and its carriers. Interviewee 2 mentions that whenever a tender is done to agree on the carriers for that year, some of the questions that the carriers are asked are about their current practices on sustainability, future goals, what types of reports and information they can provide. This alone is enough to ensure the contracted company's practices align with the core organization's goals.

Furthermore, Kraft Heinz feels increasing societal and governmental pressure as laws regarding environmental practices become stricter. This will influence both in the short and long term which kind of transportation and which kind of energy source you can use. One of the interviewees states that considering current events such as the war in Ukraine and the fuel crisis it's creating, it is expectable that getting rid of fossil fuels could be very beneficial for the company's image. However, since implementing sustainable practices is also a matter of

investment, stakeholders face a complex decision-making process. Therefore, those actions towards sustainability are still at an incipient stage.

4.1.7 Transportation risk management

The way Kraft Heinz currently manages risks within its supply chain and its possible improvement areas were also constant topics within the interviews. For most participants, Kraft Heinz lacks proactivity in managing risks and instead focuses on a more reactive approach to the topic. Furthermore, it was observed from the interviews that, although a few BUs are proactively trying to identify possible disruptions, there is no organizational effort to monitor risks actively. According to Interviewee 5, there is also a gap between identifying risks and taking actions towards mitigating them. The D&E BU is trying to map the risks, which is a proactive measure, but when talking about acting upon the risks, then they are currently very reactive because they wait until risks start materializing.

When it comes to performance, it is necessary to mention that accurate demand forecasting has a positive impact on risks related to transportation capacity shortages. This is by correctly predicting what capacity will be needed from carriers pre-emptively and adjusting resources accordingly. In terms of capacity, the lack of safety net carriers makes it more challenging to handle unexpected orders. A safety net carrier can help with the extra demand for a pre-agreed rate in the same way a main contracted carrier does. However, in this case, the core organization is not obliged to comply with a minimum number of trucks. Although all interviewees agree that the spot market should be used as a last resort, most BUs still use the spot market instead of building safety net carrier contracts.

Kraft Heinz's setup is essential to highlight how the company operates towards transportation risks in terms of the internal organizational structure. It is observable that the efforts towards risk management are usually through practical experience from logistics managers, who try to adapt to each individual disruption and act according to what has been proven to work in the past, although it might not be the ideal solution. Therefore, it is possible to conclude from such a scenario that a cross-functional approach towards risk management is necessary to build more supply chain resilience.

Besides helping to build up knowledge within the organization on how to mitigate transportation risks, cross-departmental integration is also necessary when considering that disruptions affect all parts of the supply chain. Every function of the operations team (demand planning, customer service, and logistics) must share information with sales, finance, and

higher management. Information sharing within the BUs in terms of financial, service-level and commercial risks is crucial towards building an appropriate risk management approach.

Finally, internal integration is essential to manage risks efficiently, but external integration also plays a vital role. One of the most recurring topics discussed when transportation risks is concerned is the lack of the necessary supply chain visibility that could enable the implementation of an efficient policy. Working closely with the contracted carriers is a must to improve visibility. Finally, building up integration between different parties will rely on effectively managing expectations and the different objectives of each member within the supply chain.

4.2 Discussion of the obtained results

In this section, data collected from the semi-structured interviews, which was analyzed in the previous section, the secondary data obtained within literature and the observations made within the company during stakeholder meetings will be compared to triangulate the data and answer both research sub-questions. Both primary and secondary data will be considered to balance what is in the academia about transportation risk management and what is observed by the stakeholders within Kraft Heinz to select which kind of practices could apply to the specific case of the company. The analysis of the research sub-questions will provide sufficient information and analysis to answer the central question of this study: "How can Kraft Heinz International improve their supply chain's preparedness towards transportation risks through creating a risk management approach?"

4.2.1 Impacts of transportation risks

To answer the first sub-research question: "What are the impacts of transportation risks for Kraft Heinz?", three main types of operational transportation risks were studied and approached in terms of their impact on Kraft Heinz's Business. Those risks were related to capacity, performance and contracting.

Regarding capacity, the impacts perceived from interviews are initially in terms of the current lack of drivers and trucks on the market, which carriers provide to the case study organization. According to Haughton, Rostami and Espahbod (2022), when capacity issues occur with the main carrier, usually the alternative is to buy transportation from the spot market for a higher price (Haughton, Rostami and Espahbod 2022). Even though prices are higher in the spot market, most interviewees state that the biggest risks of utilizing the spot market is the service level provided. The service level of spot market carriers is too unpredictable to be used

as a recurrent option (Pellegrino, Constantino and Tauro 2021). Additionally, service level is also affected by capacity shortages because the stock that the customer ordered will not arrive within the expected time frame. If the problem prolongs itself for too long, the customer might end up running out of stock. This scenario can significantly damage customer relations and lead to financial penalties (S. Eduardo, et al. 2022). Lastly, demand uncertainty was flagged as a risk to logistical capacity by one of the interviewees. Uncertain demand makes it difficult to predict precisely how much logistical capacity will be needed, which can lead to a shortage in capacity (Chu, et al. 2017).

Regarding performance, another risk that can arise from transportation disruptions is damage to customer relations. This is due to performance issues causing orders to be delayed or ultimately cancelled. Even though some of these delays do not directly affect service-level, all setbacks can affect customer reputation (Senthilkumar and Nallusamy 2021). Another risk studied within literature is the damage of goods during distribution, ranging from one product to the entirety of the stock shipped (Camargo, et al. 2018). The concern of Kraft Heinz interviewees regarding damage to deliveries was primarily related to service level, as the stock will be sent back, and Kraft Heinz needs to send a replacement for the damaged products and pay for a second truck to perform transportation. Additionally, some interviewees mention the supply chain losses associated with food waste that arises from these risks. Literature on the food waste repercussions of transportation disruptions reaffirms the direct impact that food sustainability has on a company's commercial and financial scope and the consumer's perception of the brand (Pullman and Wu 2021, Surucu-Baci and Tuna 2021).

Contracting-related risks were also approached by secondary and primary data as possible sources of impact on the Kraft Heinz supply chain. Mostly, interviewees found that contracting can limit the logistical capacity to an extent where the organization will not have enough flexibility to cope with the fluctuating demand. However, this would likely be the case in situations where the partnership is damaged. Kraft Heinz's entirely outsourcing logistics operations strategy could enhance these risks (Chen, et al. 2018). Literature supports that contracting should be done by a logistics procurement team to establish the overall process between organizations (Richards 2018). Even though contracting should be made by a procurement team, interviewees state that in some BUs, namely D&E, contracting is done by the logistics team. The limited knowledge of contracts can lead to the company having less control and visibility over its logistics operations. Furthermore, the issues arising from these contracts might affect the trust between Kraft Heinz and its carriers, which is key to producing long-term results (Bastiaansen, et al. 2020).

The sustainability impact (in terms of people and planet), although very present within the literature about the damages it could cause to an organization and its supply chain associates (Pullman and Wu 2021, Surucu-Baci and Tuna 2021), seems to be less considered by the company's employees. Nevertheless, it does not mean that there is no risk of impact on Kraft Heinz's brand reputation, but rather that such impacts have not been felt to this date. Given the complexity of Kraft Heinz's supply chain and demand instability, the probability of not delivering stock before it becomes unhealthy is higher. This will ultimately generate food waste (Lindsey and Mahmassani 2017, Muha, Škerlič and Erčulj 2020). Since Kraft Heinz does not have a specific approach to mitigating sustainability risks within its transport operations, it is possible to conclude that possible impacts in the future could be worsened due to the reactive nature of the current approach.

Finally, although risks such as brand reputation, supply chain losses, and financial impacts were discussed within the interviews, it is possible to highlight the importance given by the participants on effectively managing the service level impacts within the organization. It ultimately relates to the organization's capacity to continue its Business, both in commercial and financial terms (Kaur, Kumar and Luthra 2021, Pettit, Croxton and Fiksel 2019).

4.2.2 Improvement of risk management within Kraft Heinz

In answer to the second sub-research question: "How can Kraft Heinz improve their transportation risk management?": Firstly, it is possible to draw from the individual semi-structured interviews that Kraft Heinz International has a reactive approach to identifying and mitigating transportation risks. Most participants acknowledged that the urge for the organization was to develop proactivity within their risk management practices. Proactiveness would enhance the organization's readiness to be ahead of future disruptions and minimize the occurrence and impact, which is also confirmed by the literature study conducted (Can Saglam, Yildiz Cankaya and Sezen 2021, Wilding 2020). Furthermore, forming networks among the supply chain could potentially assist the organization by enhancing information flows and allowing the creation of cross-functional risk management teams (Ambrose, Matthews and Rutherford 2018).

Due to Kraft Heinz's logistic operations setup, done via a contracted specialized carrier, the first step of developing a proactive approach is straightening the connections between the two distinct organizations. Before establishing a partnership with an organization, the contracting phase will dictate an essential part of how the relationship will be conducted. As both perceived during primary and secondary data analysis, the contracting stage should partially

avoid future discussions and establish the initial grounds for trust between the parties. This is done by eliminating disputes by establishing clear rights and responsibilities and possibly setting up a mechanism for solving those without damaging trust within the parties (Lynn, et al. 2021, Nyamrunda and Freeman 2021). When managerial decision-making is involved within contracting, the manufacturer must pursue, to some extent, strict terms that can assure that the operator will deliver a minimum contracted service to maintain the continuity of the processes during disruptions. At the same time, the manufacturer must also be careful when setting strict terms not to damage supply chain flexibility to increase performance or capacity when a disruption makes it necessary (Lindstedt, Armour and Noakes, 2017).

Still within contracting, although the analysis of the interview data showed that Kraft Heinz is still at the initial stages of mitigating environmental-related risks within its transport operations, it is mostly not considered when a partnership with a provider is established. The literature shows that when one or more supply chain associates are not complying with the expected labor or environmental regulations, the impact on the organization's brand reputation could potentially damage its finances in the long term (Pullman and Wu 2021, Surucu-Baci and Tuna 2021).

The final step of contracting is related to the IT capabilities of the supply chain, namely of the carrier. Lack of truck visibility is another recurrent topic within the interviews, as it can impact both customer relations and service level directly (Rudd 2020). Since Kraft Heinz is not the owner of the trucks, they are not allowed to implement tracking systems on transport operations. However, during contracting, the company can ask for information on the current IT capabilities of the carriers to ensure that they meet the necessities of the logistics team. After contracting, there should be an initial phase in which communication lines and information flows are tested and established. Afterwards, feedback must be given to the responsible IT team regarding the processes that are not working to be adjusted to future operations (Tang, Huang and Wang 2018).

Regarding Kraft Heinz's reactive approach towards transportation risks, these can be improved by establishing action rules and alternatives to operations that could enhance supply chain resilience. To gain more control over transport operations, establishing safety net carriers can help mitigate both capacity constraints and the uncertain performance of spot market carriers (Pellegrino, Constantino and Tauro 2021). Additionally, putting in place fines when carriers do not meet their promised service level and bonuses for carriers who exceed contracted objectives can also help improve the carrier's overall performance (Presser, Cafaro and Cafaro 2021).

5 BUSINESS CONTINUITY PLAN

To answer the main research question: "How can Kraft Heinz International improve their supply chain's preparedness towards transportation risks through creating a risk management approach?", the adopted method was to create a Business Continuity plan with guidelines correctly assessing and acting upon transportation risks. This Business Continuity Plan Is to be put In place In the D&E Business Unit, which Is the focus Business Unit of this work. The following sub-chapters give Insight on the adopted plan and the four phases of risk management covered by the framework.

5.1 Adopted Plan

The proposed BCP was built based on Zsidisin, Ragatz and Melnyk (2003)'s model called "Supply Chain Business Continuity Planning Framework" (Figure 3). This model was chosen given its broader approach to supply chain operations planning while having a strategy behind it that matches the issues identified during primary and secondary data analysis. The research was carried out through semi-structured interviews, with the aid of a literature study to compare theoretical and practical knowledge. Another relevant factor for selecting the chosen model was the feedback tool proposed in the knowledge management stage of the framework, which allows the organization to continuously improve the BCP.

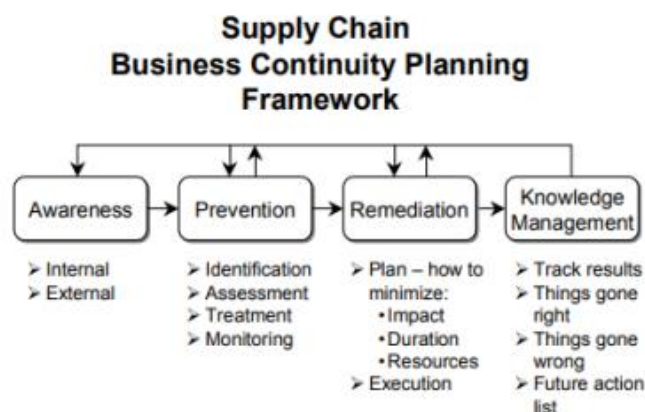


Figure 5.1 - BCP Framework (Zsidisin et al., 2003)

The BCP is divided into four steps of risk management: awareness, prevention, remediation, and knowledge management. The first step, awareness, is vital to Kraft instigate the

necessity of discussing and managing risk throughout the entire supply chain. In the second step, prevention, the intention is to develop a proactive approach towards risk. In the third step, remediation, the goal is to improve the reactive approach of Kraft Heinz towards transportation risks. Finally, the fourth step, knowledge management, will aid the organization in avoiding the BCP from becoming outdated when external and internal impacting factors change.

To best implement organizational changes, Kraft Heinz should deploy a specialized cross-functional team. This team must englobe members of all departments of the supply chain to correctly map and analyze the risks of transport operations. Specifically for D&E, this team must include sales to efficiently quantify commercial risks; finance for financial impacts; and the operational team, which is divided into customer service for measuring service-level and brand reputation impacts, and the logistics team which is responsible for planning transportation with the carrier and is the first point of contact when transportation disruptions occur and must quickly escalate these disruptions throughout the remaining supply chain members of the team. Cross-functional teams are an effective measure to ensure information and knowledge is shared and evaluated quickly within the supply chain and higher management positions (Ambrose, Matthews and Rutherford 2018).

5.2 Awareness

Awareness is the initial phase of the proposed BCP. At this phase, raising internal and external awareness within different managerial positions is necessary to ensure engagement within the organization and the supply chain. The awareness phase is divided into three principles (Zsidisin, Ragatz and Melnyk 2003). The first principle of this stage is creating awareness within the organization from a bottom-up approach. For example, higher management within Kraft Heinz need to be informed about the possibility of transportation risks and the impact they may bring to the organization in financial and competitive terms. Lower positions within the organization, mainly workers within operational roles (e.g., logistics workers, truck drivers and carrier contact points), are usually better prepared to spot possible risk causalities. Secondly, higher management can push the resources and drive the necessary planning tactics into risk management. The third principle is to spread awareness within other supply chain entities to establish the initial communication lines and information flows and motivate BUs to proactively map and mitigate possible risks (Zsidisin, Ragatz and Melnyk 2003).

At this step, the organization must be aware of the occurrence and possible impacts of transportation risks. Such risks can be in terms of damaging sales, finances, market share, commercial relationships, service level, or even brand reputation (Heidinger and Gatzert 2018). Collaboration within both internal and external teams through an efficient information flow is crucial to enable individuals to prepare in advance and efficiently handle the impacts of transportation disruptions. Moreover, awareness within the supply chain accelerates and improve the recovery process (Kurapati, et al. 2013).

For a practical approach towards the goal of the awareness stage, skills related to leadership in change management are needed. To facilitate comprehension, Table 4 summarizes the Awareness phase with related risks, actions, practitioners, and gains.

Table 5.1 - Awareness phase applied to Kraft Heinz

Phase	Risk	Actions	Practitioners	Gains
Awareness	Low engagement of Kraft Heinz employees in risk management	Raise awareness within the supply chain about the occurrence and impacts of possible risks	Bottom employees (operational) to raise awareness within higher management, which will form cross-functional teams to share the urgency across the supply chain	Acceleration and improvement of the recovery process

Ultimately, the below guidelines should be put in place for Kraft Heinz's awareness improvement plan:

1. Bottom-up approach: logistics managers start monitoring contracting-related risks and have their teams develop daily monitoring of transportation operational indicators (capacity and performance). The aim is to find indicators of potential threats to the continuation of Kraft Heinz' business within the markets served. The risks are then shared with the higher management.
2. Top-down approach: higher management forms a cross-functional team to monitor those risks, feeding on the insights provided at the first step by the operational teams and the logistics managers.
3. The cross-functional team informs the carriers of the risks they are monitoring and their developments to raise awareness with the supply chain.

5.3 Prevention

Prevention is the second phase of the BCP, in which proactive action is proposed. Organizations need to be aware of four main tasks that must be completed (Zsidisin, Ragatz and

Melnyk 2003). The first is risk identification, in which the root cause for each possible transportation disruption is investigated to develop a proactive approach towards risk management. The second task is risk assessment, in which stakeholders must evaluate the impact that each disruption could potentially cause within operations. The risk identification and assessment phases were conducted by analyzing semi-structured individual interviews.

Further, a risk treatment process is implemented within the third task. Issues are prioritized, and strategies are developed to avoid disruptions and react when they occur. Finally, the last prevention task is effectively monitoring both the supply chain and the external environment for possible complexity traits that could worsen the effects of disruptions (Zsidisin, Ragatz and Melnyk 2003).

Within the identification stage, the organization needs to prioritize specific markets and products, which are the most critical to focus its attention on. This involves considering the entire product and information flow across the supply chain and understanding the chances of risks and the impacts they may cause. Further into the prevention stage, the organization must strive to eliminate or reduce the risk exposure whenever possible or provide buffering strategies to tackle possible occurring disruptions. After that, the task becomes to develop risk indicators guided by information collected from multiple sources within the supply chain. Those risk indicators are the base for the treatment stage, in which preventive action is proposed. Finally, those preventive actions should be constantly reviewed, as the external environment factors and the setup of the supply chain could change, which affects how risk management works towards the prevention phase (Zsidisin, Ragatz and Melnyk 2003).

Contracting is the function in which most preventive (proactive) risk management can be done by selecting carriers according to the quality of the services provided. Therefore, Kraft Heinz must be attentive to the carrier's capabilities and resources. These capabilities include (but are not limited to): truck capacity, type of trucks used, price, lead-time, service-level, IT capabilities (Richards 2018, Xu, et al. 2013). The perceived benefits of a well-established contract are not limited to operational performance and productivity, but also involve a higher perception and awareness of overall operational risks (Tang, Huang and Wang 2018).

The organization must also be aware of the environmental impact that its transport operations might cause. With environmental laws becoming increasingly strict, Kraft Heinz needs to make sure the carriers' goals towards decreasing carbon footprint are in line with the companies. At this stage, requesting information how products are moved (e.g. via road or sea freight transportation), as well as the amount of electric vehicles owned by the carrier and data on their environmental footprint play a vital role in ensuring a long-term relationship with the

carriers (Bastiaansen, et al. 2020). Although the Impact of poor sustainable-oriented practices might be less felt within short-term finances, Kraft Heinz must prevent possible brand-reputation damage, which could cause commercial losses to the organization (Pullman and Wu 2021, Surucu-Baci and Tuna 2021).

Before setting up operations, organizations must set targets and responsibilities that the hired partner must provide as a service level agreement. Those performance indicators are based on company-specific goals, which are, in most cases, related to customer servicing and profitability. Moreover, the contract also protects the hired party by not being obliged to perform additional to what is stated as a minimum service level.

Logistics contracting must consider the commercial context and the background of each organization involved. When it comes to the numbers that will serve as a measurement for performance levels, those need to be correctly specified and detailed and consider as many unforeseen events that could affect those numbers as possible (Bandeira, Mello and Maçada 2012). Within contracting, responsibilities, duties, technical specificities, and possible compensations for when the agreement is not fulfilled need to be clearly stated to avoid unnecessary discussions over the pre-established terms (Sols, Nowick and Verma 2007). Moreover, special clauses for contract termination, incentives over extraordinary performance, flexibility, and operational control must be established. The aim is that the core organization is protected as much as possible from a sudden halt in operations.

The manufacturer might be exposed to risks when either the contract is too rigid or too flexible. In situations where the contracting is done with a higher level of stiffness, the organization might have difficulties enhancing the flexibility of the services provided by the carrier. This is due to the propensity of the hired party not to increase the performance or capacity of the facility when the manufacturer requires it. When contracting with a higher margin for flexibility, the manufacturer must pay attention not to harm its business. This would be due to not agreeing on a safe service level that would not damage Kraft Heinz's operations. Therefore, the objective of the core organization is to find a balance that could be acceptable for both involved parties, and that would not damage either of the organization when disruptions occur (Niemann, et al. 2019).

Contracts also need to include clauses that enable compensations for any impacts the organization might have in terms of finances or servicing its customers due to performance or capacity issues due to the carrier. Because in many cases, it is difficult to calculate the commercial losses impacts in the company's finance, the financial compensation for issues that are a

responsibility of the operator should be set agreed upon as soon as operations and possible risks are established (Presser , Cafaro and Cafaro 2021).

Because all partnerships within supply chains could be subject to conflict of interest between the parties, especially when discussing the agreed terms and if they are being put into practice, there needs to be a dispute mechanism stipulated within the contract. Such a dispute mechanism would aid the supply chain to quickly and efficiently solve possible discussions that may arise during the contracted period. Furthermore, an effort to smoothly solve possible disputes is essential to maintaining the partnership agreement without harming trust between associates (Bandeira, Mello and Maçada 2012, Selviardis and Spring 2018).

Due to the nature of an outsourcing relationship, in which two different entities have separated data management tools, integration is an essential part of providing visibility across the supply chain. Due to the complexity of Kraft Heinz International and its logistics network, topics such as truck visibility and availability are crucial for effective mapping and identification of possible transportation disruptions. The deployment of IT-related tools is essential at the preventive stage in facilitating communication between the parties to share insights and knowledge about the day-to-day operations (Anitha, et al. 2020, Tang, Huang and Wang 2018).

Information Technology tools are set up within a supply chain to facilitate information flow. However, before interoperability is achieved, tests must be implemented to ensure that data is visible to the same extent and quality by both parties. Furthermore, necessary adjustments within the IT setup must be performed so that Kraft Heinz is more in control of its operations and possibly more prepared to deal with future risks (Stajniak and Koliński 2016, Tang, Huang and Wang 2018).

The company should be also able to provide buffers that compensate for the loss in capacity or performance from the carriers. Before the low capacity or performance becomes a supply chain risk, organizations must set additional resources (e.g., workforce and own trucks) that enhance capacity (and possibly performance) to compensate for what is lacking. Capacity planning must, therefore, include elements of buffering, which regards both internal solutions and immediately available third parties that can be hired for specific periods (Bertoluci, Ramos and Lopes 2019).

Finally, the company must constantly monitor external (environmental) factors, such as political, economic, and social instabilities that cause the proposed preventive action not to work for future disruptions. Being able to collect and analyze information from those sources is essential to enhance the adaptability of the BCP.

To facilitate comprehension, Table 5 summarizes the Prevention phase with related risks, actions, practitioners, and gains. The subsequent action list will develop in detail about the actionables for the Prevention phase.

Table 5.2 - Prevention phase applied to Kraft Heinz

Phase	Risk	Actions	Practitioners	Gains
Prevention	Commercial	Prioritize products and markets	Cross-functional team collects the information about risks and higher management must prioritize	Avoiding service level impacts to the most important products and clients
	Lack of control over risks	Monitor risk through Key Performance Indicators (KPIs)	Cross-functional team supports operational team	Having visibility over possible internal risks
	External impacts (network-related)	Monitor situation from the carrier's perspective	Cross-functional team with the support of the carrier management team	Having visibility over possible external risks
	Lack of visibility over the impacts of disruptions	Estimate impact of each possible disruption in terms of service level and costs	Cross-functional team with the support of operational team and finance	Proper resource and effort allocation to each disruption
	Partnership contract	Evaluate the necessary aspects of well-established contracting	Cross-functional team with the support of logistics procurement and specialized lawyers	Prevent possible damages from poor contracting
	IT integration (GPS tracking system)	Set up the correct integration between Carriers and KH. Establish a test environment before going live	IT support team with insights provided by the operational team	Avoid future truck visibility issues
	Performance/capacity of the carrier	Set possible buffers (company owned trucks) to extend operational capabilities when needed	Cross-functional team with the support of the logistics managers	Being able to quickly recover operations during disruptions
	Changing environmental factors	Monitor the development of environmental factors that can influence the risk approach	Cross-functional team	Avoiding the preventive actions to become unsuitable

Ultimately, the below guidelines should be put in place for Kraft Heinz's prevention improvement plan:

1. With the support of higher management, the cross-functional team should prioritize clients and markets as the first step of prevention since, in some situations, it is not possible to eliminate risks for all markets and products. Therefore, Kraft Heinz must pre-establish priorities to be the first ones to be secured during disruptions based on their strategic needs. This is done at the identification stage within prevention.

2. The cross-functional team needs to monitor operational risk KPIs for correct risk identification.
3. The cross-functional team should also monitor external impacts with support of the carrier's management team, which refers to possible impacts to the carriers capacity and performance.
4. The cross-functional team must evaluate the possible impact of each possible disruption. Impacts should be investigated from both service level and cost perspectives, in which factors as the possible damage to a business partnership must be considered. Looking into possible commercial losses is essentially dependable on the product and market priorities previously established. Estimating impacts will also allow the organization to understand how much time and resources need to be allocated to each disruption.
5. For contracting risks, a specialized team (formed by the procurement team and lawyers) needs to support the cross-functional team in selecting carriers that comply pre-determined conditions from Kraft Heinz. The main points of attention for Kraft Heinz can be seen below:
 - a) Ensure necessary employee training for the activities performed within the transportation routine and documentation checks.
 - b) Evaluate the compliance of the carrier with the best practices to reduce the environmental impact of the operations.
 - c) Evaluate the compliance of the carrier with local labor regulations.
 - d) Minimum service level for the carrier.
 - e) Establish bonus payments for the carrier in case of overperformance.
 - f) Compensation system for low performance and contract termination clause.
 - g) Availability of contract information between the carrier and truck owner (if hiring a 4PL as an operator) to avoid unplanned capacity issues.
 - h) Establish a dispute mechanism for contractual discussions between the partners, preferably with an impartial party involved, such as a public juridical institution.
 - i) IT capabilities of the contracted carrier.

6. After a partnership contract has been sealed, Kraft Heinz IT must focus on integrating its IT capabilities with the carrier's. Data must be correctly available and visible to all members of the supply chain to avoid future data mismatches. A specialized IT team must support the integration setup. After interoperability is reached, a testing environment must be established to guarantee the effectiveness of the systemic integration.
7. To proactively mitigate performance and capacity risks, the cross-functional team, with the assistance of logistics managers, needs to pre-establish operational boosters that could be used to compensate for possible shortages in capacity or performance. The main possible operational buffering possibility is the purchase of a small fleet of trucks that can be used during workforce shortages by the carriers.
8. Finally, Kraft Heinz must constantly monitor the transport operational risk to map environmental conditions that might affect the development of the disruption. The root cause must also be taken into consideration. The most relevant factors to be monitored can be seen below:
 - a) Demand and customer behavior switches.
 - b) Regional or global shortages in carrier of workforce availability.
 - c) Governmental regulations (e.g., related to environmental and labor).

5.4 Remediation

The third phase of the BCP is remediation, characterized by the core organization recognizing that it is impossible to avoid all disruptions by a proactive risk mitigation policy altogether. At this stage, the manufacturer must be able to shorten the period in which the disruption takes place and mitigate the impact within the service level and company finances (Zsidisin, Ragatz and Melnyk 2003). During crises, Kraft Heinz must have an efficient guideline for actions that need to be taken to minimize the impact of transportation disruptions by establishing transparent processes and rules for the supply chain to deal with risks. It is essential at this level that Kraft Heinz is prepared to identify the resources that are needed to push the plan forward.

The first principle of remediation is to plan for the disruptions (Zsidisin, Ragatz and Melnyk 2003). Planning does not mean that the organization needs to eliminate such disruptions, as it is virtually impossible. Nevertheless, the length of the disruption and its financial impacts must be estimated, as they might be used to guide the following actions. Finally, the

remediation phase works at the four stages of a disruption identified by (Zsidisin, Ragatz and Melnyk 2003):

1. Interruption: operations come to a partial or complete halt.
2. Response: the organization employs the first measures to mitigate the impacts.
3. Recovery: the organization starts to plan the re-establishment of operations.
4. Restoration of operations: the organization starts to normally function again.

In terms of BCPs, they must be tailored to each different disruption that occurs, considering external and internal factors that might affect transportation performance or capacity (Hatton, et al. 2016). In terms of interruption, the BCP must quickly identify possible root causes, so the basis for planning can be set for an appropriate approach towards risks. At this stage, the possible impacts must be correctly prioritized (Aboutorab, et al. 2022).

The specialized cross-functional team must be set up to approach the risks from different perspectives and possible benefit from sharing knowledge across the supply chain to enable more entities to act upon those (Russo 2019). Further onto the response stage, when the first practices determined at the interruption stage are applied, the organization needs to start pushing the goods and services flows towards their average level. When the organization understands that operations will soon return to their normal levels, the recovery stage starts. Once the normal level is reached, the organization enters the restoration of operations stage, and the disruption ends (Zsidisin, Ragatz and Melnyk 2003).

To facilitate comprehension, Table 6 summarizes the Remediation phase with related risks, actions, practitioners, and gains. The subsequent action list will develop in detail about the actionables for the remediation phase.

Table 5.3 - Remediation phase applied to Kraft Heinz

Phase	Risk	Actions	Practitioners	Gains
Remediation	Low visibility on impact and duration of the disruption	Assess duration and total impacts of the disruption by monitoring the KPIs established in the prevention phase	Cross-functional team with the support of the logistics and carrier operational team	Visibility over the necessary efforts and resources to allocate for the disruption
	Lack of planning for the disruption	Monitor the developments of the disruption and determine ownership of tasks for each employee	Cross-functional team with the support of the logistics and carrier operational team	Tailor specific BCPs for each disruption

Ultimately, the below guidelines should be put in place for Kraft Heinz's remediation improvement plan:

1. At the interruption stage, when operations are brought to a (partial) halt, Kraft Heinz's cross-functional team must gather the necessary risk KPIs and analyze them to estimate the duration of the disruption, as well as the impacts on service level and the organization's finance. The impacts on the service level to the customers must be assessed by each BU individually with the support of sales and customer service managers.
2. Meetings between the cross-functional team need to be organized to share information on developments of the disruption and determine the ownership of tasks. This refers to the response stage of a disruption.
3. The cross-functional team needs to feed from the previously collected data in terms of contracting, performance, and capacity-related risks to find the root cause for the disruption. This data will support the team to achieve the best approach to the specific causes and impacts. When the BCP is put into practice, the recovery stage starts. When operations are restored, it means that the disruption has ended.
4. The cross-functional team must gather information on which resources are needed to counter the effects of the disruption and shorten its duration. Below are the main aspects that can be analyzed as possible solutions (which are also bearing costs):
 - a) Hiring additional workforce
 - b) Hiring additional trucks

5.5 Knowledge management

The last phase of the BCP is knowledge management, which is done by retroactive feedback on past disruptions occurrences and how the organization managed them. After each crisis, such effort involves an audit process to evaluate aspects that worked well and those that did not. There could be, as an example, an indication that an issue within the prevention phase occurred, and the process must be reviewed to prevent the same issues from occurring in the future. Therefore, besides improving the points that did not work on previous disruptions, attention must be paid to keeping (and even improving whenever possible) the aspects that

worked well (Zsidisin, Ragatz and Melnyk 2003). The three principles of knowledge management are as follow:

1. Continuously focus on improving the organization's approach towards risk by constantly looking for possible weaknesses and risk exposure.
2. An evaluation must be drawn from previous disruptions experiences to provide empirical knowledge to the company.
3. Share knowledge within the supply chain and spread the learning points to other business associates, so the entirety of the supply chain is more resilient to the occurrence of disruptions (Zsidisin, Ragatz and Melnyk 2003).

Within the three principles of the knowledge management phase, lessons drawn from previous experiences will be an essential part of the BCP in keeping it up to date. Within such a task, decision-makers must consider that the developed plan is not failure-proof, and shortcomings that were not foreseen might occur during the risk management process. The deficiencies need to be seen as learning opportunities rather than signs that the plan did not work entirely. Those learning points must then be shared with other supply chain partners to build knowledge from experience. The aspects that worked well must be maintained.

Nevertheless, it does not mean those do not need to be reviewed. Feedback must also consider external and internal factors that could vary and cause such aspects not to have the same effectiveness for future disruptions. Finally, Kraft Heinz must be attentive in not over-complicating the feedback but instead focusing on practical aspects and investigating the most probable or obvious reasons before moving into more in-depth investigations (Margherita and Heikkilä 2021, Zsidisin, Ragatz and Melnyk 2003).

Table 7 summarizes the Knowledge Management phase with related risks, actions, practitioners, and gains. The subsequent action list will develop in detail about the actionables for the Knowledge Management phase. The establishment of regular audits to review financial and commercial results, Identifying and analyzing previous aspects that can be changed Internally and externally can bring additional complexity to operations. Nonetheless, reviewing actions Internally is not enough to take conclusions on a risk management plan. Information needs to be managed externally as well as Internally.

Table 5.4 - Knowledge Management phase applied to Kraft Heinz

Phase	Risk	Actions	Practicioners	Gains
Knowledge Management	Not improving the aspects that did not work for previous disruptions	Effort to understand why such aspects did not work and how they can be improved for future disruptions	Cross-functional team and their respective superiors, with the aid of information provided by operational employees	Updating the BCP with aspects that could work for future disruptions, avoiding the same issues happening again
	Not improving the aspects that worked for previous disruptions	Monitor external and internal factors that might change so those aspects are adapted to future disruptions	Cross-functional team and their respective superiors, with the aid of information provided by operational employees	Not having BCP become outdated and possibly improving the points that worked well
	Carrier operational team not being aware of the learning points	Share learning points across supply chain and its associates	Cross-functional team with the support of higher management	Improve the risk management approach throughout the entirety of transport operations

Ultimately, the below guidelines should be put in place for Kraft Heinz's knowledge management improvement plan:

1. Establish an audit process to track each disruption's financial and commercial results and each step of the previous BCP.
2. Identify and analyze aspects that worked well and try to map what could change internally and externally, which would make it necessary to review those. The previously established disruptions and risks need to be constantly monitored.
3. Identify and analyze aspects that did not work well and map why they happened and what could be improved for future transportation disruptions.
4. After the learning process from past experiences is concluded, the results should be shared with all involved parties of transportation processes. Those are mainly the carrier operational team and the customers to improve risk management within other supply chain members.
5. Elaborate an action list for future risks and improvement of the BCP.

6 CONCLUSION

This research aimed to create a structured approach towards risk management within the D&E Business Unit of Kraft Heinz. The central focus question of this research is "How can Kraft Heinz International improve their supply chain's preparedness towards transportation risks through creating a risk management approach?". To answer it, the present work had two research sub-questions. The first one aimed to understand which impacts were perceived as more damaging to the company, and the second focused on how to improve Kraft Heinz's transportation risk management strategy. Through analysis of both research sub-questions, the central focus question of the research is answered through creating a Business Continuity Plan with guidelines tailed to the D&E Business Unit on how to prepare and act when transportation risks become apparent to the company. In this way, the company will now be better prepared towards dealing with issues arising in transport operations.

When it comes to the two research sub-questions, the results showed that the service level impact was perceived as the most important and that the approach of Kraft Heinz could be improved by increasing proactive activities within the organization. In addition, the structure division of the company between the BU could be a potential barrier to the implementation.

Therefore, one of the conclusions from this study is that the company culture must be changed from a cost-oriented vision to a customer-focused one. Changing the organizational culture can also enable the company to visualize long-term impacts of risks, such as commercial losses and possible damages to the brand reputation, by being seen as an organization that does not fulfil its commercial agreements. Furthermore, focusing on the client perspective enables Kraft Heinz to have more control over its market presence.

To achieve better results in terms of servicing the customer demand, Kraft Heinz must pursue a proactive approach to transportation risks, which is done by enhancing the organization's preparedness for the occurrence of transportation disruptions. Proactivity also means that the company should focus most of its efforts on acting before risks start materializing. It might also aid the supply chain in recovering more quickly and efficiently when disruptions happen.

The dynamic business environment of Kraft Heinz also played a role in bringing complexity to the research. Cross-functionality is essential for a successful Kraft Heinz transportation risk management approach. By aligning the different entities' objectives and establishing

shared goals, it becomes more apparent for the organization which long-term impacts the company could expect. Further, it enables BUs to be more integrated by sharing knowledge throughout the supply chain. Cross-functionality is, therefore, an element that enables knowledge management and assists the organization's risk management practices in being kept up to date.

The contribution of this research was to approach transportation risk management to enhance Kraft Heinz' preparedness towards risks and build towards business continuity. This was achieved through developing a business continuity plan to reduce the impact of transportation risks of the company. Another contribution of this work is exploring and validating Zsidisin et al. (2003) BCP framework by testing how his research could be used in real-life events.

The work also identifies how the lack of IT capabilities might affect a supply chain's ability to deal with transport operations. Digitalization plays an essential and strategic role within companies in a globalized and connected world. Another focus area is the cross-functional alignment and the need to reduce individual BU operation methods within companies to enhance performance. Future research could study how bridging different functions and departments can enhance supply chain resilience on food FMCG supply chains.

Although exciting insights about how a food FMCG supply chain approached transportation risks, due to the case study design of this research, it is not entirely possible to confirm that those implications could apply to different organizations. Furthermore, the abductive reasoning method strongly depends on the researcher's interpretation of the findings. It would be ideal to have the proposed BCP quantitatively tested during transportation disruptions in Kraft Heinz International to bring more credibility to it. In other words, the impacts of the disruptions with the implementation of the BCP would need to be mathematically assessed compared to a situation where the plan was not applied.

7 BIBLIOGRAPHY

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APPENDIX 1 - INTERVIEW QUESTIONNAIRE

Questionnaire 1 – KH Transportation risk Management BCP

Kraft Heinz transportation strategy

1. In what ways is your BU outsourcing transportation services?
2. Why was it decided that this kind of service would be delegated to a third-party?
3. What is the importance of the sustainability factors when choosing a service provider?

Transporting risks

4. What are your biggest challenges in terms of transportation?
5. Which kind of risks are more present when you think about your transportation?
6. What kind of risks can arise from transportation capacity problems?
7. What kind of risks can arise from transportation performance problems?
8. What kind of risks can arise from transportation contracting problems?

Risk management within Kraft Heinz

9. How do you manage transportation risks within your BU? (pro-active or reactive approach?)
10. Does your BU map the most common risks within transport operations?
11. Does your BU have a structured contingency plan for transport-related risks?
12. What is lacking from the approach of your BU towards transportation risks and disruptions?
13. How do you currently deal with No-Shows?
14. How often does your BU utilize the spot market? In which situatio