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The business model of Dutch container trucking companies – an analysis of internal change for 2016-2021

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Abstract

This study assesses potential changing internal factors of the business model of Dutch container trucking companies centered on the area of the port of Rotterdam and is written in cooperation with AZV/TLN. A total of 14 interviews are conducted in order to determine five different trends that are expected to have an impact on the business model of the Dutch container trucking companies by 2021. The Business Model Canvas, together with the five trends, helped to draft a survey that has been spread amongst 236 different companies. The results of the survey are analyzed with help of a strength of consensus analysis in order to quantify the dispersion in opinion amongst different sized Dutch container trucking companies. A selection of the key findings of this study are: (1) horizontal cooperation will become more important, (2) higher educated staff will be required, but at the same time more foreign staff will be employed, (3) the level of automation will increase, especially for medium and large sized companies, (4) the focus on diversification will increase and (5) hardly any changes in market structure will occur, only large sized companies potentially take over small sized companies.

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1. Introduction

1.1 Container transport as one of the key drivers in the Netherlands

Since the introduction of the container in the twentieth century a lot has changed in the world of logistics. The container made it possible for consumers to buy, at a larger scale, a great variety of products at local stores at relatively low prices, whilst those products occurred on the other side of the world. It has accelerated global transport and developed logistics to the global level as we know it by and although many may not realize this, the introduction of this metal box induced one of the largest impacts on our daily modern lives (Levinson, 2006).

Naturally, through the years the Netherlands anticipated on this highly potential development, resulting in an excellent position in the global port industry with its leading port of Rotterdam (Port of Rotterdam, 2011a). In the Netherlands, logistics has become of massive influence for the Dutch economy; all logistic activities in and around the Netherlands amount to 4,5% of the Dutch GDP (CBS, 2015). The development of the Dutch logistic sector during the last decades is supported by figures showing the total number of containers transported via the port of Rotterdam. One could observe in Figure 1 a positive growth in terms of container throughput, which could even indicate that containerization is still continuing in the Netherlands. However, one can see a significant downturn in container throughput suffered in 2009 which is most likely the result of the global economic crisis and the slackening demand from developing economies such as the one from China, amongst other factors (Lalkens & Couzy, 2015).

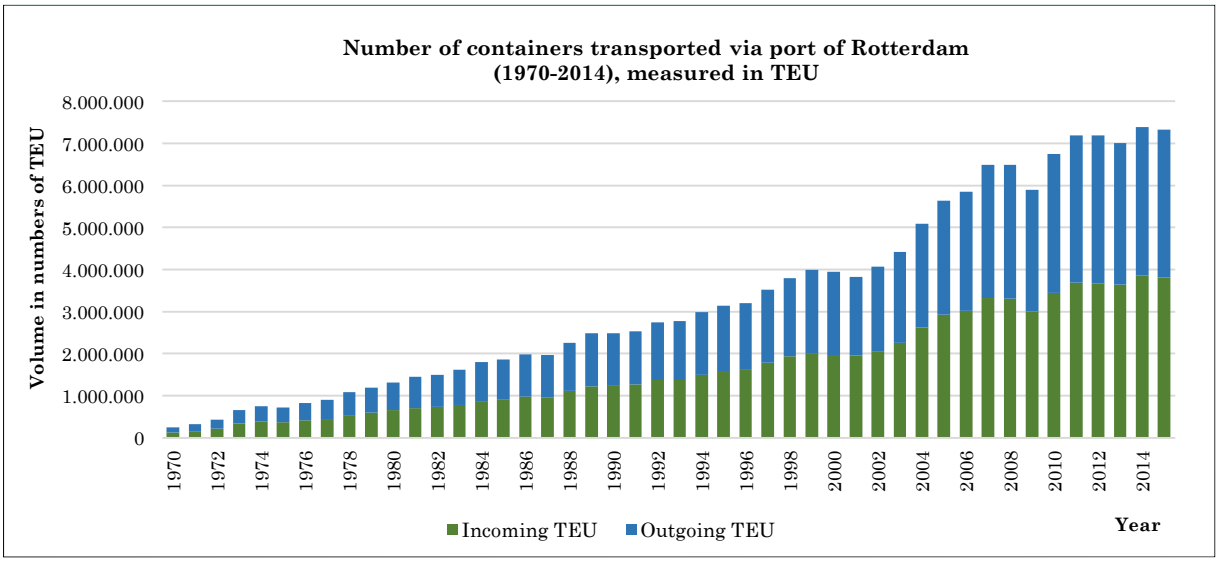

Figure 1: Container throughput of Rotterdam in 1970-2014 (Port of Rotterdam, 2016a)

It can also be seen in Figure 1 that millions of containers are arriving in Rotterdam each year. However, these arriving containers are not solely intended for the Dutch market and are mainly transported onwards from Rotterdam to its contestable hinterland of which the most important markets are those of Germany, Belgium and France, respectively accounting for 45,8%, 34,4% and 11,2% of the total Dutch bilateral road transport, measured in tons (TLN, 2016a). At the same time,

these markets, and the port of Rotterdam, are part of the well-known Hamburg-Le Havre range, an area in which severe competition exists amongst the Northern-European ports (Thorez & Joly, 2006). The port of Rotterdam has the opportunity to differentiate itself by excelling and characterizing itself as a port with perfect hinterland connections (Port of Rotterdam, 2011a). To achieve this, optimal integration of different transportation modes is required, whereby one can choose from container transportation via inland waterways (barges), rail (trains) and road (trucks). In 2015, container transportation by truck was most prevalent and accounted for approximately 53,5% of total container transport from and to the port of Rotterdam, whereas container transport via rails and inland waterways contributed 10,5% and 36,2% respectively (Port of Rotterdam, 2016b).

Container transport via road has always been the most popular transportation mode due to its relatively flexible, fast and cheap characteristics (Rodrigue, Comtois, & Slack, 2006). Container trucking transportation accounted for, at the beginning of the Dutch containerization around 1966, approximately 90% of the total Dutch container transport. However, the position of Dutch container trucking has gradually weakened over the decades, especially since 1980 due to the increasing popularity of barge and rail container transport. This resulted not only in a rise in competitiveness within the Dutch container transport sector, but also lead to a loss in market share for container trucking. Although the Dutch container trucking sector is locked in severe competition with other transportation modes, it still succeeded in securing and remaining the leading container transport mode (Paardenkooper, 2016). The leading position of container trucking amongst transportation modes cannot only be observed in the Netherlands, but also the hinterland transport of most worldwide ports is dominated by container trucking (Merk & Notteboom, 2015). The container trucking sector could hold on to this position by progressively developing and characterizing itself, in contrast to the other transportation modes, as a sector specialized in domestic and relatively short-distance container transportation (CBS, 2015).

The container trucking sector is a crucial mode of port-related container transport, and, therefore, one could expect that this sector would be receiving frequent review by academics. This seems to be a false expectation with there being a dearth of related academic literature that has been written about the container trucking sector. Although some literature exists, it is rather unilateral due to being:

- *Rather specific and small*; most literature focuses on detailed topics such as the planning and optimization of transportation schemes (Chung, Ko, Shin, Hwang, & Kim, 2007 ; Jula, Dessouky, Ioannou, & Chassiakos, 2005 ; Phan & Kim, 2016 ; Zhang, Yun, & Kopfer, 2010)
- *Mostly focused on local geographies*, whereby cities in the United States and Asia are most common (Chung, Ko, Shin, Hwang, & Kim, 2007 ; Liao, Tseng, & Lu, 2009)
- *Not being strategy-focused*, whereby especially the cost side of operational activities is emphasized (Coslovich, Pesenti, & Ukovich, 2006 ; Sterzik, Kopfer, & Yun, 2015 ; Wang, Su, & Ruamsook, 2011)

1.2 Research objectives

Container trucking has, in both the Netherlands and worldwide, managed to achieve a leading position in the container transport sector. This leading sector is part of the broader port industry which is currently in rapid development in the face of new problems, bottlenecks and opportunities. Think of, for example, additional environmental regulations, such as the EURO-6 truck regulation, and new technological innovations, such as platooning and autonomous driving. These developments are directly affecting the Dutch container trucking companies and their corresponding business model (ABN Amro, 2013 ; Rabobank, 2016). However, an exact determination of the changing context of the sector has not been thoroughly identified as a result of the aforementioned lack of existing academic literature. This study will therefore aim to fill this gap through the provision of an improved understanding of the container trucking sector. Its purpose is to determine to what changes the business model of Dutch container trucking companies will go through in the upcoming five years. To achieve this, the main research question that this study aims to answer is as follows:

"Which internal changes have an impact on the business model of Dutch trucking companies?"

In addition, several sub-questions are posed to adequately answer this main research question. These sub-questions help to ensure a structural approach of answering and to make sure that all aspects that are related to this main research question are covered. The following sub-questions will be answered in this study:

- *Sub-question 1: "How can the (Dutch) container trucking sector be characterized?"*
- *Sub-question 2: "What is the business model of Dutch container trucking companies nowadays?"*
- *Sub-question 3: "How will the Dutch container trucking sector be developed by 2021?"*

1.3 Research scope

This study will entirely focus on the changes in the Dutch container trucking sector centered on the area of Rotterdam. Since a lot of factors may affect this sector, specifically *internal* factors will be considered and all *external* factors and developments will not fall under the scope of this study[1]. Due to the fast changing context of the logistics industry and since this study will identify both the present and future, the temporal scope is chosen to be equal to 6 years. With regards to the future, the study will go 5 years ahead in time and will examine the years 2017-2021, whilst the year 2016 is considered as the present year.

[1] This research is written in cooperation with Ana Duškov, Urban, Port and Transport Economics student at the Erasmus University Rotterdam, whose research emphasizes the external aspects of the Dutch container trucking sector.

2. Research design and methods

2.1 A four-phased research process

To perform the research and answer accurately the research question, four different phases will be executed. These phases will help to structurally determine the expected changes in the business model of Dutch container trucking companies. Knowledge will be acquired via these phases through the performing of both a qualitative and quantitative research. The actions that have been undertaken to successfully complete each phase are described below and are pictured in Figure 2.

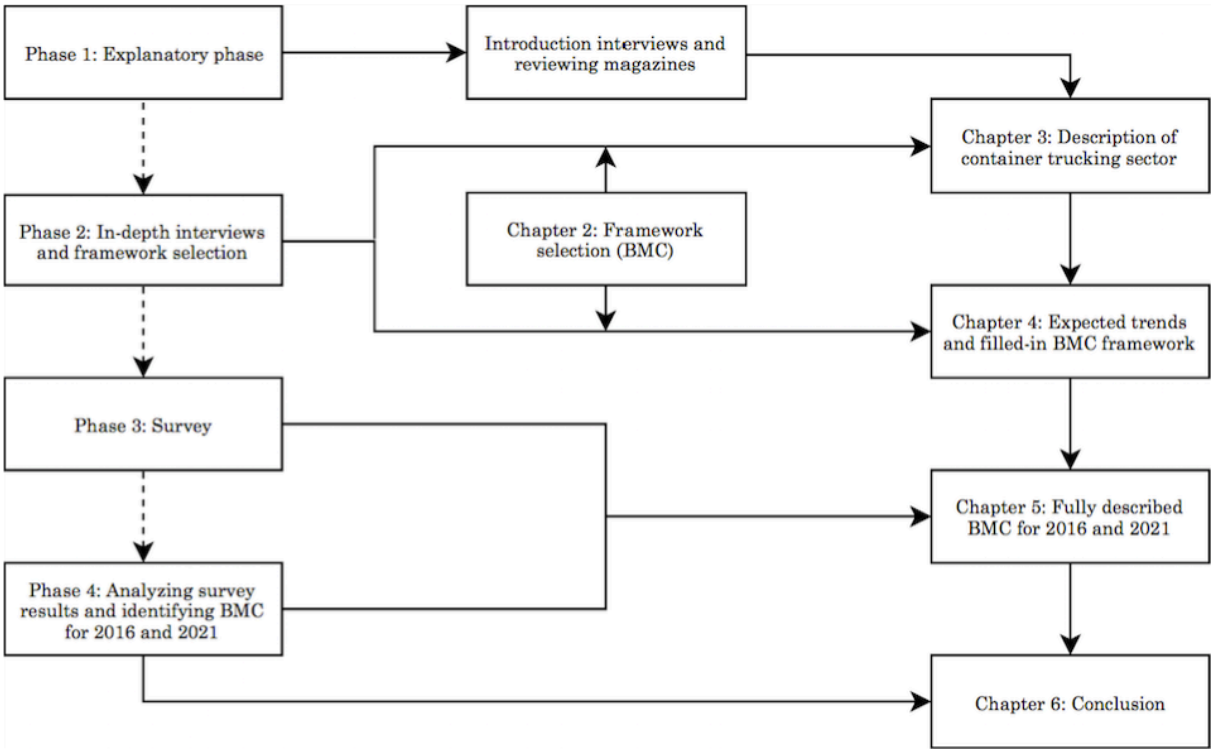

Figure 2: Visual summary of the four-phased research process

2.1.1 Phase one: Explanatory phase

In the first phase, the exploratory phase, general information was collected by conducting 'introduction-interviews' with the directors of two container trucking companies to get a first impression of the sector. These specific directors were chosen, as a result of AZV/TLN[2] having their direct contact details at their disposal and, additionally, these companies are part of the 2016 AZV/TLN board. The directors explained broadly how a container trucking company functions within the supply chain and gave their unvarnished opinion on the problems they are daily facing. Emphasis was placed on environmental regulations, performance of container trucking companies and technological innovations such as platooning and electric driving amongst others. In addition to this, articles from the years 2015 and 2016 from both the biweekly magazine *Transport & Logistiek* and the weekly newspaper *Nieuwsblad Transport* were reviewed to gain additional

[2] This study is written in cooperation with the *Alliantie Zeecontainervervoer (AZV)*, submarket of the Dutch transport and logistics association *Transport Logistiek Nederland (TLN)* and was of great value in this study in terms of providing both the data and contacts for conducting the interviews and survey in the first three phases.

information. Furthermore, the general members meeting of the AZV, the submarket of container trucking of TLN, was attended in June 2016. During this meeting, the board members of the AZV and several active members discussed daily business and possible future changes and problems. This phase mainly functioned as input to answer sub-question 1 whereby the container trucking sector is described in Chapter 3, and, in addition, assisted in the early determination of trends seen in Chapter 4.

2.1.2 Phase two: In-depth interviews and framework selection

This phase consisted of more in-depth interviews in which previously discussed topics were more comprehensively examined. To give structure to these interviews, a guideline had to be set. For this, 4 different frameworks were reviewed whereby the template of the Business Model Canvas (Figure 3) was eventually selected to function as framework. This template consists of nine different building blocks and, together with previous information collected during the first phase, were used to structure the conduction of the interviews. A more comprehensive reasoning and explanation why the Business Model Canvas has been chosen and how it is structured, can be found in sections 2.2 and 2.3.

In order to create a reliable view of the Dutch container trucking sector, different parties of different sectors had to be interviewed, whereby the scheduling of these appointments was made possible through AZV/TLN. A detailed list of the interviewees can be found in Table 26 in Appendix 8.1[3]. During the first phase appeared that the relationship between Dutch container trucking companies and terminal operators is rather complicated. Therefore, three department managers of two different terminal operators were interviewed in order to give their view on the Dutch container trucking sector. Additionally, five spokespersons of different associations and a department manager of the Port Authority of Rotterdam were interviewed, whereby each association represented key players within the port industry. These interviews with the associations and Port Authority made it possible to highlight the Dutch container sector from different perspectives which led to more interesting and reliable insights. For instance, the spokesperson of the *EVO*, representing shippers in the Netherlands, gave clear insight of the view of shippers on Dutch container trucking companies. At the same time, interviewing the spokesperson of the Port Authority of Rotterdam gave a clearer understanding of the actions and regulations of Dutch governments. During all in-depth interviews the following topics were broadly discussed: customers, distinguishing of competitors, workforce, automation, market structure, sustainability and environment, technological and social developments, cooperation and cost and profit structures.

Additionally, since this study also examines the expectations for 2021, five different expected trends emerged from the interviews (Chapter 4). Furthermore, general input acquired from all

[3] All input and personal contacts were provided by Wout van den Heuvel, specialist IT at TLN and secretary of AZV/TLN board 2016.

interviews and the determined expected trends, were processed into multiple sub-topics and were allocated to the building blocks of the Business Model Canvas. This eventually led to a 'filled-in' framework of the Business Model Canvas and can be found in section 4.6. This 'filled-in' framework has been used as guideline for formulating the survey questions. Subsequently, this phase aimed to lay the foundation for answering both sub-questions 2 and 3 whereby the Business Model Canvas is used as main tool to identify the business model of container trucking companies.

2.1.3 Phase three: Survey

In this phase, the newly constructed 'filled-in' framework of the Business Model Canvas of section 4.6 has been processed into 43 different survey questions. These questions were formulated with help of feedback from TLN[4]. After drafting a final version of the survey, it was sent out for a trial to 3 different board members of the AZV. After processing their suggestions and improvements, the survey was converted into an online version with help of DataIM, a company specialized in data collection. The survey has been distributed on the 12th of August 2016, via a personalized link, to 236 of the 243 registered AZV members (the full contingency was not delivered as a result of missing contact information or the emails bouncing back). After sending out several reminders with weekly intervals, a decision was made to close the survey on the 5th of October 2016. In total, 27 of the 236 respondents have filled in the survey completely, a response rate of approximately 11,44%.

The largest share of the survey questions relates to the grading of statements and subjects regarding the current circumstances in 2016[5]. For these type of questions, an ordinal scale from 1 (very negative) to 10 (very positive) was used. Additionally, other questions focused on the expectations of these same statements and subjects for 2021. For these questions, a symbolized ordinal Likert scale (--, -, 0, +, ++) was used and indicated the relative changes compared to the circumstances of 2016. Each symbol of the Likert scale has an allocated corresponding quantified value in order to be able to perform a consensus analysis. The symbols have the following meaning:

--	denotes a large negative relative change	= 1
-	denotes a small negative relative change	= 2
0	denotes no relative change	= 3
+	denotes a small positive relative change	= 4
++	denotes a large positive relative change	= 5

The Likert scale is a method used to measure the attitude of a respondent to a certain question or statement. It is the most universal method in surveys and is relatively easy for respondents to understand. Since the answers, when using a Likert scale, represent a single number, it will be easy to code the data and perform statistical tests. However, a commonly referenced disadvantage

[4] Wout van den Heuvel has great knowledge about most members of the AZV and therefore he knew how to optimally and understandably formulate the survey questions.

[5] Please note that in the survey additional questions were asked that are related to external topics chosen by Ana Duškov, such as slots at terminals and relationships with external parties such as terminal operators and the Port Authority. However, these questions do not fall into the scope of this study and can therefore be ignored.

is that the distance between the Likert items are not equal for each respondent which can subsequently result in unreliable outcomes (Allen & Seaman, 2007 ; Likert, 1932). In survey research an alternative scale is the so-called 'slider scale' whereby the respondent can pick its own value on a scale from 1-10 or 1-100. However, unlike the Likert scale, not each value will have its own interpretation. Whilst the slider-scale seems to be an qualified alternative, it does not increase the reliability or the validity of the outcomes in any way (CheckMarket.com, 2014). For this reason, the Likert scale was prioritized over the slider-scale. Alongside the Likert and 1-10 scaled questions, several open and closed questions were asked. A complete and detailed version of the survey can be found in Appendix 8.2.

2.1.4 Phase four: Analyzing the results and identifying the BMC for both 2016 and 2021

The last phase aimed to give a comprehensive answer, with help of previous phases, to both sub-questions 2 and 3 and consisted of the analysis of the survey data. Depending on the type of data, either a general descriptive analysis (such as percentage shares and weighted average calculations) or a more advanced analysis, the strength of consensus, has been performed. Since the analysis of each survey question is allocated to one of the nine building blocks of the BMC, the results of the analysis can be translated into a fully described version of the BMC for the Dutch container trucking sector for both the years 2016 and 2021 (Chapter 5).

As mentioned previously, most questions included an ordinal scale (e.g. the symbolized Likert and 1-10 scale). However, ordinal scales are relatively difficult to analyze due to only containing information about absolute values, while the meaning of relative distances is missing (University of St Andrews, 2016). For this reason, the consensus analysis has been used in order to standardize the interpretation of the used ordinal scales. The consensus analysis calculates the strength of consensus (sCns) and is used as method to assess ordinal scaled data with respect to its dispersion around a calculated mean. The generally used consensus analysis is developed by Tastle, Wierman and Dumdum (2005) and is mostly used to measure consensus amongst populations during group discussion research. In order to predetermine the mean, and thereby making it possible to examine if respondents are more moving towards a certain position, Tastle and Tastle (2006) made an adapted version of the sCns which can be calculated with the following formula:

$$sCns\ (X) = 1 + \sum_{i=1}^{n} p_i \log_2 \left(1 - \frac{|X_i - \mu_x|}{2d_x}\right) \qquad (1)$$

where X_i is any discrete random variable with probability distribution of $p(x)$ and is in this case the given grade on either the 1-10 or symbolized Likert scale. The d_x denotes the width of each X and could be calculated by $X_{max} - X_{min}$. The μ_x represents the mean of X and could also be forced to be a certain fixed value. In this study, for each consensus analysis, three different types of strengths of consensus are calculated:

- A sCns with a μ of X_i ($sCns_x$)

- A sCns with a forced μ of 1 ($sCns_1$)
- A sCns with a forced μ of either 5 or 10, depending on the scale ($sCns_5$ or $sCns_{10}$)

Combined, one is able to deduct for each statement, or subject, towards which position the respondents are tending, what the strength of consensus is in this position and what the overall consensus, amongst the entire sector, is about the certain statement or subject (Tastle & Tastle, 2006). The consensus analysis formula will give an outcome that represents the strength of consensus concerning a certain statement or subject. However, no rule of thumb exists that indicates what outcome belongs to either a weak or strong level of consensus. Therefore, the following interpretation criteria are chosen based on an expert's opinion:

- A sCns from 0 to 0,69 indicates no consensus
- A sCns of 0,7 to 0,89 indicates a weak consensus
- A sCns of 0,90 to 1,00 indicates a strong consensus

Additionally, alongside the measurement of the strength of consensus amongst all respondents, the strength of consensus is also measured amongst different classifications of the container trucking companies. Hereby a distinction is made between relatively small, medium and large sized Dutch container trucking companies. This distinction is based on the number of daily used trucks (both owned and chartered) and can be seen in Table 1.

Table 1: Relative Dutch container trucking company size classification criteria based on number of daily used trucks

Relative size	**Number of daily used trucks**
Small	≤ 9
Medium	10-49
Large	≥ 50

2.2 Possible frameworks for analyzing transport markets

This section is an important complement to the second phase of this research, wherein the framework that functions as guideline during this study is chosen. Since the container trucking sector is constantly subjected to change and is continually influenced by internal factors, a theoretical framework should be selected that is able to map such changes for transport markets. This section will highlight four different frameworks, whereby eventually one is chosen to function as research guideline.

2.2.1 Description of the four possible frameworks

Literature provides numerous types of frameworks to analyze (transport) markets, however, not every framework is appropriate for the examination of the Dutch container trucking sector in particular. In Table 2, a summary is given of four selected frameworks and their corresponding characteristics (unit of analysis, explanandum and disadvantages). As one could see, the Business Model Canvas is highlighted due to its selection as the best possible framework for this study.

Table 2: Summary of possible frameworks for analyzing transport markets

	SWOT-Analysis	Porter's Five Forces Model	McKinsey 7S Framework	Business Model Canvas
Unit of analysis	Company or business unit	Industry structure of a company or sector	Company or business unit	Product, company or sector
Explanandum	Monitoring external and internal environments	Identifying current position of competitiveness	Assessing internal elements	Developing and documenting business models
Disadvantage(s)	Excludes uncertainty, alternative decisions and prioritizing	Represents a 'snapshot' and excludes time	Little empirical evidence and high level of difficulty	Excludes strategic objects and not applicable for NGO

SWOT-Analysis

This framework is able to monitor both the external and internal business environments of a company or sector by distinguishing four different facets. The analysis evaluates the internal strengths and weaknesses within the company or sector and the external threats and opportunities within the market. It could give insight in which opportunities can be incorporated by the already acquired strengths, or which strengths should be developed to respond to those opportunities. At the same time, the SWOT-analysis could indicate which weaknesses could be improved or solved, what threats may affect the business environment and how to deal with those threats to minimize the impact (Kotler & Keller, 2012 ; Fleisher & Bensoussan, 2003). However, the SWOT-analysis also has its downsides such as not considering uncertainty in factors, not offering alternative decisions and not prioritizing the offered aspects (Queensland Government, 2016).

Porter's Five Forces Model

A commonly used framework to analyze an entire market sector is the Five Forces Model developed by Michael Porter. The model helps to examine the balance of power amongst different parties within the sector and could help to identify the current position of competitiveness of the company or sector. According to Porter (1979), five forces have an impact on this competitive power:

- Bargaining power of suppliers
- Bargaining power of buyers
- Threats of substitute products
- Threats of new entrants
- Intensity of industrial rivalry within the industry

The Five Forces Model is only a 'snapshot' of a current situation of a company or sector and does not include time. This could be a crucial disadvantage for sectors that are rapidly developing and changing, which is commonly the case for logistic-related sectors. Although it seems that this model may be outdated, since it was developed decades ago, research shows that, in the contemporary business environment of technology, the model is still applicable and accurate (Dälken, 2014).

McKinsey 7S Framework

Employees of the consultancy firm McKinsey & Company, Waterman and Peters, developed a framework to assess internal elements of a firm or sector. The framework consists of seven different elements and could be used to increase performance, to examine expected effects of future changes

within a company and to help determining the implementation of strategies. The framework includes the following elements:

- Strategy: the vision to improve competitive advantage
- Structure: the way the company is designed
- Systems: the daily activities within the company
- Shared values: the core values of the company within the business environment
- Style: the way the leadership within the company is characterized.
- Staff: the capabilities and characteristics of the employees
- Skills: the matters that characterize the company or employees the best

These seven elements together form the entire framework and should be in line with each other to achieve successfulness for the company (Waterman, Peters, & Phillips, 1980). However, little empirical support exists about the results of this model and therefore it is characterized as a rather difficult model to implement in practice (Fleisher & Bensoussan, 2015).

Business Model Canvas

The Business Model Canvas (BMC) is developed by Alexander Osterwalder and Yves Pigneur and is commonly used as strategic management tool to describe and to help developing a company's or sector's business model. It consists of nine different building blocks, whereby each block highlights a certain important aspect of a sector or company. The following building blocks are recognized by the framework:

- Customer Segments
- Communication Channels
- Customer Relationships
- Value Propositions
- Revenue Streams
- Key Resources
- Key Activities
- Key Partners
- Cost Structure

Determining these building blocks could enhance structure within a company or sector and could result in obtaining higher efficiencies. Additionally, it could give more insight in what aspects should receive more or less focus and what aspects could be considered as strengths or weaknesses (Osterwalder & Pigneur, 2013). However, this framework also has its downsides such as it not taking strategic objectives into account and also it not being completely applicable to non-profit organizations (Ching & Fauvel, 2013).

2.2.2 Selection of the framework

To analyze the internal changes of the business model of Dutch container trucking companies, it is crucial that an adequate framework is chosen. All four aforementioned frameworks are, to a certain extent, suitable for this study, however some are more applicable and comprehensive than others. The SWOT-analysis is a well-known model and is quite commonly used, however, a relatively large share of the model focusses on external forces which is not within the scope of this study. A similar

argument can be made against the use of the Five Forces Model of Porter, since it takes external aspects such as substitution and suppliers into account, and, additionally, focusses mainly on competitiveness. Both the McKinsey 7S framework and the BMC are extensive analytical tools and seem to be both applicable in case of analyzing the Dutch container sector. However, the BMC is more accepted amongst academics due to a lack of evidence and a relatively difficulty in the applicability of the McKinsey framework. For this reason, the guideline and foundation of this study will be based on the BMC and will assist in the analysis of the different facets of the Dutch container trucking sector.

2.3 Comprehensive description of the Business Model Canvas

2.3.1 Defining a business model

To completely understand the BMC, it is important to fully comprehend the definition of a 'business model'. A business model in itself is a relatively vague concept; one is able to recognize it, but one finds it difficult to define (Ovans, 2015). For this reason, many varying definitions exist, given by multiple researchers. Zott & Amit (2010), who focus on the development of business models, use the following definition: *"the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities".* At the same time, Chesbrough (2010), a researcher of business model innovation, is not able to give a qualified definition, instead he states that business models have to fulfill certain functions, such as: *"articulating value propositions, identifying market segments, defining value chain structures, clarifying cost and revenue structures, describing a firm's position and formulating competitive strategies".* Additionally, Osterwalder and Pigneur (2013), founders of the BMC, presume that *"a business model describes the rationale of how an organization creates, delivers, and capture value".*

Although these are only three of the many definitions related to business models, one could say that despite the variation amongst the aforementioned definitions and functions, for the most part, researchers are in reasonable agreement in case of the purpose of business models: to try, wherever possible, to capture value for a company or, in case of this study, entire sector.

2.3.2 The application of the Business Model Canvas

Alexander Osterwalder, one of the founders of the BMC, is a researcher whose main focus lies in the creation of value for firms and customers. He refined his ideas and reasoning over the years and brought his concepts to a wider audience when he released his book *Business Model Generation: A handbook for visionaries, game changers and challengers* in 2010 in cooperation with Yves Pigneur (O'Neill, 2015).

Despite what the name of the BMC suggests, one should see the BMC as a management tool for firms to develop a business model and should therefore not be acknowledged as a business model itself. Osterwalder and Pigneur clarify the function of the BMC by defining it as follows: "*strategic management and entrepreneurial tool. It allows to describe, design, challenge, invent and pivot your*

business model" (Osterwalder, 2016). The BMC is actually a tool to develop a business model and helps to ensure structure by introducing nine different building blocks of which each concerns a certain facet of business[6].

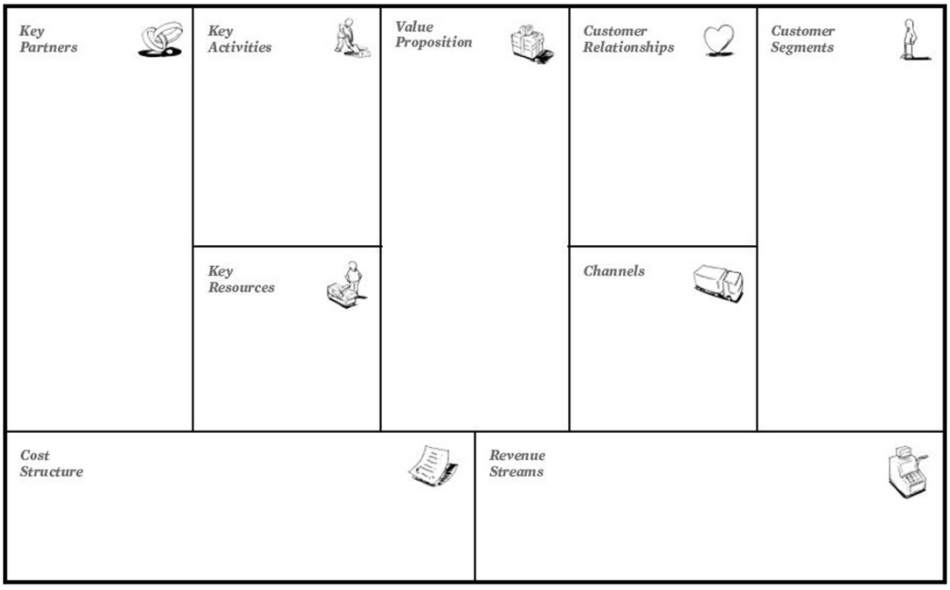

Figure 3: Business Model Canvas Template (Mennink, 2010)

Figure 3 gives a distinction of the nine building blocks. According to Osterwalder, these building blocks can be subdivided into four different business areas; infrastructure, offerings, customers and financials. The middle building block 'value proposition' represents the 'offerings' business area and functions as a border between the left-side 'infrastructure' building blocks and the right-side 'customer' building blocks. The business area 'financials' is represented by the two bottom-sided building blocks. The 'customers' business area is assigned the highest priority, followed by 'offerings'. The underlying thought of this chosen priority is that a firm should fulfill the needs and problems of its customers by providing the required value propositions, whereas these only can be provided when the appropriate infrastructure is enabled (Rytkönen & Nenonen, 2014).

Customer Segments

The core of a business model is composed of the company's customers. Valuable and profitable customers are crucial for a company to guarantee its continuity. A company should divide its customer base into different segments, whereby each segment consists of customers with homogenous characteristics, in order to efficiently reach and be aware of each customer (Osterwalder & Pigneur, 2013).

[6] Please note that the BMC is commonly used for creating business models of companies, however, in this study the BMC will function as guideline to analyze the entire Dutch container trucking sector. Therefore, the building blocks are described from a company perspective, but will be translated into a sector perspective.

Value Propositions

According to Osterwalder and Pigneur (2013) this building block comprises the aggregation of products and services that lead to value creation for the company's customer segment(s). These products and services are required to solve and fulfill the customer's problems and needs. Proper value propositions a company could set as their goal are, for example, guaranteeing best price, best quality, luxury and sustainability (Tjan, 2009). The value proposition principle is partly based on the Value Disciplines' by Treacy and Wiersema (1993) and will be further explained in Chapter 5.

Communication Channels

Once a company has set its value propositions and has determined on which customer segment(s) it aims to focus, it is time to decide which channel(s) the company is going to utilize. A channel is the medium through which the company reaches and communicates with its customers to distribute its chosen value propositions. Channels are an important part in the business model, since they could increase the awareness of the company's provided products and services which could lead to customer-loyalty (Osterwalder & Pigneur, 2013).

Customer Relationships

A company should not only determine its customer segments, but additionally decide how it wants its customer relationships to be. According to Osterwalder and Pigneur (2013) it could be beneficial for a company to identify what type of customer relationships it has, which relationships need extra investments and which relationships need to be changed to gain more profitability (Cleverism.com, 2015). Relationships could vary in terms of intensiveness, level of automation and level of personal communication.

Revenue Streams

A company can only guarantee its continuity when sufficient revenue streams are generated. Each customer segment of a company generates a different revenue stream in terms of size and frequency of occurrence. To guarantee a company's continuity it must not be dependent on the revenue streams of solely one customer. It is important to spread a company's risk by generating revenues from multiple customers from varying customer segments. This is supported by a well-known theory of Pareto, also known as the 80/20 Pareto Principle, which indicates that 20% of the customers are responsible for 80% of the revenues. If a company is able to identify the characteristics of its top 20% customers, it should search for similar customers to efficiently increase its revenues (Lavinsky, 2014 ; Nisonger, 2008).

Key Resources

The key resources are a fundamental part in the BMC and are able to connect previous building blocks with each other. Key resources are required for a company to reach its customers, to maintain its customer relationships, to provide the chosen value propositions and to generate sufficient revenue. However, the required key resources vary amongst companies and are

depending on the business markets in which the company is operating (Osterwalder & Pigneur, 2013). Examples of common key resources are educated staff, machinery, vehicles and intellectual property.

Key Activities

This building block describes what actions the company has to perform to successfully run its business. Similar to key resources, key activities are necessary to provide the chosen value propositions to its reachable customer segments. Since not all companies are the same, logically also the key activities differ amongst companies (Osterwalder & Pigneur, 2013).

Key Partnerships

Doing business is not something one does entirely alone, one always has to deal with other parties which one may have to form a partnership with. These partnerships can be formed with a range of different types of parties, such as suppliers, customers, (non)-competitors and governmental organizations.

Cost Structure

Providing, determining, realizing and performing the aforementioned building blocks has a price. Each building block has its own specific costs which can be found in the cost structure of the company. This structure gives insight in to what costs are incurred to keep the company running. Naturally, profit-driven companies want to minimize their costs in the most efficient way.

2.3.3 Criticism on the Business Model Canvas

The BMC is increasingly being used by companies as a result of the praise it has received for the simplicity of its application. However, this advantage of simplicity also comes with its drawbacks. During the application of and experiences with the BMC, Ching and Fauvel (2013) and Kraaijenbrink (2012, 2013) encountered several downsides that one should be aware of when applying this model:

- *Excludes strategic purpose of a company*: the BMC does not take strategic matters into account, such as a company's mission, vision or strategic objectives. The BMC assumes that a company's primarily goal is to generate as much revenue as possible, however, especially nowadays, not all companies share this objective.
- *Excludes a notion of competition*: decisions concerning a company's competition are highly relevant to run a business, however the BMC excludes a focus on competition. When creating a business plan, one should be highly aware of competitors and their strategies.
- *Mixes level of abstraction*: certain aspects of the BMC are paid more attention than other aspects, and, additionally, the distinction between building blocks is sometimes relatively small. These two matters could result in an imbalanced and inefficient business model.

Coes (2014) shares these shortcomings of the BMC, but adds even more weaknesses to this list. One of his arguments is that the model excludes 'social value', resulting in the inapplicability of the

BMC to non-profit and governmental organizations. However, one could say that this argument is an extension of the lack of strategic purpose. Additionally, different factors such as focus, perspective and time are not taken into account which all can have a significant influence on the result of the BMC. Therefore, having an exact same outcome when applying a BMC twice is relatively hard, since these three factors are constantly subjected to change.

3. Description of the container trucking sector

This chapter will describe key characteristics of the container trucking sector. In order to give a full description, both general aspects and those specifically related to the Dutch container trucking sector will be discussed. The given description in this chapter will therefore provide an answer to the first sub-question: "*How can the (Dutch) container trucking sector be characterized?*".

3.1 The trucking hinterland import chain

Container trucking companies play an important role in the supply chain of maritime containers, together with other key players such as shippers, shipping lines and terminal operators. The role of these container trucking companies is transporting the container from seaport to its destination in the hinterland and vice versa. This service that is provided by the container trucking companies is mainly required in only a part of the maritime supply chain: from the warehouse of the producer to the deep-sea terminal abroad and from the terminal to the warehouse of the retailer in the arrival country. This so-called 'trucking hinterland import chain' is visualized in Figure 4 and includes the involved actors, container flow and contracts between the actors (van der Horst & de Langen, 2008).

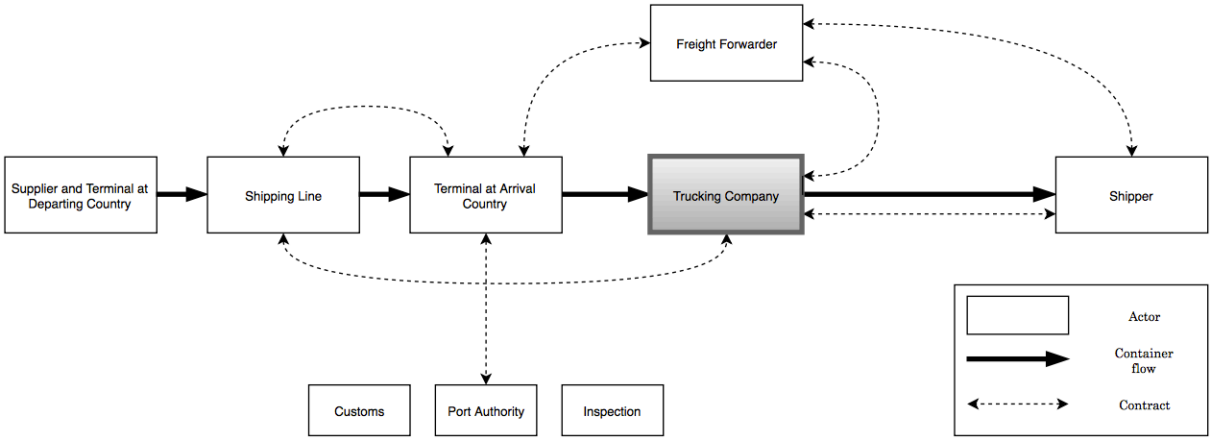

Figure 4: Visualization of the trucking hinterland import chain (van der Horst & de Langen, 2008, edited by author)

The first phase within this hinterland trucking chain is the transportation of the container from the foreign supplier to the terminal operator abroad where it is loaded onto a vessel, managed by a shipping line, and transported overseas to the country of destination. The container is unloaded from the vessel by the deep-sea terminal operator, whereby formal procedures are performed by customs to check and inspect the load of the container. To reach the hinterland, the container is picked-up at the terminal by the container trucking company and transported to its final destination that is determined by the shipper. Shippers are not the only customers of container trucking companies; shipping lines and freight forwarders can also be their clients. Freight forwarders can be seen as a third party that is used when either the shipping line or the shipper are outsourcing their responsibility of organizing the inland transportation. If the organizing of inland transport is performed by a shipping line, one speaks of *carrier haulage*, whilst with *merchant haulage* the responsibility of this organization lies with either a shipper or freight

forwarder (Konings, 1993). If carrier haulage is followed, the shipping line is a customer of both the terminal operator and the container trucking company. Since not many different shipping lines are active in one and the same port, for instance only between 20-30 in the port of Rotterdam, the organization of inland transportation is arranged by a select amount of organizations. However, if merchant haulage is followed, the organization of inland transportation is arranged by a countless number of shippers and freight forwarders. When one takes into account that each shipper and freight forwarder has its own way of arranging transport and doing business, one could understand that, from a port perspective, this entails a relatively high level of complexity. In addition, in case of merchant haulage, terminal operators and container trucking companies have different customers and do not have a mutual contractual relationship which could result in coordination and communication problems between both parties. For instance, from the interviews followed that waiting times at the terminal and the recently introduced slots are hot topics of which both parties do not share the same understandings. Moreover, the popularity of merchant and carrier haulage varies per port (region). In the United States carrier haulage is relatively popular compared to Europe in which merchant haulage accounts for approximately 70% of the total haulage (Mol, 2009). In case of the port of Rotterdam, merchant haulage is most commonly used, but exact numbers are unknown.

3.2 The market structure of the (Dutch) container trucking sector

In order to describe the market structure of the (Dutch) container trucking sector, the structure-conduct performance (SCP) paradigm could be of great help. This paradigm describes that the performance of a sector is the function of its behavior which in itself is a function of the market structure in which the company is operating (Bain, 1956). Within this paradigm, market structure is influenced by multiple determinants; the following four are the most important and relevant, as selected and clarified by Cowie (2010), Florida Golf Coast University (2013), Koeppe (1997) and Konings (2009):

- Nature of the product
- Entry barriers
- Number of sellers
- Number of buyers

General aspects of the container trucking sector, but also specific aspects applicable to both the Dutch sector and the port of Rotterdam[7], will be used to shape and elucidate these determinants in sections 3.2.1-3.2.4. The behavioral aspect of the paradigm is translated into bargaining power held by the different actors and will be discussed in section 3.3. Lastly, the actual performance of the (Dutch) container trucking sector is measured with its profitability and can be found in section 3.4.

3.2.1 Nature of the product

The nature of the product is of substantial influence when it comes to the type of market structure, especially in terms of its level of differentiation and existing substitutes. If the level of

[7] The in-depth interviews functioned as input of the aspects of the market structure determinants that specifically relate to the port of Rotterdam.

differentiation is extremely high, (which in itself indicates that there is no substitution available due to too much variance in the products) one could speak of a tendency towards a monopoly. When the products offered are differentiated, but are also substitutes of each other, one could speak of either an oligopoly or a monopolistic competition structured market. Another possibility is the existence of the market structure of perfect competition whereby the products are perfect substitutes due to little to no differentiation in product. In the case of the container trucking sector, the offered services hardly differ whereby some even speak of a homogeneous product. This also directly implies a rather high level of substitution. Due to these characteristics of homogeneity and substitution, this determinant moves the container trucking sector more towards that of perfect competition.

3.2.2 Entry barriers

This determinant indicates the level of difficulty involved in entering a specific sector. If there are hardly any costs involved and no other entry barriers exist, one could speak of a perfect competition. In the case of a monopoly, one party has obtained exclusive rights making it impossible for other firms to participate in the market. If a sector's structure is in the form of monopolistic competition or an oligopoly, varying entry barriers exists. However, it is still possible for these barriers to be overcome and for a firm to enter the market. Regarding the container trucking sector, no exclusive rights are given to certain parties which excludes the possibility of monopolistic behavior. More specifically, if one wants to enter this sector, the only investment that has to be made is the purchase of a truck. For this reason, the entry barriers of the container trucking sector can be considered as relatively low to non-existent which indicates that it is tending towards perfect competition.

3.2.3 Number of sellers

The number of sellers within a sector gives an indication as to its level of concentration, where, in the case of perfect competition, a low level is perceived whilst a high level is observed in case of a monopoly. Regarding the Dutch container sector, the sellers are the container trucking companies. To determine both the market structure and its level of concentration, the quantification of the size of the Dutch container trucking sector is of substantial importance. This brings up immediate difficulties due to the exact size of the sector being an unknown factor. This quantification challenge is the result of two factors. Firstly, it is hard to keep track of an up-to-date database that comprises all companies performing container transport. Each company owning a truck is able to provide container transport which implies that the number of operational companies that fall into this category is fluctuating daily. Secondly, the difficulty of maintaining an up-to-date database is strengthened by Dutch legislation. In the Netherlands, the registration of a company's type is based on its core (primary) business (Konings, 2009). Therefore, a company performing container transport as a secondary business will not be officially acknowledged as a container trucking company as per Dutch legislation. Despite the challenges of determining the size of the Dutch

container trucking sector, Holland Transport (2016) succeeded in providing a register of all licensed container trucking companies settled in the Netherlands. This register gives a rather good indication of the current size of the sector; a total of 941 Dutch container trucking companies were counted in 2016. However, this register could still have inaccuracies due to exclusion of companies that did not indicate (correctly) the market in which they are operational. Furthermore, the member database of AZV/TLN also assists in identifying the size and structure of the Dutch container trucking sector, see Table 3.

Table 3: Overview of AZV/TLN members in 2016 (TLN, 2016b)

Number of licenses	Number of companies	%	Cumulative %
0	4	2	2
1	54	22	24
2	14	6	30
3	16	7	37
4	9	4	40
5-10	36	15	55
10-20	39	16	71
20-50	46	19	90
50-100	14	6	96
100+	9	4	100
Total	241	100%	100%

In 2016, 241 container trucking companies were a member of the AZV/TLN. The largest share comprises of relatively small companies with 10 or less licenses (55%), whilst only 10% of the members have more than 50 licenses. This database indicates a relatively low market concentration due to the relatively large amount of (small) sellers. Therefore, the individual market share of each seller is relatively low. This observation is also confirmed by the interviewees of which many spoke of a 'fragmented sector' due to the countless number of sellers. This characteristic of relatively low market concentration is an aspect of a perfect competition (Tremblay & Tremblay, 2012). Therefore, with regards to this determinant, the market structure of the Dutch container trucking sector tends to be a perfect competition.

3.2.4 Number of buyers

Not only the sellers themselves, but also the buyers within the sector have an influence on market structure. As mentioned before, the type of buyer of container trucking companies depends on performing either carrier or merchant haulage. In case of carrier haulage, the main buyers are shipping lines, whilst in case of merchant haulage shippers and freight forwarders are considered as main buyers.

In the port of Rotterdam, all of the major shipping lines are operational, whereby also the relatively small ones aim to gain some market share (Port of Rotterdam, 2016c). Recently, four major alliances were formed which lead to an even more concentrated sector. Therefore, in case of carrier haulage, the number of buyers is limited whilst the number of sellers is relatively large. This is also known as an oligopsony (Ferrer, 2013). The difference in concentration amongst both sectors

puts the individual shipping lines in a relatively strong position compared to the container trucking companies. However, carrier haulage is relatively uncommon in the Netherlands and therefore it might be more reliable to determine the market structure based on a scenario of merchant haulage. In this case, as mentioned before, freight forwarders and shippers are the main buyers. In the Netherlands, a large amount of freight forwarders and shippers are operational. During the interviews clearly emerged that, like the container trucking sector, their sectors are low-concentrated and fragmented due to the large amount of small firms. In such case, when the number of buyers and sellers are relatively high, literature teaches us that this also tends to be a perfect competition (Tremblay & Tremblay, 2012).

3.3 Held bargaining power within the trucking hinterland import chain

As reasoned in previous paragraph, most determinants of market structure indicated that the Dutch container trucking sector is most likely to be structured as a perfect competition. Having the market structure set, one could start with observing the corresponding behavior of the Dutch container trucking sector. In this study the influenced behavior is translated into one aspect; held bargaining power. Additionally, attention will also be directed towards an analysis of bargaining power held by the buyers of Dutch container trucking companies. Within the hinterland chain, the degree of bargaining power is influenced by multiple factors such as level of concentration of the actor's sector, engaged business realignments and agreements between actors and the contribution of the actor to the port's economy (World Bank, 2016). In this paragraph, both the bargaining power of sellers and buyers will be discussed, as well as the bargaining power of terminal operators.

3.3.1 The bargaining power of Dutch container trucking companies

From the interviews it followed that Dutch container trucking companies hold little bargaining power. This can additionally be explained from a theoretical perspective; since the Dutch container trucking sector most likely takes the structure of perfect competition, the concentration within the sector is rather low (Table 3). Due to the extremely large amount of players active within this sector, each player is relatively small (from a port perspective) which implies that each player has little to no influence on the entire hinterland chain (Porter, 1974). During the interviews it was often indicated that the bargaining power of the Dutch container trucking companies is not expected to increase on a short term. One way to increase their bargaining power is, for example, to engage in mutual alliances to create larger container trucking companies which may result in having increased influence on the hinterland chain. Although this may be a partial solution, actual realization will be difficult to achieve which discourages the Dutch container trucking companies from doing so.

3.3.2 The bargaining power of shipping lines

Shipping lines are known for their tremendous bargaining power held within the hinterland chain. This is the probable result of their large contribution to the port whereby the ports have come to rely on these shipping lines (World Bank, 2016). In the port of Rotterdam, all of the major shipping

lines are operational, whereby also the relatively smaller ones aim for some market share (Port of Rotterdam, 2016c). Recently, four major shipping line alliances were formed which resulted in a more concentrated shipping line sector which strengthened their bargaining power and put the relatively small shipping lines offside (Financial Times, 2016 ; ShippingWatch, 2014). In case of carrier haulage, the bargaining power of Dutch container trucking companies was already relatively weak, but due to the increase in bargaining power of shipping lines as an effect of alliance formations, the position of these trucking companies was further weakened.

3.3.3 The bargaining power of freight forwarders and shippers

The current situation of freight forwarders and shippers within the port industry is similar to the characteristics of the Dutch container trucking companies. A countless number of freight forwarders and shippers co-exist in the industry which is tending towards perfect competition. Subsequently, freight forwarders and shippers are generally operational within a fragmented sector wherein both parties are relatively small in size which therefore limits their scope of influence on the trucking hinterland chain. However, exceptions exist whereby several shippers, mostly multinationals, have achieved some bargaining power due to their importance as a client of multiple port actors.

3.3.4 The bargaining power of terminal operators

Although the terminal operators are not direct buyers of (Dutch) container trucking companies, they have achieved a significant influence on the hinterland chain. This influence is partly due to their relative size and role of importance; terminal operators are quite often relatively large companies and without their services it is unlikely container transport would arise in the surrounding areas. In the port of Rotteram, the Maasvlakte II has recently been berthed, introducing automated newcomers APMT2 and RWG (Port of Rotterdam, 2016d). As general economics explains, a growth in suppliers will increase the competition between the terminal operators. Surprisingly, according to the interviewees, this is not the case in the port of Rotterdam. A possible explanation is that newcomer APMT2 is owned by incumbent APM terminal and RWG is owned by a conglomeration of shipping lines that were already operational in the port of Rotterdam. Therefore, the interviewees determine that the terminal operators not being newcomers to the industry negates the theoretically expected increase in competition. On the other hand, the terminal operators argue that the automation processes are not running at their full ability yet. These processes will eventually be optimized and once this is realized, one could expect the long awaited increase in competition between the terminal operators. This expected increase in competition is likely to slightly weaken the current strong position of the terminal operators and this will create opportunities for the other actors within the hinterland chain.

3.4 The profitability of the Dutch container trucking sector

When looking at the market structure determinants of the Dutch container trucking sector, one could observe that all of them are tending towards perfect competition. However, perfect

competition is a hypothetical market structure, since it is realistically impossible for all the assumptions to be met in their entirety. For instance, in a perfect competition firms do not make any profit, whilst in the container trucking sector this is actually the case (Healy, 2015). For this reason, one could speak of a near-perfect competition. A huge concern that comes along with the near-perfect competition condition is the profitability of the Dutch container trucking sector. In theory, the condition of near-perfect competition will force the freight rates downwards resulting in a competitive struggle between the Dutch container trucking companies. This negative consequence is in line with empirical observations of the Dutch container trucking sector (Konings, 2009).

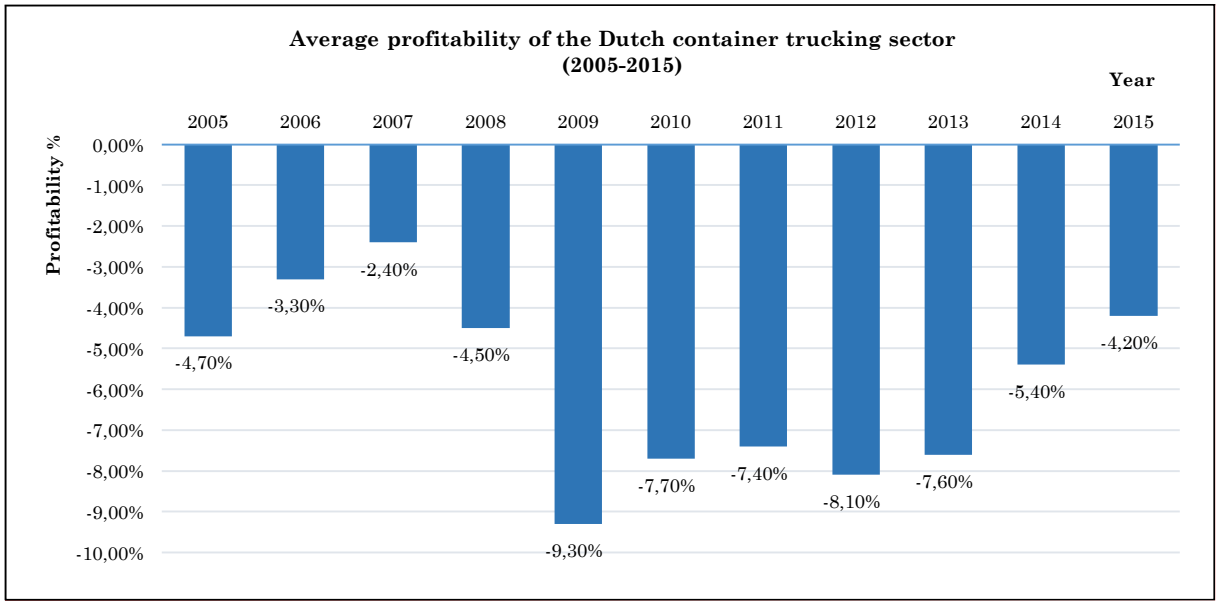

Figure 5: Average profitability of the Dutch container trucking sector in 2005-2015 (Panteia/NEA, 2016a)

As one could see in Figure 5, for the last decade the profitability of the Dutch container trucking sector was rather poor. This may confirm that Dutch container trucking companies are part of a highly competitive, dynamic, but also vulnerable sector (Konings, 2009). The severe competitiveness, which exists in a near-perfect competition market structure, is a direct threat to the profitability of the sector and has indeed dragged the freight rates down (Transport-Online, 2013). This negative market force is hard to avoid in such an environment of near-perfect competition and is far beyond control of an individual container trucking company. Keeping the poor profitability in mind, it is rather surprising that companies are still entering the sector. On the other hand, there is still logic to this decision to enter the market due to the aforementioned extremely low entry barriers. Looking again at Figure 5, one could observe a pronounced decline in profitability between 2009-2013. This most likely resulted from the global economic downturn which also negatively affected the container transport sector. Although profitability was still negative in 2015 (-4,20%), a small increase can be observed for the last three years. This may be an indication of a slow recovery of the Dutch container trucking sector and maybe a positive profitability could even be realized in future years. Indeed, according to TLN (2016c), the Dutch

container trucking companies are regaining their trust in the sector and an increasing amount of companies expect to end this fiscal year with positive figures.

3.5 The competitive position of the container trucking sector compared with rails and IWT

The container trucking sector offers a simple homogenous service; transporting containers from A to B within a certain time period. Presently, the nature of the container trucking sector is changing due to the trend of globalization (Rushton, Croucher, & Baker, 2010). A result of globalization is that more products are moved over longer distances (Rodrigue, 2007) and since container trucking is a suitable mode for relatively short distances (whilst barge and rail transport are more suitable for relatively long distances), one could say that the trend of globalization is more in favor of the competition of container trucking (de Langen, Nijdam, & van der Lugt, 2012). Additionally, the pressure from rail and inland waterway transport (IWT) on the container trucking sector is increasing. Nowadays, it is of rising importance that the container trucking sector improves its competitive advantages over the alternative means of transportation modes. In this section, 4 different potential competitive advantages of container trucking will be discussed and compared to those of rail and inland waterway transport.

3.5.1 Comparison of cost structures

First, a large competitive advantages of container trucking compared to rail and inland waterway transport is the relatively small capital costs of a truck (van der Horst, de Langen, & van der Lugt, 2009). Purchasing a truck requires less financial resources than buying a barge or train which could easily require an investment of several millions of euros. Secondly, trucks have no transshipment costs whilst these do incur at inland terminals of trains and barges. However, container trucking also has cost disadvantages compared to rail and inland waterway transport. Container trucking has relatively high costs per kilometer (Rushton, Croucher, & Baker, 2010). Due to its focus on relatively short distances, the costs cannot be spread over a large amount of kilometers which is often the case with rail and inland waterway transport. Additionally, container trucking is forced to pay for several infrastructure costs such as road taxes and toll which occur less often in case of the other two modalities (Rodrigue, Comtois, & Slack, 2006).

3.5.2 Comparison of the reliability

A great advantage of container trucking is its relatively high level of reliability. Trucks have the ability to be deployed in a relatively short time, whilst barges and trains need longer to be completely prepped for transport (Rodrigue, Comtois, & Slack, 2006). However, a shortcoming of trucking lies especially in urban areas due to the common occurrence of road congestion, specifically in port areas. On the other hand, barges and trains also have to deal with factors of uncertainty. Barges are highly dependent on the water levels and since these fluctuate, large delays could occur. The rail network is rather reliable on a national level, but once you cross the border a lot of potential problems arise. The voltage and security systems of rail networks vary between countries which

makes it impossible for some types of trains to run on foreign rail networks (ABB, 2010 ; van der Horst, de Langen, & van der Lugt, 2009).

3.5.3 Comparison of customer reachability

One of the key attributes of container trucking is its flexibility of route choice (Rodrigue, Comtois, & Slack, 2006). In most (European) countries, the road network has been widely constructed through the entire country which creates the possibility for trucking to provide door-to-door services. This is a huge competitive advantage, since rail and inland waterway transport are limited by the extents of their networks. Containers can be transported far land inwards by rail and inland waterway transport, but container transport will always have to rely on trucking to be able to reach the final destination. However, although inland waterway transport is known for its large flows of containers to relatively far inland destinations, it is currently gaining grounds on relatively short distances by transporting smaller container flows on smaller barges (Verberk, 2010). This development is a direct threat to the position of container trucking which could result in losing its competitive advantage of its relatively high level of customer reachability. In my opinion, in order to retain its competitive advantages, the container trucking sector should change its focus to that of *last mile trucking* as its considered option. Last mile trucking suggests that all relatively long distance transport is performed by barges and trains and container trucking companies only function as short distance transporters from (inland) terminals to final destinations (Transport & Logistiek, 2015). Since container trucking is sometimes still used for long distances, this trend would imply that these operations have to be terminated. The *last mile trucking* principle goes hand in hand with the trend of intermodal transportation and is defined as follows:

"the concept of utilizing two or more 'suitable' modes, in combination, to form an integrated transport chain aimed at achieving operationally efficient and cost-effective delivery of goods in an environmentally sustainable manner from their point of origin to their final destination." (Lowe, 2005, pp. 1)

I believe that the combination of last mile trucking and intermodal transportation is the key for the container trucking sector in order to retain its leading position in container transport. Although it implies the giving up of certain long distance and international transport activities, the sector may receive an opportunity for specialization in return (European Parliament, 2015). This opportunity could develop into increasing levels of efficiency and may eventually result in a positive profitability for the container trucking sector.

3.5.4 Comparison of the sustainability

Another competitive advantage, often mistakenly overlooked, is the relative sustainable character of road transport. It is often heard that container road transport should be diminished in favor of the more sustainable barges and trains. However, looking at different emission figures of CE Delft (2016), trucks are, compared to barges, actually more environmental friendly in case of certain

types of emissions. Additionally, as mentioned before, trucks have the possibility to deliver containers door-to-door, whereas barges and trains need to rely on additional movements and transportation modes to reach the final destination, which results in additional emissions (Verweij, 2010). Next to this, from the interviews it appeared that, container trucks have a relatively short life cycle compared to barges and trains, which makes it possible for container trucking companies to more quickly update their fleet to the most efficient, technologically advanced and greenest trucks. Therefore, the pace of adapting to new sustainability standards is for trucks much faster than for barges and trains with their relatively long life cycles. Over the years, new efficient truck engines have been introduced and it is expected that the efficiency of engines will even increase further in upcoming years. Therefore, eventually, the container trucking sector may become as efficient and sustainable as, or even more than, rail and inland waterway transport.

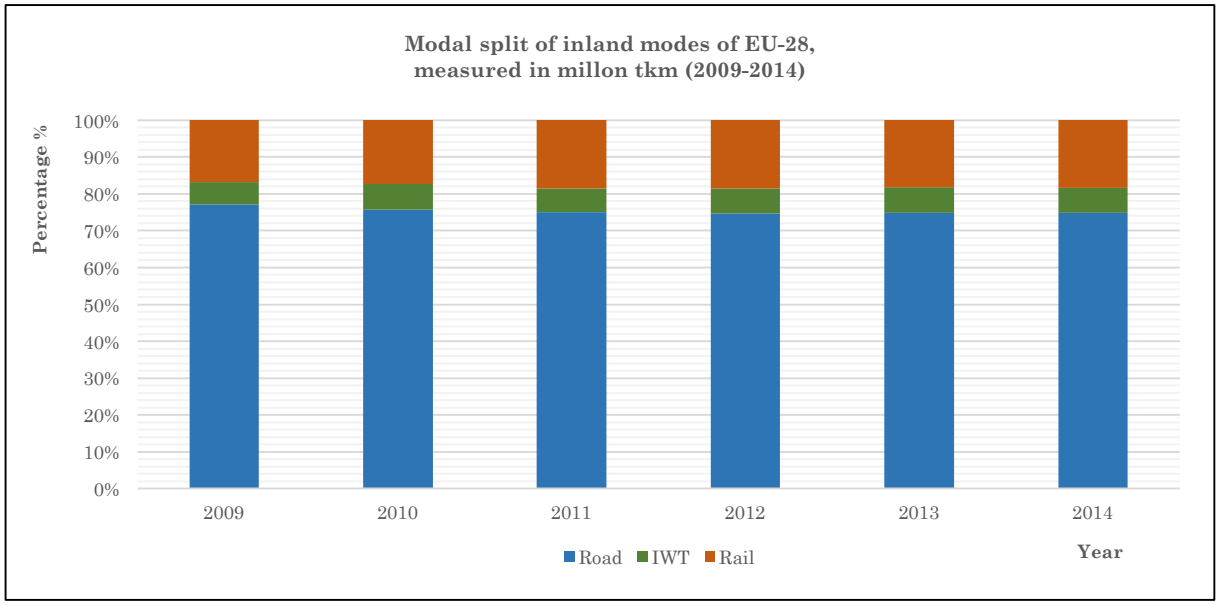

Figure 6: The European modal split for total transport freight in 2009-2014, measured in tkm[8] (EuroStat, 2016)

Sustainability is a matter of large importance from a governmental perspective. This is confirmed by existing policies regarding container transportation in Europe and the Netherlands. For instance, the Dutch government tightened their sustainability regulations by only allowing EURO-6 engines at the newly developed Maasvlakte II in Rotterdam (Port of Rotterdam, 2011b). As a result, in order to continue the container transportation activities of Dutch container trucking companies in Rotterdam, they had to replace parts of their fleet to meet the new regulation standards. From a social perspective these regulations can be regarded as positive due to an increase in sustainability, but from an economic perspective these regulations may not seem as good. Replacing a fleet requires the making of investments which may result in unexpected forced costs for Dutch container trucking companies. Small sized companies in particular can, as a result

[8] Please note that Figure 6 is measured in tonne-kilometers which results into allocating relatively more share to inland waterway and rail transport due to being specialized in long haul transport. Using other measurements, such as tonnes-lifted statistics, could result in a different modal split distribution (Eurostat, 2009).

of these regulations, fall into financial trouble. In addition to this example of a national policy, international policies on a European level exist. The European Commission has set a target that 30% of the road hinterland transport over 300 kilometers should be replaced by other transport modalities by 2030, and more than 50% by 2050 (European Commission, 2011). The reasoning behind these targets is the relatively unsustainable character of road transport compared to rail and inland waterway transport and, in addition, these targets may reduce road congestion which could make port areas more accessible (Port of Rotterdam, 2011a). One could say that these targets may have a negative influence on the position of trucking in the modal split. However, empirical observations show that these targets have actually had a limited impact on the modal split so far. As one could see in Figure 6, the loss in market share, over a 5-year time period, is still rather small (approximately 2,10 percentage point from 2009 to 2014). Nevertheless, the (container) trucking sector should continue to be aware of the increasing pressure of rail and inland waterway transport to prevent further modal split share losses (Seidelmann, 2010).

4. Expected trends for Dutch container trucking companies

After the completion of the interviewing and framework selection phases, further insight was gained in to the Dutch container trucking sector. During the interviews, a range of matters were discussed such as the daily operations, the problems faced and the future expectations of the sector. This chapter focusses on the latter and discusses 5 different expected trends that clearly emerged during these interviews. The selected trends are related to the following topics: horizontal cooperation (increasing transparency), workforce, innovation and automation, diversification and market structure. This chapter aims to answer partially sub-question 3: *"How will the Dutch container trucking sector be developed by 2021?"*.

4.1 Horizontal cooperation leading to transparency and better use of assets

One of the expected trends in container trucking is better integration and cooperation with other container trucking companies. This integration could be achieved by means of sharing assets, such as load and trucks, or by sharing data. The sharing of assets could lead to an increase in efficiency due to the possibility of bundling trips and decreasing the frequency of empty trips (Islam, Olsen, & Ahmed, 2013). Although truck sharing may sound like a relatively simple way to diminish congestion, emissions and fuel consumption, (with potential for associated cost reductions), it is relative hard to achieve due to existing constraints (Agarwal, Ergun, Houghtalen, & Ozener, 2009). For instance, differences in objectives, coordination problems and lack of trust amongst container trucking companies and, additionally, the sometimes-limited operating hours of seaports resulted in the failure of many truck sharing initiatives (Islam & Olsen, 2014). However, research shows that when truck sharing initiatives do succeed, the empty kilometers could even be reduced by approximately 14,59% (Peetijade & Bangviwat, 2012). It clearly emerged from the interviews that truck and load sharing are taken seriously in the Netherlands, whereby some companies have already joined the Dutch 'Boxreload' initiative, developed with help of the Erasmus University Rotterdam (Port of Rotterdam, 2015). However, to achieve optimal horizontal cooperation, data sharing is also required. From the interviews it followed that, currently, Dutch container trucking companies collect and use their own data, but are not willing to share this, on a large scale, with their direct competitors. This lack of transparency amongst container trucking companies creates the first barrier to achieve data sharing. A second obstacle is that container trucking companies may have different goals which makes, in their opinion, data sharing unnecessary. Next to this, legislation hinders data sharing initiatives which thus causes relatively slow developments (Neumann, 2015). Although there are many barriers to data sharing, it certainly has advantages. From the interviews it was clear that Dutch container trucking companies view transparency as a growing social need. For instance, it could increase the efficiency of the planning department due to more insight in congestions around the port area and it could lead to an increase in the likeliness of sharing trucks due to more information symmetry. Additionally, data sharing also has technological benefits since transparency could lead to the possibility of transporting more perishable goods due to it increasing the efficiency of available infrastructure and, thereby, overall

faster transportation possibilities. Although the sharing of data on a large scale is currently not the case, one could expect that the level of transparency will slowly increase in upcoming years, which could definitively be seen as a positive prospect.

4.2 The ageing and higher education requirements of the workforce

The central human resources within a container trucking company are the trucking drivers and the planners. However, some large companies have additional staff such as maintenance and administration departments, whilst in relatively small companies multiple job functions are performed by one and the same person. Nowadays, a trend can be observed whereby the workforce of a container trucking company is required to be higher educated due to more advanced tasks such as the planning of an entire fleet via technological tools. Additionally, an expected trend is the increasing outflow of qualified drivers, while the inflow is still lacking behind (Short, 2014). This will result in a relatively old workforce, while new generations are not joining the sector. In 2013, approximately 33,8% of the trucking drivers in the freight transport sector were over 50 years old, whilst only 3,2% were younger than 25 years (TLN, 2016a). It is even expected that in coming years the share of trucking drivers over 50 years old will increase to 40% (SOOB, 2013). This trend may result in a serious shortage of qualified drivers within the Dutch container trucking sector (Rabobank, 2016). A logical alternative is recruiting drivers from other European countries, particularly the relatively cheaper Eastern-European drivers (Nicolai, 2016a). Lastly, the preferences of trucking drivers are changing: it is preferred to not be on the road for an entire week and, in addition, it is preferred that irregular working hours are more an exception than the rule (van der Heijden, 2016).

4.3 Cost and emission reductions due to using new innovations and automation

Trucks are the central assets in the container trucking sector and can be acknowledged as one of the most important key resources. Surprisingly, the truck itself has not changed much and has not yet been subjected to drastic innovations. However, regulation ensures more efficient and sustainable trucks by forcing the use of EURO-6 engines for new trucks in certain areas such as the newly developed Maasvlakte II and Low Emission Zones (Aarse, 2016 ; Port of Rotterdam, 2016e). As a result, container trucking companies had to renew their fleet sooner than expected which was not much appreciated within the sector. During the interviews, potential technological innovations were discussed, whereby 5 different innovations emerged, each expected to have the potential to develop into playing an important role within the Dutch container trucking sector. The following 5 potential innovations will be discussed briefly: platooning, autonomous driving, using LHVs, electric or LNG driving and internal automation (Rabobank, 2016 ; ING Economisch Bureau, 2015).

4.3.1 Platooning

It is expected that the concept of 'platooning' will be put into practice on a larger scale. Platooning makes it possible to let trucks closely follow each other with help of driving support systems and

advanced technologies. The trucks can form a 'train' whereby constant communication between trucks exists which makes it possible to brake simultaneously, drive at a constant speed, decrease congestion and increase the overall traffic safety. Additionally, it could lead to cost savings by decreasing the fuel consumption and decreasing its CO_2 emission. Several successful pilots already have been performed, however, current regulation prevents platooning to be operative on a large international scale (European Truck Platooning, 2016).

4.3.2 Autonomous driving

Secondly, another technology that is expected to have a significant impact on the Dutch trucking sector is the autonomous driving of trucks. This innovation could eventually lead to no longer requiring trucking drivers. In 2016 in the Netherlands, the labor costs of trucking drivers were by far the largest expense and accounted for approximately 43,8% of the total costs of operating a truck for one year (Panteia/NEA, 2016b). This would mean that large cost savings could be achieved by incorporating autonomous driving. Additionally, this technology makes less fuel consumption and an increase of safety possible. From the interviews followed that this innovation will be inevitably in the future, although most interviewees do not like the idea of a sector without any trucking drivers (Roland Berger, 2016).

4.3.3 Using more LHVs

Currently, long heavy vehicles (LHVs) are being used on a relatively small scale, while it is expected that this vehicle could increase the efficiency of the Dutch container trucking sector. Increasing the use of LHVs could lead to cost reductions, CO_2 reductions (decreasing the emission by 3% to 6%) and even less congestion (TLN, 2016d). However, although the LHVs are becoming more common on an international level, international legislation hinders this innovation to fully develop due to still not being allowed in all European countries (de Weerd, 2016).

4.3.4 Electric and LNG driving

Another potential innovation is changing the fuel of the trucks, whereby electric and LNG driving are expected to have the largest chances to succeed. Currently, LNG is in a much further stadium compared to electric driving, however, they both have in common that the innovations could reduce the emission of trucking tremendously (Financieel Dagblad, 2016 ; Phillips, 2016). Additionally, these alternative fuels are relatively cheap compared to the currently used diesel. It is estimated that in 2016 in the Netherlands, the annual fuel costs of a truck accounted for approximately 19,50% of the annual total costs of operating a truck (Panteia/NEA, 2016b). This could mean that these alternative fuel innovations could lead to tremendous cost savings.

4.3.5 Internal automation

It is expected that the Dutch container trucking companies will increase their level of internal automation to operate more efficiently. Currently, automation is already, to a certain extent, integrated in the sector; for instance, the introduction of the onboard computer increased efficiency

for both the trucking driver and the planning department. However, the current level of automation could be seen as just the beginning and is expected to increase radically in future years. Certain processes, such as transport ordering, and, customer and terminal communications could be automated. It is expected that automation eventually will increase the efficiency and performance gains of the Dutch container trucking sector (ING Economisch Bureau, 2015).

4.4 Tendency to compete on either price or specialized and additional services

Another expected trend is the focus of the Dutch container trucking sector moving more towards differentiation. Since the core business of the container trucking sector is transporting a container, which can be acknowledged as a rather homogenous good, it is currently rather difficult for a company to distinguish oneself. A possible solution is to differentiate by providing specialized and additional services to customers, while others may differentiate themselves by offering low freight rates (Rabobank, 2016). Services that can be added to the daily operations of container trucking companies could be, for instance, storing empty containers, stuffing and stripping of containers and warehousing (Konings, 2009). Eventually, it is expected that the sector will split into two types of companies:

- Price-oriented: trying to offer the lowest rates by cutting operational costs.
- Service-oriented: trying to create customer loyalty by providing specialized services.

This can be confirmed by research of Fenex (2012) which shows that customers of container trucking companies value price, reliability, flexibility and frequency of services the most. Container trucking companies should decide themselves which value propositions should receive the most attention in order to differentiate from the competition. Additionally, it is expected that this diversification of providing extra services even will change the nature and role of the Dutch container trucking companies in the future. More of this is broadly discussed in the next trend.

4.5 A disappearing middle class and becoming a full logistic service provider

In general, the Dutch container trucking sector is composed of all sizes of trucking companies, as can be seen in Table 3 in section 3.2.3. Relatively small and medium sized companies account for the largest share, whereby most small companies are only operating one or a few trucks. A smaller share is composed of relatively large companies which have a large fleet with sometimes more than a hundred trucks at their disposal. Since a relatively few companies are considered being large sized, one could say that the sector is not making good use of economies of scale. However, it is expected that this is about to change. A commonly heard trend is the restructuring of the container trucking sector; smaller and large sized companies will remain, while the medium sized companies will eventually disappear. This may result in extremely large sized companies with an extraordinary fleet of more than a couple of hundred trucks, while the small companies will remain as they are. This increase of economies of scale could not only gain more efficiency within the sector, but could also strengthen the negotiation position of the Dutch container trucking companies (Konings, 2009). In fact, one could say that this trend is already in progress when one compares the

current distribution of AZV/TLN members with 10 years ago. In 2006, 105 AZV/TLN members were considered as medium sized, whilst in 2016 this number has reduced to only 78 medium sized companies (Konings, 2009). This may indicate already the beginning of a disappearing medium sized company class. Additionally, in 2006, a total of 5 container trucking companies had a fleet of more than 100 trucks, whilst in 2016 this has almost doubled to a total of 9 container trucking companies. This may indeed confirm the tendency towards more economies of scale whereby eventually only extremely relatively large sized and small sized companies will coexist within the sector.

As mentioned in previous trend, the diversification of the sector could lead to an altered nature and role of the Dutch container trucking companies in the future. How this role will exactly be designed is difficult to say, but it is likely that the larger Dutch container trucking companies will function as director of the smaller (and maybe even the medium) sized companies, due to their acquired benefits of economies of scale. Additionally, large sized companies may not only partly take over the role of small and medium sized companies, it is even expected that some Dutch container trucking companies will take over some functions of current freight forwarders. They will be arranging the entire hinterland connection, whereby the Dutch container trucking companies will hire both barge operators and rail companies themselves. This would mean that some original Dutch container trucking companies will slowly develop into full logistic service providers and thereby changing the current market structure. However, it is still rather uncertain how these processes will eventual turn out.

4.6 The 'filled-in' conceptual framework of the BMC

A summary is given in Figure 7, whereby the observed trends are converted into different topics that are allocated to the nine building blocks of the BMC. As one could see, additional topics have been added to the framework that have not been discussed during the observation of the trends, such as 'customer type', 'profitability', and 'distinction of costs'. The selection of these additional topics is based on the general characteristics to analyze a sector and, as discussed in Chapter 2, are also core themes within the BMC. The 'filled-in' conceptual framework of Figure 7 will be used as foundation of the survey, whereby each relevant topic of the building blocks will be translated into one or more question(s).

<table>
<tr><th>Key Partners</th><th>Key Activities</th><th>Value Propositions</th><th>Customer Relationships</th><th>Customer Segments</th></tr>
<tr><td rowspan="3">Horizontal Cooperation:
Truck sharing
Data sharing

Market structure</td><td>Level of complexity

Level of automation

Efficiency investments:
Economies of scale
Technological innovations</td><td rowspan="3">Differentiation:
Price
Service
Others

Importance of value propositions

Value discipline model:
Operating excellence
Product leadership
Customer intimacy</td><td>Contractual relationships:
Type
With who?

Relationship type:
Personal
Automated</td><td rowspan="3">Customer quantity

Customer type

Customer frequency of requiring service</td></tr>
<tr><td>Key Resources</td><td>Communication Channels</td></tr>
<tr><td>Trucks:
Fleet size
Engine type

Workforce:
Finding new staff
Foreign staff</td><td>Type

Level of automation</td></tr>
<tr><td colspan="2">Cost Structure</td><td colspan="3">Revenue Streams</td></tr>
<tr><td colspan="2">Distinction of costs

Expectation of future costs</td><td colspan="3">Profitability:
Measuring profitability

Expectations of future revenue

80/20 Pareto Principle</td></tr>
</table>

Figure 7: The 'filled-in' conceptual framework of BMC

5. The BMC of Dutch container trucking companies in 2016 and 2021

In this chapter, the Business Model Canvas of the Dutch container trucking sector will be fully described. Each building block and their corresponding allocated topics (Figure 7) will be discussed and will be supported by quantitative data retrieved from the conducted survey. Both the current situation and the expectations of the developments within the Dutch container trucking sector will be addressed. In addition, a consensus analysis will be performed to measure the agreement concerning different expectations amongst different sized companies within the Dutch container trucking sector. This chapter aims to comprehensively answer both sub-questions 2 and 3.

5.1 Customer segments

The customers play a crucial role within the business model of Dutch container trucking companies and in order to efficiently satiate those customers, it is important to be aware of the quantity and type of customers, as well as the frequency services are required by those customers.

5.1.1 Quantity of customers

From the survey appears that currently small, medium and large sized Dutch container trucking companies have on average, respectively, 5, 52 and 132 customers per year (Table 4). All company size classifications (small, medium and large) agree on the expectation that the quantity of customers per year will be slightly increased by 2021 ($sCns_{3,59} = 0,89$), whereby larger companies expect the largest change ($\bar{x} = 3,89$) followed by the medium sized companies ($\bar{x} = 3,58$). It is not surprising that larger companies have brighter expectations for their future than smaller and medium sized companies regarding their customer base. Larger companies are less uncertain due to their available resources, capacity and achieved continuity and therefore one could say it is rather logical that especially these companies have more positive expectations of an increase in customer base.

Table 4: Number of customers in 2016 and 2021* (expectations)

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q1 (number of customers)	#	$\bar{x}$	#	$\bar{x}$	#	$\bar{x}$	#	$\bar{x}$
Average number of total customers	5	3,17	52	3,58	132	3,89	64	3,59
		sCns Small		**sCns Medium**		**sCns Large**		**sCns Total**
Survey Q1 (expectation of number of customers in 2021; strength of consensus)								
Total number of customers $\mu = \bar{x}$		0,95		0,88		0,96		0,89

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

5.1.2 Type of customers

The customers can be divided into different types of segments. Table 5 gives more insight in the structure of the customer base of the Dutch container trucking companies. As one could see, the most important type of customer varies amongst the different size classifications. 46% of the customers of smaller companies are other trucking companies, which could implicate that relatively many of the smaller companies are each other's customer. The customer base of medium sized companies consists mostly of freight forwarder (32%) and shippers (31%), whilst for larger companies freight forwarders (47%) are by far the most important customer type. In addition, it

seems to be that if terminal operators require the service of container trucking companies, they choose for the relatively large sized trucking companies (7%). Concerning the expectations of 2021, all size classifications are in mutual agreement (all $sCns_x \geq 0{,}88$) that it is not likely that the distribution of the customer segments will change severely (all $\bar{x}$ $3{,}00 \leq 3{,}53$); smaller companies do not expect a change at all, whilst the medium and larger sized companies expect a slight increase in the share of their most important customer types. One could state that these expectations are again logical, smaller companies have a rather small customer base without large variations in customer types. It is therefore plausible that smaller companies stick to their known customers in order to prevent additional risk that may be faced by replacing current customers with new, different customer types. Thereby, medium and larger sized companies are facing less uncertainty and are able to afford changes in their customer base. It is therefore reasonable that these company size classifications are expecting an increase in their most important customer types.

Table 5: Customer segments in 2016 and 2021* (expectations)

		Small		**Medium**		**Large**		**Total**	
		2016	2021	2016	2021	2016	2021	2016	2021
Survey Q2 (share of customer type)		*%*	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
Shippers		26%	3,00	32%	3,58	21%	3,33	27%	3,37
Freight forwarders		12%	3,00	31%	3,33	47%	3,33	32%	3,26
Shipping lines		17%	3,00	21%	3,42	18%	3,11	19%	3,22
Terminal operators		0%	3,00	2%	3,17	7%	3,22	3%	3,15
Other trucking companies		46%	3,00	14%	3,08	3%	2,67	17%	2,93
			sCns Small		**sCns Medium**		**sCns Large**		**sCns Total**
Survey Q2 (expectation of share of customer type in 2021; strength of consensus)									
Shippers	$\mu = \bar{x}$		1,00		0,91		0,89		0,90
Freight forwarders	$\mu = \bar{x}$		1,00		0,90		0,88		0,91
Shipping lines	$\mu = \bar{x}$		1,00		0,89		0,89		0,90
Terminal operators	$\mu = \bar{x}$		1,00		0,95		0,90		0,94
Other trucking companies	$\mu = \bar{x}$		1,00		0,88		0,92		0,92

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

5.1.3 Frequency of services required by customers

It is not only important to know the type of a customer, but also the frequency the customer is requiring the service of a Dutch container trucking company. Regular customers generate a steady revenue stream, whilst new or irregular customer will require more effort in terms of acquisition, discovering and fulfilling their wishes. From the survey followed that, on average, 65% of the customer portfolio is made up of daily customers, whilst irregular customers (half-yearly, yearly, one–time) only account for approximately 10% (Table 6). Personally, I believe that this is a rather good aspect of the business model of the Dutch container trucking companies, since, if 65% of the customer base requires regularly your services, less risk is faced due to constant revenue streams. These findings are also in line with the results of the conducted interviews, whereby often was said that the largest customers require daily services, whilst irregular customers are relatively uncommon and only require service in the case of an emergency transport. Additionally, medium sized companies have hardly any weekly customers (1%), whilst this is more common at smaller (9%) and larger (17%) companies. The survey respondents do not expect immense changes in the distribution of the frequency that services are required by customers, however, smaller companies expect a slight increase in only daily and weekly customers, whilst medium and larger sized

companies expect a slight increase for all service frequency requirements. In addition, strong consensus exists amongst all size classifications regarding the expected changes in the frequency that services are required by customers (minimum $sCns_{\bar{x}} = 0{,}87$).

Table 6: Customer frequency in 2016 and 2021* (expectations)

	Small		Medium		Large		Total	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q4 (frequency customers)	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
Daily	70%	3,17	61%	3,50	66%	3,00	65%	3,26
Weekly	9%	3,17	1%	3,50	17%	3,22	13%	3,33
Monthly	3%	2,83	7%	3,33	5%	3,22	5%	3,19
Half-yearly	0%	2,83	5%	3,25	8%	3,22	5%	3,15
Yearly	1%	2,83	2%	3,25	2%	3,11	2%	3,11
One-time customers	1%	2,83	6%	3,08	1%	3,11	3%	3,04

		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**
Survey Q4 (frequency customers in 2021; strength of consensus)					
Daily	$\mu = \bar{x}$	0,95	0,87	0,96	0,90
Weekly	$\mu = \bar{x}$	0,95	0,89	0,94	0,91
Monthly	$\mu = \bar{x}$	0,95	0,92	0,94	0,93
Half-yearly	$\mu = \bar{x}$	0,95	0,93	0,94	0,94
Yearly	$\mu = \bar{x}$	0,95	0,93	0,96	0,95
One-time customers	$\mu = \bar{x}$	0,95	0,94	0,96	0,96

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

5.1.4 Potential impact of the change in 'customer segments' on the business model

Although not immense changes are expected regarding the customers of Dutch container trucking companies, some expectations might have an influence on the profitability of these companies. It is expected that the total number and frequency of customers will slightly increase, this could imply that the Dutch container trucking companies will expect higher demand in terms of transport services. This expectation not only implicates a most likely increase of the revenue stream, it could also imply that the profitability of Dutch container trucking companies is most likely to be improved by 2021.

5.2 Communication channels

5.2.1 A more automated communication in the future

Communication channels are the media through which a company reaches and communicates with its customers. Communication is a key element within the daily operations of container trucking companies and occurs not only before (e.g. acquisition) and after (e.g. billing), but also during sales in the form of constant contact between the planning department and its customers. Not only do new orders come in via chosen communication channels, also potential problems should be able to be solved via these same communication channels. Therefore, it is important that the chosen communication channels are able to communicate; internally, externally, smoothly, fast and clearly. The following can be stated about the customer channels of the Dutch container trucking companies (Table 7):

- Most smaller companies use the telephone as channel (48%), whilst this is less popular amongst medium (26%) and larger (29%) sized companies.
- Medium (56%) and larger (43%) sized companies mostly use email to communicate which is also relatively popular amongst smaller companies (35%).
- Portbase (2%), fax (2%) and face-to-face communication (4%) are hardly used.

- Integrated customer systems are mainly used by larger companies (17%). From the interviews followed that such integrated customer systems require relative high investments which could explain the relatively low implementation amongst smaller and medium sized companies.

Table 7: Type of channels used in 2016 and 2021* (expectations)

		Small		**Medium**		**Large**		**Total**	
		2016	2021	2016	2021	2016	2021	2016	2021
Survey Q3 (type of channel used)		%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
Telephone		48%	3,17	26%	2,42	29%	2,78	32%	2,70
E-mail		35%	3,83	56%	3,58	43%	3,44	47%	3,59
Fax		0%	3,00	1%	2,33	5%	2,11	2%	2,41
Face-to-face		6%	3,00	3%	3,17	5%	3,11	4%	3,11
Portbase		0%	3,00	3%	3,42	1%	3,67	2%	3,41
Integrated customer systems		7%	3,00	10%	3,92	17%	4,00	12%	3,74
			sCns Small		**sCns Medium**		**sCns Large**		**sCns Total**
Survey Q3 (type of channel used in 2021; strength of consensus)									
Telephone	$\mu = \bar{x}$		0,95		0,91		0,87		0,89
E-mail	$\mu = \bar{x}$		0,84		0,87		0,86		0,83
Fax	$\mu = \bar{x}$		1,00		0,85		0,84		0,85
Face-to-face	$\mu = \bar{x}$		1,00		0,95		0,89		0,94
Portbase	$\mu = \bar{x}$		1,00		0,91		0,92		0,91
Integrated customer systems	$\mu = \bar{x}$		1,00		0,96		0,91		0,90

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

It is expected that most companies will increase their usage of e-mail by 2021 ($\bar{x}$ = 3,59), whilst the usage of telephone is expected to diminish ($\bar{x}$ = 2,70). Most remarkable is that especially the medium and larger sized companies expect that the usage of automated systems, such as Portbase ($\bar{x}$ = 3,42 and 3,67) and integrated customer systems ($\bar{x}$ = 3,92 and 4,00), will increase, whilst smaller companies do not expect any changes regarding these automated channels. According to the interviewees, these automated channels are positively experienced due to the smooth communication and lack of human interference. It is most likely that the entire sector is gradually moving towards such automated systems, therefore, it is advisable that Dutch container trucking companies already invest in such systems to be prepared for the automated future. Please note that one should be aware of the differences in pace and methods amongst the different size classifications to adapt to automated communication channels. For instance, the installation of a board computer is already a large step in the right direction for one-truck companies, whilst this is likely to already be installed in all trucks of medium and larger sized companies years ago. For these medium and larger sized companies investing in actual automated integrated customer systems might be the next logical step to innovate their communication channels.

5.2.2 Potential impact of the change in 'communication channels' on the business model

The expected changes in the type of used customer channels are also most likely to influence the future business of Dutch container trucking companies. Currently, the most used channels 'e-mail' and 'telephone' are rather labor intensive, resulting in additional labor costs from office employees. However, the expected trend of automation might decrease these labor costs due to using integrated customer systems instead of the current manual labor. This development might result in less employment in the Dutch container trucking sector, but on the other hand less costs will be incurred. This might eventually be beneficial for the financial position and the profitability of Dutch container trucking companies.

5.3 Customer relationships

5.3.1 An expected increase in engaging long term contracts with most important customers

Creating and maintaining the desired relationships with customers is an important aspect of a business model. A perfect relationship with a customer not only eases the act of doing business but could also lead to trust, commitment and eventually customer retention (Gounaris, 2005). From the interviews followed that currently most relationships within the Dutch container trucking sector are based on trust and are relatively ad hoc which implicates that hardly any contractual agreements are made. This results in relatively low switching costs for customers which brings a relatively high level of uncertainty for Dutch container trucking companies. Engaging contractual relationships could decrease this uncertainty by receiving guaranteed revenue streams for a fixed period of time. Although most interviewees found it desirable to increase the amount of long term contracts, currently these contractual relationships are hardly engaged with customers. Looking at the results of the survey, one could say that also here the tendency towards engaging more long term contracts is observable (Table 8). In the current situation, a relatively small share of the survey respondents is engaging contractual relationships, whereby long term contracts with shippers and freight forwarders are slightly more common than short term contracts. Regarding the expectations for 2021, smaller companies do not expect an increase in the amount of engaged contracts, whilst medium and larger sized companies do expect a positive change for especially long term contracts. Personally, although the sector strives for more long term contractual relationships, I believe this will be difficult to be realized within upcoming 5 years. Since the Dutch container trucking sector provides a homogenous product, has a near-perfect competition market structure and the switching costs of its customers are almost equal to zero, customers will not be willing to engage long term contracts on a large scale. For these reasons I do not find it likely that suddenly long term contracts will be engaged between Dutch container trucking companies and their customers.

Table 8: Percentage share of companies that are engaging contractual relationships in 2016 and 2021 (expectations)

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q6 (contractual relationships)	%	%	%	%	%	%	%	%
Short term contract shipper	17%	17%	17%	17%	0%	11%	11%	15%
Short term contract freight forwarder	0%	0%	8%	8%	0%	0%	4%	4%
Long term contract shipper	50%	50%	8%	33%	44%	56%	30%	44%
Long term contract freight forwarder	0%	0%	17%	42%	22%	33%	15%	30%

5.3.2 Potential impact of the change in 'customer relationships' on the business model

As already stated, if the amount of engaged contractual relationships between Dutch container trucking companies and their customers will be increased, the uncertainty of these companies will diminish. Switching costs of customers will rise which could lead to guaranteed revenue streams for the Dutch container trucking companies. However, due to the characteristics of the Dutch container trucking sector it is not likely that customers will engage in these type of contracts and therefore the level of uncertainty and the ability of customers to switch between companies is expected to remain the same.

5.4 Value propositions

5.4.1 The increasing awareness of the importance of diversification

The accumulation of company-offered products and services leading to value creation can be translated into value propositions. These propositions can be set as company goals such as offering the best quality, price or services. The concept of value propositions resembles the Value Discipline Model of Treacy and Wiersema (1993) wherein a distinction can be made between several disciplines that a company could follow:

- *Operating Excellence*: Diversify in terms of price and convenience by making their operations lean and efficient.
- *Product Leadership*: Surpass competitors by providing an endless stream of innovative, creative and revolutionary products and services.
- *Customer Intimacy*: Excel at customer attention and service by providing tailor-made products to fulfill each individual customer's needs.

Based on the interviews, different diversification aspects were chosen on which Dutch container trucking companies could base their diversification strategies. All aspects can be allocated to one of the three value disciplines of Tracey and Wiersema (last column Table 9). As seen in Table 9, the chosen diversification aspects are relatively equally divided over the three different value disciplines, which implicates that the Dutch container trucking sector is not centralized around one specific discipline. This creates relatively high potential for the Dutch container trucking companies to compete on one of the many facets of all three value disciplines. When looking at the results of the survey in Table 9, one could observe the following:

- Reliability of arrival times is found to be the most important aspect to diversify amongst the entire sector ($\bar{x}$ = 8,70).
- Smaller companies allocated overall the lowest grades which could implicate that such companies do not value diversification or have lack of awareness of the corresponding benefits of diversification.
- Smaller companies found specialization in type of load to be an important aspect ($\bar{x}$ = 7,83) which can also be observed in the Netherlands; a lot of small sized specialized container trucking companies exist.
- Medium ($\bar{x}$ = 5,67) and larger sized ($\bar{x}$ = 6,67) companies focus more on price competition than smaller companies ($\bar{x}$ = 2,83).
- Medium and larger sized companies believe that sustainability, offering sufficient truck capacity and sharing data with customers are part of the most important aspects to achieve diversification.
- Smaller companies believe that sustainability is also rather important to diversify ($\bar{x}$ = 6,50).
- By 2021, medium ($\bar{x}$ = 4,08) and larger ($\bar{x}$ = 4,11) sized companies expect that data sharing will increase in importance regarding diversification strategies. In addition, large sized companies also expect that sustainability ($\bar{x}$ = 4,11) will become a more important diversification aspect.

- Small sized companies hardly expect any changes in the importance of all diversification aspects ($\bar{x}$ = 3,17).
- $sCns_{\bar{x}}$ is higher than $sCns_1$ and $sCns_5$ for all diversification aspects, which indicates that the average values ($\bar{x}$) are reflecting the expectations of the respondents most accurately.
- There is hardly any strong consensus amongst the entire sector which implicates that the opinion about the importance of the different diversification aspects differs between the different size classifications.

Table 9: Diversification aspects in 2016* and 2021** (expectations)

	Small		**Medium**		**Large**		**Total**		
Survey Q7 (diversification)	2016 $\bar{x}$	2021 $\bar{x}$	2016 $\bar{x}$	2021 $\bar{x}$	2016 $\bar{x}$	2021 $\bar{x}$	2016 $\bar{x}$	2021 $\bar{x}$	
Price	2,83	3,17	5,67	3,17	6,67	3,44	5,37	3,26	
Specialization type of load	7,83	3,17	5,58	3,08	6,44	3,67	6,37	3,30	
Specialization geo-location	4,67	3,17	5,75	3,33	6,56	3,33	5,78	3,30	
Proven quality (ISO, SQAS)	2,5	3,17	5,58	3,67	6,22	3,56	5,11	3,52	
Reliability of arrival time	8,33	3,17	8,58	3,75	9,11	3,78	8,70	3,63	
Sustainable operations	6,50	3,17	6,83	3,75	6,67	4,11	6,70	3,74	
Offering sufficient truck capacity	5,83	3,17	6,58	3,67	7,78	3,56	6,81	3,52	
Sharing data with customers	2,17	3,17	6,33	4,08	7,11	4,11	5,67	3,89	

		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**	**Value Discipline**
Survey Q7 (diversification aspects in 2021; strength of consensus)						
Price	$\mu = \bar{x}$	0,95	0,86	0,91	0,88	Operational Excellence
	$\mu = \bar{1}$	0,54	0,60	0,47	0,51	
	$\mu = \bar{5}$	0,62	0,60	0,68	0,63	
Specialization type of load	$\mu = \bar{x}$	0,95	0,91	0,86	0,89	Customer Intimacy
	$\mu = \bar{1}$	0,54	0,56	0,40	0,50	
	$\mu = \bar{5}$	0,62	0,60	0,73	0,65	
Specialization geo-location	$\mu = \bar{x}$	0,95	0,92	0,90	0,92	Customer Intimacy
	$\mu = \bar{1}$	0,54	0,50	0,49	0,50	
	$\mu = \bar{5}$	0,62	0,66	0,66	0,65	
Proven quality (ISO, SQAS)	$\mu = \bar{x}$	0,95	0,92	0,88	0,90	Product Leadership
	$\mu = \bar{1}$	0,54	0,41	0,43	0,45	
	$\mu = \bar{5}$	0,62	0,73	0,71	0,70	
Reliability of arrival time	$\mu = \bar{x}$	0,95	0,93	0,87	0,89	Operational Excellence
	$\mu = \bar{1}$	0,54	0,47	0,37	0,41	
	$\mu = \bar{5}$	0,62	0,75	0,75	0,72	
Sustainable operations	$\mu = \bar{x}$	0,95	0,92	0,85	0,87	Product Leadership
	$\mu = \bar{1}$	0,54	0,46	0,27	0,38	
	$\mu = \bar{5}$	0,62	0,75	0,82	0,74	
Offering sufficient truck capacity	$\mu = \bar{x}$	0,95	0,92	0,88	0,89	Operational Excellence
	$\mu = \bar{1}$	0,54	0,49	0,43	0,44	
	$\mu = \bar{5}$	0,62	0,73	0,71	0,70	
Sharing data with customers	$\mu = \bar{x}$	0,95	0,97	0,87	0,90	Customer Intimacy
	$\mu = \bar{1}$	0,54	0,46	0,27	0,34	
	$\mu = \bar{5}$	0,62	0,82	0,82	0,78	

* The diversification aspects of 2016 are measured via a 1-10 scale, whereby 1 denotes 'very unimportant to diversify' and 10 denotes 'very important to diversify'
** The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

These observations of 2016 implicate that the different size classifications value different diversification aspects. One could observe that smaller companies focus more on the wishes of specific customers (specialized load) than on price, whilst medium and larger sized companies focus more on providing additional services such as sufficient capacity and data sharing. It is surprising that medium and larger sized companies have indicated to find price diversification more important than smaller companies. Personally, I would have found it more logical if the smaller companies focused more on price competition, since they do not have the same resources to provide additional services as the medium and larger sized. Therefore, in order to compete with the medium and larger sized companies, I expected the smaller companies to follow a price-cutting strategy. On the contrary, as the results of the survey show, the smaller companies decided to compete by serving

more niche and specialized markets. A second odd observation is the rather low overall allocation of the smaller companies. This low allocation could indicate that the smaller companies do not believe that diversification is important, however, I believe that a more logical explanation is that the smaller companies do not have the resources to diversify on multiple diversification aspects and therefore are fully focusing on only one aspect. This could be a rather logical strategy whereby the smaller companies aim to provide the best tailor-made service for specialized cargo. Regarding the expectations of 2021, all size classifications indicated an expected increase in the importance of the different diversification aspects which could indicate that diversification will become more important by 2021.

5.4.2 Potential impact of the change in 'value propositions' on the business model

That diversification of companies is a positive development is supported by economic literature. Regardless of the size of the company, it should always increase their focus on diversification. Research shows that not only diversified medium and larger sized companies, but also smaller diversified ones, outperform their undiversified counterparts in terms of financial performance and revenue growth (Corner, 2015). For this reason, it is highly advisable that Dutch container trucking companies follow a diversification strategy to achieve a business model that realizes higher efficiencies and (financial) performance gains.

5.5 Revenue streams

The continuity of Dutch container trucking companies can only be guaranteed if sufficient revenue streams are generated. According to the interviews, the core business that generates the most cash inflow is the container pick-up and delivery services provided by the container trucking companies. In addition, some companies perform supplementary activities to gain additional revenues, such as the provision of storing space for containers and warehousing. In this section four different aspect of the revenue streams of Dutch container trucking companies will be discussed: annual revenue, the validity of the Pareto Principle, the unit of measurement of profitability and the aspects that lead to the revenue streams.

5.5.1 An expected increase in the annual revenue

In the survey was asked to the respondents to indicate their annual revenue of 2016 by selecting a revenue range (Table 10). Naturally, almost all smaller companies belong to the lowest range of ≤ €300.000 (84%), whilst most medium (75%) and larger (56%) sized companies fall into the category of an annual revenue of €3.000.000 - €10.000.000. More interesting is the expected change in annual revenue by 2021. Table 10 shows that all size classifications expect an increase in the annual revenue, whereby smaller companies foresee a relative small increase ($\bar{x} = 3{,}33$) compared to the expectations of the medium ($\bar{x} = 3{,}83$) and larger ($\bar{x} = 4{,}00$) sized companies. In addition, the strength of consensus ($sCns_x$) for each size classification is relatively strong which indicates that the expectations regarding the positive change in annual revenue by 2021 is shared within the entire Dutch container trucking sector. This expected positive change is in line with the findings from the

interviews; most interviewees expect increasing freight rates in the near future. Due to the current relatively low freight rates, most companies are not able to generate additional revenue streams since they are entirely focused on surviving within the highly competitive sector. If the freight rates will recover, most companies expect to broaden their focus by moving more towards horizontal cooperation and providing additional services which will, hopefully, generate additional cash inflows that will increase the annual revenue of the Dutch container trucking companies.

Table 10: Annual revenue in 2016 and 2021* (expectations)

		Small	**Medium**	**Large**	**Total**
		2016	2016	2016	2016
Survey Q42 (annual revenue)		%	%	%	%
≤ €300.000		84%	0%	0%	19%
€300.000 - €1.000.000		0%	8%	0%	4%
€1.000.000 - €3.000.000		17%	17%	0%	11%
€3.000.000 - €10.000.000		0%	75%	56%	52%
€10.000.000 - €20.000.000		0%	0%	33%	11%
≥ €20.000.000		0%	0%	11%	4%
Revenue in 2021	$\bar{x}$	3,33	3,83	4,00	3,78
		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**
Survey Q42 (annual revenue in 2021; strength of consensus)					
	$\mu = \bar{x}$	0,92	0,95	0,96	0,92
Revenue in 2021	$\mu = \bar{1}$	0,50	0,37	0,32	0,38
	$\mu = \bar{5}$	0,66	0,77	0,80	0,76

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

5.5.2 Annual revenue distributed according to the Pareto Principle

A company is facing high risk if its revenue is largely depending on solely one customer. Therefore, it is wisely to spread revenue streams amongst multiple regular customers. The 80/20 Pareto Principle is a common guideline for revenue distribution and indicates that 20% of the customers should be responsible for 80% of the revenues. From the survey followed that this principle was valid for approximately 52% of the Dutch container trucking companies in 2016, whereby some companies spread their revenues amongst even more customers (Table 11). By 2021, even 67% of the Dutch container trucking companies expect that their revenue streams will be distributed according to the low-risk Pareto Principle, which I personally see as a huge positive development within the Dutch container trucking sector.

Table 11: Pareto Principle validity within Dutch container trucking sector in 2016 and 2021 (expectations)

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q5 (Pareto principle)	%	%	%	%	%	%	%	%
True	67%	67%	67%	83%	22%	44%	52%	67%
False	33%	33%	33%	17%	78%	56%	48%	33%
If false, average value of %	100%	100%	28%	33%	34%	50%	42%	57%

5.5.3 Factors leading to profitability and how to measure it

From the interviews followed that some companies, especially small sized, are not constantly fully aware of their financial health. Container trucking companies do not always know how much revenue and costs are generated on a daily or sometimes even yearly basis. For this reason, the survey questioned which operational aspects are leading to their own profitability (Table 12) and how this profitability is measured (Table 13). The following can be stated:

- 96% of all container trucking companies believe that efficient planning (e.g. combining trips or preventing empty trips) leads to their profitability, whilst 93% believes that this is achieved by an efficient occupancy rate of drivers and equipment (Table 12).
- 92% of the medium sized companies say that offering additional services leads to profitability, whilst this is only believed by 50% of the smaller and 78% of the larger companies (Table 12).
- It is believed by 67% of the companies that achieving economies of scale will lead to profitability by 2021, whilst this was only 44% in 2016 (Table 12).
- Most companies (70%) measure their profitability only once a month (Table 13).

Table 12: Profitability aspects in 2016 and 2021 (expectations)

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q43 (profitability aspects)	%	%	%	%	%	%	%	%
Cost-benefit analysis for each trip	83%	83%	50%	83%	33%	44%	52%	70%
Efficient planning (load/trips)	83%	83%	100%	100%	100%	100%	96%	96%
Realizing economies of scale	33%	50%	25%	58%	78%	89%	44%	67%
Efficient outsourcing of activities	50%	50%	83%	92%	78%	78%	74%	78%
Offering additional services	50%	67%	92%	100%	78%	78%	78%	85%
Effic. occupancy rate drivers/equipm.	67%	67%	100%	100%	100%	100%	93%	93%

Perhaps the most shocking finding is the relatively large interval of measuring profitability. 70% of the companies only measure their profitability on a monthly basis, whilst in the container trucking sector it is rather important to measure it more often due to constantly changing circumstances such as freight rates, costs and transportation times. During the interviews was heard that sometimes companies even accepted orders that eventually resulted into a loss due to the lack of checking the relevant revenue and costs. For this reason, measuring the profitability only once a month is certainly not enough. It is of large importance that the Dutch container trucking companies decrease their measurement interval, whereby a unit of measurement of the profitability per trip is highly preferred to gain as much insight in the financial health as possible.

Table 13: Percentage share of companies chosen different units of measurement of profitability in 2016

	Small	**Medium**	**Large**	**Total**
	2016	2016	2016	2016
Survey Q44 (unit of measurement of profitability)	%	%	%	%
Trip	0%	33%	33%	26%
Truck	0%	42%	33%	30%
Revenue group	17%	25%	22%	22%
Day	0%	25%	0%	11%
Week	50%	25%	33%	33%
Month	33%	75%	89%	70%
Year	33%	50%	22%	37%

5.5.4 Potential impact of the change in 'revenue streams' on the business model

As mentioned in section 5.5.1, the annual revenue is expected to increase by 2021. Together with a more risk-averse revenue distribution of the Pareto Principle and the awareness of which aspects are leading to profitability, the Dutch container trucking companies have a rather bright future ahead. However, the most critical variable determining the profitability of Dutch container trucking companies is, and always will be, the freight rates. The future of the sector will be dependent of the potential recovery of these freight rates. It is rather likely that eventually the freight rates will recover, actually a slow increase (0,10%) has already been observed during the

third quarter of 2016 (Nicolai, 2016b). One could assume that if this recovery continues, the profitability of the Dutch container trucking companies will eventually also increase.

5.6 Key resources

Key resources enable the possibility for a company to reach its customers, to maintain its customer relationships, to provide the chosen value propositions and to generate sufficient revenue. Osterwalder and Pigneur (2013) distinguish four different types of key resources:

- Physical
- Human
- Intellectual
- Financial

According to the interviews, the trucks (physical capital) and staff (human capital) are considered to be the most valuable key resources. However, it is expected that the characteristics of these two resources will go through substantial changes that will have an effect on the business model of Dutch container trucking companies.

5.6.1 Trucks: expected changes in fleet size

Trucks are the most important and valuable physical assets of Dutch container trucking companies due to being essential for the delivery of containers. However, not all container trucking companies have sufficient financial resources to purchase such expensive assets. For such companies, the concept of chartering trucks is a possibility to still run a business while no own trucks have to be acquired. Regularly, independent trucking drivers that own a truck are hired by such Dutch container trucking companies.

Table 14: Number of trucks at disposal in 2016 and 2021* (expectations)

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q.A (number of trucks)	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
Average # of own trucks	2	3,33	22	3,50	67	4,00	30	3,63
Average # of chartered trucks	0	3,33	7	3,83	24	4,00	11	3,78
Total average # of trucks at disposal	3	-	28	-	90	-	43	-
Own trucks (average %)	88%	-	77%	-	74%	-	75%	-
Charted trucks (average %)	13%	-	23%	-	26%	-	25%	-
		sCns Small		**sCns Medium**		**sCns Large**		**sCns Total**
Survey Q.A (number of trucks in 2021; strength of consensus)								
Average # of own trucks	$\mu = \bar{x}$	0,92		0,89		0,91		0,89
	$\mu = \bar{1}$	0,50		0,45		0,31		0,41
	$\mu = \bar{5}$	0,66		0,69		0,80		0,72
Average # of chartered trucks	$\mu = \bar{x}$	0,92		0,94		0,91		0,90
	$\mu = \bar{1}$	0,50		0,44		0,31		0,37
	$\mu = \bar{5}$	0,66		0,77		0,80		0,75

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

From the survey appeared that 75% of the trucks are owned by Dutch container trucking companies themselves, whilst 25% is being chartered. In Table 14 can be seen that smaller companies have, on average, 3 trucks at their disposal, whilst this is for medium and larger sized companies respectively 28 and 90 trucks. In addition, the survey questioned the expected change in the operational fleet by 2021. The smaller companies expect a relatively small increase in both the owned ($\bar{x}$ = 3,33) and chartered fleet ($\bar{x}$ = 3,33), whilst the medium sized companies expect a larger positive change for chartered trucks ($\bar{x}$ = 3,83) than for owned trucks ($\bar{x}$ = 3,50). The larger companies

expect an even larger positive change for both owned ($\bar{x}$ = 4,00) and chartered trucks ($\bar{x}$ = 4,00). The result that the larger the company, the more it is expecting to increase its fleet size is rather logical due to having more resources available and therefore being able to invest in additional trucks. Additionally, almost strong consensus exists amongst the entire sector regarding the expected positive change in fleet size, for both owned and chartered trucks, by 2021 (minimum $sCns_x$ = 0,89). This would mean that all companies are planning to invest in new trucks, however, it is questionable if all companies, especially the smaller ones, have sufficient financial resources available.

5.6.2 Trucks: expected changes in used engines

Not is only the size of the operational fleet expected to change, also the type of engines within the fleet is probably going to be innovated. As told in section 3.4.4, the government is favoring the use of the newly developed EURO-6 engines, whilst the more environmentally unfriendly EURO-4 engine is hopefully being used less in the near future. In the survey was asked which engines are currently in use and expected to be used by 2021 (Table 15). Approximately 1% of the total trucks is equipped with an EURO-4 engine, whilst this is 37% and 62% for respectively the EURO-5 and EURO-6 engines. Especially the medium (54%) and larger (65%) sized companies are already making great use of the more advanced EURO-6 engine, whilst the most popular engine for smaller companies is still the EURO-5 (72%). By 2021, it is also expected that within the entire sector, the use of EURO-4 ($\bar{x}$ = 2,26) and EURO-5 ($\bar{x}$ = 2,04) engines will diminish drastically in favor of the EURO-6 engine ($\bar{x}$ = 4,48). However, looking at the strength of consensus amongst the entire sector and within the size classifications, one could notice that the expectations are still varying. Especially the expectations regarding the use of EURO-4 ($sCns_{2,26}$ = 0,77) and EURO-5 ($sCns_{2,04}$ = 0,78) engines have a weak consensus which indicates that still some companies want to make use of them by 2021, whilst others expect to fully equip their fleet with EURO-6 engines. From the different strength of consensus tests, one could conclude that the sector is not in full agreement regarding the use of more environmentally friendly engines. A probable cause for this are the corresponding relatively high replacement costs of acquiring a new EURO-6 fleet.

Table 15: Type of used engines in 2016 and 2021* (expectations)

		Small		**Medium**		**Large**		**Total**	
		2016	2021	2016	2021	2016	2021	2016	2021
Survey Q20 (type of used engines)		%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
EURO-4		4%	3,00	4%	1,67	0%	2,56	1%	2,26
EURO-5		72%	3,17	42%	1,42	35%	2,11	37%	2,04
EURO-6		24%	4,17	54%	4,75	65%	4,33	62%	4,48
			sCns Small		**sCns Medium**		**sCns Large**		**sCns Total**
Survey Q20 (type of used engines in 2021; strength of consensus)									
	$\mu = \bar{x}$		0,80		0,83		0,79		0,77
EURO-4	$\mu = \tilde{1}$		0,55		0,86		0,66		0,72
	$\mu = \tilde{5}$		0,55		0,19		0,44		0,35
	$\mu = \bar{x}$		0,83		0,93		0,79		0,78
EURO-5	$\mu = \tilde{1}$		0,52		0,98		0,75		0,77
	$\mu = \tilde{5}$		0,60		0,11		0,31		0,29
	$\mu = \bar{x}$		0,84		0,96		0,89		0,88
EURO-6	$\mu = \tilde{1}$		0,25		0,83		0,21		0,16
	$\mu = \tilde{5}$		0,83		0,95		0,87		0,90

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

5.6.3 Workforce: difficulties in finding new qualified staff

The container trucking sector is highly labor intensive due to requiring trucking drivers, planners, administrative assistants and management positions. From the interviews followed that an increasing amount of companies are facing difficulties in finding new qualified staff, especially container trucking drivers.

Table 16: Difficulties in finding new staff in 2016 and 2021 (expectations)

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q8 (difficult finding new staff)	%	%	%	%	%	%	%	%
Trucking drivers	33%	33%	50%	92%	44%	89%	44%	78%
Planners	17%	33%	42%	67%	67%	89%	44%	67%
Administrative employees	0%	0%	17%	42%	11%	11%	11%	22%
Managers	0%	0%	17%	52%	11%	22%	11%	26%
Other staff*	33%	50%	25%	33%	22%	33%	26%	37%

* For instance: mechanic and facilities employees

Firstly, an often heard cause of this difficulty is the relatively bad image of the job of a trucking driver referring to the long working hours and often spending nights at the side of the road away from their family. Secondly, it is expected that the required level of education of staff working in the Dutch container trucking sector will increase due to an expected increase in complexity of activities (more of this in section 5.7.2). Thirdly, the workforce of the Dutch container trucking sector is ageing which increases the need for young qualified staff. To solve this problem of a shortage in qualified staff, more Dutch container trucking companies are moving towards foreign labor markets whereby especially foreign staff from Eastern-European countries is attracted.

Table 17: Employing foreign trucking drivers in 2016 and 2021* (expectations) and experiencing ageing workforce in 2016

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q9 (foreign trucking drivers)	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
Employing foreign trucking drivers	0%	3,00	25%	3,50	67%	3,56	33%	3,41
Survey Q12 (ageing workforce)								
Experiencing ageing workforce	67%	-	83%	-	78%	-	78%	-

		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**
Survey Q9 (employing foreign trucking drivers in 2021; strength of consensus)					
Employing foreign trucking drivers	$\mu = \bar{x}$	1,00	0,91	0,88	0,90
	$\mu = \bar{1}$	0,58	0,53	0,43	0,47
	$\mu = \bar{5}$	0,58	0,69	0,71	0,67

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

The following can be stated about the difficulties regarding the workforce (Table 16, 17 and 18):

- In 2016, 50% of the medium and 44% of the large sized companies are facing difficulties in finding qualified trucking drivers, whilst this is 33% of the small sized companies (Table 16).
- In 2016, 42% of the medium and 67% of the large sized companies are facing difficulties in finding qualified planners, whilst this is only 17% of the small sized companies (Table 16).
- By 2021, 78% of the Dutch container trucking companies expects to face difficulties in finding qualified trucking drivers and 67% expects difficulties in finding new planners (Table 16).
- In 2016, 78% of the Dutch container trucking companies is experiencing an ageing workforce (Table 17).
- 33% of the Dutch container trucking companies are currently employing foreign trucking drivers whereby especially large sized companies (67%) contribute to this (Table 17).

- All small sized companies ($sCns_3 = 1$) do not employ foreign trucking drivers and also do not expect to do this by 2021 (Table 17).
- A strong consensus ($sCns_{3,41} = 0{,}90$) exists amongst the entire sector that more foreign trucking drivers will be employed by 2021 (Table 17).
- The most given reason to employ foreign trucking drivers is the current shortage of qualified Dutch trucking drivers (37%), especially medium (42%) and large (56%) sized companies face this problem (Table 18).
- The most given reasons to not employ a foreign trucking driver are the potential communication problems (44%) and being against the principles of the company (44%) (Table 18).

Table 18: Reasons to (not) employ a foreign trucking driver in 2016

	Small	**Medium**	**Large**	**Total**
	2016	2016	2016	2016
Survey Q11 (pro reasons)	%	%	%	%
Lower wages	17%	8%	11%	11%
Dutch trucking driver shortage	0%	42%	56%	37%
No preference for country of origin	0%	17%	22%	15%
Customer preference foreign driver	17%	8%	0%	7%
Does not employ foreign trucking drivers	33%	33%	11%	26%
Survey Q10 (con reasons)				
Potential communication problems	17%	75%	22%	44%
Relatively worse driving behavior	33%	25%	22%	26%
Results in unfair competition	33%	33%	0%	22%
Against the company principles	50%	50%	33%	44%
Does employ foreign trucking drivers	0%	17%	56%	26%

One could learn from these observations that the Dutch container trucking sector can expect some drastic problems in the near future regarding its workforce. That especially the medium and large companies are facing problems finding new qualified staff is not surprising due to the simple reason of requiring more human resources. At smaller companies, often different tasks are performed by one and the same person and therefore I believe it is plausible that the smaller companies hardly experience difficulties in finding new qualified staff. What surprised me the most was that 44% of the companies indicate not to employ foreign trucking drivers due to being against their own principles. During the interviews was often said that companies benefit from cheap labor and do not care about any principles due to the severe competitiveness within the sector; if you do not benefit from cheap labor opportunities, your competitor will. However, the results of the survey indicate to a certain extent the opposite. Some of the companies apparently prefer quality over cheap labor and are maybe even trying to protect the domestic labor market of the Netherlands.

The expected problems of finding new qualified staff could have an enormous impact on the Dutch container trucking companies and therefore it is key that these companies already start with acquiring new qualified staff, even if they maybe have to move towards foreign labor markets. Another solution could be the retraining of already employed staff, however, this could be both a time and money consuming solution. If it is yet not enough, not only will the companies probably face problems in finding new qualified staff, also the preferences of current employees are changing. From the interviews clearly emerged that especially younger Dutch container trucking drivers are nowadays preferring a 9-to-5 job over irregular working hours. This change in preferences makes

the Dutch container trucking sector even less attractive for future employees and worsens the difficulties of finding new staff even further.

5.6.4 Potential impact of the change in 'key resources' on the business model

The problems regarding the workforce are rather troublesome and could have a substantial negative effect on the business model of Dutch container trucking companies. If the Dutch container trucking companies will be unable to attract sufficient container trucking drivers, the capacity to transport containers will diminish which most likely will eventually decrease the revenue streams of companies. Additionally, due to the large need of qualified staff, labor costs are likely to increase due to higher wage expectations. Both potential developments could destabilize the already poor financial health of the Dutch container trucking sector even further and therefore it is key to prevent or solve these issues on a relatively short term.

5.7 Key activities

Key activities are the actions and tasks that need to be performed by a company to successfully generate revenue. The most important key activity of Dutch container trucking companies is the provision of pick-up and delivery services for containers. However, other key activities could also be performed such as warehousing and packaging. From the interviews followed that the key activities of Dutch container trucking companies are geographically changing their scope: years ago the operations were performed internationally whereby some trucks even drove to Italy or Eastern-Europe, however, nowadays only performing domestic transport by trucks is getting more common. Not only is this 'last mile' tendency affecting the key activities of Dutch container trucking companies, also the increasing importance of sustainability and automation developments have substantial influences. In this section, four different topics will be discussed: the current level of automation, the expected change in the level of complexity of activities, the performed and expected sustainability measures, and, the expectancy of the importance of several technological innovations.

5.7.1 The current level of automation of daily activities

Although from the interviews appeared that still a lot of activities are performed manually, some companies have already automated several activities. Based on data from TLN, the most common daily activities of Dutch container trucking sectors were listed in the survey. The respondents had to indicate the corresponding level of automation in 2016 of those activities (Table 19). The following observations can be made:

- Amongst the entire sector, 'pre-notification of containers' ($\bar{x} = 7{,}48$) and 'billing' ($\bar{x} = 7{,}48$) have the relatively highest level of automation.
- Smaller companies have an overall relatively low level of automation, only 'pre-notification of containers' and 'reserving slots' are somewhat automated ($\bar{x} = 5{,}83$).

- On average, the larger the company, the higher the level of automation: smaller sized companies score lower than medium sized companies which score lower than larger size companies.

From the data of Table 19, one could conclude that the level of automation within the Dutch container trucking sector is still relatively low. Especially certain activities are currently done manually, whilst they can easily be automated (such as the entering of orders). From the interviews followed that an increase in the level of automation not only will lead to efficiency gains, also the occurrence of human failures will be less likely. Currently, the number one reason of container retention at a terminal is the mistyping of container information by employees. Such a relatively simple problem could easily be prevented by automating more processes. However, incorporating any form of automation will require substantial financial investments and not all companies are able to spend such resources. This also might explain why the smaller companies have currently a relatively low level of automation. One should keep in mind, just like the customer channels, that each next step towards automation is different for each company size. For instance, a logical next step for larger companies is to fully incorporate integrated customer systems, whilst digital billing might already be a step in the right direction for some smaller companies. Nevertheless, it is of large importance that the Dutch container trucking companies eventually automate more processes to gain more customer satisfaction and to increase the efficiency gains.

Table 19: The level of automation and complexity in 2016 and the expected required increased level of education

	Survey Q15 Level of automation in 2016*				**Survey Q16 Level of complexity in 2016****				**Survey Q16 Education level*****
	Small	**Medium**	**Large**	**Total**	**Small**	**Medium**	**Large**	**Total**	
	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	%
Controlling order information	4,33	3,75	5,33	4,41	4,50	6,67	7,89	6,59	44
Issuing and entering an order	4,33	4,42	4,78	4,52	4,33	6,50	7,11	6,22	33
Allocating shipments	2,83	5,00	5,22	4,59	4,00	5,83	5,89	5,44	41
Allocating trucking drivers	2,83	3,50	5,22	3,93	4,17	5,50	5,44	5,19	30
Allocating trucks	4,33	3,50	5,22	4,26	4,17	5,58	5,44	5,22	33
Pre-notification container	5,83	7,00	9,22	7,48	4,67	7,00	7,22	6,56	30
Reserving slots at terminal	5,83	5,33	7,56	6,19	4,50	7,08	7,67	6,70	33
Communicating with trucking driver	2,83	6,17	8,89	6,33	4,50	5,67	5,89	5,48	37
Procedures at terminal	5,00	6,25	7,89	6,52	3,83	6,08	6,89	5,58	30
Checking the container	4,17	5,33	5,56	5,15	4,33	5,50	5,78	5,33	22
Billing	5,50	7,42	8,89	7,48	5,50	5,83	5,78	5,74	37

* The level of automation is measured via a 1-10 scale, whereby 1 denotes 'entirely manual' and 10 denotes 'entirely automated'.
** The level of complexity compared to previous years, measured via a 1-10 scale, whereby 1 denotes 'no change' and 10 denotes 'strong increase in complexity'.
*** Indicates which share of the respondents expect that the required level of education will increase for the specific activity.

5.7.2 The change in the level of complexity of daily activities

During the interviews was an often heard problem that Dutch container trucking companies are expected to do more complex activities, whilst their revenue is still remaining the same. More complex activities mean higher costs which will influence the financial position of Dutch container trucking companies. To measure the change in complexity during last years, the respondents were asked to quantify this change for the list of daily activities provided by TLN. The following observations can be made (Table 19):

- On average, the larger the company, the higher the experienced level of increased complexity: small companies score lower than medium sized companies which score lower than large companies.
- Amongst the entire sector, the level of complexity of all activities has been experienced as increased ($minimum\ \bar{x} = 5{,}19$), especially the activities 'reserving slots' ($\bar{x} = 6{,}70$), 'controlling order information' ($\bar{x} = 6{,}59$), and 'pre-notification of containers' ($\bar{x} = 6{,}56$) have become more complex.

From these observations, one could conclude that Dutch container trucking companies indeed experience a somewhat higher level of complexity. Especially activities involving third parties (customers and terminals) became more complex during recent years. If this trend of complexity is continuing in coming years, it may be useful for Dutch container trucking companies to find a solution. A possibility, as earlier said, is to invest in automated integrated systems which will mostly solve the complexity problem with third parties. However, such systems will require a relatively large financial investment which will not be possible for all companies, especially not for small sized ones. In addition, the survey questioned if an increased level of complexity of activities will require a higher level of education of staff (last column Table 19). One could observe that especially activities involving the planning department are expected to require a higher level of education (such as controlling order information, allocating assets and communication with trucking drivers).

5.7.3 The expectancy of the importance of five technological innovations

As mentioned in section 4.3, the truck itself has not gone through drastic innovations during recent years. Although pilot tests have been performed for several technologies, real innovative breakthroughs have not occurred yet. However, if such technologies succeed to be applied on large scales, substantial efficiency and costs gains can be achieved within the Dutch container trucking sector. The respondents were asked to quantify the expected importance of five potential technological innovations in 2021 (Table 20). The chosen technological innovations, also described in section 4.3, were electric driving, autonomous driving, LNG trucks, LHVs and platooning. The following can be observed regarding these technological innovations:

- All size classifications expect, on average, that none of the chosen innovations will play a large role in the future ($maximum\ \bar{x} \leq 6{,}83$), which may indicate the sector's conservative character.
- LHVs are expected to play, on average, the largest role ($5{,}41 \leq \bar{x} \leq 6{,}83$).
- Amongst the entire sector, there is no strong consensus for any technological innovations which means that the expectations regarding the technological innovations are divided.
- $sCns_1$ is higher than $sCns_{10}$ for all technological innovations, except LHVs, which indicates that the sector more agrees on the expectation that the technological innovations will not play an important role than that they will be of large importance in upcoming years.

These observations somewhat confirm the conservative character of the Dutch container trucking sector: no new technologies are expected to play an important role in upcoming five years. What is

most surprising is that companies show little faith in the potential importance of platooning, despite, firstly, being favored by governments and, secondly, its relatively maturity in the R&D process. The negative attitude towards platooning held by most Dutch container trucking companies may be a result of a bias due to the expectation of a negative effect on business resulting from its adoption; i.e. an expected outcome of a reduction in trips and trucking drivers.

Although the results from the survey indicate that none of the five technological innovations will play a substantial role in upcoming five years, the interviewees stated that they actually do expect that some of these technological innovations eventually will influence the Dutch container trucking companies on the long term. Especially aforementioned platooning and autonomous and electric driving are eventually expected to have major impacts on the Dutch container trucking business.

Table 20: Technological innovations in 2021* (expectations)

		Small	**Medium**	**Large**	**Total**
		2021	2021	2021	2021
Survey Q24 (technological innovations)		$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
Electric driving		3,67	4,33	5,56	4,59
Autonomous driving		3,83	4,08	4,89	4,30
LNG trucks		3,83	3,75	4,11	3,89
Using LHVs		6,83	5,41	6,22	6,00
Platooning		3,50	4,17	5,44	4,44
		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**
Survey Q24 (technological innovations in 2021; strength of consensus)					
Electric driving	$\mu = \bar{x}$	0,87	0,83	0,77	0,82
	$\mu = 1$	0,76	0,69	0,54	0,65
	$\mu = 10$	0,36	0,43	0,56	0,46
Autonomous driving	$\mu = \bar{x}$	0,85	0,84	0,73	0,80
	$\mu = 1$	0,74	0,68	0,60	0,67
	$\mu = 10$	0,37	0,45	0,47	0,44
LNG trucks	$\mu = \bar{x}$	0,93	0,84	0,81	0,85
	$\mu = 1$	0,75	0,72	0,70	0,72
	$\mu = 10$	0,39	0,40	0,40	0,40
LHVs	$\mu = \bar{x}$	0,90	0,87	0,82	0,85
	$\mu = 1$	0,43	0,58	0,48	0,51
	$\mu = 10$	0,71	0,56	0,64	0,62
Platooning	$\mu = \bar{x}$	0,85	0,81	0,82	0,81
	$\mu = 1$	0,77	0,62	0,56	0,63
	$\mu = 10$	0,33	0,50	0,55	0,48

* The expectation of the innovation playing a role in 2021 is measured via a 1-10 scale, whereby 1 denotes 'will play no role' and 10 denotes 'will play a very important role'

5.7.4 Performed and expected measures to fulfill sustainability desires

Dutch container trucking companies are expected to increase their level of sustainability from both a governmental and customer perspective. Since recent years, society has become more aware regarding the importance of sustainability and is, according to research, even willing to pay extra for more sustainable services (Nielsen, 2014). Although the container transport sector is not the first sector that comes to mind of being sustainable, certain measures are already put into practice, or are still in development, to enhance the sustainable character of the sector. The respondents were asked to indicate which measures they already have taken in 2016 to become more sustainable and, in addition, were asked which measures they expect to increasingly use by 2021. The chosen sustainable measures that were submitted to the respondents were based on input of TLN. The following observations can be made (Table 21):

- In 2016, using efficient engines (78%), reducing empty kilometers (59%) and bundling of trips (56%) were the most common measures to increase the level of sustainability.

- In 2016, especially the large sized companies used multiple different sustainable measures (22% even used electric driving, LNG and biofuels).
- The entire sector has, on average, relatively high expectations that efficient engines ($\bar{x}$ = 4,41), decreasing empty kilometers ($\bar{x}$ = 4,36) and bundling trips ($\bar{x}$ = 4,36) will be increasingly used as measures to achieve more sustainability by 2021.
- Medium sized companies expect, on average, to increase their economies of scale ($\overline{x}$ = 4,00) and to shift more transport to other modes ($\overline{x}$ = 4,00).
- A strong consensus amongst the entire sector exists that the measures of using more efficient engines, using LNG and biofuels and reducing empty kilometers will be increasingly used.
- Especially medium sized companies agree that all sustainable methods will be increasingly used by 2021 (minimum $sCns_x$ = 0,91).

These observations could indicate that also the Dutch container trucking sector is trying to fulfill the sustainability desires of society, whereby large sized companies are leading in terms of used sustainable methods. This seems rather logical due to large sized companies having more resources available and therefore being able to invest more in sustainable methods. Moreover, personally I believe customers will become more sustainable aware and will therefore eventually prefer sustainable companies over non-sustainable ones. Therefore, being sustainable could lead to customer retention or even to the acquisition of new (sustainable) customers.

Table 21: Used sustainable methods in 2016 and 2021* (expectations)

		Small		**Medium**		**Large**		**Total**	
		2016	2021	2016	2021	2016	2021	2016	2021
Survey Q22 (used sustainable methods)		%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
More efficient engines		83%	4,00	83%	4,58	67%	4,44	78%	4,41
Using LNG		0%	3,20	17%	3,44	22%	3,89	15%	3,57
Using biofuels		0%	3,20	25%	3,33	22%	3,56	19%	3,39
Electric driving		17%	3,40	17%	3,33	22%	4,00	19%	3,61
Reducing empty kilometres		33%	4,80	67%	4,27	67%	4,22	59%	4,36
Bundling trips		17%	4,40	67%	4,36	67%	4,33	56%	4,36
Economies of scale		0%	3,20	8%	4,00	44%	3,75	19%	3,73
Modal shift to other modes		0%	2,80	33%	4,00	33%	3,67	26%	3,63
			sCns Small		**sCns Medium**		**sCns Large**		**sCns Total**
Survey Q4 (expected used sustainable methods in 2021; strength of consensus)									
More efficient engines	$\mu = \bar{x}$		0,94		0,95		0,91		0,90
	$\mu = \bar{1}$		0,31		0,72		0,18		0,19
	$\mu = \bar{5}$		0,80		0,92		0,89		0,88
Using LNG	$\mu = \bar{x}$		0,94		0,91		0,92		0,90
	$\mu = \bar{1}$		0,53		0,47		0,34		0,43
	$\mu = \bar{5}$		0,63		0,68		0,78		0,71
Using biofuels	$\mu = \bar{x}$		0,94		0,92		0,88		0,90
	$\mu = \bar{1}$		0,53		0,50		0,43		0,48
	$\mu = \bar{5}$		0,63		0,66		0,71		0,67
Electric driving	$\mu = \bar{x}$		0,88		0,92		0,91		0,88
	$\mu = \bar{1}$		0,47		0,50		0,31		0,42
	$\mu = \bar{5}$		0,67		0,66		0,80		0,72
Reducing empty kilometres	$\mu = \bar{x}$		0,94		0,95		0,94		0,90
	$\mu = \bar{1}$		0,06		0,59		0,25		0,20
	$\mu = \bar{5}$		0,96		0,86		0,85		0,88
Bundling trips	$\mu = \bar{x}$		0,86		0,94		0,92		0,89
	$\mu = \bar{1}$		0,18		0,65		0,21		0,20
	$\mu = \bar{5}$		0,88		0,87		0,87		0,87
Economies of scale	$\mu = \bar{x}$		0,79		0,96		0,89		0,86
	$\mu = \bar{1}$		0,50		0,53		0,38		0,38
	$\mu = \bar{5}$		0,60		0,80		0,75		0,73
Modal shift to other modes	$\mu = \bar{x}$		0,86		0,96		0,86		0,86
	$\mu = \bar{1}$		0,62		0,51		0,40		0,41
	$\mu = \bar{5}$		0,51		0,80		0,73		0,71

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

5.7.5 Potential impact of the change in 'key activities' on the business model

Different developments are in process regarding the key resources of Dutch container trucking companies. First of all, as already mentioned before, the increasing importance of automation is most likely to affect the business model of Dutch container trucking companies. Automation will lead to cost savings, especially labor costs, but will also require relatively high investments which will not be feasible for all small and medium sized companies. Secondly, the chosen technological innovations are unlikely to develop within upcoming five years, and therefore will hardly affect the business model. However, if a certain technological innovation manages to be used on a large scale, the business model of a container trucking company might change entirely. For example, autonomous driving would make container trucking drivers no longer necessary whereby a fundamental part of the current business model will disappear. Lastly, although the sustainable methods are not likely to directly lead to more profitability, some will even involve additional costs, adapting to these sustainable methods could be beneficial for Dutch container companies on the long term due to retaining or attracting new sustainable aware customers. On the long term, this could generate additional revenue streams which might eventually have a positive effect on the profitability of the Dutch container trucking companies.

5.8 Key Partners

Dutch container trucking companies are often dealing with several third party companies such as terminal operators, freight forwarders, customs and also other Dutch container trucking companies. Since the scope of this study only focuses on the internal aspects of the Dutch container trucking sector, only the key partnerships with Dutch container trucking companies will be taken into account.

5.8.1 The existing horizontal cooperation and its importance

As mentioned in section 4.1, an expected trend is the increase of horizontal cooperation amongst Dutch container trucking companies which also will have an impact on the transparency within the sector. Horizontal cooperation may lead to benefits for the sector such as efficiency gains and cost reductions due to creating synergies. As already stated, currently, the level of horizontal cooperation is not optimal yet, but, according to the interviews, is expected to change within the upcoming five years. In the survey was asked to quantify the expectations of mutual information sharing becoming reality by 2021 (Table 22). The following can be stated:

- In general, all size classifications are reserved regarding the expectations of an increase in mutual information sharing ($5{,}89 \leq \bar{x} \leq 6{,}33$). This could mean that the Dutch container trucking companies are not sure what the future will bring regarding this topic, however a slight tendency exists towards an increase in mutual information sharing.
- There is no strong consensus for any size classification which means that the expectations amongst the entire sector regarding mutual information sharing are divided.

Table 22: Mutual information sharing in 2021* (expectations)

		Small	Medium	Large	Total
		2021	2021	2021	2021
Survey Q25 (information sharing)		$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
Mutual information sharing		6,17	6,33	5,89	6,15
		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**
Survey Q25 (mutual information sharing in 2021; strength of consensus)					
Mutual information sharing	$\mu = \bar{x}$	0,87	0,85	0,83	0,85
	$\mu = 1$	0,50	0,47	0,52	0,49
	$\mu = 10$	0,64	0,65	0,60	0,63

* The expectation of information sharing becoming reality in 2021 is measured via a 1-10 scale, whereby 1 denotes 'very unlikely' and 10 denotes 'very likely'

Moreover, it was questioned how the Dutch container trucking companies have experienced several methods of cooperation in 2016 and, in addition, to rank these methods in terms of importance for both 2016 and 2021 (Table 23). The following can be stated:

- In general, all methods of cooperation are experienced relatively badly by the Dutch container trucking companies in 2016, except for the chartering of trips by medium and large sized companies.
- Amongst the entire sector, only the chartering of trips in 2016 scored relatively high ($\bar{x} = 6{,}81$) and is found to be the most important in terms of the ranking ($\bar{x} = 3{,}30$ out of 4,00). Sharing empty trips scored the second highest ($\bar{x} = 5{,}11$) and is found to be second most important ($\bar{x} =$ 2,81 out of 4,00)

Table 23: Experience of methods of cooperation in 2016* and ranking of the importance of these methods in 2016 and 2021**

	Small	Medium	Large	Total
	2016	2016	2016	2016
Survey Q32/33 (experience method cooperation)	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
Sharing empty trips	3,83	5,83	5,00	5,11
Sharing trucking drivers	2,50	2,50	1,44	2,15
Chartering of trips w/ trucking companies	5,17	6,92	7,78	6,81
Renting trucks/trailers w/ trucking companies	3,50	5,25	4,00	4,44

	Ranking Small		**Ranking Medium**		**Ranking Large**		**Ranking Total**	
Survey Q32/33 (ranking of importance method cooperation in 2016 and 2021)								
	2016	2021	2016	2021	2016	2021	2016	2021
	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
Sharing empty trips	2,17	2,17	2,92	3,08	2,89	2,89	2,74	2,81
Sharing trucking drivers	2,50	3,00	1,50	1,50	1,78	1,78	1,81	1,93
Chartering of trips w/ trucking companies	2,83	2,33	3,58	3,42	3,22	3,22	3,30	3,11
Renting trucks w/ trucking companies	2,50	2,50	2,00	2,00	2,11	2,11	2,15	2,15

* The experience of the methods of cooperation of 2016 is measured via a 1-10 scale, whereby 1 denotes 'very bad experience' and 10 denotes 'very good experience'

** The ranking of 2016 and 2021 is based on a weighted average. The respondents could rank the methods from 1-4, whereby within the table 1 denotes 'least important' and 4 denotes 'most important'

In addition, was asked to rank the methods of cooperation in terms of importance for 2021. The following observations can be made: The sector expects that…

- … sharing empty trips will become more important
- … sharing trucking drivers will become more important
- … chartering of trips will become less important
- … renting trucks and trailers will not change in terms of importance

As one could see, the sequence of the experience grades is in line with the sequence of the ranking. This may indicate that the negative experiences of the methods of cooperation are caused by the unwillingness to cooperate, since, for example, the worst experienced method is also found to be the least important. One could also interpret it the other way around; the methods of cooperation are

found to be unimportant because they are negatively experienced. If certain methods were actually being positively experienced, Dutch container trucking companies may have realized the large importance of horizontal cooperation. That the current level of horizontal cooperation is relatively low is not a complete surprise since this already was made clear during the interviews. The main given reason for the lack of horizontal cooperation is the fear of giving away too much information to other Dutch container trucking competitors.

5.8.2 Hardly any expectations of a changing market structure

As stated in section 4.5, it is expected that the market structure of the Dutch container trucking sector will change. One of the expected trends is that small and large sized companies will remain, while the medium sized companies will eventually disappear. Another expectation is the changing role of large sized companies; they will entirely take over, or will function as directors of, the smaller and medium sized companies. Some companies even expect that the role of large sized companies will evolve into a full service logistics provider whereby also container transportation via other modalities are arranged by these companies. To test the general opinion of the Dutch container trucking companies regarding these trends, several statements were given in the survey whereby the respondents had to indicate the likeliness of those statements (Table 24). The following can be observed:

- Small sized companies believe that it is rather likely that large company will either take them over ($\bar{x} = 6{,}50$) or function as their director ($\bar{x} = 7{,}17$).
- Medium and large sized companies do not strongly believe that the market structure will change severely by 2021 ($maximum\ \bar{x} = 5{,}76\ of\ all\ statements$).
- Amongst the entire sector, most likely is that large sized companies will take over small sized companies ($\bar{x} = 5{,}67$), albeit still not very likely.
- Amongst the entire sector, least likely is that large sized companies will take over medium sized companies ($\bar{x} = 3{,}85$).
- $sCns_{\bar{x}}$ is higher than $sCns_1$ and $sCns_{10}$ for all statements, which indicates that the average values ($\bar{x}$) are reflecting the expectations of the respondents most accurately.
- Strong consensus exists amongst small sized companies about the statements related to them. They agree that it is rather likely that large sized companies will function as their director or take them over completely.

The observations from the interviews and the findings from the survey differ from each other. During the interviews was often said that the market structure of the Dutch container trucking sector will change severely in coming years, however, this expectation is not shared by the survey respondents. This indicates the relatively large division in opinion regarding potential market structure changes amongst the entire sector, which is also confirmed by the strength of consensus tests. The only change that might happen in the near future, is that the large sized companies will either fully take over the small sized companies or function as their director. I do not find this

expectation surprising, especially due to the relatively high level of uncertainty the small sized companies are facing. I believe it will be a logical step for small sized companies to be taken over by large sized companies since this will give these companies more certainty and continuity prospects, even if this would mean that the small sized company owners will no longer be in charge of their own operations. This expectation would implicate that even larger sized companies will arise whereby economies of scale, and thus efficiency gains, could be realized. The commonly heard trends of a disappearance of the medium sized companies and large sized companies turning into full service logistics providers are not believed by most survey respondents and are therefore also not likely to happen by 2021. Although some changes in the current market structure of the Dutch container trucking sector will be beneficial in terms of efficiency and bargaining power, almost all potential market structure changes are not expected to happen soon. Unfortunately, this may again be an indication of the conservative character of the sector.

Table 24: Market structure statements for 2021* (expectations)

		Small	**Medium**	**Large**	**Total**
Survey Q18/19 (market structure statements)		2021 $\bar{x}$	2021 $\bar{x}$	2021 $\bar{x}$	2021 $\bar{x}$
Large companies will take over small companies		6,50	4,75	2,78	4,48
Large companies will function as director for small companies		7,17	5,67	4,67	5,67
Medium companies will disappear due to not keeping up with automation		6,67	4,25	5,11	5,07
Large companies will take over medium companies		5,50	4,00	2,56	3,85
Large companies will function as director for medium companies		6,00	4,17	4,22	4,59
Companies will emerge with more than 1.000 trucks		4,17	5,17	3,89	4,52
Dutch container trucking companies taking over role of freight forwarder		5,00	4,50	4,22	4,52
The Dutch container trucking sector will remain the same as in 2016		4,17	4,25	4,56	4,33
		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**
Survey Q18/19 (market structure statements in 2021; strength of consensus)					
Large companies will take over small companies	$\mu = \bar{x}$	0,90	0,77	0,81	0,77
	$\mu = 1$	0,47	0,63	0,83	0,66
	$\mu = 10$	0,68	0,46	0,23	0,43
Large companies will function as director for small companies	$\mu = \bar{x}$	0,95	0,78	0,77	0,80
	$\mu = 1$	0,39	0,54	0,64	0,54
	$\mu = 10$	0,75	0,57	0,45	0,57
Medium companies will disappear due to not keeping up with automation	$\mu = \bar{x}$	0,85	0,80	0,76	0,79
	$\mu = 1$	0,44	0,69	0,58	0,60
	$\mu = 10$	0,69	0,41	0,50	0,50
Large companies will take over medium companies	$\mu = \bar{x}$	0,87	0,80	0,83	0,79
	$\mu = 1$	0,57	0,71	0,84	0,73
	$\mu = 10$	0,57	0,38	0,19	0,36
Large companies will function as director for medium companies	$\mu = \bar{x}$	0,86	0,81	0,73	0,78
	$\mu = 1$	0,51	0,70	0,67	0,65
	$\mu = 10$	0,62	0,41	0,39	0,45
Companies will emerge with more than 1.000 trucks	$\mu = \bar{x}$	0,84	0,78	0,73	0,77
	$\mu = 1$	0,71	0,59	0,70	0,65
	$\mu = 10$	0,41	0,52	0,35	0,44
The Dutch container trucking sector will remain the same as in 2016	$\mu = \bar{x}$	0,81	0,76	0,77	0,78
	$\mu = 1$	0,70	0,68	0,64	0,67
	$\mu = 10$	0,41	0,40	0,44	0,42
Dutch container trucking companies taking over role of freight forwarder	$\mu = \bar{x}$	0,88	0,86	0,79	0,84
	$\mu = 1$	0,63	0,67	0,68	0,67
	$\mu = 10$	0,51	0,45	0,40	0,45

* The expectation of the statements becoming reality in 2021 is measured via a 1-10 scale, whereby 1 denotes 'very unlikely' and 10 denotes 'very likely'

5.8.3 Potential impact of the change in 'key partners' on the business model

It is important that the Dutch container trucking sector increases its level of horizontal cooperation due to the corresponding benefits. Horizontal cooperation leads to efficiency gains, and thus decreases the costs, by realizing synergies. According to transport economic literature, horizontal cooperation will eventually lead to (1) operational synergies, (2) coordination synergies and (3) network synergies (Cruijssen, Dullaert, & Fleuren, 2007). If a large integration of horizontal cooperation will be achieved, it is most likely that the business model will be positively affected. Costs will be lowered and efficiency gains will be realized which are factors that are highly influencing the profitability of the Dutch container trucking companies. Secondly, although hardly any market structural changes are expected, the small companies (partly) being taken over by large sized companies could lead to cost savings. The large sized companies will increase in size, whereby economies of scale could be achieved. Additionally, also the position of the container trucking companies within the hinterland trucking chain could be strengthened by this due to the realization of a more unified and less fragmented sector.

5.9 Cost structure

5.9.1 The expectation of further increasing costs

Operating a business implies making costs which is also the case for Dutch container trucking companies. From the interviews appeared that the Dutch companies are dealing with different multiple cost components such as the relatively large fuel and labor costs, but also relatively smaller ones such as toll and maintenance costs. Currently, the Dutch container trucking companies are facing several problems due to the not increasing freight fares, whilst the costs of the companies are rising. This threatens the financial health and profitability of the Dutch container trucking sector's future. Since the specific cost structure of a Dutch container trucking company is not entirely known, the survey questioned to indicate the cost structure by allocating percentage shares of different faced cost components (Table 25). The following can be stated:

- In 2016, labor (45%) and fuel (23%) were, on average, the largest cost components.
- In 2016, many (relatively small) cost components of medium and large sized companies were, in proportion, lower than small sized companies which may indicate economies of scale benefits.
- The entire sector expects that the toll costs will increase the most ($\bar{x} = 3{,}67$), especially by the small sized companies ($\bar{x} = 4{,}00$).
- The entire sector expects that the labor, fuel and automation costs will increase strongly.
- The entire sector does not expect that any cost component will decrease.
- A strong consensus amongst the entire sector exists that every cost component will increase, except for the fuel ($sCns_{3,26} = 0{,}87$) and automation ($sCns_{3,48} = 0{,}88$) costs.

Firstly, it is remarkable that the respondents, especially medium and large sized companies, expect an increase of the automation costs. This could indicate that these type of companies expect to invest in the automation of processes. This automation, however, brings a lot of investment costs

and not all companies will be able to afford this. Although automation involves additional costs, it could also lead to cost savings. For instance, labor and administration costs could be diminished. Secondly, it is not surprising that the labor costs and fuel costs are currently, and also expected to be, the largest cost components of a Dutch container trucking company. These two cost components represent the two most important assets in the business model, the trucks and workforce. Lastly, all size classifications expect that most cost components will increase in the future. This could implicate that the pressure on the profitability of Dutch container trucking companies will increase, if the revenue streams do not grow proportionally. For this reason, it is even more important that the Dutch container trucking companies are becoming more cost aware, since during the interviews was often heard that some companies do not know their exact cost structure and revenue streams.

Table 25: Cost structure in 2016 and 2021* (expectations)

	Small		**Medium**		**Large**		**Total**	
	2016	2021	2016	2021	2016	2021	2016	2021
Survey Q39 (cost structure)	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$
Labor costs trucking drivers	28%	3,67	38%	3,58	38%	3,67	35%	3,63
Labor costs office staff	3%	3,33	7%	3,50	19%	3,56	10%	3,48
Fuel costs	28%	3,17	24%	3,42	18%	3,11	23%	3,26
Toll costs	6%	4,00	3%	3,58	2%	3,56	3%	3,67
Maintenance costs	7%	3,33	6%	3,33	4%	2,78	5%	3,15
Insurance costs	5%	3,50	4%	3,50	3%	3,11	4%	3,37
Administration costs	4%	3,17	4%	3,42	2%	2,89	3%	3,19
Financing costs	8%	3,00	2%	3,25	3%	3,22	4%	3,19
Depreciation costs	9%	3,17	5%	3,25	5%	2,89	6%	3,11
Housing costs	2%	3,33	4%	3,33	3%	2,78	3%	3,15
Automation costs	1%	3,33	3%	3,75	3%	3,22	3%	3,48

		sCns Small	**sCns Medium**	**sCns Large**	**sCns Total**
Survey Q39 (cost structure in 2021; strength of consensus)					
Labor costs trucking drivers	$\mu = \bar{x}$	0,92	0,91	0,92	0,91
	$\mu = \bar{1}$	0,41	0,43	0,41	0,42
	$\mu = \bar{5}$	0,73	0,71	0,73	0,72
Labor costs office staff	$\mu = \bar{x}$	0,92	0,91	0,91	0,91
	$\mu = \bar{1}$	0,50	0,45	0,44	0,46
	$\mu = \bar{5}$	0,66	0,70	0,71	0,69
Fuel costs	$\mu = \bar{x}$	0,84	0,90	0,89	0,87
	$\mu = \bar{1}$	0,53	0,55	0,55	0,51
	$\mu = \bar{5}$	0,61	0,67	0,60	0,63
Toll costs	$\mu = \bar{x}$	0,87	0,91	0,91	0,90
	$\mu = \bar{1}$	0,30	0,43	0,44	0,41
	$\mu = \bar{5}$	0,80	0,71	0,71	0,73
Maintenance costs	$\mu = \bar{x}$	0,92	0,90	0,94	0,92
	$\mu = \bar{1}$	0,50	0,49	0,63	0,54
	$\mu = \bar{5}$	0,66	0,66	0,53	0,61
Insurance costs	$\mu = \bar{x}$	0,91	0,91	0,96	0,91
	$\mu = \bar{1}$	0,45	0,45	0,56	0,49
	$\mu = \bar{5}$	0,70	0,70	0,61	0,67
Administration costs	$\mu = \bar{x}$	0,95	0,91	0,92	0,92
	$\mu = \bar{1}$	0,54	0,48	0,1	0,53
	$\mu = \bar{5}$	0,62	0,68	0,55	0,62
Financing costs	$\mu = \bar{x}$	0,87	0,91	0,90	0,90
	$\mu = \bar{1}$	0,57	0,52	0,52	0,53
	$\mu = \bar{5}$	0,56	0,64	0,63	0,62
Depreciation costs	$\mu = \bar{x}$	0,83	0,93	0,96	0,92
	$\mu = \bar{1}$	0,52	0,52	0,61	0,55
	$\mu = \bar{5}$	0,60	0,64	0,56	0,60
Housing costs	$\mu = \bar{x}$	0,92	0,92	0,94	0,93
	$\mu = \bar{1}$	0,50	0,50	0,63	0,54
	$\mu = \bar{5}$	0,66	0,66	0,53	0,61
Automation costs	$\mu = \bar{x}$	0,92	0,93	0,87	0,88
	$\mu = \bar{1}$	0,50	0,47	0,52	0,45
	$\mu = \bar{5}$	0,66	0,75	0,63	0,69

* The expectations of 2021 are measured via a Likert scale (1-5), whereby the values denote the change compared to 2016
1 = large negative change, 2 = small negative change, 3 = no change, 4 = small positive change, 5 = large positive change

5.9.2 Potential impact of the change in 'cost structure' on the business model

The costs are, logically, directly negatively affecting the profitability of Dutch container trucking companies. Since the costs, especially labor and fuel costs, are likely to increase, an increase in pressure on the profitability is expected. On the other hand, as mentioned in section 5.5.1, also the revenue streams are expected to increase. It is important that this increase in revenue streams is in proportion with the increase in costs, otherwise the profitability of Dutch container trucking companies will further destabilize. Since it is hard to quantify the expected changes in both revenue streams and cost components, it is still rather uncertain how the profitability of the Dutch container trucking companies will develop in future years. However, a very important issue is the lack in cost awareness amongst the Dutch container trucking companies and it is advisable that companies acquire more knowledge regarding this topic.

6. Conclusions

6.1 Key findings

The Dutch container trucking sector has perpetually been of large importance to the national logistic industry yet despite this, both its current characteristics and its future prospects have evaded thorough scientific research. Additionally, the little scientific research that has been done, has become to a certain extent, obsolete. Therefore, TLN commissioned this research in order to gain more insight in to and understanding about the current situation of the Dutch container trucking sector. The primary objective of this study was to indicate potential internal changes which are likely to have an impact on the business model of Dutch container trucking companies in 2021. A structured research process composed of four different phases was utilised in order to determine these expected changes:

1) Logistic magazines were reviewed and interviews with Dutch container trucking companies were conducted.
2) The BMC framework was selected and used as guideline for the in-depth interviews conducted with organizations that are part of the Dutch maritime supply chain. The results from these interviews were translated into 5 different trends.
3) A survey was crafted and sent out to 236 Dutch container trucking companies in order to quantify the current characteristics and future expectations of the sector (response 11,4%).
4) The results of the survey were descriptively analysed and the agreement amongst different sized container trucking companies were measured via a consensus analysis. The results of both the survey and the analysis functioned as an input for designing the BMC of the Dutch container trucking companies.

The first sub-question dealt with the analysis of the current structure of the Dutch container trucking sector. This sector is part of the trucking hinterland chain and deals with several actors on a daily basis, such as freight forwarders, terminal operators and shipping lines. The power base of these large actors is negatively affecting the position of the companies within the Dutch container trucking sector and together with the near-perfect competition market structure of this sector, little bargaining power is held by Dutch container trucking companies. In addition, the sector is exposed to severe and increasing competition from rail and inland waterway transport and together with its near-perfect competition market structure - which involves a fragmentation of the sector - any form of profitability is challenging to obtain. Whilst it may sound like this sector is doomed to continue to exist, several positive expectations lie ahead. Its core business of delivering and picking-up containers is most likely to generate more cash inflow by 2021 as a result of the expected recovery of freight rates, an increase in the customer base and an increase in the frequency of purchase of container transport services. Lending credence to this expectation is the recently realized 0,10% increase of freight rates of the Dutch container trucking sector as seen in the third quarter of 2016.

The second and third sub-questions focused on the business model of the Dutch container trucking sector and how it will change by 2021. There are five different trends expected to exert influence on the business model of the Dutch container trucking companies by 2021. Although these trends may affect certain components of the business model of these companies, it is not expected that its core components will change entirely. Unaffected core components are for example the method of generating revenue (offering delivery and picking-up services for containers), the type of customers and the external parties a container trucking companies will have to deal with.

The first trend is horizontal cooperation. This is expected to become more important by 2021, although there is still uncertainty as to in which form. Most likely is an increase in mutual information sharing, sharing empty trips and chartering of trips. These means may result in substantial efficiency gains for the Dutch container trucking companies. Secondly, key activities, especially those involving third parties, are expected to become more complex. This will require more educated (and more expensive) staff. To cut labor costs, Dutch container trucking companies are likely to employ foreign trucking drivers, mainly from Eastern-Europe. However, employing staff originating from relatively cheap labor markets may involve an increase in communication problems. Thirdly, the level of automation is likely to increase, especially amongst medium and large sized container trucking companies. Increasing automation will have a positive cost impact in the long run, but relatively large investment will be required in the short term which is not always feasible for all companies due to insufficient financial resources. Although many rumours abound regarding technological innovations, such as platooning and autonomous driving, it is not expected that these will have a major impact within the upcoming five years. Fourthly, it is particularly expected for medium and large sized Dutch container trucking companies that there will be an increased focus on diversification, since small sized companies are already rather specialized. The most likely aspects to be focused on to achieve diversification are sustainability, data sharing with customers and offering sufficient truck capacity. Lastly, the final trend that is expected to affect the business model of Dutch container trucking companies concerns one change in the market structure: large sized companies are expected to take over, or function as director of, small sized companies. Furthermore, additional expected trends in the market structure are the transition of large sized companies into full logistic service providers and also the disappearance of medium sized companies. However, neither of these two occurrences are expected to take place within the next five years and therefore do not fall within the scope of this research as it stands. Additionally, although it not being a trend, the cost awareness amongst Dutch container trucking companies is a serious problem. Not all companies are aware of their exact revenue and costs, resulting in profitability issues amongst the entire sector. Therefore, it is crucial that the Dutch container trucking companies, in particular the small sized ones, are able to identify both their revenue and cost structure in order to prevent further declines in profitability.

6.2 Recommendations and limitations

First of all, some discussed innovations and trends will take longer than five years to be fully put into practice and therefore fell outside the scope of this study. One of those developments is platooning. Although it is in a late development stage, Dutch container trucking companies still do not expect its breakthrough within five years. The breakthroughs of other developments, such as autonomous and electric driving, are expected to be even further away in time. However, if these developments manage to be practiced on a large scale, the effect on the business model of Dutch container trucking companies could be enormous. Due to the large potential of these developments, it is recommended for future research to expand its temporal scope in order to provide a greater focus on these developments. Additionally, this research only discussed trends that followed from the interviews, therefore some crucial trends may be missing out. For instance, start-up ideas (such as Convoy and foldable containers), developments at external parties (such as remote check-in), the development of worldwide container throughput and developments in (European) legislation may be interesting factors that could be incorporated in future research.

Secondly, future research should aim for a higher response rate. This not only creates more reliable results, but with the same type of currently used data, more advanced statistical tests could be performed such as OLS, ordered logit models and a Kruskal-Wallis test. In addition, in case of a relatively low response rate, the consensus analysis does not provide rather specific results. As one could have read, most of the time the consensus analysis concluded that all size classifications share the same opinion, whereby no substantial differences between the size classifications could be observed. Therefore, increasing the size of the sample is important to achieve more specific observations and, in addition, this will also lead to more reliable results.

Thirdly, the survey was spread solely amongst members of AZV/TLN which could potentially lead to a bias amongst the results. In particular, small sized Dutch container trucking companies may not be interested in joining a logistics association and would therefore be under-represented amongst the survey respondents. Also, the interviews were conducted with only relatively large sized Dutch container trucking companies that were also part of the board of AZV/TLN. This could have led to a bias in the determination of the possible future trends; large sized companies may expect different trends than their medium and small sized counterparts. On the other hand, these large sized companies can be seen as leader firms and are therefore more likely to be aware of future developments and innovations within the industry. In addition, for the analyses of matters that require collective action, the conducting of interviews/surveys amongst companies that are members of an association can actually be perceived as a benefit; the association of members will make collective action more approachable.

Lastly, this research has been performed in the rather specific context around the port of Rotterdam. Therefore, it is recommended to reproduce this research for other ports or submarkets of TLN in order to be able to make comparisons. These comparisons could give more specific insights and better understandings of the (Dutch) container trucking sector.

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8. Appendix

8.1 Overview of conducted interviews

Table 26: Overview of conducted interviews in the first and second phases

Date	Interviewee(s)	Company Name	Location
Phase One: Explanatory phase			
6th of June 2016	Frans van den Boom	Groenenboom Transport	Ridderkerk
7th of June 2016	Marco Post	H.N. Post en Zonen B.V.	Pijnacker
Phase Two: In-depth interviews and framework selection			
21st of June 2016	Cees Deelen	Port Authority of Rotterdam	Rotterdam
30th of June 2016	Aad Scholten and Tara de Graaf	ECT	Rotterdam
30th of June 2016	Jouke Schaap	APM Terminals	Rotterdam
30th of June 2016	Jan Verlaan	De Jong – Grauss Transport B.V.	Hoogvliet
1st of July 2016	Rob Bagchus	ECT	Rotterdam
1st of July 2016	Jasper Nagtegaal	VRTO/DeltaLinqs	Rotterdam
4th of July 2016	Johan Groeneveldt and Fred Visser	HebraGTO	Rotterdam
5th of July 2016	Lodewijk Wisse and Patricia de Wilde	EVO	Zoetermeer
6th of July 2016	Menno Duin	VRC	Rotterdam
6th of July 2016	Gertjan van der Most	Van der Most Transport BV	Rotterdam
7th of July 2016	Jordy Bakker	Portbase	Rotterdam
8th of July 2016	Robin van Leijen	Fenex	Rotterdam

8.2 Example of the conducted survey

Onderzoek naar positie van de wegvervoerder in de containersector

De vragen in deze enquête gaan in op de containerwegvervoerder en bijbehorende partijen. De resultaten die deze enquête oplevert, zullen geanalyseerd worden voor twee masterscripties aan de Erasmus Universiteit in Rotterdam. Deze masterscripties zijn in opdracht van de deelmarkt Alliantie Zeevervoer (AZV) van Transport Logistiek Nederland (TLN) en zullen uiteindelijk leiden tot een nieuw beleidsplan (2016-2021). Dit beleidsplan zal zeecontainerwegvervoerders inzicht geven in (nieuwe) ontwikkelingen in de containersector.

In deze enquête zal gekeken worden naar 5 jaar geleden (2011), het heden (2016) en de toekomstige 5 jaar (2021). Wij willen benadrukken dat uw antwoorden vertrouwelijk worden behandeld, in zowel de scripties als in het bedrijfsplan zullen geen individuele antwoorden van bedrijven worden genoemd. Aan de hand van de individuele antwoorden zal er enkel een algemeen beeld van de sector worden afgeleid.

Bij bepaalde vragen is de volgende range weergeven: **- - / - / 0 / + / + +**. Wanneer deze range in beeld komt, wordt er gevraagd naar de verandering van 2011 en 2021 ten opzichte van 2016. Waarbij - - staat voor een grote negatieve verandering, - voor een negatieve verandering, 0 voor geen verandering, + voor een positieve verandering en ++ voor een grote positieve verandering.

Dit zal nu worden geïllustreerd aan de hand van een voorbeeldvraag:

"Geef aan hoe groot uw klantenbestand is op dit moment, of deze kleiner of groter was in 2011 en of u verwacht dat deze in 2021 is gegroeid of geslonken."

	2016	**Situatie in 2011**	**Verwachting voor 2021**
Totaal aantal klanten	**.....**	**- - / - / 0 / + / + +**	**- - / - / 0 / + / + +**

Wanneer u aangeeft dat u in 2016 in totaal 10 klanten had, kunt u met - - / - / 0 / + / + + aangeven of u er in 2011/2021 (verwacht) veel minder, iets minder, evenveel, iets meer of veel meer had (te hebben). Stel u vult bij 2011 een 0 in, dan wordt ervanuit gegaan dat er voor 2011 geen verandering van het aantal klanten

Indien u een vraag niet zeker weet, probeer dan een zo goed mogelijke schatting te maken of te kiezen voor een antwoord die het dichtst bij uw eigen mening ligt. Daarnaast is het mogelijk om bij enkele vragen extra informatie te geven indien u dit nodig acht. Dit zal erg worden gewaardeerd, omdat we hiermee uw redenering beter kunnen begrijpen.

Het invullen van de enquête duurt ongeveer 60 minuten. Wij zijn ons er van bewust dat dit enigszins tijdrovend is, maar wij geloven dat dit onderzoek ook voordelen voor u zou kunnen hebben. Alvast hartelijk bedankt voor uw medewerking.

Naam van het bedrijf (optioneel)	
Locatie(s) van het bedrijf in Nederland	
Locatie(s) van vestiging(en) in het buitenland	
Uw functie binnen het bedrijf	
Aantal jaren actief in de containervervoer markt	
Maakt u gebruik van andere transport modaliteiten naast trucks? (bijvoorbeeld trein en/of barge)	□ Ja, namelijk: … □ Nee
Voert u andere soorten transport uit naast zeecontainervervoer? (bijvoorbeeld bouwmaterialenvervoer)	□ Ja, namelijk: … □ Nee
Voert u andere activiteiten uit naast transport? (bijvoorbeeld warehousing)	□ Ja, namelijk: … □ Nee
Bent u anno 2016 een familiebedrijf?	□ Ja □ Nee

Algemeen

A) Hoeveel operationele trucks voor containervervoer gebruikte u per dag in 2016, hoe was de situatie in 2011 en geef daarnaast uw verwachting voor 2021 aan.

	2016	Situatie in 2011	Verwachting voor 2021
In eigen bezit		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Charter		-- / - / 0 / + / ++	-- / - / 0 / + / ++

B) Hoeveel werknemers, die werkzaam zijn voor de container afdeling, had u in dienst in 2016, hoe was dit in 2011 en geef tot slot uw verwachting voor 2021 aan.

	2016	Situatie in 2011	Verwachting voor 2021
Chauffeurs		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Planners		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Administratieve medewerkers		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Management		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Overige werknemers (zoals monteurs, facilitair medewerkers, etc.)		-- / - / 0 / + / ++	-- / - / 0 / + / ++

Klant

1) Geef aan hoe groot uw klantenbestand, met betrekking tot containertransport, is op dit moment, of deze kleiner of groter was in 2011 en of u verwacht dat deze in 2021 is gegroeid of geslonken.

	2016	Situatie in 2011	Verwachting voor 2021
Totaal aantal klanten voor containertransport		-- / - / 0 / + / ++	-- / - / 0 / + / ++

2) Geef per partij aan welk aandeel zij ongeveer heeft in uw klantenbestand, of deze kleiner of groter was in 2011 en of u verwacht dat deze in 2021 is gegroeid of geslonken (verdeel totaal 100% over de verschillende partijen). ***Bijvoorbeeld wanneer u 40% toekent aan 'verlader', wil dit zeggen dat 40% van uw klanten bestaat uit verladers.***

Partij	Percentage 2016	Situatie in 2011	Verwachting voor 2021
Verlader	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Expediteur	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Rederij	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Terminal	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Collega wegvervoerders	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Anders, namelijk: ...	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
	= 100%		

3) Geef het aandeel van elk communicatiekanaal aan waarmee u uw klanten bereikte in 2016, of dit percentage kleiner of groter was in 2011 en of u verwacht dat deze in 2021 is gegroeid of geslonken (verdeel totaal 100% over de verschillende communicatiekanalen). ***Bijvoorbeeld wanneer u 40% toekent aan 'telefoon', wil dit zeggen dat 40% van de communicatie met de klant wordt uitgevoerd over de telefoon.***

Communicatiekanaal	Percentage 2016	Situatie in 2011	Verwachting voor 2021
Telefoon	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
E-mail	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Fax	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Face-to-Face	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Portbase	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Rechtstreeks vanuit eigen systeem	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Anders, namelijk: ...	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
	= 100%		

4) Geef het aandeel van elk van onderstaande klanten aan voor 2016, of dit percentage kleiner of groter was in 2011 en of u verwacht dat deze in 2021 is gegroeid of geslonken (verdeel totaal 100% over de verschillende soorten klanten). ***Bijvoorbeeld wanneer u 40% toekent aan 'dagelijks', wil dit zeggen dat 40% van de klanten dagelijks een dienst met betrekking tot containertransport bij u afneemt.***

Soort klant	Percentage 2016	Situatie in 2011	Verwachting voor 2021
Klanten die **dagelijks** een dienst van u verlangen?	.....%	-- / - / **0** / + / ++	-- / - / **0** / + / ++
Klanten die **wekelijks** een dienst van u verlangen?	.....%	-- / - / **0** / + / ++	-- / - / **0** / + / ++
Klanten die **maandelijks** een dienst van u verlangen?	.....%	-- / - / **0** / + / ++	-- / - / **0** / + / ++
Klanten die **halfjaarlijks** een dienst van u verlangen?	.....%	-- / - / **0** / + / ++	-- / - / **0** / + / ++
Klanten die **jaarlijks** een dienst van u verlangen?	.....%	-- / - / **0** / + / ++	-- / - / **0** / + / ++
Klanten die **eenmalig** een dienst van u verlangen?	.....%	-- / - / **0** / + / ++	-- / - / **0** / + / ++
	= 100%		

5) In hoeverre klopt de volgende stelling voor uw bedrijf:

"20% van de klanten zorgt voor 80% van de omzet?"

Voor 2011:

□ Dit klopte

□ Dit klopte niet, het was namelijk: **….%** van de klanten zorgde voor 80% van de omzet.

Voor 2016:

□ Dit klopt

□ Dit klopt niet, het is namelijk: **….%** van de klanten zorgt voor 80% van de omzet.

Voor 2021:

□ Dit zal kloppen

□ Dit zal niet kloppen, het zal namelijk zijn: **….%** van de klanten zal zorgen voor 80% van de omzet.

Toelichting (optioneel):

6) Heeft u met onderstaande (belangrijkste[1]) partijen een contractuele relatie[2] (gehad) in 2011 of 2016 en verwacht in 2021 u een contractuele relatie met de belangrijkste partijen te hebben?

Contract met:	Korte termijn contract (≤ halfjaar)	Lange termijn contract (> halfjaar)
Belangrijkste verlader	2011: ja/nee 2016: ja/nee 2021: ja/nee	2011: ja/nee 2016: ja/nee 2021: ja/nee
Belangrijkste expediteur	2011: ja/nee 2016: ja/nee 2021: ja/nee	2011: ja/nee 2016: ja/nee 2021: ja/nee

[1] Met belangrijkste wordt de partij bedoeld die voor de meeste omzet zorgt.

[2] Met contractuele relatie wordt bedoeld dat bepaalde afspraken schriftelijk zijn vastgelegd.

Onderscheiden van collega wegvervoerders

7) Geef voor 2016 een cijfer van 1-10 waarbij u aangeeft hoe belangrijk de onderstaande karakteristieken binnen uw bedrijfsvoering zijn om uw bedrijf te onderscheiden van collega wegvervoerders. Cijfer 1 staat voor geheel onbelangrijk; hiermee onderscheid ik mijn bedrijf niet. Cijfer 10 staat voor heel belangrijk; hierbij ligt de focus om mijn bedrijf te onderscheiden. Geef daarnaast voor de jaren 2011 en 2021 aan in welke mate dit is veranderd/gaat veranderen.

Karakteristiek	2016 (1-10)	Situatie in 2011	Verwachting voor 2021
Prijs		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Specialisatie op type lading/container		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Specialisatie op bepaald geografisch gebied		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Aantoonbare kwaliteit (ISO, AEO, SQAS)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Betrouwbaarheid dat lading op tijd arriveert op bestemming		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Duurzaam opereren		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Capaciteit m.b.t. aantal trucks		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Informatie-uitwisseling van lading (track and trace, EDI)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Anders namelijk: ...		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Toelichting (optioneel):			

Personeel

8) Geef voor 2016 aan of u problemen ondervindt bij het vinden van de onderstaande type medewerkers, geef daarnaast aan of dit het geval was in 2011 en of u problemen verwacht voor 2021.

Problemen met het vinden van...	Situatie in 2011	2016	Verwachting voor 2021
...nieuwe chauffeurs	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
...nieuwe planners	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
...nieuwe administratieve medewerkers	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
...nieuw management	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
...overig personeel (zoals monteurs, facilitair medewerkers, etc.)	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
Toelichting (optioneel):			

9) Geef voor 2016 aan hoeveel procent van uw chauffeurs afkomstig is uit het buitenland[3] en in welke mate dit is veranderd/gaat veranderen voor de jaren 2011 en 2021.

	Percentage 2016	2011	2021
Percentage buitenlandse chauffeurs	.....%	- - / - / 0 / + / + +	- - / - / 0 / + / + +

[3] Met uit het buitenland wordt personeel afkomstig uit lageloonlanden bedoeld.

10) Om welke reden(en) zou u <u>geen</u> chauffeur afkomstig uit het buitenland[4] aannemen? (meerdere antwoordopties mogelijk)

□ Mogelijke problemen omtrent communicatie

□ Het rijgedrag

□ Resulteert in oneerlijke concurrentie

□ Gaat tegen het principe in van het bedrijf

□ Anders, namelijk:…

□Ik zou **<u>wel</u>** een buitenlandse chauffeur aannemen

[4] Met uit het buitenland wordt personeel afkomstig uit lageloonlanden bedoeld.

Toelichting (optioneel):

11) Om welke reden zou u <u>wel</u> een chauffeur afkomstig uit het buitenland[5] aannemen? (meerdere antwoordopties mogelijk)

□ Lager arbeidsloon

□ Werknemers tekort op Nederlandse arbeidsmarkt

□ Geen voorkeur wat betreft herkomst van de chauffeur

□ Voorkeur van klanten voor buitenlandse chauffeurs

□ Anders, namelijk: …

□ Ik zou **<u>geen</u>** buitenlandse chauffeur aannemen

[5] *Met uit het buitenland wordt personeel afkomstig uit lageloonlanden bedoeld.*

Toelichting (optioneel):

12) Merkt u dat er langzaam vergrijzing in ontwikkeling is binnen uw bedrijf?

□ Ja, ik heb mijn personeelsbestand om deze reden deels verjongd

□ Ja, ik ben van plan mijn personeelsbestand binnen 5 jaar te verjongen

□ Ja, ik ben van plan mijn personeelsbestand op de lange termijn (>5 jaar) te verjongen

□ Ja, ik merk dit maar ben niet van plan actie te ondernemen

□ Ja, maar het lukt niet om mijn bedrijf te verjongen

□ Nee

13) Hoe groot, op een schaal van 1-10, verwacht u dat de impact van de onderstaande ontwikkelingen op de arbeidsmarkt zal zijn binnen uw bedrijfsvoering voor 2021. Waarbij cijfer 1 staat voor geen impact/deze ontwikkeling zal geen invloed hebben op mijn bedrijfsvoering en cijfer 10 staat voor zeer grote impact/deze ontwikkeling zal grote invloed hebben op mijn bedrijfsvoering. Geef daarnaast aan of deze impact als iets positiefs of negatiefs zal worden ervaren.

Ontwikkeling	Verwachting voor 2021 (1-10)	Positieve of negatieve impact
Nieuwe regelgeving vanuit Brussel met betrekking tot arbeidsomstandigheden van gedetacheerde* werknemers. **tijdelijke uitzending van een werknemer door een werkgever naar een ander land* Denk aan het wetsvoorstel waarin zal staan dat: "gedetacheerde werknemers hetzelfde loon voor hetzelfde werk moeten ontvangen als waar werknemers in het gastland recht op hebben"		□ Positief □ Negatief
De trend dat er in de containersector meer vraag is naar HBO'ers en WO'ers		□ Positief □ Negatief
De trend van vergrijzing in de Nederlandse samenleving		□ Positief □ Negatief

14) Moeten de volgende zaken, met betrekking tot personeel, volgens u op nationaal of Europees niveau besloten worden?

Zaken	Nationaal of Europees niveau
Arbeidsomstandigheden gedetacheerde werknemers	□ Nationaal □ Europees
Minimumloon	□ Nationaal □ Europees
Sociale zekerheid	□ Nationaal □ Europees
Toelichting (optioneel):	

Automatisering

15) De onderstaande vier procesfases spelen een rol bij de dagelijkse werkzaamheden van een wegvervoerder. Geef op een schaal van 1 tot 10 aan of u de volgende processen heeft geautomatiseerd. Cijfer 1 staat voor geen automatisering/geheel handmatig en cijfer 10 staat voor geheel geautomatiseerd. Geef daarnaast voor de jaren 2011 en 2021 aan in welke mate dit is veranderd/gaat veranderen.

Procesfase	Proces	2016 (1-10)	2011	2021
Ontvangst/ invoer order	Controleren van de order of juiste informatie aanwezig is		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Invoeren van de order		-- / - / **0** / + / ++	-- / - / **0** / + / ++
Planning	Indelen van zendingen		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Indelen van chauffeurs		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Indelen van voertuigen		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Voormelden		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Reserveringen van slottijden		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Overige activiteiten, zoals codes aanvragen etc.		-- / - / **0** / + / ++	-- / - / **0** / + / ++
Uitvoering orders	Communicatie met chauffeur		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Procedures op de terminal (denk aan remote check-in, gebruik cargocard en doorgeven status van de container)		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Administratieve taken gerelateerd aan uitvoering orders (zoals vervangen van registratieformulieren, registreren van schades en afwijkingen)		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Controleren van de container (zoals visuele controle door de chauffeur, checken juistheid container)		-- / - / **0** / + / ++	-- / - / **0** / + / ++
Administratie	Facturatie		-- / - / **0** / + / ++	-- / - / **0** / + / ++
	Overig: zoals verzekeringen, schades, snipperdagen etc.		-- / - / **0** / + / ++	-- / - / **0** / + / ++
Toelichting (optioneel):				

16) De onderstaande vier procesfases spelen een rol bij de dagelijkse werkzaamheden van een wegvervoerder.

a) Geef allereerst aan op een schaal van 1-10 in hoeverre de taken binnen deze procesfases complexer zijn geworden tussen 2011-2016. Cijfer 1 staat voor geen verandering in de mate van complexiteit en cijfer 10 staat voor een zeer sterke toename in complexiteit.

b) Geef aan in welke mate u verwacht dat de complexiteit in 2016-2021 ten opzichte van 2011-2016 gaat veranderen.

c) Geef daarnaast aan welk effect dit heeft op het benodigde personeel. Is er een hoger opleidingsniveau benodigd, is er meer personeel nodig of is er niets veranderd met betrekking tot personeel.

d) Geeft tot slot aan, indien de taak complexer is geworden, of automatisering de complexiteit enigszins heeft kunnen verminderen

e) Geef een korte toelichting hoe u tot het antwoord komt.

Procesfase	**Proces**	**(a) Cijfer 2016 (1-10)**	**(b) Verwachting 2016-2021**	**(c) Effect op personeel**	**(d) Automatisering heeft complexiteit verminderd**
Ontvangst/ invoer order	Controleren van de order of juiste informatie aanwezig is		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
	Invoeren van de order		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
(e) Toelichting:					
Planning	Indelen van zendingen		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
	Indelen van chauffeurs		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
	Indelen van voertuigtuigen		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
	Voormelden		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee

Procesfase	Karakteristieken	(a) Cijfer 2016 (1-10)	(b) Verwachting 2016-2021	(c) Effect op personeel	(d) Automatisering heeft complexiteit verminderd
Planning (vervolg)	Reserveringen van slottijden		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering personeel	□ Ja □ Nee
	Overige activiteiten, zoals codes aanvragen etc.		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
(e) Toelichting:					
Uitvoering orders	Communicatie met chauffeur		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
	Procedures op de terminal (denk aan remote check-in en doorgeven status van de container)		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
	Controleren van de container (zoals visuele controle door de chauffeur, checken juistheid container)		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
(e) Toelichting:					
Administratie	Facturatie		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
	Overig: zoals verzekeringen, schades, snipperdagen etc.		**- - / - / 0 / + / + +**	□ Hoger niveau □ Meer personeel □ Geen verandering	□ Ja □ Nee
(e) Toelichting:					

17) Zijn er naast bovengenoemde activiteiten (zoals controleren van de container, voormelden, reserveren van slottijden, etc.) nog meer activiteiten die u moet doen en die u mist in bovenstaande tabellen?

Toelichting:

Marktvorm

18) In hoeverre op een schaal van 1-10 verwacht u dat onderstaande stellingen in 2021 werkelijkheid zijn geworden? Waarbij cijfer 1 staat voor zeer onwaarschijnlijk en cijfer 10 staat voor zeer waarschijnlijk.

Stellingen	Verwachting voor 2021 (1-10)
De grote wegvervoerders[6] zullen de kleine wegvervoerders in de markt hebben opgekocht.	
De grote wegvervoerders zullen als regisseur[7] functioneren voor de kleine wegvervoerders.	
De middelgrote wegvervoerders zullen uit de markt zijn verdwenen omdat ze niet mee konden komen met de automatisering.	
De grote wegvervoerders zullen de middelgrote wegvervoerders in de markt hebben opgekocht.	
De grote wegvervoerders zullen als regisseur functioneren voor de middelgrote wegvervoerders.	
Er zullen wegvervoerders ontstaan met meer dan 1.000 trucks.	
De wegvervoersector zal er hetzelfde uit zien als in 2016.	
Toelichting (optioneel):	

[6] Grote speler: ≥80 trucks voor containervervoer

Middelgrote speler: 6 tot 80 trucks voor containervervoer

Kleine speler: ≤ 5 trucks voor containervervoer

[7] Met regisseur wordt bedoeld dat de grotere partij taken, zoals de planning en administratie, voor de kleinere partij regelt. De kleine partij hoeft zich enkel te focussen op het rijden van A naar B

19) In hoeverre op een schaal van 1-10 verwacht u dat onderstaande stellingen in 2021 werkelijkheid zijn geworden? Waarbij cijfer 1 staat voor zeer onwaarschijnlijk en cijfer 10 staat voor zeer waarschijnlijk.

	Verwachting voor 2021 (1-10)
De wegvervoerder zal de rol van expediteurs over hebben genomen	
De terminals zullen de rol van expediteurs over hebben genomen	
De verladers zullen de rol van expediteurs over hebben genomen	
De rederijen zullen de rol van expediteurs over hebben genomen	
De expediteurs zullen de rol van expediteurs blijven vervullen in 2021	
Anders, namelijk: …	
Toelichting (optioneel):	

Duurzaamheid en milieu

20) Geef voor de jaren 2011 en 2016 aan hoeveel procent van de voertuigen met een bepaalde motor zijn uitgerust (verdeel totaal 100% over de verschillende soorten voertuigen). Geef daarnaast voor het jaar 2021 aan in welke mate dit is veranderd/gaat veranderen.

Soort voertuig	Percentage 2011	Percentage 2016	Verwachting voor 2021
Euro 4	.....%	.....%	-- / - / 0 / + / ++
Euro 5	.....%	.....%	-- / - / 0 / + / ++
Euro 6	.....%	.....%	-- / - / 0 / + / ++
Alternatieve brandstof	.....%	.....%	-- / - / 0 / + / ++
	= 100%	**= 100%**	

21) Wat is de belangrijkste reden voor uw bedrijf om voor duurzaamheid te kiezen? (één antwoord aankruisen)

□ People, mensen binnen en buiten de onderneming

□ Planet, de gevolgen voor het (leef)milieu

□ Profit, de voortbrenging en economische effecten van goederen en diensten

22) Op welke manier heeft u geprobeerd om uw bedrijf duurzamer te maken in de tijdperiode 2011-2016? (meerdere antwoordopties mogelijk). Geef daarnaast voor iedere methode aan of u verwacht in 2021 meer, minder of geen gebruik van deze methode te zullen maken.

2011-2016	Verwachting voor 2021
□ Schonere motoren gebruiken	-- / - / 0 / + / ++
□ Gebruik maken van LNG	-- / - / 0 / + / ++
□ Gebruik maken van biobrandstof	-- / - / 0 / + / ++
□ Elektrisch rijden	-- / - / 0 / + / ++
□ Reduceren lege kilometers	-- / - / 0 / + / ++
□ Bundelen van ritten	-- / - / 0 / + / ++
□ Schaalvergroting	-- / - / 0 / + / ++
□ Modal shift naar andere modaliteiten	-- / - / 0 / + / ++
□ Anders, namelijk: …	-- / - / 0 / + / ++
Toelichting (optioneel):	

23) Merkt u dat opdrachtgevers vragen om duurzamere operationele activiteiten in 2011, 2016 en 2021?

Situatie in 2011 … van de opdrachtgevers heeft hierom gevraagd	2016 … van de opdrachtgevers heeft hierom gevraagd	Verwachting voor 2021 … van de opdrachtgevers zal hierom vragen
□ Nee □ < 25%... □ 25% - 50%… □ 50% - 75%… □ > 75%…	□ Nee □ < 25%... □ 25% - 50%… □ 50% - 75%… □ > 75%…	□ Nee □ < 25%... □ 25% - 50%… □ 50% - 75%… □ > 75%…
Toelichting (optioneel):		

Ontwikkelingen

24) Geef op een schaal van 1-10 voor onderstaande technologische ontwikkelingen aan of u verwacht dat deze in de tijdsperiode 2016-2021 een rol gaan spelen in de wegvervoersector. Cijfer 1 staat voor totaal geen rol en cijfer 10 staat voor een zeer grote rol. Indien u niet bekend bent met de technologische ontwikkeling voer dan een 0 in. Geef tot slot aan of u dit een negatieve of positieve ontwikkeling vindt.

W*anneer u bijvoorbeeld cijfer 3 toekent aan platooning, houdt dit in dat u verwacht dat platooning een beperkte rol zal gaan spelen binnen de sector. Vervolgens moet u aangeven of u het ontstaan van platooning een positieve of negatieve ontwikkeling vindt.*

Technologische ontwikkeling	Cijfer (1-10)	Positieve of negatieve ontwikkeling?
Elektrisch rijden		□ Positief □ Negatief
Autonoom rijden van trucks		□ Positief □ Negatief
Rijden met trucks op LNG		□ Positief □ Negatief
Gebruik van LZV's		□ Positief □ Negatief
Platooning		□ Positief □ Negatief
Container Exchange Route (CER)		□ Positief □ Negatief
Maasvlakte Plaza; Central Gate		□ Positief □ Negatief
Geautomatiseerd platform om ritten te delen (zoals Box Reload)		□ Positief □ Negatief
3D-Printing		□ Positief □ Negatief
Inklapbare container		□ Positief □ Negatief
Toelichting (optioneel):		

25) Geef op een schaal van 1-10 voor onderstaande stellingen aan of u verwacht dat deze in 2016-2021 werkelijkheid zijn geworden. Cijfer 1 staat voor zeer onwaarschijnlijk en cijfer 10 staat voor zeer waarschijnlijk. Geef daarnaast aan of u verwacht dat deze stelling de positie van de wegvervoerder in de keten zal versterken of verzwakken.

Stellingen: de wegvervoerders zullen in 2021 ….	Verwachting voor 2021 (1-10)	Versterkt/verzwakt positie van wegvervoerder in de keten
.. onderling meer informatie gaan delen		□ Versterkt □ Verzwakt
.. meer informatie gaan delen met verladers		□ Versterkt □ Verzwakt
.. meer informatie gaan delen met expediteurs		□ Versterkt □ Verzwakt
.. meer informatie gaan delen met rederijen		□ Versterkt □ Verzwakt
.. meer informatie gaan delen met terminals		□ Versterkt □ Verzwakt
.. synchromodaal vervoer aanbieden aan hun klanten		□ Versterkt □ Verzwakt
.. zich focussen op de last mile[8]		□ Versterkt □ Verzwakt
Toelichting (optioneel):		

[8] Met last mile wordt bedoeld dat het wegvervoer enkel wordt gebruikt voor korte afstanden, zoals van een inland terminal naar de bestemming (houd spoedtransport buiten beschouwing)

26) Verwacht u dat in 2021 het aantal containers dat wordt vervoerd over de weg zal toenemen, afnemen of gelijk zal blijven voor Rotterdam, Antwerpen en Hamburg? Bepaal dit uit het oogpunt van de gehele Nederlandse sector, maar ook vanuit enkel uw bedrijf. Geef daarnaast een kleine toelichting.

	Nederlandse sector	**Eigen bedrijf**
Rotterdam	□ Sterk toenemen □ Licht toenemen □ Licht afnemen □ Sterk afnemen □ Blijft gelijk	□ Sterk toenemen □ Licht toenemen □ Licht afnemen □ Sterk afnemen □ Blijft gelijk □ Ik ben hier niet actief
Toelichting:		

	Nederlandse sector	**Eigen bedrijf**
Antwerpen	□ Sterk toenemen □ Licht toenemen □ Licht afnemen □ Sterk afnemen □ Blijft gelijk	□ Sterk toenemen □ Licht toenemen □ Licht afnemen □ Sterk afnemen □ Blijft gelijk □ Ik ben hier niet actief
Toelichting:		

	Nederlandse sector	**Eigen bedrijf**
Hamburg	□ Sterk toenemen □ Licht toenemen □ Licht afnemen □ Sterk afnemen □ Blijft gelijk	□ Sterk toenemen □ Licht toenemen □ Licht afnemen □ Sterk afnemen □ Blijft gelijk □ Ik ben hier niet actief
Toelichting:		

27) Verwacht u dat u in 2021 meer zaken zal doen in andere havens? Zo ja, waar en in welke mate?

Antwoord:

Slottijden

28) De opening van de twee nieuwe terminals op Maasvlakte-II hebben geleid tot de invoering van een slottijdsysteem. Bepaal of u het eens of oneens bent met onderstaande stellingen over de slottijden op een schaal van 1-10. Cijfer 1 staat voor zeer oneens en cijfer 10 staat voor zeer eens.

Stellingen	Cijfer (1-10)
Ik ben inmiddels gewend aan slottijden.	
Slottijden geven terminals een beter inzicht in de verwachte drukte op de terminal.	
Slottijden zullen voor 2021 ook op ECT en APM I zijn ingevoerd.	
Slottijden zullen voor 2021 ook op meerdere depots zijn ingevoerd.	
Slottijden zullen voor 2021 ook door meerdere klanten zijn ingevoerd.	
Slottijden halen de flexibiliteit uit de planning van de wegvervoerder.	
Het zou een goed idee zijn wanneer slots in daluren gratis worden aangeboden en dat er in de piekuren een kleine vergoeding moet worden betaald.	
Ik verwacht dat slottijden het congestie probleem op de terminal in grote mate verminderen.	
Slottijden zijn de toekomst.	
Slottijden hebben een voordeel voor wegvervoerders.	
Mijn klant houdt rekening met slottijden.	
Toelichting (optioneel):	

Portbase

29) Maakt u in 2016 dagelijks gebruik van Portbase? Geef daarnaast voor de jaren 2011 en 2021 aan in welke mate dit is veranderd/gaat veranderen.

2016	2011	2021
□ Ja □ Nee	**- - / - / 0 / + / + +** □ Ik gebruikte geen Portbase	**- - / - / 0 / + / + +** □ Ik ben niet van plan Portbase te gaan gebruiken
Toelichting (optioneel):		

30) Geef aan van welke services van Portbase u gebruik heeft gemaakt in 2011 en 2016. Geef daarnaast aan welke services u verwacht te gaan gebruiken in 2021 (meerdere antwoordopties mogelijk).

Situatie in 2011	2016	Verwachting voor 2021
□ Douance Scan Proces □ Melding Import Documentatie □ Transportopdracht □ Afmelding NCTS Export Containers □ Anders, namelijk: … □ Geen van allen	□ Douance Scan Proces □ Melding Import Documentatie □ Transportopdracht □ Afmelding NCTS Export Containers □ Anders, namelijk: … □ Geen van allen	□ Douance Scan Proces □ Melding Import Documentatie □ Transportopdracht □ Afmelding NCTS Export Containers □ Anders, namelijk: … □ Geen van allen
Toelichting (optioneel):		

31) Bepaal of u het eens of oneens bent met onderstaande stellingen over Portbase op een schaal van 1-10. Cijfer 1 staat voor zeer oneens en cijfer 10 staat voor zeer eens.

Stellingen	Cijfer (1-10)
Portbase wordt in 2021 door de gehele haven gebruikt.	
Portbase moet verplicht worden gesteld binnen de haven van Rotterdam.	
Portbase heeft ondernemen in de Rotterdamse haven vergemakkelijkt.	
Portbase moet meer concurrentie krijgen van andere platforms.	
Ik ben tevreden over Portbase.	

Samenwerking

32) Geef voor de volgende aspecten van samenwerking met collega wegvervoerders een rapportcijfer van 1 (zeer slecht) tot 10 (zeer goed) voor het jaar 2016. Geef daarnaast aan hoe frequent u van deze samenwerking gebruik maakt en met wie.

Samenwerking op het gebied van ….	Rapportcijfer 2016 (1-10)	Frequentie	Met wie?
..delen van lege ritten (denk aan het Boxreload principe[9])		□ Regelmatig □ Af en toe □ Nooit	□ Met een selecte groep □ Met iedereen □ Met niemand
..huren van trucks en/of opleggers van collega wegvervoerders		□ Regelmatig □ Af en toe □ Nooit	□ Met een selecte groep □ Met iedereen □ Met niemand
..uitcharteren van ritten (zonder combinatie) aan collega wegvervoerders		□ Regelmatig □ Af en toe □ Nooit	□ Met een selecte groep □ Met iedereen □ Met niemand
..delen van chauffeurs		□ Regelmatig □ Af en toe □ Nooit	□ Met een selecte groep □ Met iedereen □ Met niemand
Anders, namelijk: …		□ Regelmatig □ Af en toe □ Nooit	□ Met een selecte groep □ Met iedereen □ Met niemand

[9] Met het delen van lege ritten wordt bedoeld dat wanneer u enkel een rit heeft van locatie A naar locatie B en uw collega wegvervoerder enkel een rit heeft van locatie B naar locatie A, dat jullie deze ritten combineren en leeg rijden wordt voorkomen.

33) Welk aspect van samenwerking met collega wegvervoerders is het belangrijkst voor de jaren 2011, 2016 en 2021? Geef de samenwerking die u het belangrijkst vindt het cijfer 1, de samenwerking die u daarna het belangrijkst vindt het cijfer 2, etc. (dit houdt in dat de minst belangrijke samenwerking het cijfer 4 krijgt).

Samenwerking op het gebied van ….	Ranking 2011	Ranking 2016	Ranking 2021
..delen van lege ritten			
..huren van trucks en/of opleggers van collega wegvervoerders			
..uitcharteren van ritten (zonder combinatie) aan collega wegvervoerders			
..delen van chauffeurs			
Toelichting (optioneel):			

34) Hoe denkt u samenwerking met collega wegvervoerders te verbeteren in de komende 5 jaar? (uitgaande dat u samenwerking met collega wegvervoerders wilt verbeteren)

Toelichting:

35) Welk cijfer van 1-10 geeft u de relatie tussen wegvervoerder en *partij X* in 2016? Waarbij cijfer 1 inhoudt dat er zeer onvoldoende tot geen relatie is en cijfer 10 inhoudt dat er een perfecte relatie is. Geef daarnaast voor de jaren 2011 en 2021 aan in welke mate dit is veranderd/gaat veranderen.

Relatie tussen wegvervoerder en:	2016 (1-10)	Situatie in 2011	Verwachting voor 2021
ECT Delta terminal		-- / - / 0 / + / ++	-- / - / 0 / + / ++
APM Maasvlakte I		-- / - / 0 / + / ++	-- / - / 0 / + / ++
APM Maasvlakte II		n.v.t.	-- / - / 0 / + / ++
RWG		n.v.t.	-- / - / 0 / + / ++
Rederijen		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Verlader		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Bevrachter (Expediteur, die enkel transport koopt en verkoopt)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Expediteur (die zich naast inkoop en verkoop van transport ook bezig houdt met douane zaken, value added services etc.)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Havenbedrijf van Rotterdam		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Portbase		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Toelichting (optioneel):			

36) Met welke drie onderstaande partijen zou u, als wegvervoerder, de relatie als eerste willen verbeteren? (3 antwoorden aankruisen)

□ ECT Delta terminal

□ APM Maasvlakte I

□ APM Maasvlakte II

□ RWG

□ Rederijen

□ Verlader

□ Bevrachter

□ Expediteur

□ Havenbedrijf van Rotterdam

□ Portbase

Positie in de keten

37)

a) Geef voor iedere keten speler, op een schaal van 1 tot 10, aan hoe sterk de positie is binnen de keten. Cijfer 1 staat voor een zeer zwakke positie en cijfer 10 staat voor een zeer sterke positie.

b) Geef daarnaast aan welke keten speler de meeste invloed[10] heeft op het gehele proces van de keten voor de jaren 2011, 2016 en 2021. *De keten speler met de meeste invloed geeft u het getal 1, de keten speler die, volgens u, daarna de meeste invloed heeft getal 2, de speler die daarna de meeste invloed heeft getal 3 etc.*

Keten speler	(a) Macht in de keten (1-10)	(b) Situatie in 2011	(b) 2016	(b) Verwachting voor 2021
Verlader				
Expediteur				
Rederij				
Terminal				
Wegvervoerder				
Toelichting (optioneel):				

[10] Denk bij invloed aan alle factoren die zich binnen de keten afspelen zoals bepaling van de ritprijs, bepaling van modaliteit, tijdsplanning, etc.

Op de terminal

38) Geef voor onderstaande terminals een rapportcijfer, van 1 tot 10, voor 2016. Indien u nooit gebruik maakt van de terminal zet dan een 0 neer. Neem voor het bepalen van het cijfer de volgende zaken mee: (1) de tijd die het kost om een container te ontvangen of in te leveren, (2) de service die de terminal aan een wegvervoerder levert en (3) de algemene tevredenheid van de terminal. Geef daarnaast voor de jaren 2011 en 2021 aan in welke mate dit is veranderd/gaat veranderen.

Naam van Terminal	Rapportcijfer 1-10 1 = zeer slecht 10 = zeer goed voor 2016	Situatie in 2011	Verwachting voor 2021
Rotterdam World Gateway (Amoerweg 50)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
APM Terminal Maasvlakte II (Europaweg 910)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Euromax Terminal Rotterdam (Maasvlakteweg 951)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Rotterdam Container Terminal (Missouriweg 17)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
APM Terminals Rotterdam (Coloradoweg 50)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Delta Container Services (Missouriweg 30)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
ECT Delta Terminal (Europaweg 875)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
ECT Delta Barge Feeder Terminal (Europaweg 875)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Waalhaven Botlek Terminal (Nieuwesluisweg 268)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Container Terminal Twente (CTT) (Propaanweg 91)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Rotterdam Short Sea Terminals (Reeweg 35)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Uniport Multipurpose Terminals (Zaltbommelstraat 10)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Barge Center Waalhaven (Waalhaven Westzijde 62)		-- / - / 0 / + / ++	-- / - / 0 / + / ++
Toelichting (optioneel):			

Kosten- en winststructuur

39) Geef aan met percentages (schatting) hoe uw kosten zijn opgebouwd en geef daarnaast voor de jaren 2011 en 2021 aan in welke mate dit is veranderd/gaat veranderen (verdeel totaal 100% over de verschillende soorten kosten).

Soort kosten	Percentage 2016	Situatie in 2011	Verwachting voor 2021
Loonkosten van chauffeurs	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Brandstofkosten	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Administratiekosten	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Financieringskosten (interest, lening etc)	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Afschrijvingskosten van bezittingen	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Tolkosten	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Verzekeringskosten	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Onderhoudskosten van trucks (zoals nieuwe banden)	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Huisvestingskosten	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Automatiseringskosten	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Loonkosten van kantoorpersoneel	.....%	-- / - / 0 / + / ++	-- / - / 0 / + / ++
	=100%		
Toelichting (optioneel):			

40) Met hoeveel procent is de totale winst in 2016 gestegen of gedaald ten opzichte van 2011?

□ Gestegen met, …%

□ Gedaald met, …%

□ Onveranderd

41) Met hoeveel procent verwacht u dat de totale winst in de toekomende 5 jaar zal veranderen?

□ Zal stijgen met, …%

□ Zal dalen met, …%

□ Onveranderd

42) Wat was de omzet met betrekking tot containervervoer in 2016? Geef daarnaast voor de jaren 2011 en 2021 aan in welke mate dit is veranderd/gaat veranderen.

Voor statistisch onderzoek zou het het beste zijn om dit antwoord nauwkeuring te geven, wanneer u dit niet wilt kunt u een keuze maken tussen onderstaande opties. Graag benadrukken wij dat het nauwkeurig invullen sterk wordt geprefereerd en dat er vertrouwelijk om zal worden gegaan met het antwoord.

Omzet met betrekking tot containervervoer in 2016	Situatie in 2011	Verwachting voor 2021
Omzet open vraag (sterk geprefereerd)	-- / - / 0 / + / ++	-- / - / 0 / + / ++
Omzet gesloten vraag (minder geprefereerd) □ ≤ €300.000 □ €300.000 - €1.000.000 □ €1.000.000 - €3.000.000 □ €3.000.000 - €10.000.000 □ €10.000.000 - €20.000.000 □ ≥ €20.000.000		

43) Op welke aspecten behaalt u uw marges/winstgevendheid in de jaren 2011, 2016 en hoe verwacht u deze te behalen voor 2021?

	Situatie in 2011	2016	Verwachting voor 2021
Kosten-baten berekeningen maken voor iedere rit	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
Slim plannen (bijvoorbeeld het combineren van ritten/ladingspakketten)	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
Schaalvergroting realiseren	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
Het efficiënt combineren van het uitbesteden en in eigen beheer houden van processen[11]	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
Extra activiteiten (services) aanbieden	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
Efficiënte bezettingsgraad (efficiënt inzetten van chauffeurs en materiaal)	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee
Anders, namelijk: …	□ Ja □ Nee	□ Ja □ Nee	□ Ja □ Nee

[11] Denk hierbij bijvoorbeeld aan het gebruik maken van charters, het uitbesteden van de boekhouding, het uitbesteden van onderhoud van trucks, etc.

44) Op welke manier houdt u uw winst in de gaten? (meerdere antwoordopties mogelijk)

Ik check de winst per:

□ Rit
□ Dag
□ Week
□ Maand
□ Jaar
□ Truck
□ Omzetgroep (groeperen op bijvoorbeeld product/container type/afdeling)
□ Anders, namelijk: …