

# The Effect of Third-Party SaaS-Based Logistics Platforms on Power within Supply Chain Relationships

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## ABSTRACT,

*In nowadays dynamic environment, supply chain collaboration and integration are crucial. In the logistics sector, third-party SaaS-based logistics platforms, an Industry 4.0 solution, are springing up and are enabling the move towards a connected, efficient and smart supply chain ecosystem. Those platforms are likely to influence supply chain relationships, for example by shifting the coordinative role to the platform and changing connections between supply chain actors. This raises the question whether those platforms will affect power within supply chain relationships. A case study based on a theoretical framework has been conducted to investigate the effect of third-party SaaS-based logistics platforms on power within supply chain relationships. Twelve business representatives, representing shippers, platforms, carriers and external supply chain organisations, have been interviewed to examine the effect of third-party SaaS-based logistics platforms on the four power components of the theoretical framework, namely structural power, perceived power, behavioural power and realised power. This study shows that the advent of third-party SaaS-based logistics platforms has influenced all four power components. Because of the introduction of those platforms, shippers are getting a stronger power position with respect to carriers. Furthermore, the competition between carriers has been intensified, strengthening the horizontal position of digitally fit carriers. Moreover, shippers and carriers are losing some power towards the platforms. Although the platforms are not aiming for it, they are getting a vertical power position due to their increased value to the supply chain which makes shippers and carriers dependent on them. Even though the advent of third-party SaaS-based logistics platforms decreases the power of shippers and carriers to a greater or lesser extent, generally all supply chain actors are (potentially) benefiting from this new phenomenon in their journey towards becoming a connected, efficient and smart supply chain ecosystem.*

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## Keywords

Third-party SaaS-based logistics platforms, vertical power, horizontal power, supply chain relationships, shipper, carrier

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# 1. INTRODUCTION

## 1.1 Industry 4.0 and Supply Chain Management: Two Trends in Literature and Practice

Nowadays, supply chains are positioned within a dynamic environment, which means that they are confronted with globalisation, rapid technology developments and increased customer responsiveness (Soosay & Hyland, 2015). Because of those factors, more collaborative and integrative efforts are crucial. In order to realise this, cloud-based platforms, an Industry 4.0 solution (Bechtold, Kern, Lauenstein, & Bernhofer, 2014; Geissbauer, Vedso, & Schrauf, 2016; Kagermann, Wahlster, & Helbig, 2013), can be of great value. This can be explained by the fact that cloud-based platforms can help firms with moving from traditional supply chains towards a supply chain ecosystem which is connected, efficient and smart (Schrauf & Bertram, 2016).

According to Freet, Agrawal, John and Walker (2015) “cloud computing is an on-demand, pay-per-use computing architecture that delivers computing resources as services over the Internet” (p. 148). Moreover, they state that “this technology provides a preconfigured infrastructure at a lower cost and allows users to utilize software or hardware resources which are owned and managed by a Cloud Service Provider (CSP) at remote locations.” (p. 148) Cloud technology offers three service models, namely Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) (Tsai, Bai, & Huang, 2014).

A trending topic within the field of cloud computing is the use of cloud-based platforms which give access to the “single source of truth”. Based on the scientific literature (Cisneros-Cabrera, Ramzan, Sampaio, & Mehandjiev, 2017; Kiel, Müller, Arnold, & Voigt, 2017; Rudolph & Emmelmann, 2017; Saarriko, 2015; Srinivasan, 2017; Wright, Roberts, & Wilson, 2017), it can be stated that cloud-based platforms are important, demanded and full of potential. Besides, the importance of cloud-based platforms is being stressed in the scientific literature, the importance and potential of it is also supported by the rise of cloud-based platforms, of which Uber, Airbnb and Trivago are famous examples.

An industry in which cloud-based platforms are springing up is the logistics industry (Baron, Zintel, Zieris, & Mikulla, 2017; Deutsche Post DHL Group, 2016; Tipping & Kauschke, 2016), with multiple logistics platforms offering SaaS-based solutions. Many of these platforms are owned by third-parties, indicating that independent parties see opportunities for value creation in joining the supply chain by providing SaaS-based solutions for logistics. Indeed, logistics is considered to be an activity in which cloud-based platforms can be effectively used (Toka, Aivazidou, Antoniou, & Arvanitopoulos-Darginis, 2013) and therefore, it is not surprising that SaaS is one of the current logistics trends (Deutsche Post DHL Group, 2016). As has been stated before, cloud-based platforms can enable the shift towards connected supply chains (Schrauf & Bertram, 2016). Besides that, the rise of cloud-based platforms is likely to have an effect on supply chain relationships, for example by changing connections (i.e. weakening, strengthening or establishing them) and shifting the coordinative role to another actor (Saarriko, 2015). Since third-party SaaS-based logistics platforms are an example of a cloud-based platform, it would be reasonable to expect that this specific type of platform will have an impact on the inter-organisational relationships within supply chains as well. One aspect worth investigating would be the impact of third-party SaaS-based logistics platforms on power within supply chain relationships.

Within supply chain relationships, power is considered to be a central element with “the question of how to gain and use power with other parties in the supply chain” being a “frequent concern in management practice” and the topic having a “long-standing stream of academic research” (Reimann & Ketchen, 2017, p. 3).

## 1.2 Problem Statement

There is quite some research on the impact of cloud computing in general on the supply chain as a whole (Giménez & Lourenço, 2008; Toka et al., 2013), but scientific literature on the influence of third-party SaaS-based logistics platforms on power within supply chain relationships is lacking.

Based on a literature review conducted by Wright, Roberts and Wilson (2017), it can be stated that research on SaaS-based platforms in general is primarily focused on understanding the related operational and technical issues that need to be considered, thus not taking aspects like power into account. Furthermore, they came to the conclusion that articles investigating cloud computing are mainly limited to the adoption or pre-adoption stages, leaving the assimilation stage almost unexamined. Since in the assimilation stage, the use of a technology (e.g. a platform) start to diffuse, in this case across the supply chain, and becomes a routine (Purvis, Sambamurthy, & Zmud, 2001), it is most likely that the effect of such a platform on power within supply chain relationships becomes evident in this stage. However, since this stage is almost unexamined for SaaS-based platforms, the effect of those platforms on power in supply chain relationships is not expected to be studied upon, thus indicating a research gap.

After an extensive literature review, no research has thus been found on the impact of third-party SaaS-based logistics platforms on power between supply chain actors and only research on related topics has been found (Allen, Colligan, Finnie, & Kern, 2000; Bakos, 1991; Standing, Love, Stockdale, & Gengatharen, 2006; Wang, Potter, Naim, & Beevor, 2011). Those studies were focused on collaborative electronic logistics marketplaces (ELMs), electronic marketplaces (EMs), and e-commerce systems. Those topics are related to third-party SaaS-based logistics platforms, since they all link supply chain actors by making use of the Internet. However, they do not have to be owned by a third-party per se and also do not have to be SaaS-based. Besides that, only collaborative ELMs are used within logistics. Additionally, the studies did not investigate the effect of a platform on power within all supply chain relationships, for example lacking investigations on the effect of platforms on horizontal supply chain relationships. Moreover, for three of those researches, it is clear that they are based on case studies, which limits their external validity (Numagami, 1998). Furthermore, the studies mentioned have been conducted between 1991 and 2011. This indicates that the results might already be outdated in relation to the research topic of this paper, since third-party SaaS-based logistics platforms are part of Industry 4.0, which is a rapidly changing field. In appendix 9.1, the main findings of the studies mentioned above are elaborated upon.

## 1.3 Research Question

The lack of research on the impact of third-party SaaS-based logistics platforms on power within supply chain relationships together with the already outdated research on related topics, opens a research opportunity. Furthermore, the combination of a personal interest in supply chain management and the awareness of the development and the use of third-party SaaS-based logistics platforms, has led to the motivation to try to close the above-mentioned research gap. Therefore, the goal of this research is to examine the influence of third-party SaaS-based

logistics platforms on power within supply chain relationships, which leads to the following research question:

*What is the effect of third-party SaaS-based logistics platforms on power within supply chain relationships?*

Kim et al. (2005) have developed a theoretical framework that integrates several theories of power. They regard power as consisting of four components: (1) structural power, (2) perceived power, (3) behavioural power, and (4) realised power. In this paper, this model will be used to investigate the effect of third-party SaaS-based logistics platforms on power within supply chain relationships and therefore, those four components of power will be investigated.

In order to answer the research question, the following sub-questions can be formulated:

- i. *What are third-party SaaS-based logistics platforms?*
- ii. *What is power?*
- iii. *What is the effect of third-party SaaS-based logistics platforms on structural power within the supply chain?*
- iv. *What is the effect of third-party SaaS-based logistics platforms on perceived power within the supply chain?*
- v. *What is the effect of third-party SaaS-based logistics platforms on behavioural power within the supply chain?*
- vi. *What is the effect of third-party SaaS-based logistics platforms on realised power within the supply chain?*

By answering the hereabove formulated research question, the paper fills a research gap by showing what the effect of third-party SaaS-based logistics platforms is on power within supply chain relationships.

## 2. THEORETICAL BACKGROUND

In this section, third-party SaaS-based logistics platforms and power will be defined, thus answering the following subquestions:

- i. *What are third-party SaaS-based logistics platforms?*  
and
- ii. *What is power?*

Furthermore, the research framework for this study will be described.

### 2.1 Third-Party SaaS-Based Logistics Platforms

The importance of cloud-based platforms in the realisation of a connected, smart and efficient supply chain ecosystem (Schrauf & Bertram, 2016) has been emphasised in the introduction of this paper. Furthermore, the rise of third-party logistics platforms offering SaaS-based solutions has been briefly touched upon. By first defining the three distinct parts (third-party, SaaS-based and logistics platforms) separately, it is possible to properly define third-party SaaS-based logistics platforms as a combination of the three separate definitions. The extensive descriptions and definitions of the three separate parts can be found in appendix 9.2. The definition of third-party SaaS-based logistics platforms can be found hereunder.

Combining the concepts of ‘third-party’, ‘SaaS-based’ and logistics platforms, results in the following definition:

*Third-party SaaS-based logistics platforms are third-party-owned “two-sided online marketplaces that match the demand for and supply of logistics services” (Deutsche Post DHL Group, 2016, p. 25) and which facilitate and coordinate the exchanges between supply chain actors (Saariko, 2015) through a standardised, on-demand software solution (Buxmann, Hess, & Lehmann, 2008; Yang, Sun, Zhang, & Wang, 2015).*

### 2.2 Power within Supply Chain Relationships

In the introduction of this paper, it has already been mentioned that power is an important aspect within supply chain relationships (Reimann & Ketchen, 2017). Based on the definitions of power in previous literature, Kähkönen (2014) defined power as “the ability to influence decision-making and actions of the other party” (p. 18). More simply put, power is the “ability to get things done” (Munson, Rosenblatt, & Rosenblatt, 1999, p. 55).

Although many authors agree that power “lies in the potential” others propose that power “is only present in its use” (Brass & Burkhardt, 1993, p. 442). The differentiation between potential and use is clearly recognisable in the literature on power focused on structural and behavioural power. Structural power refers to sources of power that together form the potential to influence (Cendon & Jarvenpaa, 2001), whereas behavioural power focuses on the actual use of power (Pettigrew & McNulty, 1998).

Olsen, Prenkert, Hoholm and Harrison (2014) found that many researchers use either a behavioural or structural perspective on power, although both perspectives should be viewed as “simultaneous, complementary processes” (Brass & Burkhardt, 1993, p. 443).

Since structural and behavioural power are linked, a framework connecting those power dimensions developed by Kim, Pinkley and Fragale (2005) will be used to investigate the probable effect of third-party SaaS-based logistics platforms on power in supply chain relationships. The growing amount and use of those platforms is expected to influence supply chains relationships, since, inter alia, connections are likely to change (i.e. weakened, established or strengthened) and coordination is being conducted by another actor (Saariko, 2015). With power being a fundamental element within supply chain relationships (Reimann & Ketchen, 2017), it would be reasonable that third-party SaaS-based logistics platforms also influence this part of supply chain relationships.

### 2.3 Research Framework

Kim, Pinkley and Fragale (2005) developed a framework which shows the relation between structural and behavioural power by connecting it to perceived and realised power. This framework was developed to describe interpersonal power in negotiations. Thus, this framework is not designed to explain power in supply chain relationships. However, it is still considered to be useful in the context of this paper. In transactions, organisations are linked through personal relationships (Granovetter, 1985; Tushman & Katz, 1980; Weigl, Hartmann, Jahns, & Darkow, 2008) with individuals acting on the behalf of their organisation (Tsisis, 2009; Wilkinson, 1996). This results in interpersonal relationship factors being present and important in interorganisational relationships (Leung, 2013; Tsisis, 2009). Furthermore, using interpersonal power frameworks in an inter-organisational setting has proven to be powerful (Davenport & Leitch, 2005; Ford, Wang, & Vestal, 2012; Oukes, von Raesfeld, & Groen, 2017). Therefore, it could be stated that the framework of Kim et al. (2005) can be used to investigate the impact of third-party SaaS-based logistics platforms on power within the supply chain. Hereunder, the four power components distinguished by Kim et al. (2005) and how they interact will be described.

#### 2.3.1 Structural power

Structural power can be defined as potential power to emphasise the possession rather than the use of power (Brass & Burkhardt, 1993; Olsen et al., 2014; Provan, 1980). There are three structural

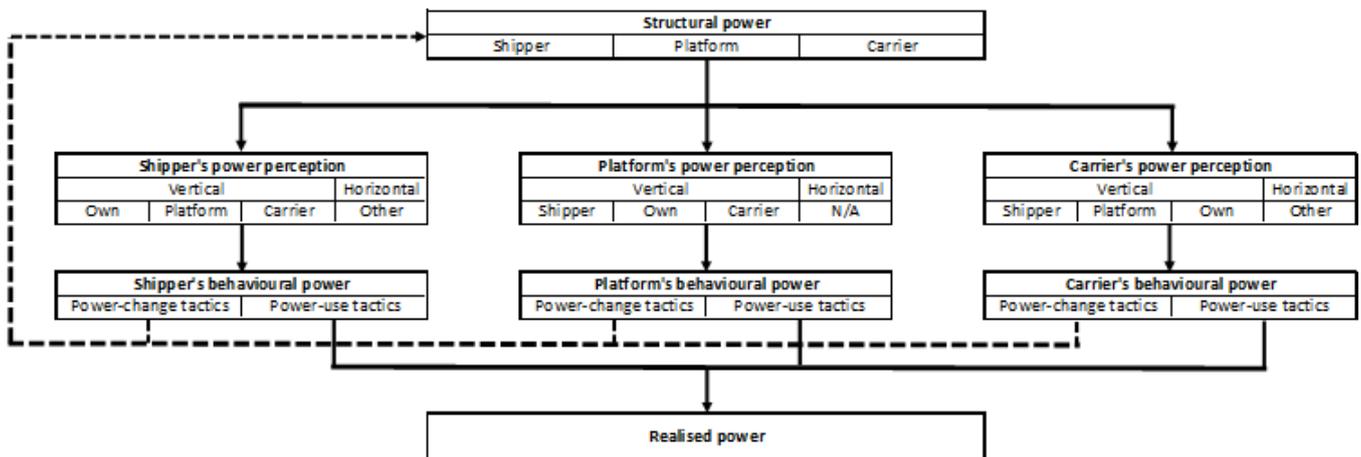


Figure 1. A theoretical model of power in relationships between shippers, platforms and carriers (adapted from Kim et al., 2005).

sources of power, namely network position, resource control and hierarchical level (Astley & Sachdeva, 1984; Brass & Burkhardt, 1993).

Organisations can gain power based on their location in their network (Astley & Sachdeva, 1984). The more central an organisation is to its network, the more structural power it will possess. According to Brass and Burkhardt (1993), an organisation's network position depends on whether it connects organisations that would otherwise not be connected, its number of alternatives and the amount of direct and indirect<sup>1</sup> connections an organisation has (Brass & Burkhardt, 1993; Freeman, 1979).

Another source of power is control over resources valued by others (Huo, Flynn, & Zhao, 2017; Pfeffer & Salancik, 1978). Organisations can become powerful by controlling valuable resources that are not controlled or mediated by other organisations, since others' dependence on them is increased (Astley & Sachdeva, 1984; Brass & Burkhardt, 1993).

Having an official position can result in an organisation possessing power (Astley & Sachdeva, 1984). The higher the position in the hierarchy, the more power an organisation will have (Provan, 1980).

### 2.3.2 Perceived power

According to Kim et al. (2005), perceived power is an organisation's assessment of both its own structural power and that of its partners. However, due to bounded rationality and the lack of perfect information, organisations cannot create a complete picture of the course of events in their own and their partners' organisations. Therefore, perceived power often deviates from structural power (Kim et al., 2005; Provan, 1980). The notion of this divergence is important, since perceived power rather than structural power is the driver behind power behaviour (Wilkinson, 1996; Wolfe & McGinn, 2005).

### 2.3.3 Behavioural power

This power component, driven by perceived power, is related to how power is exercised and is viewed in terms of power tactics (Cendon & Jarvenpaa, 2001), which are split up into power-change tactics and power-use tactics (Kim et al., 2005).

<sup>1</sup> Organisations with only a few direct connections can still be central in a network due to the fact that those few direct connections are with highly central partners.

<sup>2</sup> By applying power-use tactics, an organisation can extract benefits from a relation, thus having a direct impact on its realised power (Kim et al., 2005).

### 2.3.3.1 Power-change tactics

Power-change tactics are applied by an organisation in order to change the power relationship. Based on their power perceptions, organisations might feel like they do not have enough structural power, relative to their partners' structural power, in order to obtain desired benefits (Kim et al., 2005). In turn, the organisation can decide to use power-change tactics in an attempt to increase its structural power (Ford et al., 2012; Kim et al., 2005).

### 2.3.3.2 Power-use tactics

Organisations applying this type of power tactics are trying to leverage their power capabilities and those tactics are used as an organisation feels like it has enough structural power to arrive at desired outcomes (Kim et al., 2005). Many power-use tactics have been identified in the literature (Plouffe, Bolander, Cote, & Hochstein, 2016; Yukl & Tracey, 1992), but Kim et al. (2005) take the distinction between conciliatory and hostile power-use tactics as the basis of their theory (Lawler, 1992). Positive acts fall into the category of conciliatory tactics and negative acts into the one of hostile tactics.

### 2.3.4 Realised power

The extent to which an organisation is able to extract desired benefits from a relationship through applying power-use tactics is called realised power (Kim et al., 2005). Relative power will also be influenced by applying power-use tactics. According to Kim et al. (2005), using conciliatory power-use tactics will increase the power of the organisation and using hostile power-use tactics will decrease the power of the organisation.

### 2.3.5 Relationships between power components

In figure 1, the relationships between the power components can be seen. The structural power, which stems from its network position, resource control and hierarchical level, of organisations determines how an organisation perceives both its own and its partners' structural power. In turn, those perceptions of the organisations drive their power behaviour, which includes both power-use and power-change tactics. Those power tactics are then determining the realised power of the organisations, with power-use tactics having a direct influence<sup>2</sup> and power-change tactics having an indirect influence<sup>3</sup>. In the model, it can be seen

<sup>3</sup> Power-change tactics can reduce a firm's own or increase its partner's dependence (Kim et al., 2005). This improved structural power can result in an improved power perception, giving the firm the opportunity to apply power-use tactics which can ultimately result in realised power. Power-change tactics are therefore having an indirect impact on realised power.

that the focus will be on power in both vertical and horizontal supply chain relationships. Vertical relationships are established between businesses that are at different levels in the supply chain (Caputo & Mininno, 1996). Third-party SaaS-based logistics platforms, *inter alia*, match demand for and supply of logistics services in which (mostly) a shipper represents the demand for and a carrier represents the supply of logistics services. The vertical relationships in the model are therefore between shipper and platform, between platform and carrier and between shipper and carrier. When talking about horizontal relationships, this includes relationships between two or more companies that are located on the same level in the supply chain (Bahinipati, Kanda, & Deshmukh, 2009; Caputo & Mininno, 1996), in this case relationships between shippers and relationships between carriers. The horizontal relationship between platforms is not part of this study.

### 3. METHODOLOGY

The purpose of this paper is to shed light on the effect of third-party SaaS-based logistics platforms on power within supply chain relationships. To collect and analyse empirical evidence on this topic, it is important to determine which research strategy fits best. According to Yin (1994), there are five major strategies used for research in the field of social sciences: archival analysis, experiments, histories, surveys and case studies. Archival analysis is considered unsuitable for this study, since it is unlikely that archival records about this relatively new research topic are at hand. Since manipulating behaviour is not possible in this study and since investigating contextual factors can provide an additional dimension to the research, experiments are considered unsuitable (Yin, 1994). Moreover, due to the fact that there are many people alive who could report about the research topic, histories will not be the main research strategy (Yin, 1994). Although surveys can be of value for this research, its limited ability to take contextual factors into account (Yin, 1994) decreases its value as a main research strategy. The fifth major research strategy, case study, is considered to be appropriate as the main research strategy for this study. This method has been chosen for two reasons: (1) a case study is suitable for an exploratory study (Miles & Huberman, 1994; Yin, 1994); and (2) a case study is the preferred method for studying contemporary events in which manipulation of behaviour is impossible (Yin, 1994). Within this case study, semi-structured interviews will be conducted, thus using the survey strategy within the case study. Within the case study, participants will also be asked to give retrospective statements, making use of a technique also used by a history, generating some overlap between the two strategies. Now the research strategy has been selected, attention will be given to the case companies, data collection and data analysis.

#### 3.1 Case Companies: Platforms and their Supply Chain Partners

The subjects of this study are third-party SaaS-based logistics platforms and their supply chain partners. There are many platforms of the type described in this paper. Three of them have been selected to participate in the research, based on information given by a relative who till recently worked for a logistics service provider (LSP) using these three platforms, thus making use of convenience sampling (Bryman, 2012). Although three platforms were targeted, only one platform agreed to participate. Therefore, only this platform has been interviewed.

Since third-party SaaS-based platforms are connecting shippers and carriers, the aim was to find multiple shippers and carriers that were willing to participate in this research. By using the methods of convenience and snowball sampling in combination with own research on the Internet (i.e. references on websites of platforms and Top 100 logistic service providers 2018), several

firms that could be contacted were found (three platforms, 21 shippers, 25 carriers/LSPs and five external experts). Those firms were contacted by e-mail, contact form and/or telephone, resulting in 12 organisations/individuals that were willing to participate in the research, consisting of one platform, three shippers, three carriers, one LSP and four external experts. For the platform, two representatives were interviewed and for the other organisations, one representative was interviewed. All organisations were interviewed once, but some were asked additional questions by e-mail or phone to get additional insights and information.

It is important to mention that shippers and carriers targeted are connected to one or more of the three targeted platforms. Therefore, the statements made by shippers and carriers (could) relate to multiple platforms and several of them might not relate to the platform that has been interviewed.

#### 3.2 Data Collection

The data for this study were collected by conducting a range of semi-structured interviews with different organisations. Using semi-structured interviews ensured that particular topics were covered during each interview while having the flexibility to alter the order of the questions and to ask additional questions (Bryman, 2012). In order to measure the effect of third-party SaaS-based logistics platforms on power within supply chain relationships, it is necessary to measure whether the power within those relationships has changed since the introduction of those platforms. Therefore, the interview questions were pointed at measuring the change in power relationship over time, from the very first moment the platform had been used until now. The interviews lasted between 15 and 110 minutes and were held with business representatives from several firms. In appendix 9.3, an overview of the conducted interviews can be found. Before the interviews started, the research participants were asked to sign the informed consent form which can be found in appendix 9.4. Several actions were taken to improve the validity of the study. To improve construct validity (i.e. selecting proper measures for the studied concepts (Yin, 1994)), several actions were taken. First of all, the interview questions were structured based on the theoretical framework, ensuring that the questions are a correct measure for the several power dimensions. Moreover, triangulation has been used, since this can “contribute to verification and validation of qualitative analysis (Patton, 1999, p. 1193)”. Triangulation of sources has been applied by using different data sources within the case study. Although the semi-structured interviews were the main data source, the websites of the participating companies were also used to gather information mainly about the structural power of the participating companies and the benefits that can be extracted from using a platform. Furthermore, several parties (i.e. both internal and external parties, multiple parties of the same type) were interviewed, increasing the number of data sources used. Finally, half of the participants validated the notes taken during the interviews and all participants were asked to review the draft report. External validity (i.e. knowing the domain to which case study results can be generalised (Yin, 1994)) has been improved by interviewing multiple shippers and carriers, thus trying to give a complete picture about the measured effect, increasing the possibility to generalise the findings beyond the studied cases. However, the fact that only one platform has been interviewed combined with specific individual shipper and carrier factors limits the external validity of this study. To improve the reliability of the study, interview templates have been developed. All shippers were asked the same questions, the same holding for carriers. Besides that, separate interview templates (that were still quite similar to those for shippers and carriers) were developed for the platform and experts, tailored towards their role in the supply chain or

knowledge areas. However, all interviews were structured around the four power components, namely structural power, perceived power, behavioural power and realised power (Kim et al., 2005). The interview templates can be found in appendix 9.5.

### 3.3 Data Analysis

During the interviews, notes were taken and afterwards, they have been worked out. The intention was to tape-record the interviews, but some participants did not give permission for it and indicated that they do not like tape-recordings. Therefore, it had been decided not to ask permission for tape-recordings anymore to prevent potential participants from withdrawing from the research. To be able to link the data to the research question and the theoretical framework, the data was coded regarding the theoretical framework. In this way, the following power components of the organisations could be identified: (1) structural power, (2) perceived power (i.e. perceptions of their own and their partners' power), (3) behavioural tactics applied and (4) realised power. Afterwards, relationships between the codes and the main findings were visualised into tables comprising data from all interviewees of a specific type of organisation (e.g. data from all carrier representatives were combined into one category). Using tables to display the data systematically and focused is essential in valid analysis (Miles & Huberman, 1994). Amongst others, it allows comparisons, noticing patterns and trends and observing differences. By analysing the data from the table, it was possible to arrive at insightful results.

## 4. RESULTS

In this section, the key results of the interviews will be described. The key results from the interviews are displayed in four different tables, covering the three vertical (e.g. shipper to platform, platform to carrier, shipper to carrier) and the horizontal supply chain relationship (e.g. carrier to carrier) that were influenced by the advent of third-party SaaS-based logistics platforms. The tables can be found in appendix 9.6. Each table displays the four different main power components (e.g. structural, perceived, behavioural and realised) for the two parties in that specific supply chain relationship. The tables show whether the power components have changed or remained the same since the advent of third-party SaaS-based logistics platforms, where the moment just before the introduction of a platform to the supply chain (i.e. the former situation) will be referred to as  $t_0$  and the current situation as  $t_1$ . At the end of this chapter, a summary of the main findings can be found in table 1.

It is important to keep in mind that shippers usually make use of a single platform which in turn their carriers should use as well. Since carriers work for multiple shippers who make use of different platforms, carriers usually make use of multiple platforms.

### 4.1 Vertical Supply Chain Relationships

#### 4.1.1 Shipper to platform

In this part, the power relationship between shippers and platforms will be described. In appendix 9.6, the table (table 2) related to this relationship can be found.

##### 4.1.1.1 Structural power

Shippers and platforms acquire structural power from their network position, resource control and hierarchical level. Between  $t_0$  and  $t_1$ , their network position and resource control have changed, resulting in a change in structural power.

As can be seen in table 2, shippers have quite some alternative platforms to choose from. In fact, the number of logistics platforms is still increasing (Banning, Buijs, & Van Amerongen, 2018). Although the number of alternative platforms is

reasonable, shippers are not likely to switch to an alternative platform as soon as they have invested time, effort and money into it. This especially holds for shippers making use of an interface, which connects their enterprise resource planning (ERP) system to external logistics processes via the platform. Over time, the number of alternative platforms might thus increase, but the likeliness of switching decreases, resulting in a weakened network position of shippers.

Shippers possess transport orders and thus initiate transactions with carriers. Since the platform facilitates those transactions, shippers' control resources (i.e. transport orders) that are needed by the platform, giving them structural power. Furthermore, although the platform has (confidential) access to data that flows through it, shippers are owner of their own data. The resource control of shippers remained the same over time.

Finally, the hierarchical level of the shipper remained constant over time and results from contractual agreements, which cover aspects such as ownership of data, service level agreement (SLA) and price. Although contractual agreements are concluded with the platform, they are not time-bound, giving shippers the opportunity to terminate the contract at any time by giving written notice and withdrawing their transactions.

The network position of platforms has strengthened over time. Platforms facilitate transactions between shippers and carriers and the number of shippers and carriers that uses the platforms is increasing. Besides that, there are quite some shippers that do not use a platform yet and those shippers can thus be seen as alternatives for the platforms. However, the number of alternative shippers decreases over time since more and more shippers are choosing a platform and those shippers are not likely to switch. Finally, some platforms are open and connect shippers with carriers to which they would otherwise not have been connected. However, this differs per platform. Some platforms are closed and require shippers to indicate the carriers they want to work with, while other platforms give shippers direct access to all carriers connected to the platform, which can then be selected based on the shippers' criteria.

The platforms also derive more power from control over resources. They offer an increasing number of functionalities which generate operational value and transparency. Functionalities such as assigning transports and booking time slots create operational value, while transparency is realised by functionalities such as status notifications. Furthermore, platforms have access to an increasing amount of data that flows through them. Although this data is still owned by shippers (and carriers), the platforms process and use the data to make it more valuable for shippers (and carriers).

Lastly, the platforms' hierarchical level is determined by concluded contracts. The contract not only includes standards and requirements that the platforms should live up to, but also indicates their rights, for example to save the data into their own system and use the combined data of all users for analytical purposes. Between  $t_0$  and  $t_1$ , the platforms' hierarchical level did not change.

##### 4.1.1.2 Perceived power

Now, it will be described how shippers and platforms assess their own structural power and that of their partner. Over time, the perceived power of both parties has changed.

Shippers realise that their perceived power is decreasing over time. Although their transport orders result in transactions that the platforms need, platforms become less dependent on the transport orders of individual shippers, since an increasing number of shippers is using the platforms, giving them enough alternative transactions to make a profit on. Shippers already

working with a certain platform for a long time start to realise this, as in the beginning, they were king and were offered excellent service, but are now seen as one of the many clients and are offered good, but less excellent service. Furthermore, shippers whose transactions are mainly dealt with via a platform indicate that they are becoming more and more dependent on it. Although they have a back-up method for assigning transports (e.g. manually via e-mail or phone), this is seen as less convenient and efficient than using a platform. Shippers do not (always) have a back-up method for booking time slots and know that this makes them dependent on the platforms. Moreover, shippers also realise that there are alternative platforms they could switch to, but switching is seen as becoming increasingly hard and unattractive, due to the time, effort, money and training it requires. Concluding, it can be stated that the shippers' perceived power changed: at  $t_1$  they perceive to have less power vis-à-vis the platforms than at  $t_0$ .

Shippers assess the structural power of the platforms to be improved since  $t_0$ . Shippers notice that the operational value generated by the platforms is giving them power at an increasing rate. Besides that, they understand that the platforms get power because of the fact that switching of current shippers is unlikely. However, this also applies the other way around, meaning that the platforms have a decreasing number of alternative shippers. Furthermore, shippers are aware that working without a platform becomes increasingly hard since more and more carriers are connected to the platforms. The access to the data that flows through the platforms is also perceived to give the platforms structural power, since it enables them to develop new functionalities that will strengthen their market position and will generate additional profit.

The perceived power of the platforms at  $t_1$  also differs compared to their perceptions at  $t_0$ . They recognise that their value to the supply chain increased over time, mainly due to the operational value and transparency offered by their solutions. Additionally, the unlikelihood of switching due to long lead times makes them realise that current shippers will probably remain loyal to them, but also that competitive platforms experience the same loyalty from their shippers, decreasing the number of alternative shippers. Moreover, the platforms think that big data is of increasing importance for growing and know that it is a potential source for offering additional services in the future, thus improving their resources. Finally, the open platforms are likely to perceive their ability to connect shippers with 'new' carriers to give them a power position. Summarizing, the perceived power of the platforms at  $t_1$  has improved compared to its perceived power at  $t_0$ .

Although the platforms did not say anything about how they perceive the power of shippers with respect to them, statements were made that shed some light on their perception of the shippers' structural power. For example, it became clear that many solutions of the platforms are built around the transactions initiated by shippers' transport orders, for example transport assignment (both no-touch orders and spot bidding), time slot booking and passing along status notifications. This shows that they need the transactions in order to provide value to the supply chain. Therefore, it is very likely that the platforms perceive the shipper to have structural power due to this resource it controls. However, since the platforms are having many shippers connected to it, it could be assumed that they perceive themselves to be dependent on shippers' transactions in general but perceive themselves not being dependent on the transactions of an individual shipper. In addition to that, the fact that they realise

that the shippers have alternatives that they are not likely to use, enables to conclude that their perceived power of shippers is decreasing, but also indicates that the platforms know that their own availability of alternatives is becoming less as well.

#### 4.1.1.3 Behavioural power

As explained in section 2.3.3, organisations can either apply power-change tactics when they perceive not to have enough structural power relative to their partner's structural power to extract desired benefits or they can apply power-use tactics when they do feel like they have enough structural power to obtain desired benefits (Kim et al., 2005). In table 2, it can be seen that the shippers only use power-use tactics and that the platforms only apply power-change tactics, which indicates that the shippers perceive to have enough potential power to arrive at the desired outcome and that the platforms do not experience this.

The fact that shippers only apply use tactics seems surprising at a first sight, but gets plausible according to the theoretical model<sup>4</sup> after some reasoning. One would maybe expect the shippers to use power-change tactics, since they realise their structural power with respect to the platforms is decreasing over time and want to improve their power position. However, the decrease in structural power does not prevent the shippers from realising the intended benefits, thus explaining why they still perceive their structural power as being sufficient compared to the platforms.

The shippers apply two power-use tactics, namely selecting a platform and (re)negotiating contracts. The first one is in fact creating the supply chain relationship described here and is thus of huge importance for the relationship that has been established and the benefits that can be obtained from it. The second tactic has been used multiple times since the introduction of a platform. Shippers make agreements with the platform about the use of data, future price adjustments and applicable SLA. By doing this, they try to assure that they will remain able to extract the desired benefits, while also giving attention to costs and risks.

The platforms are applying several power-change tactics to improve their structural power. Apparently, they perceive not to have enough structural power with respect to the shippers to arrive at the desired outcomes. First of all, the platforms update their software regularly to include recent developments in the market, making it less attractive and necessary for shippers to switch to another platform. Furthermore, the platforms are proactively developing new solutions and functionalities. Hereby, one could think of solutions for the capacity shortage and solutions for further improving visibility within the supply chain. Besides offering new solutions, the shippers indicate that the platforms also try to attract more carriers. By attracting more carriers, it becomes harder for the shippers to work without the platforms, thus increasing the structural power of the platforms. Moreover, platforms try to change their structural power by creating additional services based on big data. Being able to make predictions will become more and more important for example. Finally, platforms are behaving in an open, honest, transparent and trustful way. In this way, they gain trust from shippers by assuring that they will not abuse their increasing power. This is all aimed at maintaining and attracting shippers.

#### 4.1.1.4 Realised power

The extent to which organisations can extract benefits from the relationship through their behavioural power is referred to as their realised power (Kim et al., 2005). In this part, the realised power of both shippers and platforms is described.

<sup>4</sup> In section 5.1.3.1 another, more likely explanation will be discussed.

The actual realised power of shippers has been described shortly in table 2. Because of the power-use tactics applied, shippers are currently using a logistics platform against the best acceptable contractual conditions. Moreover, their power-use tactics allow shippers to extract several benefits. It is important to mention here that they can obtain those benefits because of their power-tactics applied in both their relationships with platforms and the relationships with carriers. After all, shippers cannot extract benefits from their relationship with platforms if they are not connected with carriers and vice versa. The extracted benefits will be listed below, but it is important to keep in mind that they differ per shipper and the platform that is used. The desired operational benefits realised by shippers are: increased efficiency/decreased costs, data exchange, more quickly accessible data which is more reliable and of better quality, forwarding transport orders to carriers, booking and managing time slots and making loading easier. Furthermore, shippers also extracted benefits that were not described as being the purpose of using the platforms. Those benefits consist of: status notifications and increased transparency of transport capacity (spot market). Moreover, two commercial benefits can be extracted, namely: improved service towards end client (via status notifications) and increased transparency of transport capacity (tendering). Shippers thus extract huge operational benefits from using a platform, but are slowly becoming dependent on it: the functionalities offered by the platforms are of great value, but (especially large) shippers cannot work without them anymore in a sector in which the need for providing better service at the lowest possible cost is increasing (Tipping & Kauschke, 2016).

Although the platforms are facilitating already many transactions, market positions are not secured yet. By applying the change tactics described before, platforms try to become bigger (e.g. more users) and better (e.g. better service and functionalities) to both ensure and strengthen their future position within the supply chain.

#### 4.1.2 Platform to carrier

In appendix 9.6, the table (table 3) displaying the results of this relationship can be found. It is important to recall that carriers are often connected to multiple platforms.

##### 4.1.2.1 Structural power

The platforms have a better network position at  $t_1$  than they had at  $t_0$  due to the increasing number of users and thus connections with carriers and shippers. Although the platforms have many alternative carriers, the value of those alternatives is limited, since carriers usually do not decide themselves to use the platforms. Moreover, open platforms can connect carriers to new shippers, thus giving them a stronger network position, while closed platforms do not offer this option.

The structural power of the platforms has also improved as a consequence of increased resource control. The offering of more and more functionalities that create operational value and transparency is one of the two major resources controlled by the platforms. Besides that, the access to more and more data that are exchanged via the platforms is a resource which is not controlled, but processed by the platforms, thus making this resource valuable for shippers and carriers.

Contracts determine the hierarchical level of the platforms. Sometimes, contracts are concluded by platforms and carriers themselves and sometimes shippers conclude contracts for the carriers. The contracts describe both rights and obligations. The platforms' hierarchical level did not change over time.

Although there are alternative platforms, carriers themselves mostly do not decide which platform to use, since shippers

usually initiate the use of it. Besides that, shippers are not likely to switch, which also limits the likelihood that carriers will switch. Therefore, the network position of carriers is weaker at  $t_1$  than it was at  $t_0$ .

Carriers control a resource that is valuable to the platforms, namely transport capacity. This resource is important for various platform solutions, such as transport assignment and time slot booking, to be valuable. Besides that, carriers are owner of their own data with the platforms having (confidential) access to it. Overall, the resource control of carriers did not change over time.

Finally, the hierarchical level of the carriers is based on the contract and its ability to stop using the platforms. The contract terms specify rights and obligations of both carriers and the platforms. Contracts with the platforms are not time-bound, which means that carriers can withdraw from the relationship at any time. Although it is unlikely that carriers make this decision (their shippers oblige them to use it), the ability to stop using the platforms did not change over time.

##### 4.1.2.2 Perceived power

The perceived power of both the platforms and the carriers changed within the period between  $t_0$  and  $t_1$ .

The platforms perceive their value to the supply chain to be increasing over time. They generate increasing operational value and transparency. Furthermore, they understand that there are many carriers that are not using a platform yet, increasing the number of alternatives for the platforms. However, the platforms are also aware of the fact that shippers mostly initiate the use of it, limiting the value of the alternative carriers. Moreover, the access to an increasing amount of data between shippers and carriers is seen as a source for additional services that could be offered in the future, giving the platforms control over more resources. Finally, open platforms might perceive that their ability to connect carriers with 'new' shippers is a source of power. Concluding, the platforms' perceived power has improved over time. They realise that since  $t_0$ , their value for the supply chain increased and that the increasing number of users and functionalities have improved their network position and resource control.

How the platforms perceive the power of carriers with respect to them has not been directly mentioned. Therefore, this power component is filled in based on statements that were made during the interview which can be related to this topic. Like the importance of transport orders, transport capacity is also considered to be important for the platforms. Several solutions such as transport assignment and time slot booking only provide operational value and transparency when transport capacity can be accessed. For that reason, it is expected that the platforms perceive carriers to have structural power based on their control over transport capacity. However, due to the connections with many carriers, they are likely to perceive themselves to be dependent on carriers' transport capacity in general but not to be dependent on the transport capacity offered by an individual carrier. Additionally, the platform indicated that carriers can easily switch to and from alternative platforms, especially because they often use web portals instead of interfaces. However, they also realise that carriers often do not make this switching decision themselves: the decision is based on that of the shippers they are connected to. Overall, the platforms perceive the structural power of carriers to be decreasing.

Carriers perceive their structural power to be decreasing over time. The combined transport capacity offered by the carriers is very important for the platforms, but they are not dependent on the transport capacity of an individual carrier. Since more and more carriers are using the platforms, the platforms have access

to enough alternative carriers and their transport capacity. Moreover, carriers also recognise that there are many other platforms to work with, but that the shipper decides which platform they should use. Important to mention is that most carriers, both those not having and having problems with their decrease in (perceived) power, indicate that the diversity of the platforms is problematic. There are many platforms and different shippers use different platforms. Therefore, carriers must use several web portals or interfaces, making working with those platforms harder and less efficient than it should be.

Finally, the carriers think that the structural power of the platforms has improved over time. It was mentioned that the platforms are facilitating an increasing number of transactions by offering an increasing number of functionalities that can generate operational value and transparency. Some carriers think those benefits to be already generated, while others emphasise that it is still in its infancy and only recognise its future potential. The carriers also realise that the platforms' access to data that flows through them enables the acquisition of structural power.

#### 4.1.2.3 Behavioural power

The platforms use power-change tactics while carriers apply power-use tactics. As in the relationship between shippers and platforms, this seems striking, since carriers perceive their structural power to decrease and platforms experience their power position to improve. However, like in the situation of shippers and platforms, according to the theoretical model<sup>5</sup>, carriers apparently perceive to, despite the decrease, have enough power with respect to platforms to arrive at the desired benefits, while platforms experience not to have sufficient power relative to carriers to achieve the benefits, even though their perceived power has improved over time.

The same power-tactics are used by the platforms as in the situation of shipper to platform. Software is updated regularly to make it less attractive for carriers to switch. The proactive development of new solutions and functionalities is aimed at attracting new carriers and preventing current carriers from switching. Moreover, platforms try to attract more carriers in order to get a better market position. Furthermore, big data is being used to generate additional services, making the platform more attractive for carriers to work with. Lastly, platforms use an open, honest, transparent and trustful behaviour to gain trust from carriers. This gain of trust is necessary to let carriers stick to their platform and to attract new carriers. By for example not showing the prices of all carriers to the shippers, carriers feel more confident that working with the platform is beneficial.

Some carriers conclude contracts with the platforms themselves and sometimes, their shippers do this for them. In the case the carrier agrees on a contract with a platform itself, it uses a power-use tactic, namely the (re)negotiation of contracts, which include agreements on future price adjustments, SLA and data-use. In this way, risks and costs are paid attention to while making sure that the carrier remains able to achieve the aimed benefits over time.

#### 4.1.2.4 Realised power

The platforms already have a good position in the market, but market positions are not secured yet. They try to become both bigger and better by using the power tactics described in the previous section. In this way, they look for ensuring and strengthening their supply chain position.

In general, carriers do not really have a choice: they have to work with logistics platforms, since their shippers use those platforms

and are slowly becoming dependent on them. Although carriers apply a power-use tactic by (re)negotiating contract terms, a better description of the realised desired benefits extracted from this power-use tactic would be mitigation of the risks resulting from being obliged by the shippers to use platforms. Carriers that can use logistics platforms properly can extract the following operational benefits (although they differ per carrier): increased efficiency/reduced costs, more quickly accessible data which is more reliable and of better quality, booking time slots, positive effect on unloading times, easy access to spot bids and increased standardisation of processes. Commercial benefits that have been extracted are the acquirement of additional transport orders and new clients. However, it is impossible to obtain those benefits from the relationship with the platform without having connections with shippers. Therefore, the benefits are realised based on both the relationships with platforms and shippers. Finally, the large number of platforms puts a limit on the extent to which carriers can extract benefits from the relationship with the platforms.

#### 4.1.3 Shipper to carrier

The table (table 4) with an overview of the statements made concerning this relationship can be found in appendix 9.6.

##### 4.1.3.1 Structural power

Table 4 displays that shippers have many alternative carriers to choose from. Due to the current capacity shortage, the number of alternative carriers is smaller than at  $t_0$ , but this is not caused by the advent of logistics platforms. Instead, the economic growth, retirement of current drivers from the baby boomer generation and the lack of new drivers are causing the capacity shortage (UWV, 2018). In addition, the number of carriers that a shipper works with differs per shipper and the extent to which it is influenced by the advent of logistics platforms depends on the platform that is used. Open platforms give shippers access to all carriers connected to their platform, thus increasing the number of carriers they have access to. This can lead to shippers working with more carriers than before logistics platforms were used, thus increasing their amount of connections. However, this does not hold for closed platforms. Moreover, some shippers get access to additional carriers, since some carriers themselves are proactively searching for shippers connected to a platform that they already use. Overall, it can be stated that their network position has remained constant until now.

Shippers control one highly important resource, namely the transport orders. This resource is the foundation of the formation of the relationship with carriers. Without transport orders, the existence of carriers would be unnecessary. The control over transport orders did not change over time.

Shippers derive a hierarchical position from being a client and the contracts with carriers. As a client, they have the authority to decide what carriers have to do. Due to the increasing transparency in the supply chain, shippers have more control over carriers, for example by being better able to measure their quality. The advent of logistics platforms thus gives them an even stronger hierarchical position than they already had.

Carriers usually work for multiple shippers. Besides that, there are many alternative shippers to work for. One of the interviewed carriers is connected to an open platform and got connections with more shippers since the advent of logistics platforms. However, this does not hold for the other interviewed carriers who are connected to closed platforms. Overall, it can be stated that the network position of carriers remained the same over time.

<sup>5</sup> In section 5.1.3.1 another, more likely explanation will be discussed.

Since transport is often outsourced (Langley Jr. & Infosys, 2018), shippers are depending on carriers for transporting their goods. Shippers could decide to insource transport, but this is unlikely due to the expertise that carriers have (Langley Jr. & Infosys, 2018). Carriers are often more cost-efficient and flexible in transporting goods than shippers themselves are. Furthermore, carriers with a good ICT-infrastructure and who are able to transform data into information, knowledge or wisdom possess two additional resources. Those resources enable not only them but also the shipper to leverage the opportunities of the platforms to a larger extent. The structural power of those carriers is thus larger than that of carriers not controlling those resources. Overall, it can be stated that the resource control of carriers with a good ICT-infrastructure has improved (since this ICT-infrastructure became more valuable), while the resource control of carriers without a good ICT-infrastructure has decreased.

Lastly, carriers' hierarchical position has weakened over time and is based on their position as a contractor and contractual agreements with the shipper. Carriers have a subordinate position as being the contractor and as a customer, the shipper is king. Using a platform is often part of the contract nowadays and this increasingly makes the supply chain more transparent, giving shippers more control over carriers.

#### *4.1.3.2 Perceived power*

Shippers know that carriers need their transport orders, providing them with structural power. Furthermore, the large number of available carriers is seen as a source of structural power, since they can quite easily switch to other carriers (although this is less easy due to the current capacity shortage). Finally, the shippers perceive to have acquired more structural power since to because they are initiating the use of a platform. Overall, shippers perceive their structural power to be increasing. They realise that their initiation of using a platform creates a more transparent market. This either strengthens the power position they already had or shifts power towards them.

Shippers perceive the carriers to derive power from the transport capacity they possess. Shippers know that they are quite dependent on carriers for the transportation of their goods. Due to the current capacity shortage, carriers are perceived to be more powerful than they were in the past. However, shippers are also aware that carriers are dependent on them for the transport orders and that their own position as a client enables them to initiate the use of a platform and to oblige carriers to make use of it. To conclude, shippers perceive the structural power of carriers' to be decreasing because of the advent of logistics platforms.

Carriers perceive themselves to control an important resource, namely transport capacity. They realise that shippers depend on them for the transportation of their goods. Furthermore, they know that there are many shippers to work for. Especially the carriers that can connect with platforms have many alternative shippers. Nevertheless, carriers also realise that competition between carriers is tough, which still gives them limited power over shippers. Overall, carriers assess their structural power to be decreasing over time. Although many carriers realise that doing business with a shipper via a platform offers many opportunities, most of them are aware that the increasingly transparent market is strengthening the power of or shifting it towards shippers. Important to mention is that this strengthening or shifting is limited at the moment due to the capacity shortage, which slightly improves carriers' perceived power. However, carriers still experience the strengthening of and shift in power.

Carriers assess the structural power of shippers to have improved since to. Carriers already realised that shippers' possession of transport orders gives them structural power, especially because they are having many alternative carriers to work with.

Nowadays, carriers are also aware that shippers are improving their structural power by initiating the use of logistics platforms.

#### *4.1.3.3 Behavioural power*

Shippers perceive to have enough structural power relative to carriers to obtain the benefits aimed for, since shippers use power-use tactics. For carriers it is exactly the other way around: they only apply power-change tactics and thus experience not to have enough structural power with respect to shippers to extract the desired benefits out of the relationship.

Shippers are using a wide range of power-use tactics since the advent of logistics platforms. First of all, they oblige carriers to use a platform. Carriers that are not able or do not want to use the platform do not qualify for transport orders anymore. Moreover, shippers decide whether they let carriers pay for using the platform or not. Most shippers are letting the carriers pay for using the platform (e.g. paying each time a time slot is booked). However, some shippers do not let their carriers pay in order to make using the platform more attractive to them. Besides that, some shippers are obliging carriers to make use of interfaces, since this enables the use of, inter alia, the status notifications functionality. However, there are also shippers that only encourage or advise carriers to use such an interface. In both situations, so encouraging/advising to use interfaces on the one hand and obliging the use on the other hand, carriers have to pay for this interface themselves. Additionally, the advent of logistics platforms has influenced the decisions of some shippers in terms of preferred carriers: carriers using an interface are given a higher chance of becoming preferred carrier than carriers who do not make use of an interface. Finally, according to some carriers, some shippers use the transparency provided by the platforms in a way in which they can achieve lower prices.

Carriers are using several power-change tactics. First of all, many carriers start using the logistics platforms. This is a requirement of many shippers in order to remain connected to them. Furthermore, some carriers are using interfaces to replace manual process by automatic ones, which is needed for realising certain benefits. There are also carriers who are not yet using an interface, but who are preparing themselves to do so, for example by replacing their current transport management system (TMS, in fact the ERP system of carriers) by a TMS which is suitable. In addition, some carriers decide to make use of an enterprise service bus which enables them to implement and integrate with platforms more quickly. Moreover, some carriers use their ability to connect with platforms as a selling tool, attempting to get additional transport orders and/or transport orders from new shippers. Finally, more and more carriers are tailoring their strategy towards connectivity, transparency and visibility for example by becoming more agile and investing in IT (both technology and personnel). They realise that keeping up with the rapidly changing market is crucial for their survival.

#### *4.1.3.4 Realised power*

Shippers are obliging their carriers to make use of the platform and in most situations, carriers have to pay for this use themselves. Sometimes, they even want their carriers to make use of interfaces at their own expense. Shippers do this, since they know that this enables them to extract huge operational and commercial benefits from the relationship, which have already been described in section 4.1.1.4.

It could be concluded that carriers who are able to use logistics platforms (preferably via interfaces, which are becoming increasingly demanded) will extract operational and sometimes commercial benefits, which have been elaborated upon in section 4.1.2.4. For carriers not able to keep up with the changes in the market, it will be hard to remain existent. They will get less and less transport orders, which could be the end of their existence.

## 4.2 Horizontal Supply Chain Relationships

### 4.2.1 Shipper to shipper

Based on the interviews, it could be stated that third-party SaaS-based logistics platforms do not have an effect on power within the relationships between shippers. Neither the shippers themselves, nor the platform or the experts have experienced that the platforms have an influence on the power within the relationship between shippers.

### 4.2.2 Carrier to carrier

Nowadays, digitalisation is transforming the way companies do business (Banning et al., 2018; Baron et al., 2017; Bechtold et al., 2014; Bughin & Catlin, 2017; Geissbauer et al., 2016; Schrauf & Bertram, 2016; Tipping & Kauschke, 2016) and the future viability of logistic companies lies in their capacity to innovate (Banning et al., 2018; Bechtold et al., 2014; Tipping & Kauschke, 2016). However, “digital fitness is a challenge for the [logistics] sector” (Tipping & Kauschke, 2016, p. 3) with part of the carriers having a good ICT-infrastructure and being able to keep up with the rapidly changing market and part of the carriers lagging behind with their ICT-infrastructure. This distinction is used in table 5, which can be found in appendix 9.6, to describe the effect of third-party SaaS-based logistics platforms on power within relationships between carriers.

#### 4.2.2.1 Structural power

The digitally fit carriers have connections with an increasing number of shippers, while this amount is decreasing for the other group of carriers. Since shippers are increasingly requiring carriers to use platforms (and using their interfaces), carriers that are not digitally fit are becoming less attractive, decreasing the amount of connections and alternatives for those carriers. In turn, digitally fit carriers will get the transport orders previously executed by the unfit carriers, increasing the number of connections and alternatives of the digitally fit ones. Both carrier groups have control over the resource transport capacity, but the digitally fit carriers possess two additional resources, namely a good ICT-infrastructure (needed for leveraging the opportunities of the platforms to their full extent) and the ability to transform data into information, knowledge and/or wisdom (data on itself has no meaning, so transforming it increases its meaningfulness and value) (Cooper, 2017). Hierarchical level is not applicable in this horizontal situation.

#### 4.2.2.2 Perceived power

The digitally fit carriers perceive their power to have improved over time. They perceive to have a large number of connections and alternatives. Besides that, they also see that their ability to use interfaces enabling real-time data exchange and the ability to transform data into information, knowledge and/or wisdom makes them more attractive for shippers compared to the other carriers, who they perceive to have a decreasing amount of connections and alternatives.

The carriers that are not digitally fit perceive themselves to be strong in offering transport capacity for the sharpest price by only focusing on cost-efficiency. However, they realise that the digitally fit shippers are getting additional opportunities, giving them a power position. Their perceived power has decreased since to, as they are aware of the fact that they are losing ground to the digitally fit group.

#### 4.2.2.3 Behavioural power

Power-use tactics are applied by the digitally fit carriers, indicating that they perceive to have enough power with respect to the other group of carriers to extract the desired benefits. First of all, digitally fit carriers make use of the logistics platforms to increase their value to shippers. They can choose between using the web portal or an interface. Nowadays, an interface is often not required yet, but it is becoming increasingly important since more and more shippers demand carriers to use an interface. Besides using logistics platforms, the carriers also use it as a selling tool in trying to get connections with new shippers. Finally, some carriers decide to create an enterprise service bus, which makes it easier to use interfaces of several platforms.

The digitally unfit carriers are applying change tactics, indicating their perceived lack of power. Those carriers often do use logistics platforms, but via their web portals. Currently, this is often still good enough, but an increasing number of shippers demand carriers using interfaces. Furthermore, those carriers sometimes decide to become pure capacity carriers and to be as cost-efficient and cost-effective as possible in order to offer something different than the digitally fit carriers. Lastly, those carriers sometimes also decide to change course and start investing heavily in becoming digitally fit.

#### 4.2.2.4 Realised power

Concluding, it can be stated that carriers that are digitally fit are getting more transport orders. These carriers will get a preferred position towards the shipper, which will be crucial for future existence. The carriers that are not digitally fit on the other hand will not be able to get this preferred status. Therefore, they have to focus on cost reduction in order to survive in the future.

## 4.3 Summary of Results

In table 1, a visual overview of the results can be found. The arrows indicate whether a power component improved or decreased due to the advent of third-party SaaS-based logistics platforms. In case no effect is present, this is indicated by a dash. For carriers, sometimes two arrows are displayed. This means that the effect depends on situational factors, such as for example the digital fitness of a carrier and the type of platform (i.e. open or closed). The extent to which a power component has changed is not included in the table, since this would require quantitative analysis, while this study is based on qualitative research.

Table 1. An overview of the results.

	Structural			Perceived		Behavioural	Realised
	Network	Resource	Hierarchical	Own	Other		
Shipper to platform	↓	-	-	↓	↑	Use	↑
Shipper to carrier	-	-	↑	↑	↓	Use	↑
Platform to shipper	↑	↑	-	↑	↓	Change	↑
Platform to carrier	↑	↑	-	↑	↓	Change	↑
Carrier to shipper	-	↑↓	↓	↓	↑	Change	↑↓
Carrier to platform	↓	-	-	↓	↑	Use	↑↓
Carrier to carrier	↑↓	↑↓	N/A	↑↓	↑↓	Change/use	↑↓

## 5. DISCUSSION AND IMPLICATIONS

In this part, the results presented in chapter 4 will be discussed by interpreting them and investigating whether they are in line with the theoretical framework. Moreover, the subquestions *iii* up to and including *vi* will be answered. Besides that, implications for both theory and practice will be elaborated upon.

### 5.1 Discussion

#### 5.1.1 Structural power

In this part, the following subquestion will be answered by discussing the effect of third-party SaaS-based platforms on the three elements that determine structural power:

- iii. What is the effect of third-party SaaS-based logistics platforms on structural power within the supply chain?*

##### 5.1.1.1 Network position

To partly answer subquestion *iii* (network position part), it can be stated that the network position has been influenced by the advent of third-party SaaS-based logistics platforms. The network position of shippers and carriers with respect to the platforms has decreased, while the network position of the platforms in those relationships has improved. Moreover, in the relationship between shippers and carriers, the network position of most shippers and carriers has remained constant. However, shippers and carriers that are using open platforms can get new connections, which slightly improves their network position. Finally, the advent of platforms improved the network position of digitally fit carriers and weakened that of digitally unfit carriers.

Interestingly, the results also show that organisation's structural power does not only depend on the relationship between them, but on their whole network. This can be confirmed by scientific literature, which states that power sources related to other actors in the network can affect the power relation between two organisations (Kähkönen, 2015). The structural power in the relationship between platforms and carriers depends on the relationship between shippers and carriers. Shippers oblige carriers to work with a certain platform, limiting the alternatives of the carriers and thus decreasing their network position in their relationship with the platforms.

Furthermore, in the future, it depends on the policy of the platform whether the network position of shippers and carriers will stay the same or not. If platforms decide to open their platform, giving shippers information about the prices, performance and free capacity of the different carriers (also the ones they do not work with), this would decrease the network position of carriers and drastically improve the network position of shippers. However, if a platform does not make this decision, the network position of both parties will remain the same.

To conclude, it can be stated that the results are in line with the theoretical framework, which states that an organisation's network position is a key source of its structural power (Astley & Sachdeva, 1984; Brass & Burkhardt, 1993).

##### 5.1.1.2 Resource control

In answering part of subquestion *iii* (resource control part), it can be concluded that the effect of third-party SaaS-based logistics platforms on structural power differs per relationship (i.e. shipper-platform, platform-carrier, shipper-carrier, carrier-carrier). In the relationships shipper-platform and platform-carrier, this effect is considerably, with the platforms having more resource control and the resource control of shippers and carriers remaining constant. Shippers and carriers need the functionalities of the platform to cope with today's dynamic environment and the platforms need the shippers' transport orders and the carriers' transport capacity for their functionalities

to become (more) valuable. As soon as the platforms become bigger and better, shippers and carriers are getting increasingly dependent on their functionalities and cannot easily switch or stop using the platform anymore. In turn, the platforms will become less dependent on the resources of individual shippers and carriers as they have plenty of other connected parties to work with. In other words: individual shippers and carriers are getting more and more dependent on the platforms' resources than the platforms will be on their individual resources. Moreover, platforms having access to an increasing amount of data will also be a likely cause of this future effect. The resources of the shippers are more valuable than the resources controlled by the carriers, since the resources controlled by the shipper, namely transport orders, are the foundation of the formation of the relationship. The value of the resources of shippers is not influenced by the advent of third-party SaaS-based logistics platforms. However, it does influence the value of the resources of carriers. Carriers that are digitally fit control more valuable resources than carriers that are not digitally fit. Besides transport orders, they namely possess a good ICT-infrastructure and the ability to transform data into information, knowledge or wisdom. Thus, the resource control of digitally fit carriers improves and that of digitally unfit carriers decreases.

In line with the theoretical framework, the difference in structural power between the supply chain actors can be (partly) explained by their resource control (Astley & Sachdeva, 1984; Brass & Burkhardt, 1993).

##### 5.1.1.3 Hierarchical level

Answering part of subquestion *iii* (hierarchical level part), it can be said that third-party SaaS-based logistics platforms are influencing the formal position of shippers and carriers. Shippers have more control over carriers due to the increasingly transparent supply chain. This strengthens the hierarchical level of shippers and weakens the hierarchical level of carriers. This can be supported by scientific literature, which states that transparency can transfer power from a firm to stakeholders (Martinez & Crowther, 2008), in this case from carriers to shippers by weakening the hierarchical position of the former and strengthening that of the latter.

Overall, the results are in line with the theoretical framework, which states that hierarchical level is a key determinant of structural power (Astley & Sachdeva, 1984; Provan, 1980). Especially in the relationship between shippers and carriers, shippers derive their structural power from their position as a client.

#### 5.1.2 Perceived power

In the following, the subquestion listed below will be answered and the findings will be compared with expectations based on the theoretical framework.

- iv. What is the effect of third-party SaaS-based logistics platforms on perceived power within the supply chain?*

In answering subquestion *iv*, it can be stated that third-party SaaS-based logistics platforms have an effect on the perceived power of all parties. In the shipper-platform and platform-carrier relationships, the perceived power of shippers and carriers decreased and that of platforms increased. In the shipper-carrier relationship, the shippers' perceived power increased, while that of carriers decreased. Finally, in the horizontal relationship between the digitally fit and digitally unfit carriers, the perceived power of the former increased and that of the latter decreased.

A notable thing was that shippers perceive themselves to be the owner of the data that flows through the platforms, which corresponds to their structural power, but that most carriers did not really had knowledge about the ownership of this data. They

mentioned that the platform was probably the owner of the data, which is thus not in line with their structural power. The shippers and carriers are namely the owners of their own data, with the platforms having (confidential) access to it and having the right to save it into their system and to use the combined data for analytical purposes. This inaccurate perception of carriers might be explained by the fact that carriers often do not conclude contracts with the platforms themselves, since the shippers do this for them. However, this inaccurate perception is not likely to have big implications. Although the carriers are the legal owner of their own data, the platforms have increasing access to these data. Since the platforms have access to these data, even without being the legal owner, carriers are losing structural power and they are aware of that. Thus, it is considered to be relatively unimportant that carriers do not know that they are the legal owner of their own data, since it does not change their perceived power compared to the situation in which they would have been aware of their legal ownership.

Something else that stands out is that carriers indicated the tough competition (which can intensify in case platforms would become completely open to shippers) between carriers for their perceived power. This has not been mentioned by the shippers, but it is very likely that shippers are well aware of it.

According to the theoretical framework, organisations' perceived power often deviates from the structural power (Kim et al., 2005; Provan, 1980). However, the results of this study reveal that shippers, platforms and carriers have a relatively accurate perception of their own and others' structural power. A possible explanation could be that shippers, platforms and carriers already work with each other for some period on a daily basis. Research shows that organisations working together in a supply chain for a substantial period of time are likely to become aware of the course of events in each other's organisations (Wilkinson, 1996).

### 5.1.3 Behavioural power

Hereunder, subquestion v will be answered and the results will be discussed in the light of the theoretical framework.

- v. *What is the effect of third-party SaaS-based logistics platforms on behavioural power within the supply chain?*

The theoretical framework used states that behavioural power is determined by perceived power rather than structural power (Kim et al., 2005; Wilkinson, 1996; Wolfe & McGinn, 2005). Since the structural and perceived power are well-aligned in this research, it cannot be confirmed nor challenged that perceived power and not structural power is driving power behaviour. However, it can be investigated whether behavioural power is driven by either structural power or perceived power and not by other factors.

#### 5.1.3.1 Shipper to platform and platform to carrier

In partly answering subquestion v (regarding shipper-platform and platform-carrier relationships), it can be stated that the advent of third-party SaaS-based logistics platforms has caused shippers and carriers to act based on (perceived) power that has changed due to a new phenomenon, thus resulting in other behavioural power than before. However, it is important to state that because of their decrease in perceived power, shippers and carriers would like to use power-change tactics, but they do not have these at hand. Finally, since the platforms are a new phenomenon, every action they take is a change in their behavioural power.

In these relationships, shippers and carriers are using power-use tactics, while platforms are using power-change tactics. It has already been stated before that this seems not to be in line with their perceived power and in sections 4.1.1.3 and 4.1.2.3, a

possible explanation based on the theoretical framework has been given. Another more likely explanation is that shippers and carriers do perceive not to have enough structural power relative to the platforms, but that they are not able to apply power-change tactics. Shippers (and thus their carriers) are becoming increasingly dependent on the platforms due to the dynamic environment they are operating in, which puts a severe limit on the change tactics they would be able to use. Carriers' dependency on shippers hinders them in applying change tactics. For shippers, except founding a platform themselves (as a group of shippers), it is highly unlikely that they can reduce their dependency on the platform. Shippers' and carriers' inability to apply power-change tactics has then probably resulted in trying to apply power-use tactics (i.e. renegotiation of contracts) to get the best out of the relationship. This is in line with the increasing attention for supply chain risk management (SCRM) over the past few years due to the fact that supply chains are influenced by an increasing number of risk events (Aqlan & Lam, 2016). Organisations are using SCRM to, inter alia, reduce possible negative effects of unchangeable risk events on their operations.

Important to state is that the shippers' power-use tactic of selecting the best platform to work with is based on their perceived power. This power-use tactic is in fact the initiation of the relationship and has thus been based on the shippers' perceived power at  $t_0$ . At that moment, the shippers perceived to have enough structural power vis-à-vis the platforms, since they (and not the platform) had the ability to decide whether they wanted to use the platform or not. The selection of a platform in itself has consequences (i.e. the foundation of a new relationship), but the specific platform that is chosen will also impact future operations. Although the existing third-party SaaS-based logistics platforms are quite similar, they do differ in certain aspects, such as size, innovation-rate and ease of integration. Selecting a big platform with which it is easy to integrate (for both shippers and carriers) and which is focused on innovation is important to deal with the rapidly changing environment.

Platforms are using change-tactics even though their perceived power has increased over time. This can be explained by the fact that platforms have not secured their market positions yet, which is necessary to maximise profits in the long-term. Currently, there are many platforms offering similar functionalities (Baron et al., 2017). However, it is expected that the market will strongly consolidate due to two causes: (1) some platforms will be driven out of business by competitors and (2) others will not obtain the critical mass required quickly enough (Baron et al., 2017). A statement made by one of the experts explains the first cause. He mentioned that the interfaces between shippers and carriers on the one hand and the platforms on the other hand will become increasingly standardised. This means that it will become easier and less time-consuming for shippers and carriers to connect with platforms. Although switching is hard and unattractive at the moment, this will thus become easier in the future. In turn, this forces the platforms to keep innovating in order to prevent their users from switching to another platform. Platforms that are lagging behind with innovation will lose their users to platforms that are innovating as soon as the interfaces have become sufficiently standardised. In explaining the second cause of the expected consolidation, the theory about network externalities comes into play. This theory states that the value of many products increases with the number of actors using it (Katz & Shapiro, 1985). This is also the case for platforms: the more connections they have with shippers and carriers, the more valuable their network becomes for both shippers and carriers. Thus, to survive and become one of the valuable platforms still left after the consolidation, it is essential to become both better

and bigger. Platforms are trying to achieve this by applying the change tactics that have been described.

The current capacity shortage has been emphasised multiple times in this paper. In thinking about solutions to solve this problem, the question arises whether platforms can be of value here. The real solution for the capacity shortage is getting more drivers, but this has proved to be a problem in recent years (UWV, 2018). Therefore, it is important to investigate other solutions. Using the available transport capacity to its full extent could be part of the solution. To realise this, it could be advisable to use the possibilities of platforms to their maximum extent, namely, for instance, by opening up the information concerning transport capacity. If platforms are connected with the shippers and carriers via interfaces and if they create an additional functionality that enables real-time insight into the actual free capacity, they have the ability to make the available transport capacity visible for the whole market. This would give shippers more insight into where there is still capacity available. In addition, it would give carriers the opportunity to increase their load factor by reducing the number of empty miles, which contributes positively to their profitability. However, in order to make this solution successful, it is important that shippers do not abuse their power towards the carriers as soon as the platform becomes more open, e.g. by offering carriers with a low load factor and/or a lot of free capacity a lower price. If shippers do abuse their power, there is a chance that carriers collectively decide not to work for those shippers anymore. Concluding, it is advisable that platforms open up the information about transport capacity. At the same time, it is important that this behavioural tactic is conciliatory, which means that it must be done in consultation with all supply chain actors.

Concerning the theoretical framework, it can be stated that shippers, platforms and carriers do act based on either their structural or perceived power in the relationships mentioned above. However, one could say that the shippers' and carriers' use of power-use tactics due to the inability to change the power relationship is not based on their (perceived) power vis-à-vis the platforms, but on the increasingly dynamic environment they operate in which forces them to use platforms. This shows that power behaviour is not just determined by perceived power, but also by the situation in which an organisation is operating (Kiyak, Roath, & Schatzel, 2001).

Kim et al. (2005) argue that organisations using hostile power-use tactics will lose power and those using conciliatory power-use tactics will gain power. Since shippers and carriers are only applying conciliatory power-use tactics, this would mean that both shippers and carriers should gain power relative to the platforms. This might not seem to be the case, since both parties' relative power has decreased. However, by using the conciliatory tactics of selecting the best platform (only shippers) and (re) negotiating contracts (both shippers and carriers), they have reduced the decrease in their relative power which would have been even lower in case they did not apply those change tactics.

An important side note here is that currently, shippers and carriers are able to (re)negotiate contract terms with (some) platforms. However, in the future, this ability is likely to decrease or even disappear. Shippers and carriers are becoming increasingly dependent on the platform, which weakens their negotiating position (Cho & Chu, 1994; Pinkley, Neale, & Bennett, 1994) and in turn decreases their relative power towards the platforms.

Also in line with the theoretical framework, it has been revealed that the platforms' power-change tactics indirectly influence their realised power (Kim et al., 2005). By regularly updating their software, adding new functionalities and creating extra

services based on big data, they improve their resource control. Furthermore, by attracting more shippers and carriers and behaving in an open, honest, transparent and trustful way, their network position is improved. In turn, those improvements in their structural power enable them to become bigger and better, which is necessary for achieving their goal of securing their future position and maximising future profits.

### 5.1.3.2 Shipper to carrier

To answer subquestion *v* for this specific relationship (shipper-carrier), it can be concluded that shippers and carriers both apply new power tactics since the advent of third-party SaaS-based logistics platforms.

Shippers already had higher relative (perceived) power with respect to carriers' (perceived) power and this has further improved since the advent of third-party SaaS-based logistics platforms. Confirming the theoretical framework, shippers apply power-use tactics, while carriers use power-change tactics.

Shippers are using conciliatory, but mostly hostile power-use tactics. Although the use of conciliatory tactics would increase shippers' power, while hostile tactics would result in a decrease in shippers' power according to the theoretical framework (Kim et al., 2005), this research reveals that both power-use tactics result in an increase of shippers' power, thus being in contrast with the theoretical framework. This can be explained by the fact that in some situations, hostile power-use tactics can be successful (M. K. Hingley, 2005). In this case, carriers accept the hostile power-use tactics of the shippers as they realise that they can also benefit from them. Besides that, carriers do not really have the option not to accept those tactics due to their number of alternatives being decreasing (Sutton-Brady, Kamvounias, & Taylor, 2015). Although there are many alternative shippers to work for, more and more shippers are using those platforms, which in turn decreases the amount of their alternatives.

Confirming the theoretical framework, carriers' power change tactics have no direct impact on their realised power (Kim et al., 2005). All their change tactics are improving their resource control, which in turn improves their network position in relation to that of carriers who do not apply those change tactics. In turn, these improvements have improved their perceived power. According to the theory, this may cause them to use power-use tactics in the future which could enable them to extract the desired benefits from the relationship. However, they do not apply power-use tactics and it is questionable whether they will do this in the future. The fact that the shipper is the client and thus the initiator of the relationship is expected to prevent the carriers from experiencing their power to be sufficient enough to apply power-use tactics. Although carriers might still be able to extract benefits from their relationship with shippers, it is unlikely that they will achieve (all) their desired benefits.

### 5.1.3.3 Carrier to carrier

In answering subquestion *v* for this specific relationship (carrier-carrier), it can be stated that third-party SaaS-based logistics platforms have an effect on the behavioural power. Digitally fit carriers are leveraging their favourable resources to become more attractive to shippers than the digitally unfit carriers are. The digitally unfit carriers are triggered by the platform to make a choice: either becoming a pure capacity carrier that supplies at a low cost or investing to become digitally fit as well.

Digitally fit carriers are using power-use tactics and digitally unfit carriers are using power-change tactics, which is in line with their perceived power.

The digitally fit carriers are only applying conciliatory power-use tactics. In line with the theory, this allows them to realise the

intended benefits. For instance, it enables them to get more transport orders and to extract operational value.

The digitally unfit carriers are applying power-change tactics. Confirming theory, this does not directly influence their realised power (Kim et al., 2005). The change tactic of becoming a pure capacity carrier and tailoring strategy towards cost reduction as well as the change tactic of using platforms via web portals changes their network position. This would namely increase their amount of connections with shippers again, since low prices are important to them. This in turn will increase their perceived power relative to digitally fit carriers. Based on that, they might perceive their power to be sufficient enough to apply power-use tactics, for example 'offering transport capacity for the lowest price while still using the basic functionalities of platforms via web portals', which could ultimately result in them being able to extract desired benefits from the relationship, namely generating profit in the long term. On the other hand, the change tactic of investing heavily to become digitally fit would change their network position and thus structural power, which will become the same as that of the currently digitally fit carriers. In turn, that will increase their perceived power and allow them to use the same power-use tactics as the digitally fit carriers are using. Finally, this will enable them to extract the same desired benefits from the relationship, since they are now also digitally fit.

#### 5.1.4 Realised power

This part will examine the similarities and/or contradictions of the results concerning extracted desired benefits for each organisation with expectations according to the theory and give answer to the following subquestion:

- vi. *What is the effect of third-party SaaS-based logistics platforms on realised power within the supply chain?*

##### 5.1.4.1 Shippers

To partly answer subquestion *vi* (for shippers) it can be stated that the advent of third-party SaaS-based logistics platform has influenced the realised power: shippers can realise several benefits and are offered great opportunities which outweigh the drawbacks of the platforms. Furthermore, their relative power position towards the carriers has been strengthened due to the increasing transparency which is caused by the shippers' decision to use the platform in their supply chain.

The operational and commercial benefits that shippers can extract from their relationships with platforms and carriers have already been described in section 4.1.1.4. In addition to those benefits, shippers can thus also strengthen their position with respect to the carriers because of the increasingly transparent market. The policy of the platforms plays an important role here. In potential, they could enable shippers not only to compare their current carriers on the basis of price and performance, but also to compare carriers they are not connected yet. However, it is questionable whether this will happen in the future, since platforms' viability depends on their capacity to fulfil the needs of both shippers and carriers instead of picking a side.

Although shippers are able to realise a whole range of benefits, their structural and perceived power vis-à-vis the platforms have decreased since they are becoming increasingly dependent on these platforms. However, they do not seem to worry about this, which is indicated by the positive overall opinions given to the logistics platforms. Apparently, the aforementioned advantages of the platform for shippers are so great that they accept this decrease in structural power. This can be explained by the fact that shippers realise that they need the functionalities of the platform to cope with today's dynamic environment.

##### 5.1.4.2 Platforms

Answering subquestion *vi* partly (for platforms), it can be said that the advent of third-party SaaS-based logistics platforms has influenced the realised power: although the platforms have not reached their ultimate goals yet, they are already on track.

The platforms have not yet been able to extract the desired benefits from their relationships with shippers and carriers. Therefore, they apply power-change tactics that are all aimed at becoming bigger and better to ensure and to secure and strengthen their future position in the supply chain. In section 5.1.3.1, it has already been discussed what platforms can do in order to secure and strengthen their market positions.

##### 5.1.4.3 Carriers

Answering this part (for carriers) of subquestion *vi*, it can be concluded that third-party SaaS-based logistics platforms have an effect on the realised power. The digitally fit carriers can extract benefits from using the platform, while the digitally unfit carriers have to change their strategy in order to survive. Besides, the relative power of carriers vis-à-vis shippers has been weakened due to the increasing transparency which has been created by the shippers' obliging the carriers to use the platforms.

In section 4.1.2.4, the operational and commercial benefits that carriers can obtain from their relationships with shippers and platforms have been elaborated upon. As has been explained before, those commercial benefits result from the strengthened position of those digitally fit carriers relative to the digitally unfit carriers. This competitive advantage is crucial for their future existence. For the digitally unfit carriers, it is time to make a move by either becoming digitally fit or by becoming a pure capacity carrier at low prices while using the platforms via a web portal. Digitally unfit carriers that do not make a choice can no longer exist. As soon as these carriers have been outcompeted, the competitive advantage of digitally fit carriers disappears. This has been confirmed by an expert, who mentioned that using the platform via an interface will not require a good ICT-infrastructure in the future anymore. This shows that carriers with a good ICT-infrastructure have an advantage over lagging carriers in the short-term, but that this advantage will diminish in the long-term. Although carriers can realise various benefits from using the platforms, the platforms will become more attractive to work with after strong consolidation of platforms has taken place. Then, the carriers no longer have to use several web portals and interfaces, but can use one, which will further standardise processes, leading to increased efficiency and ease of use.

Although digitally fit carriers can extract quite some benefits from using the platform, both their structural and perceived power vis-à-vis shippers and platforms have decreased. For some carriers, this is not a real problem, which is indicated by positive overall opinions concerning the advent of logistics platforms. They mentioned that the benefits realised by using the platforms outweigh the decrease in (perceived) power and help them in coping with today's rapidly changing environment. However, some carriers experience it to be a big problem, indicated by negative overall opinions concerning the advent of logistics platforms. They said that some shippers use the platform to get lower prices, which will decrease the carriers' already low margins further. Overall, it could be stated that the carriers are benefiting from the platform, but to a lesser extent than shippers.

In the relationships with shippers, carriers apply power-change tactics, which would, according to Kim et al. (2005), mean that they are changing their structural vis-à-vis shippers' power rather than extracting desired outcomes from the relationship. However, this is not in line with the findings, since carriers do extract desired benefits from the relationship with the shipper without applying any power-use tactics. Apparently, benefits can

also be extracted by applying power-change tactics. After comparing two studies, it appears that this can indeed be the case. Kim et al. (2005) state that it is highly unlikely that the structural power of two organisations in a relationship is the same. Since the structural and perceived power in this study are quite accurately aligned, it would be safe to say that it is also very unlikely that both parties perceive their structural power to be exactly the same as that of the other party. This implies that one of the organisations, namely the one with the highest own relative power perception, applies power-use tactics and that the other one, with the lowest own power perception, uses power-change tactics. According to Hingley (2005), power-use tactics can be applied as long as the other organisation also benefits from the relationship. Combining the theory of Kim et al. (2005) and Hingley (2005) would result in the following. In a relationship where power-use tactics are applied, both the organisation applying power-use tactics as well as the organisation applying power-change tactics extract benefits from the relationship. This in turn explains the fact that carriers can extract benefits from their relationship with shippers, even though they are not applying power-use tactics.

## 5.2 Implications

### 5.2.1 Theoretical implications

This study contributes to current literature by studying the effect of an Industry 4.0 solution, namely third-party SaaS-based logistics platforms, on power within supply chain relationships. No dedicated research studying this effect had been conducted. Although researchers have studied related topics, namely EMs and ELMs, and derived at some power-related findings, those studies were not fully focused on examining the effect of those marketplaces on power within supply chain relationships. It can thus be stated that this research fills a research gap. The findings give insight into how the advent of third-party SaaS-based logistics platforms influence the four power components from the model developed by Kim et al. (2005), namely structural power, perceived power, behavioural power and realised power. Therefore, this study also contributes to the power literature by investigating the relationship between structural and behavioural power by linking it to perceived and realised power. This shows that shippers and carriers will get a disadvantaged position compared to the platform because of their dependency created by the decision to use the platform and because of the many functionalities and opportunities offered by the platform that will help shippers and carriers to meet the requirements of today's demanding environment. Moreover, this study shows that the framework of Kim et al. (2005) to a great extent can be applied to study the effect of third-party SaaS-based logistics platforms on power within supply chain relationships, although it has been originally designed to describe power in interpersonal negotiations. It has been confirmed that perceived power is influenced by structural power. However, it cannot be confirmed whether perceived instead of structural power is driving power behaviour, since they were quite accurately aligned in the relationships between shippers, platforms and carriers. Moreover, it can be stated that besides perceived power, the environment an organisation operates in also determines its power behaviour. This environment should thus become an additional dimension in the theoretical framework. In line with their model, it has been found that power-change tactics indirectly influence realised power and that power-use tactics have a direct impact. Besides that, it was also confirmed that conciliatory power-use tactics increase the power of the organisation that applies this tactic. However, this study shows that hostile power-use tactics also enable an organisation to gain power, while the theoretical framework argued the opposite. This study therefore shows that the model should be expanded and

should indicate that in some situations (i.e. when the disadvantaged organisation accepts it either because it can realise benefits or because it lacks alternatives) hostile power-use tactics can gain an organisation power. A final contribution to the power literature is the multi-sided approach taken, since most studies taking two-sided view (M. Hingley, Angell, & Lindgreen, 2015). Instead of only looking at power in relationships between two supply chain actors, it has also been investigated whether power had been influenced by power in another relationship in the network. This especially holds for the power in the relationship between platforms and carriers, which is to a large extent influenced by the power exercised by shippers in their relationships with carriers.

### 5.2.2 Practical implications

This research has several practical implications. The most important one is that it shows shippers and carriers, especially the ones not working with a platform yet, that they have to act quickly. In nowadays' dynamic environment, using a platform is crucial for future existence. Especially for carriers, it is important to take action by either becoming digitally fit or by pursuing a low-cost strategy. Shippers should select the right platform. Selecting a big platform with which it is easy to integrate and which focuses on innovation is important for success in today's and future dynamic environment.

Furthermore, this paper shows that platforms cannot rest on their laurels. The anticipated strong consolidation in combination with the expected easiness of integration in the future makes it extremely important for platforms to become bigger and better in order to secure their future market position. This can be done by continuing to apply their current power-change tactics, namely updating software and adding new functionalities, creating additional services based on big data, attracting more users and behaving openly, honestly, transparently and trustfully. Platforms that lag behind in innovation will probably be driven out of business by platforms that keep up with the requirements of today's rapidly changing environment.

Additionally, this study shows that third-party SaaS-based logistics platforms could be of help in solving the problem of the current capacity shortage. It could be advisable to use the possibilities of the platform by making the information concerning transport capacity visible to all supply chain actors. However, this only works as long as shippers do not abuse their power with respect to carriers and when opening up this information is done in consultation with all supply chain actors. This study thus shows that in order to become the connected, efficient and smart supply chain ecosystem that is needed to cope with the current rapidly changing environment, the common interest in the supply chain should be superior to the interest of the individual actors.

Shippers, platforms and carriers can also benefit from this study by looking at how the research participants act with respect to this trending topic in order to improve the course of events in their own business.

## 5.3 Limitations and Future Research

This study contributes to theory and practice in several ways. However, it has limitations that provide directions for future research. The first limitation is the result of the methodological approach chosen. Although the case study is useful for an exploratory study like this, its small sample size restricts the generalisability of the findings. Moreover, it would have been better to measure the effect of third-party SaaS-based logistics platforms on power within supply chain relationships by performing a longitudinal case study, since this would allow to compare the situation before and after the introduction of those

platforms. In this study, this comparison has been enabled by asking the business representatives to give statements about both the before and after situation, while it would have been better to ask about the before situation in the respective period. Now, it might be the case that the business representatives did not mention some important aspects about the situation prior to the introduction of logistics platforms, since they simply forgot them due to the passage of time.

Besides limitations that are attached to this research, it also provides opportunities for future research. First of all, performing this research in a longitudinal way combined with a larger sample size would be valuable in increasing the generalisability of this study. Moreover, it could be interesting to investigate how the effect of third-party SaaS-based logistics platforms on power within supply chain relationships develops in the future. Furthermore, taking another type of logistics platform, for example one owned by a consortium, shipper or carrier, as subject for a study would be interesting to see whether the results are comparable to or different from the findings of this study. Besides that, conducting this research in other continents as well would allow comparisons between those continents. A research participant namely indicated that the power positions in the logistics sector in those continents differ from those in Europe. Moreover, having control towers, another Industry 4.0 phenomenon, as subject of a future study is also worth investigating. Control towers are another important solution in creating visibility and making the supply chain more transparent, thus sharing characteristics with logistics platforms, but those control towers go a step further and are often controlled by the shipper instead of by a neutral party. Future research could also focus on measuring the effect of platforms in other industries on power within supply chain relationships. One could for example think of Uber in the market of passenger transportation and Airbnb in the lodging market. Additionally, it would be interesting to perform the same study based on another theoretical framework. There are many dimensions of power and although the framework used in this research covers quite a few, not all of them can be captured in a single model (Belaya, Gagalyuk, & Hanf, 2009). Moreover, future research could focus on researching whether behavioural power is always based on perceived power instead of on structural power in situations where supply chain actors already do business with each other for a long period of time, since this study did not give a clear view on that point due to the alignment between the two.

## 6. CONCLUSION

In today's dynamic environment, supply chains have to collaborate and integrate in order to cope with globalisation, rapid technology developments and increased customer responsiveness (Soosay & Hyland, 2015). This can be realised by making use of an Industry 4.0 solution, namely cloud-based platforms. Especially in the logistics industry, those platforms are a trending topic. In this research, the effect of a specific type of cloud-based platforms, namely third-party SaaS-based logistics platforms, on the power within supply chain relationships has been examined. Since such platforms position themselves between two supply chain actors, namely shippers and carriers, it was expected that the power relationship between shippers and carriers is influenced by the advent of platforms. Moreover, the effect of third-party SaaS-based logistics platforms on power within two other vertical (shippers to platforms and platforms to carriers) and two horizontal (shippers to shippers and carriers to carriers) supply chain relationships has been investigated.

This study shows third-party SaaS-based logistics platforms cause shippers to get a stronger power position relative to

carriers. Moreover, those platforms intensify the competition between carriers and strengthen the horizontal position of carriers that are digitally fit. Within the horizontal relationships between shippers, the power positions are not affected by the advent of the platforms. The platform itself is not aiming for a power position, but it realises one based on its increasing value to the supply chain which makes shippers and carriers dependent on them. Therefore, shippers and carriers are losing some power towards the platforms.

Although the advent of third-party SaaS-based logistics platforms decreases the power of the existing organisations (i.e. shippers and carriers) to a greater or lesser extent, all supply chain actors are (potentially) benefiting from those platforms in their journey towards becoming a connected, efficient and smart supply chain ecosystem.

## EPILOGUE

A fully connected, efficient and smart supply chain can only be realised when all the potential benefits from cloud-based platforms are leveraged to their maximum extent. This can only be achieved when the platforms and their users are completely open and transparent and as long as all partners get a fair price for their contribution to the supply chain ('live and let live'). In the end, this is the best for all individual partners and the supply chain as a whole. Whether this will succeed in a logistic world in which shippers have a very dominant power position, the future will tell!

## 7. ACKNOWLEDGMENTS

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## 9. APPENDICES

### 9.1 Elaboration on main findings of related research topics

In the introduction, it has already been shortly mentioned that despite a lack of research on the topic of this paper, research on related topics has been found. Despite the limitations of transferring the findings of those related researches to the topic of this paper, the main findings will be summarised in order to shed light on aspects that may be relevant for the research that will be conducted.

Bakos (1991) argues that EMs can reduce the market power of sellers in differentiated markets by increasing price competition as a result of reduced search costs. EMs can thus leave sellers no other choice than lowering their prices in order to stay competitive, showing that EMs can exert power over sellers.

In a study on Translease, an interorganisational information system which facilitates e-commerce between repair agents and lease companies, it turned out that after having persuaded repair agents to use the system, the lease companies were able to exert power over them, for example not doing business anymore with repair agents not using this system (Allen et al., 2000).

Moreover, another research links the possibility to exert power over other organisations as a determinant of interorganisational relationships to the formation of electronic marketplaces (Standing et al., 2006). Major players within an industry may decide to jointly create an EM in order to exert power over other organisations by determining the policies and structure of the EM. Nonetheless, this finding is related to platforms owned by consortia which implies that this may not be the case for third-party owned platforms.

Wang, Potter, Naim and Beevor (2011) conducted a case study on the drivers and implications of collaborative ELMs, in which collaborative means that a few companies within the supply chain, often shippers, jointly create an ELM. Some carriers that were not using telematics before the ELM stated that they were being forced to use the ELM, which indicates that power has been exerted over them. Furthermore, the researchers concluded that power issues prohibited a quick adoption and sustainability of the collaborative ELM. However, explanations about what the power issues mentioned encompass are lacking.

## 9.2 Descriptions and definitions of ‘third-party’, ‘SaaS-based’ and ‘logistics platforms’

### 9.2.1 Third-Party Ownership

As has been stated before, this paper will focus on third-party SaaS-based logistics platforms. It has already been explained why the focus will be on logistics platforms that are offering SaaS solutions, but the reason for choosing third-party owned platforms has been left unjustified thus far. As will be described later on, platforms can be owned by buyers or sellers instead of being owned by an independent third-party. However, those platforms are not part of this research for two reasons. First, focusing on all different ownership types falls beyond the scope of this study. Second, based on a conversation with someone knowledgeable in this field, it is expected that collecting data could become a problem when focusing on platforms that are owned by either buyers or sellers. In those situations, the platform owners are not neutral parties, leading to potential friction and dissatisfaction within the supply chain that could be worsened by the outcomes of this paper. Therefore, it has been decided to focus on neutral, third-party-owned, SaaS-based logistics platforms, reducing the chance of problems in the data collection process.

Third-party relates to the ownership structure of a platform. In the academic literature, several ownership structures of EMs have been discussed. Since marketplaces are a category of platforms (Täuscher & Laudien, 2017), it is assumed here that the same ownership structures can be applied for platforms. Standing et al. (2006) pinpointed the following four ownership and governance structures: private marketplaces, public or intermediary marketplaces, consortia marketplaces and community or cooperative e-Marketplaces. Another typology identifies three ownership structures, namely: buyer-owned marketplaces, supplier-owned marketplaces and neutral or independent third-party-owned marketplaces (Yoo, Choudhary, & Mukhopadhyay, 2007). Other researchers identified three different ownership structures, namely: independent or third-party EMs or exchanges, consortium-based EMs and private EMs or exchanges (Chelariu & Sangtani, 2009; Truong, Le, Senecal, & Rao, 2012). Overall, it can be concluded that there are neutral or independent platforms owned by third-parties and “biased” (Yoo et al., 2007, p. 952) platforms owned by buyers or sellers. As has been stated before, this paper will thus focus on the neutral, non-biased platforms owned by third-parties who are not participating in the supply chain as either a buyer or a seller.

### 9.2.2 SaaS-based solutions

Nowadays, “cloud services are new business models” (Wu, 2011, p. 15058). SaaS-based solutions belong to one of the three service models of cloud technology (Tsai et al., 2014) and is the cloud service most commonly used (Wu, 2011). A standardised software solution is offered on-demand by the provider to the customer via the Internet (Buxmann et al., 2008; Yang et al., 2015). The existence of SaaS solutions enables organisations to outsource several applications (including both operation and maintenance) (Buxmann et al., 2008; Yang et al., 2015), which can result in lower IT costs (Gupta, Seetharaman, & Raj, 2013; Wu, Lan, & Lee, 2011). Users do not pay a fixed license fee, but often pay only for the chosen software components and service costs or on a pay-per-use basis (Buxmann et al., 2008). In most occasions, access to the Internet and a web browser are sufficient to be able to make use of those solutions. The standardisation of the software offered enables users to integrate the SaaS solutions with their own in-house systems (Buxmann et al., 2008).

### 9.2.3 Logistics Platforms

Flexibility, transparency and easy adjustability of logistics services are of increasing importance, resulting in the rise of logistics platforms (Deutsche Post DHL Group, 2016). Logistics platforms can be defined as “two-sided online marketplaces that match the demand for and supply of logistics services through digital interfaces.” (Deutsche Post DHL Group, 2016, p. 25) The platform plays a facilitating role in the exchanges between supply chain actors, mainly shippers and carriers, by establishing a connection between the actors and taking the lead in the coordination of the exchanges between them (Saarikko, 2015). Such a platform can streamline transport, improve customer service contributions and allows for generating, developing and distributing logistics- and SCM-related knowledge (Cambra-Fierro & Ruiz-Benitez, 2009; Toka et al., 2013). Although platforms are not a completely new phenomenon, information technology has transformed them by reducing the need to own physical assets (Van Alstyne, Parker, & Choudary, 2016). Therefore, platforms own almost no physical assets nowadays (Baron et al., 2017), resulting in low cost structures and high gross margins (Hagiu & Rothman, 2016). In turn, the use of a platform business model in general is expected to deliver value to its founder (Bughin & Catlin, 2017). Besides that, logistics platforms can be of help in realising an efficient, connected and smart supply chain by making it more transparent (Schrauf & Bertram, 2016). Both internal and external data, including transport data and status information, are put into the platform and are combined with information about for example the weather, traffic and supply chain events. After this information has gone through some analytics, the platform has generated a “single source of truth” (Schrauf & Bertram, 2016, p. 17) which can help supply chain actors in improving their decision-making. The visibility enabled by the platform and the possibility to quickly adapt to information provided by the platform result in an opportunity to achieve a competitive advantage and to reduce risks (Schrauf & Bertram, 2016).

### 9.3 Overview of Interviews

Type of organisation	Name of organisation or interviewee	Date	Type of interview	Approximate length***
Platform	Transporeon Group	28-05-2018	Phone	110 minutes
Shipper	VPK Packaging	29-05-2018	Face to face	60 minutes
Shipper	-*	05-06-2018	Phone	45 minutes
Shipper	Knauf	06-06-2018	Face to face	30 minutes
Carrier	-	30-05-2018	Face to face	110 minutes
Carrier	HST Groep	01-06-2018	Face to face	60 minutes
LSP	-	11-06-2018	Phone	25 minutes
Carrier	Nijhof-Wassink	12-06-2018	Face to face	40 minutes
Expert	-	23-05-2018	Phone**	15 minutes
Expert	-	23-05-2018	E-mail	Not applicable
Expert	M. Wouterse	31-05-2018	Phone	50 minutes
Expert	-	05-06-2018	Phone	30 minutes

\*For anonymity reasons, the names of those organisations are not shown.

\*\*Additional information was sent by e-mail

\*\*\*The interviewees knew that the maximum duration of the interview could be minimised to one hour, but some of them agreed to a longer duration.

## 9.4 Informed consent form

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

### To be signed by the participant and the researcher:

I declare to be informed about the nature, method, target and load of the research in an understandable way.

I know that my contribution to the research can be published anonymously. Herewith, I declare that my contribution to this research will/will not be (strike out what does not apply) published anonymously.

I received the interview questions before the interview. Moreover, I know that I can refuse to answer certain questions.

My participation in this research is voluntary. I can withdraw from the study at any time, without having to give a reason and without negative consequences. I understand that I will not receive a reward or payment for my participation.

I was offered the possibility to answer questions and the questions that I had were answered satisfactorily. I am aware that I can contact Anouk ten Dam at any moment about questions that I might have in the future.

### To be signed in duplicate:

\_\_\_\_\_  
**Name of participant**

\_\_\_\_\_  
**Signature of participant**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Name of researcher**

\_\_\_\_\_  
**Signature of researcher**

\_\_\_\_\_  
**Date**

### Contact information

Responsible researcher: Anouk ten Dam

E-mail:

Tel.:

## 9.5 Interview templates

### 9.5.1 Interview template shippers

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

1. Which of the above-mentioned logistics platforms do you use and for what purpose? (data exchange regarding orders and realisation, marketplace for spot traffic, other?)
2. Have you, as a shipper, taken the initiative yourself to use these platforms?
3. Does the platform connect you with carriers with whom you would otherwise not have been connected?
4. Do you encourage carriers to use the platform? Do carriers that do not use the platform still qualify for your transport orders?
5. Carriers can feed the platform either manually or with an automatic connection from their own TMS. Do you encourage carriers to use such an automatic connection?
6. Do you make (long-term) contract agreements with the platform? If so, are agreements made about the ownership of the data?
7. Are you dependent on the platform for the execution of your transport orders? Do you have a back-up method? Can you switch quickly to this back-up method?
8. Do you make (long-term) contract agreements with carriers? Do you work with ‘preferred’ carriers? Does the advent of those logistics platforms influence the content/duration of contract with carriers and your ‘preference’ with respect to carriers?
9. How do you assess the contribution of the platform to your business on an operational level in the following areas, on a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
  - Efficiency and costs
  - Reliability, speed and quality of data
  - Transparency of the market in terms of availability of transport capacity
  - Managing the execution of transport (for example info about delays, last-mile info etc.)
  - Sustainability
  - Personal contacts within the supply chain (e.g. between shipper and planner)
10. How do you assess the contribution of the platform to your business on a commercial level in the following areas, on a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
  - Transparency of the market in terms of availability of transport capacity
  - Transparency of the market in terms of quality/delivery reliability of transport (rating carriers)
  - Transparency of the market in terms of transport prices
  - Improvement of service towards end customer (e.g. last-mile information)
  - Competition between shippers
  - Sustainability
  - Personal contacts within the supply chain (e.g. between shipper and account manager of carrier)
11. Which resources, qualities, factors of you as a shipper are important for the platform and the carriers?
12. Which resources, qualities, factors of the platform and the carriers are important for you as a shipper?
13. How do you assess the effect of those platforms on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers
  - Horizontally: relationships between shippers
14. Has the advent of logistics platforms affected your strategy?
15. Do you expect the advent of logistics platforms to affect the strategy of carriers in general? Could it be an impetus for (further) concentration (mergers and acquisitions) among carriers?
16. What is your final opinion regarding the advent of these logistics platforms, taking all aspects into account? On a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?

Finally, do you have additional information about third-party SaaS-based logistics platforms and/or other types of logistics platforms that I should include in my research?

### 9.5.2 Interview template platform

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

1. How and when did the platform arise? On whose initiative?
2. Who is the current owner of the platform?
3. Which solutions/functionalities are offered by your platform? (Database of carriers with or without rating, exchange and realisation of transport orders, marketplace/spot bidding, otherwise?)
4. In which markets (branches/countries) is your platform used? On which market do you focus particularly?
5. What is the revenue of the platform? Subscription or pay-per-transaction?
6. How many transactions flow through your platform on an annual basis? How many users does your platform have (shippers and carriers)? What is your market share? What is your goal for the coming years?
7. Can carriers make use of both automatic connections as well as manual entry? Which part of your users uses those automatic connections? Are carriers encouraged by shippers to make use of automatic connections? Why? To what extent are carriers capable of doing this?
8. Who initiates the use of your platform? Is this always the shipper?
9. Do shippers and/or carriers have to fulfil certain requirements to use your platform?
10. Does your platform connect shippers and carriers that would otherwise not be linked to each other?
11. Do you make (long-term) contract agreements with shippers and/or carriers? If so, are agreements made about the ownership of the data?
12. Are there competitive platforms in the market? What distinguishes your platform from competitors?
13. Can shippers and carriers easily switch to a competitive platform?
14. Can shippers and carriers easily switch to your platform?
15. How do you assess the contribution of your platform for shippers and carriers on an operational level in the following areas, on a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
  - Efficiency and costs
  - Reliability, speed and quality of data
  - Transparency of the market in terms of availability of transport capacity
  - Managing the execution of transport (for example info about delays, last-mile info etc.)
  - Sustainability
  - Personal contacts within the supply chain (e.g. between shipper and planner)
16. How do you assess the contribution of your platform to shippers and carriers on a commercial level in the following areas, on a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
  - Transparency of the market in terms of availability of transport capacity
  - Transparency of the market in terms of quality/delivery reliability of transport (rating carriers)
  - Transparency of the market in terms of transport prices
  - Improvement of service towards end customer (e.g. last-mile information)
  - Competition between shippers and competition between carriers
  - Sustainability
  - Personal contacts within the supply chain (e.g. between shipper and account manager of carrier)
17. Which resources, qualities, factors of you as a platform are important for the shippers and the carriers?
18. Which resources, qualities, factors of the shippers and the carriers are important for you as a platform?
19. How do you assess the effect of logistics platforms in general on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers

- Horizontally: relationships between shippers and relationships between carriers

20. Do you expect the advent of logistics platforms to affect the strategy of carriers in general? Could it be an impetus for (further) concentration (mergers and acquisitions) among carriers?
21. Do you have additional information about third-party SaaS-based logistics platforms and/or other types of logistics platforms that I should include in my research?

Finally, do you know people/companies in the supply chain which I could contact for my research?

### 9.5.3 Interview template carriers

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

1. Which of the above-mentioned logistics platforms do you use and for what purpose? (data exchange regarding orders and realisation, marketplace for spot traffic, other?). What share of all your transport orders is currently dealt with using a logistics platform?
2. Who initiates the use of those logistics platforms?
3. Carriers can feed the platform either manually or with an automatic connection from their own TMS. Do you use such an automatic connection? Why (not)?
4. Are there reasons for you not to use the platform?
5. Does the platform connect you with shippers with whom you would otherwise not have been connected?
6. Do you make (long-term) contract agreements with the platform? If so, are agreements made about the ownership of the data?
7. Do you make (long-term) contract agreements with shippers? Do shippers work with ‘preferred’ carriers? Does the advent of those logistics platforms influence the content/duration of contract with shippers and the ‘preference’?
8. How do you assess the contribution of the platform to your business on an operational level in the following areas, on a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
  - Efficiency and costs
  - Reliability, speed and quality of data
  - Transparency of the market in terms of availability of transport capacity
  - Sustainability
  - Personal contacts within the supply chain (e.g. between customer and planner)
9. How do you assess the contribution of the platform to your business on a commercial level in the following areas, on a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
  - Transparency of the market in terms of availability of transport capacity
  - Transparency of the market in terms of quality/delivery reliability of transport (rating carriers)
  - Transparency of the market in terms of transport prices
  - Improvement of service towards end customer (e.g. last-mile information)
  - Competition between carriers.
  - Number of transport orders. Load factor.
  - Sustainability
  - Personal contacts within the supply chain (e.g. between customer and account manager of carrier)
10. Which resources, qualities, factors of you as a carrier are important for the platform and the shippers?
11. Which resources, qualities, factors of the platform and the shippers are important for you as a carrier?
12. How do you assess the effect of those platforms on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers
  - Horizontally: relationships between carriers
13. Has the advent of logistics platforms affected your strategy?

14. Do you expect the advent of logistics platforms to affect the strategy of carriers in general? Could it be an impetus for (further) concentration (mergers and acquisitions) among carriers?
15. What is your final opinion regarding the advent of these logistics platforms, taking all aspects into account? On a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?

Finally, do you have additional information about third-party SaaS-based logistics platforms and/or other types of logistics platforms that I should include in my research?

#### 9.5.4 Interview template Expert 1

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

1. In your opinion, who initiates the use of those platforms? And for what purpose? (data exchange regarding orders and realisation, marketplace for spot traffic, other?)
2. Are data available about the use of those platforms by shippers and carriers, both over the past 5 years and prospects? (Number of users, number of transactions per year etc.)
3. Are carriers encouraged by shippers to use the platform?
4. Carriers can feed the platform either manually or with an automatic connection from their own TMS. An automatic connection offers additional possibilities, for example reporting delays more effectively and providing the end customer with additional information (e.g. last-mile information). To what extent are carriers encouraged by shippers to make such automatic connections?
5. Do shippers make (long-term) contract agreements with the platform? If so, are agreements made about the ownership of the data?
6. Are there reasons for shippers not to use logistics platforms?
7. Is it easy for shippers to switch to another logistics platforms?
8. How do you assess the contribution of the platform for shippers on an operational level (positive, neutral or negative) in the following areas?
  - Efficiency and costs
  - Reliability, speed and quality of data
  - Transparency of the market in terms of availability of transport capacity
  - Personal contacts within the supply chain
9. How do you assess the contribution of the platform for shippers on a commercial level (positive, neutral or negative) in the following areas?
  - Transparency of the market in terms of availability of transport capacity
  - Transparency of the market in terms of quality/delivery reliability of transport (rating carriers)
  - Transparency of the market in terms of transport prices
  - Improvement of service towards end customer (e.g. last-mile information)
  - Number of carriers/relationships
  - Competition between shippers
  - Personal contacts within the supply chain (e.g. between shipper and account manager of carrier)
10. How do you assess the effect of those platforms on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers
  - Horizontally: relationships between shippers
11. What is your final opinion regarding the advent of these logistics platforms for shippers, taking all aspects into account? Positive, negative or neutral?
12. Do you have additional information about third-party SaaS-based logistics platforms and/or other types of logistics platforms that I should include in my research?

Finally, do you know people/companies in the supply chain which I could contact for my research?

### 9.5.5 Interview template Expert 2

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

1. In your opinion, who initiates the use of those platforms? And for what purpose? (data exchange regarding orders and realisation, marketplace for spot traffic, other?)
2. Are data available about the use of those platforms by shippers and carriers, both over the past 5 years and prospects? (Number of users, number of transactions per year etc.)
3. Are carriers obliged by shippers to use the platform?
4. Carriers can feed the platform either manually or with an automatic connection from their own TMS. An automatic connection offers additional possibilities, for example reporting delays more effectively and providing the end customer with additional information (e.g. last-mile information). To what extent are carriers encouraged by shippers to make such automatic connections? Are carriers capable of doing that?
5. Do carriers make (long-term) contract agreements with the platform? If so, are agreements made about the ownership of the data?
6. Are there reasons for carriers not to use logistics platforms?
7. How do you assess the contribution of the platform for carriers on an operational level (positive, neutral or negative) in the following areas?
  - Efficiency and costs
  - Reliability, speed and quality of data
  - Transparency of the market in terms of availability of transport capacity
  - Personal contacts within the supply chain (e.g. between customer and planner)
8. How do you assess the contribution of the platform for carriers on a commercial level (positive, neutral or negative) in the following areas?
  - Transparency of the market in terms of availability of transport capacity
  - Transparency of the market in terms of quality/delivery reliability of transport (rating carriers)
  - Transparency of the market in terms of transport prices
  - Improvement of service towards end customer (e.g. last-mile information)
  - Number of customers/relationships
  - Competition between carriers
  - Personal contacts within the supply chain (e.g. between customer and account manager of carrier)
9. Do you expect the advent of logistics platforms to affect the strategy of carriers in general? Could it be an impetus for (further) concentration (mergers and acquisitions) among carriers?
10. How do you assess the effect of those platforms on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers
  - Horizontally: relationships between carriers
11. What is your final opinion regarding the advent of these logistics platforms for carriers, taking all aspects into account? Positive, negative or neutral?
12. Do you have additional information about third-party SaaS-based logistics platforms and/or other types of logistics platforms that I should include in my research?

Finally, do you know people/companies in the supply chain which I could contact for my research?

### 9.5.6 Interview template Expert 3

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

1. What are the major differences between third-party SaaS-based logistics platforms and control towers?

## Logistics platforms

2. In your opinion, who initiates the use of those platforms? To what extent does the initiator encourage the other parties to use the platform as well?
3. Carriers can feed the platform either manually or with an automatic connection from their own TMS. To what extent are carriers encouraged by shippers to make such an automatic connection?
4. Are agreements made about the ownership of the data?
5. How do you assess the contribution of the platform for shippers and carriers on an operational level? Positive, neutral or negative? You could think of the following areas:
  - Efficiency and costs
  - Reliability, speed and quality of data
  - Transparency of the market in terms of availability of transport capacity
  - Sustainability
  - Personal contacts within the supply chain
6. How do you assess the contribution of the platform for shippers and carriers on a commercial level? Positive, neutral or negative? You could think of the following areas:
  - Transparency of the market in terms of availability of transport capacity
  - Transparency of the market in terms of quality/delivery reliability of transport (rating carriers)
  - Transparency of the market in terms of transport prices
  - Improvement of service towards end customer (e.g. last-mile information)
  - Number of transport orders. Load factor.
  - Sustainability
  - Personal contacts within the supply chain
7. How do you assess the effect of those platforms on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers
  - Horizontally: relationships between shippers and relationships between carriers
8. Do you think that the logistics platforms themselves, as a new player in the supply chain, are looking for a power position or are they mainly concerned with their competitive position in relation to the other logistics platforms?
9. Do you expect the advent of logistics platforms to affect the strategy of carriers in general? Could it be an impetus for (further) concentration (mergers and acquisitions) among carriers?
10. What is your final opinion regarding the advent of these logistics platforms for shippers and carriers, taking all aspects into account? On a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
11. Do you have data about the use of logistics platforms?

## Control towers

12. Are control towers usually designed for one shipper and the associated supply chain? For example, as is the case with Albert Heijn which uses Simacan as a control tower?
13. Who is usually the owner of the control tower?
14. How do you assess the effect of those control towers on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers
  - Horizontally: relationships between shippers and relationships between carriers

### 9.5.7 Interview template Expert 4

**Title of the research:** “The effect of third-party SaaS-based logistics platforms on power within supply chain relationships”

**Responsible researcher:** Anouk ten Dam

1. In your opinion, who initiates the use of those platforms? To what extent does the initiator encourage the other parties to use the platform as well?
2. Carriers can feed the platform either manually or with an automatic connection from their own TMS. To what extent are carriers encouraged by shippers to make such an automatic connection?

3. Are agreements made about the ownership of the data?
4. Within my research, my focus is mainly on the logistics platforms . . . Are those platforms generally the same or are they different in certain areas?
5. How do you assess the contribution of the platform for shippers and carriers on an operational level? Positive, neutral or negative? You could think of the following areas:
  - Efficiency and costs
  - Reliability, speed and quality of data
  - Transparency of the market in terms of availability of transport capacity
  - Sustainability
  - Personal contacts within the supply chain
6. How do you assess the contribution of the platform for shippers and carriers on a commercial level? Positive, neutral or negative? You could think of the following areas:
  - Transparency of the market in terms of availability of transport capacity
  - Transparency of the market in terms of quality/delivery reliability of transport (rating carriers)
  - Transparency of the market in terms of transport prices
  - Improvement of service towards end customer (e.g. last-mile information)
  - Number of transport orders. Load factor.
  - Sustainability
  - Personal contacts within the supply chain
7. How do you assess the effect of those platforms on power relationships within the supply chain?
  - Vertically: relationships between shippers, platform and carriers
  - Horizontally: relationships between shippers and relationships between carriers
8. Do you think that the logistics platforms themselves, as a new player in the supply chain, are looking for a power position or are they mainly concerned with their competitive position in relation to the other logistics platforms?
9. Do you expect the advent of logistics platforms to affect the strategy of carriers in general? Could it be an impetus for (further) concentration (mergers and acquisitions) among carriers?
10. What is your final opinion regarding the advent of these logistics platforms for shippers and carriers, taking all aspects into account? On a scale from 0 to 10 (0 = very negative, 5 = neutral, 10 = very positive)? Why?
11. Do you have data about the use of logistics platforms?

Finally, do you have additional information about third-party SaaS-based logistics platforms and/or other types of logistics platforms that I should include in my research

## 9.6 Tables with results

On the next four pages, the four tables covering the four power components in the three vertical supply chain relationships and in the horizontal supply chain relationship can be found.

The power use tactics are either italicised or underlined. Power-use tactics that are italicised are conciliatory and underlined power use tactics are hostile.

**Table 2. Overview of the four power components of the power relationship between shippers and platforms.**

	Structural power			Perceived power		Behavioural power		Realised power
	<i>Network</i>	<i>Resource</i>	<i>Hierarchical</i>	<i>Own</i>	<i>Other</i>	<i>Change tactics</i>	<i>Use tactics</i>	<i>Actual</i>
<b>Shippers</b>	- Several alternative platforms, but unlikely that shippers will switch after having invested heavily in a platform	- Transport orders - Owner of own data	- Contract - Ability to stop using the platform	- Platform depends on shippers' transactions, but in the beginning, shipper was king, now you are just one of many clients - Dependency on platform differs per shipper, but increases over time - Possible to switch to and from alternative platforms, but becomes increasingly hard and unattractive  Perceived power changed: they realise that their power is decreasing over time	- Huge and increasing operational value for shippers - Possible to switch to and from alternative platforms, but becomes increasingly hard and unattractive - More carriers are connected to platform: hard for shipper to work without it - Platform holds more and more data and has (confidential) access to data that flows through it		- <i>Selecting</i> best platform for doing business with - <i>(Re)negotiation</i> of contract terms, e.g.: use of data, future price adjustments, applicable SLA	- Using the best platform against acceptable contract terms - Shippers extract huge operational benefits from using the platform, but are slowly becoming dependent on it.
<b>Platforms</b>	- Increasing number of connections with many shippers and carriers - Many alternative shippers - Some platforms connect shippers to 'new' carriers	- Functionalities generating increasing operational value and transparency - Access to increasing amount of data between shipper and carrier	- Contract	- Functionalities generating increasing operational value and transparency - Possible to switch to and from alternative platform, but unattractive due to long lead times - Data access is a potential source for additional future services - Some platforms: ability to connect shippers with 'new' carriers  Perceived power changed: they realise that their value for the supply chain is increasing over time	- Platform needs shippers' transactions - Possible to switch to and from alternative platform, but unattractive due to long lead times	- Regular software updates and new functionalities - Creating extra services based on big data - Attracting more shippers and carriers - Open, honest, transparent and trustful behaviour		- Platforms are focused on getting bigger and better to ensure and strengthen their future position within the supply chain

**Table 3. Overview of the four power components of the power relationship between platforms and carriers.**

	Structural power			Perceived power		Behavioural power		Realised power
	<i>Network</i>	<i>Resource</i>	<i>Hierarchical</i>	<i>Own</i>	<i>Other</i>	<i>Change tactics</i>	<i>Use tactics</i>	<i>Actual</i>
<b>Platforms</b>	<ul style="list-style-type: none"> <li>- Increasing number of connections with many shippers and carriers</li> <li>- Many alternative carriers, but decision is based on that of shippers</li> <li>- Some platforms connect carriers to 'new' shippers</li> </ul>	<ul style="list-style-type: none"> <li>- Functionalities generating increasing operational value and transparency</li> <li>- Access to increasing amount of data between shipper and carrier</li> </ul>	<ul style="list-style-type: none"> <li>- Contract</li> </ul>	<ul style="list-style-type: none"> <li>- Functionalities generating increasing operational value and transparency</li> <li>- Many alternative carriers, but decision is made by shipper</li> <li>- Data access is a potential source for additional future services</li> <li>- Some platforms connect carriers to 'new' shippers</li> </ul>	<ul style="list-style-type: none"> <li>- Platform needs carriers' transport capacity</li> <li>- Possible to switch to and from alternative platforms, but decision is based on that of shipper</li> </ul>	<ul style="list-style-type: none"> <li>- Regular software updates and new functionalities</li> <li>- Creating extra services based on big data</li> <li>- Attracting more shippers and carriers</li> <li>- Open, honest, transparent and trustful behaviour</li> </ul>		<ul style="list-style-type: none"> <li>- Platforms are focused on getting bigger and better to ensure and strengthen their future position within the supply chain</li> </ul>
<b>Carriers</b>	<ul style="list-style-type: none"> <li>- Several alternative platforms, but shipper usually decides which platform carriers should use</li> </ul>	<ul style="list-style-type: none"> <li>- Transport capacity</li> <li>- Owner of own data</li> </ul>	<ul style="list-style-type: none"> <li>- Contract</li> <li>- Ability to stop using the platform</li> </ul>	<ul style="list-style-type: none"> <li>- Platform needs carriers' transport capacity</li> <li>- Possible to switch to and from alternative platforms, but decision is made by shipper</li> </ul>	<ul style="list-style-type: none"> <li>- Facilitates an increasing number of transactions between shippers and carriers</li> <li>- Functionalities generating increasing operational value for (some) carriers</li> <li>- Possible to switch to and from alternative platforms, but decision is made by shipper</li> <li>- Platform holds more and more data and has (confidential) access to data that flows through it</li> </ul>		<ul style="list-style-type: none"> <li>- <i>(Re)negotiation</i> of contract terms, e.g.: use of data, future price adjustments, applicable SLA</li> </ul>	<ul style="list-style-type: none"> <li>- Shippers are slowly becoming dependent on platform, leaving carriers no other choice than to work with platform</li> <li>- Carriers can extract operational and commercial benefits from using platform</li> <li>- Large number of platforms limits the extent to which carriers can extract operational benefits from using platforms</li> </ul>

Table 4. Overview of the four power components of the power relationship between shippers and carriers.

	Structural power			Perceived power		Behavioural power		Realised power
	Network	Resource	Hierarchical	Own	Other	Change tactics	Use tactics	Actual
<b>Shippers</b>	- Many alternative carriers to choose from (but less due to capacity shortage) - Number of connections with carriers differs per shipper	- Transport orders	- Client - Contracts	- Carriers need shippers' transport orders - Many alternative carriers to choose from (but less due to capacity shortage) - Initiator of platform Perceived power changed: they realise that being the initiator of using a platform, which results in a more and more transparent market, shifts/strengthens the power more towards/of shippers, thus improving their perceived power	- Shippers need carriers' transport capacity		- <u>Obliging</u> carriers to use platform - <u>Not letting</u> or <u>letting</u> carriers pay for using platform - <u>Encouraging/advising</u> or <u>obliging</u> carriers to use interfaces - <u>Obliging</u> carriers to arrange and/or pay for interfaces themselves - <u>Giving</u> carriers who make use of interfaces a <u>higher chance</u> of becoming preferred carrier - <u>Giving</u> carriers who do not make use of interfaces a <u>lower chance</u> of becoming preferred carrier - Using platform to <u>get lower prices</u> of carriers	- Shippers oblige carriers to work with the platform (and sometimes even to use interfaces) to extract huge operational benefits and to create a more transparent market, resulting in additional commercial benefits
<b>Carriers</b>	- Usually connections with many shippers - Many alternative shippers to work for	- Transport capacity - Good ICT or not - Ability to transform data into information, knowledge and or wisdom	- Contractor - Contracts	- Shippers need carriers' transport capacity - Many shippers to work for - Tough competition between carriers Perceived power changed: they realise that the increasingly transparent market shifts/strengthens the power more towards/of shippers and although it also offers carriers opportunities, they perceive their power has decreased	- Carriers need shippers' transport orders - Many alternative carriers to choose from - Initiator of platform	- Using logistics platforms - Using interfaces (with some platforms) - Replacing TMS to (amongst others) facilitate using interfaces - Creating an enterprise service bus - Using ability to use platform and interfaces as a selling tool - Tailoring strategy towards connectivity, transparency and visibility		- Carriers that are able to use the platform (and interfaces) will extract operational and possibly commercial benefits - For carriers that cannot meet new requirements, the platform could be the end of their existence

**Table 5. Overview of the four power components of the power relationship between digitally fit and digitally unfit carriers.**

	Structural power			Perceived power		Behavioural power		Realised power
	<i>Network</i>	<i>Resource</i>	<i>Hierarchical</i>	<i>Own</i>	<i>Other</i>	<i>Change tactics</i>	<i>Use tactics</i>	<i>Actual</i>
<b>Carriers that are digitally fit</b>	- Connections with increasing number of shippers - Many alternative shippers to work for	- Transport capacity - Good ICT-infrastructure - Ability to transform data into information, knowledge and or wisdom		- Connections with many shippers - Many alternative shippers to work for - Interfaces enable real-time data exchange - Ability to transform data into information, knowledge and/or wisdom Perceived power changed: they realise they are getting more transport orders than carriers with bad ICT-infrastructure	- Connections with decreasing number of shippers - Decreasing number of alternative shippers to work for		- <i>Using</i> logistics platforms via web portals and/or interfaces - <i>Using</i> ability to use platform and to use interfaces as a selling tool - <i>Creating</i> an enterprise service bus	- Carriers that have a good ICT-infrastructure, who are able to use platforms and who are using interfaces will get a preferred position towards the shippers, which could be crucial for future existence.
<b>Carriers that are not digitally fit</b>	- Connections with decreasing number of shippers - Decreasing number of alternative shippers to work for	- Transport capacity		- Ability to offer capacity for the sharpest price Perceived power changed: they realise they are getting less transport orders than carriers with good ICT-infrastructure	- Connections with many shippers - Many alternative shippers to work for - Able to exchange real-time data	- Using logistics platforms via web portals - Becoming a pure capacity carrier - Tailoring strategy towards cost reduction - Invest heavily to become digitally fit		- Carriers that have a bad ICT-infrastructure, who are not always able to use platforms and who are not using interfaces are not getting a preferred position towards the shipper, which makes cost reduction crucial for future existence.