Real-life views on Security in the Logistics Sector

The Case of Secure Logistics

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Management Conclusion

This thesis was a research done in commission by Secure Logistics, daughter of DeltaLinqs in the Port of Rotterdam. The research explored the opinion of customers of Secure Logistics through a survey and in-depth interviews. This was done to obtain information on the current view of customers on Secure Logistics' products and performance. Next to this, the research obtained information regarding the balance between efficiency, security & safety in the contemporary port-related industries.

The survey and interview have shown that Secure Logistics have a good product at the core but that operational processes surrounding their products dissatisfy customers. By distinguishing between product type, customer type and industry it has become clear that Secure Logistics needs to generally overhaul their operations, but also needs to distinguish more closely between cardholders and cardacceptants. This overhaul implicates a new CRM system, more documentation, more staff and the sharing of information internally.

Regarding academics this research has discovered a big gap that has not been researched. Previous research has focused on observing and the effect of implementing legislation from a macro perspective, yet has neglected to communicate with the industry about the consequences experienced within companies. Future research might shed light on the relationship between the industry and governments and can enhance the production of new legislation to improve the balancing of efficiency versus security and safety.

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1. Introduction

This thesis is written on the themes of efficiency, security and safety within the transport and logistics sector in the Netherlands. It is based on a research performed for Secure Logistics, a company providing services for companies within the logistics and transport sector. In this thesis the themes of efficiency, security and safety are discussed both through theory review and interaction with the customers of Secure Logistics. This introduction starts out with displaying the importance of obtaining knowledge and views within companies regarding these themes in the contemporary world. There it follows with a brief introduction of Secure Logistics and establishing the research goals and questions. Later on the methods, theory and empirical data will be discussed to reach a conclusion towards aforementioned themes.

As security is becoming an increasingly bigger concern for companies, governments and other institutions the literature regarding supply chain security has substantially grown. Especially since the ISPS code from the IMO has been placed into practice in 2004 as a consequence of the 9/11 terrorist attacks, the control and practice of security measures has become more stringent in ports (Bichou, 2004; Sheu et al., 2006; Autry & Bobbit, 2008). Multiple measures came into place, and the focus on efficiency shifted to a focus on security (Bradbury, 2010). According to Bichou, 2004 this does not only affect the port itself, but also logistics and transport throughout the supply chain. Bichou, 2004 also mentions that measures taken include regular checking and reviewing of facilities and vehicles, which can lead to restricting or denying access. These measures can be seen as part of supply chain security management, which according to Closs and McGarrel (2004, p. 8) entails:

"Application of policies, procedures, and technology to protect supply chain assets […] from theft, damage, or terrorism, and to prevent the unauthorized introduction of contraband, people, or weapons of mass destruction into the supply chain".

Lee & Whang (2006) mention that the "heightened inspection and scrutiny of the goods flowing through a supply chain […] can add cost, delays, and uncertainties in the supply chain. However they also note that there might be indirect costs to a supply chain without security – as insurance and freight rates might be higher. Next to this they mention that

inspection does not improve quality (as it is expensive and is conform to Type I and Type II errors[1]).

However following from this, Sheffi (2001) raises the point that security measures cost resources, and that these costs must be weighed versus the use of the resources for other corporate goals. Jüttner et al (2003) concur and mention that there is a trade-off decision between managing risk and delivering value. Prokop (2004) also mentions this trade-off with the example of the US-Canadian FAST programme. Autry & Bobbit (2008) show in their research that respondents of their survey find the maintenance of business relationships with customers and suppliers as an essential element in addressing supply chain security breaches. Their research shows that physical enhancements are common among respondents. However Lee & Whang (2006) find that informational, rather than physical activities form the core of measures.

Following this there has been found evidence that safety and time [saving] are important aspects to choose a specific firm for its services (Danielis et al., 2004). Autry & Bobbit (2008) do show that there are implementations of measures that lower costs (they name reducing variable costs associated with monitoring or loss/theft/sabotage). Other examples they mention are decreased lead times, greater product reliability, waste reduction, and increased reliability. Lee & Whang (2003) mention that labour costs of inspection, together with congestion, causing added lead-time and uncertainties. These inspections have been taking place since the increased stringency of security and ask for alternative measurements to improve security. Peck (2007) mentions that the supply chain management community believes that process monitoring and information sharing, via even better technological "solutions", is a route to more effective supply chain risk management. Russel & Saldanha (2003) mention that a suitable security system should be in place to exclude unauthorized personnel – in which they mention biometrics as a possibility for identifying persons.

This short journey through the current literature shows that enhancing safety and security brings increased costs, but also increased benefits. The cost-benefit balancing and implementation of processes in ports [and the rest of the supply chain] is a constant challenge and important to the competitive power of a supply chain. In the Port of Rotterdam, Secure Logistics is the current main player that focuses on delivering solutions for the balancing of efficiency, security and safety. This balancing in which one side

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[1] A type I error is assuming a relationship while it is absent, and a type II error is the rejection of a relationship while there

(efficiency) is enhanced without the other being burdened (security and safety) is integral for offering the best logistics solutions. As Secure Logistics is the company in the Port of Rotterdam that delivers products to make this possible the next paragraph will give a brief description of the company.

1.1 Secure Logistics: a brief background

Following these measures, the company Secure Logistics was founded in 2003 responsible for the development, management and the administration of the XS-Key system. The system is an identification- and registration system based on smartcard technology, combined with biometric information. Secure Logistics is the daughter company of DeltaLinqs, which describes itself as representing

 "The common interests of all the logistical and industrial companies in the Rotterdam port and industrial area […] The organization is considered to be the focal point and spokesman of more than 700 registered companies and associations".

The fact that Secure Logistics is a daughter company of this community representative defines their strategy and goals. It has a non-profit aim to distribute their system (and corresponding products) as widely as possible, to ensure low costs and high usability for the users. They provide multiple [biometrical] identification methods to transport and logistic companies to enhance security and efficiency in the movement of goods. By making the identification of drivers, employees and visitors easy by implementing a Mifare 1k chip-card[2] and accompanying hand-scans, Secure Logistics attempts to offer increased time-efficiency whilst complying with the International Ship and Port Facility Safety (ISPS) code from the International Maritime Organization (IMO).

Secure Logistics is currently focused mainly on the Port of Rotterdam (through DeltaLinqs) and is interested in offering a new product namely the *Digital Safety Passport (DSP)* to new markets. Although there is a strong connection with Rotterdam (which might prove a difficulty with companies in rivalling cities such as Amsterdam) there is a need for expansion to new markets, ensuring more growth and an increased security in the sector. However Secure Logistics currently has no view on how their customers assess their existing products, their services or efficiency, security and safety measures in general.

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[2] A commonly accepted chip-card currently used in the Dutch public transport

Therefore the main goal of this thesis is to inquire how their customers (or more broadly speaking the logistics and transport industry) assess the existing products of Secure Logistics – as well as give more insight in the near future of Secure Logistics in which they plan to roll-out their new product. Leading from this it is possible to establish a base for further research regarding topics related to efficiency, security and safety that currently keep the industry in its grasp. The products that Secure Logistics offers benefit highly from network effects. The more companies that make use of the cards (either as acceptant or holder), the lower the cost per user will be. The aim is to ease the rollout stage of the DSP, as it gives insight in the perception and satisfaction of current customers, making it possible to address these problems pro-actively with the DSP. This research will give Secure Logistics the knowledge of their customers that can enhance their products. This collection of customer knowledge to improve products has only been around for a short period of time (García-Murillo & Annabi, 2001) and according to Gibbert et al. 2002, make corporations more likely to sense emerging market opportunities and to create more rapidly economic value. Joshi & Sharma (2004) support this view claiming that customer knowledge development is a prerequisite for new product success. This thesis follows this notion of customer knowledge collection to improve current products and successfully remove any pre-existing barriers towards the new product.

1.2 The Research: goal and research questions

The central problem why this research is needed is a lack of information by Secure Logistics of the assessment of their customers on the products and services provided. Without this knowledge Secure Logistics has problems with optimizing their new product, as well as handling the current workload. Next to this the current literature does not give away any information about the current stance of the logistics and transport sector on security and efficiency measures – however this will be discussed later on in this thesis.

This thesis is aimed to offer knowledge to Secure Logistics about their customers and hence be an exploratory research on the topics of efficiency, security and safety in the logistics and transport field as well as obtaining more specific knowledge about Secure Logistics' products and services. Through a SWOT analysis, survey and in-depth interviews of the customers of Secure Logistics questions are to be answered regarding the position of Secure Logistics and to gain insightful knowledge of the current ideas and concerns of the industry.

The main research question to be answered in this thesis is the following: *"What is the current view on Efficiency, Security and Safety and Secure Logistics among their Customers?"* Since the research is conducted through Secure Logistics and their customers, a large part of this thesis addresses Secure Logistics and their products. To fully be able to explain the main question some different aspects are addressed.

1. What is the current stance of academics regarding efficiency, security and safety?
2. How do we obtain customer knowledge?
3. What is Secure Logistics and what are the products and services provided?
4. What is the current stance on efficiency, security and safety among Secure Logistics' customers?
5. How do the customers of Secure Logistics rate the different products and services provided by Secure Logistics?

Through these questions it becomes clear what the current position of the transport and logistics industry is on efficiency, security and safety (and measures taken regarding these topics). Complementary from this, Secure Logistics gains more insight in the current trend, but also more insights towards how customers view the company and more importantly rate their products and service.

1.3 Limits & Relevance

The data obtained is purely of customers of Secure Logistics. Therefore the information is limited to 2500 potential companies that are not evenly distributed regarding the nature of neither their work nor their size. Due to these constraints the research can be considered exploratory, adding to the literature through a survey and follow-up interviews. Through these methods this study adds to current literature by updating on views and measures regarding efficiency, security and safety in the transport and logistics industry through the customers of Secure Logistics. Next to this, it evaluates the current products of Secure Logistics providing valuable insights in how Secure Logistics can add to the existing systems - improving security, safety and efficiency.

1.4 Next sections

Following this introduction the research approach and methodology will be discussed, continued with a theoretical review regarding security in the logistics sector but also the

implementation of marketing tools to assess customer views. After this the case of Secure Logistics will be handled, followed by a discussion of the survey and the follow-up interviews. The thesis will be concluded with the implications and suggestions lead from the findings of this research.

2. Research Approach & Methodology

The company of Secure Logistics, based in Rotterdam, wants to expand to new markets with a new product (DSP). Before they attempt to take this new challenge they want to have a better view on their current position as a company among their customers. This position they have with their customers is the main problem researched in this thesis. In this chapter the methods and approach to tackle the problem are described and clarified
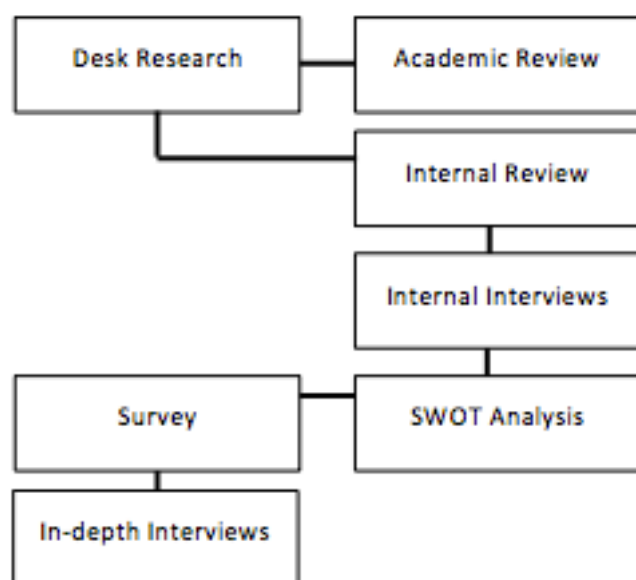

Figure 1: schematic of the way the research was conducted

The research will consist of a theoretical framework (compiled through desk research) focusing on security and safety in the logistic industry. This will be followed by an analysis of Secure Logistics and its products through internal interviews, desk research and a SWOT analysis to fully depict Secure Logistics' current position. The desk research will focus mostly on security and safety in the transport and logistics industry but will also touch upon the tools that the field of marketing can provide to obtain customer knowledge. It has as a goal to inform on the current status of the literature, and providing some insights in previous opinions and measures that have taken place within these topics as well as to establish a toolset for the fieldwork performed in this thesis. The desk research will make it possible to answer the first two sub-questions relevant to the research namely; (1) *what is the current stance of academics regarding efficiency, security and safety,* (2) *how do we obtain customer knowledge.*

After the exploration of the current literature and general knowledge about efficiency, security and safety, Secure Logistics will be discussed as a company, including a profile and

SWOT analysis, and with respect to products and services offered. As the core of the research is aimed at Secure Logistics, there is a chapter devoted to explain and explore Secure Logistics as a company. The SWOT analysis is an internal review of the current situation of Secure Logistics and can be linked to the external analysis that will be conducted through a survey and interviews. This internal review containing interviews with employees, a SWOT analysis and review of documentation serve to address the core of the research namely (3) *what is Secure Logistics?*

Following from the company description and the SWOT, a survey has been send to customers of Secure Logistics. The aim of the survey is to explore customers' views on the research topic, as well as measure customer satisfaction among the customers of Secure Logistics. This will serve as to explore the current status of efficiency, security and safety among companies in the logistics industry, and will give insights in the strengths and weaknesses of Secure Logistics and its products.

2.1 The Survey

The collection of data on the topics of efficiency, safety and security (and the satisfaction regarding the products of Secure Logistics) is started with a survey. A survey is used, as the main objective is to establish a starting point for this research with information from multiple sources for further research. As there is no previous up-to-date information on the views of the logistics and transport sector with respect to safety and security product assessment, desk research was not an option. There has been little to no survey-based research regarding efficiency, security and safety in the logistics and transport sector, which creates a gap in our contemporary knowledge. Next to this the survey had as goal to establish a starting point for the interviews to take place. The interview is considered the only option of getting information on the current situation and views of companies regarding the research topic (as no other type of research contains information towards this type of data (Parasuraman et al., 2006)). General views are discussed in the survey with quantifiable and fast-to-answer questions (Likert scale).

Next to this respondents were given the possibility to add comments to give insight in what plays a big role in their experience (as a lead for the follow-up interviews). However the survey is still a sample survey – wherein not the full sector of logistics and transport provider was reached. The survey itself is a mainly closed question (Likert scale) questionnaire, with the possibility to give comments. The rationale behind picking mostly closed questions is to

create an easy unambiguous database. By being able to quantify scores for the products of Secure Logistics it is possible to segment different customer groups. The more in-depth knowledge will later be obtained through the interviews. Details behind the survey will be reported in chapter 5, which considers the data analysis.

Lastly the respondents were asked if they could be approached after this survey for further inquiry, and consequently asked for their company name. After this they were given the option to give general comments, remarks, and complaints about Secure Logistics in an open question. The option to be approached afterwards (giving up anonymity) was based on the need for in-depth interviews.

As direct observation was not possible the next best option of research was the survey to establish a fair amount of data. The survey was most efficient in handling the constraints and gathering information on the sample. It also gave a way to easily contact possible participants for interviews, which lead to more in-depth data. The survey is considered a good method of gaining data regarding the other questions within this research (4) *what is the current stance on efficiency, security and safety among Secure Logistics' customers?* And (5) *what is the current stance on Secure Logistics among their customers?* However a survey has its limitations regarding depth of the information gained. Other limitations are the disability to clarify questions or of respondents to clarify their answers. For these particular reasons a follow-up interview has been established to fill in the lacking data resulting from the survey.

2.2 The Interviews

Seven in-depth interviews were held to gain more in-depth knowledge about the companies' view on efficiency, safety and security, but also the experience with legislation, pressure from the market or other companies, and the changing world regarding these topics. Some of the interviews were done in person (which was the preferred option) however due to full schedules and transportation options, some were done by phone. All interviews started with the question if the person in question had filled in the survey, and were explained how the interview was laid out. After they had knowledge on the range of questions (starting with going in-depth on the efficiency, safety and security topic and following with the Secure Logistics related questions) and the duration (maximum of 1 hour), they were asked if the interview could be recorded. An example of the list of questions asked in the interviews is presented in appendix X.

The combination between desk research, a SWOT analysis, survey and in-depth interviews gives a broad and complete image. With the image created through these multiple tools the central problem regarding the lack of knowledge considering products and services of Secure Logistics can be solved.

Before presenting the results of the empirical research the next chapter will go into detail about the current theoretical backgrounds regarding efficiency, security and safety. It will cover contemporary literature as well as explore the tools of marketing fit for researching products in the field of safety and security.

3. Integrating academics with reality

The goal of this chapter is to create a basic understanding of where the academics stand currently regarding security and logistics. It discusses some main directions of the scientific literature and follows up with tools that can be used to solve the research problem of this thesis, related to the problem that Secure Logistics has regarding the knowledge of their customers. Obtaining the type of knowledge that Secure Logistics needs to improve their products and services, and consequently improve the balance of efficiency, security and safety within the transport and logistics sector (in the Netherlands) has not been done before in academia. The majority of the contemporary scientific literature has focused on observing and describing measures taken after the terrorist attacks of 9/11. This unique event caused the amount of academic papers to proliferate on the topic – especially considering (air) ports. However most academic papers focus only on specific areas within the topic of security and logistics. In this section an overview will be created of which areas are currently covered – and consequently not covered for the first time. This will be followed by a review of marketing tools used to obtain data from the customers of Secure Logistics

If looked at the state of the current academic literature regarding security in the logistics sector it can be seen that it has been growing into three fundamentally different directions. Firstly the direction and depth of co-operation between different institutions regarding measures taken has been a topic for research. Secondly the question of who is to bare the costs for measures improving security. Thirdly the balance between efficiency and security and how measures affect this balance has been a thoroughly discussed topic. This increase in both practical and theoretical views on security has continued to grow, as terrorist attacks have continued to occur. The attacks in Madrid in 2004, London in 2005 (and the thwarted plans of attacks on Glasgow and London in 2007) and Volgograd in 2013 have shown that the threat of an attack is constantly real and keeps leading to initiatives and consequently research.

3.1 Complexity, measures, costs and balance

This constant threat has lead to multiple topics of research within logistics and security and returning discussions to increase measures and laws. Keefer (2007) mentions "the lack of any real security measures at U.S. seaports raised perhaps even greater concerns". In this paper the fact that many institutions play a role in securing the ports (and supply chains) and both private and governmental institutions co-operate in this field of work is being

addressed. However it is mentioned that there is a difference between every-day criminal activity (such as Eski (2011) addresses) and terrorist activity. Next to legal literature also maritime and logistics economics call for more research towards security measures and its impacts on the industry (Panayides, 2006). By taking a layered approach to security, failures of institutions might prove to be less cataclysmic as Keefer mentions – but "ultimately, some of the success in this arena will depend upon advancements in technologies that can be made available at reasonable price".

This reasonable price has become a point of discussion in multiple papers. Banomyong (2005) mentions that security has its cost and the fact that there are multiple players involved in security of the supply chain (governments, traders, ports, service providers and insurance providers). Following, it is suggested in his paper that security initiatives need to be synchronized – which seems to be a continuous problem internationally but also nationally. This problem is recognized by Eski (2011) whom discusses the "mass (or mess) of port authorities and private security" as a reason for the complexity of security in ports. This same problem is mentioned earlier, as the questions arise who will pay for added security measures, and how regulations will be applied (Rodrigue & Slack, 2002).

The complexity associated with security in the supply chain is also noticed by Urciuoli (2010), in which an overview of available security measures is made in combination with recommendation for managers and future research. Hintsa et al. (2006) give a more basic and elementary overview; discussing actions, actors and the enforceability of measures. A similar compilation (but more extensive) has been provided by Williams, Lueg & LeMay (2008) in which – due to extensive literature research – they discern four themes for further research. (1) Intra-organizational efforts, (2) quantitative research towards supply chain security, (3) the link between organizational performance and supply chain security and finally (4) strategies companies use towards supply chain security. The main notion that comes forward from the literature is the constant balance (and difficulty to keep) between security, safety and efficiency (or timesaving if you will) (Lee & Whang, 2003; Christopher & Rutherford, 2004; Closs & McGarrel, 2004; Willis & Ortiz, 2004; Sheu et al., 2006).

However there has also been research on the management and calculation of risk that can be relevant for companies in the maritime and logistics industry. Danielis et al. 2005 shows through adaptive conjoint analysis that logistics managers' preference for freight transport service attributes are considered to be cost, travel time, risk of delay and loss/damage. This

shows that again here efficiency (timesaving) is weighed as heavily as security (risk or the diminishing of risk). In addition Maier et al. 2002 found that stability is worth a lot to logistics managers. Tsai et al. (2009) address this stability by investigating truckload options – which shows that it could be a useful way to hedge uncertainty. To address the assessment of supply chain risk it is recommended to read Zsidisin & Ritchie (2009).

Other papers are focused on government and international initiatives, their effects and influence on companies. Prokop (2004) appraises the Canada-US border after the attacks on September 11th 2001. Haughton (2007) assesses the Canada-US Border Free and Secure Trade (FAST) initiative, which shows to be beneficial to trucks crossing the border (not only participants) – although FAST and other security measures tend to be more costly for smaller firms than larger firms. Bradbury confirms this again in 2010 with another research on the FAST program. Russel & Saldanha (2003) discuss the 'five tenets' of security-aware logistics and supply chain operation', which come down to companies partnering up with government organizations, knowing their trade partners, flexibility, communication and building military notions of agility. However these tenets are followed by the discussion of multiple initiatives taken in the US. Sheu et al. (2006) present a similar overview of security initiatives in the US and the implementation dates. They focus on the C-TPAT program – which current value at that time was not clear due to inconsistent practices of supplier involvement. Outside the US the biggest initiative is the International Ship and Port Facility Security (ISPS) code. The ISPS code has significant influence on ports, a topic addressed by Bichou (2004). In this research however the view on port facility security is stretched to a supply chain security framework.

Friedman (2010) mentions the discrepancy between the amount of security and the amount of liberty and calls it an overreaction – which is closest to observing an opinion regarding the balance. This is been noted and calculated for the aviation industry with a cost-benefit analysis by Stewart and Mueller (2013). They conclude that FAMS (Federal Air Marshal Service) put in place by the US is not cost-effective unless there are two attacks per year. This number crunching example shows that measures are not always to be considered successful. From an outside perspective some measures are justifiable, however the industry can consider some measures inadequate or obsolete. By questioning companies it is possible to come to new insights, explore the effect measures have on the micro level and obtain information otherwise missed through observation or desk research.

It is noticeable from all these works that there are certain main topics or problems to discern. First of all security within the logistics sector is considered to be a complex problem, mostly due to multiple actors with conflicting interests. The price of security has also been a returning point of discussion; both in the sense that there is a balance to be found between efficiency (in terms of timesaving and scheduling) and security/safety (to protect goods and personnel), but also regarding the question who will ultimately bare the costs of security measures. The researches that were previously mentioned however have been conducted with data obtained through observation and desk research. There has been no initiative taken to question the companies that have to deal with the initiatives (internationally and nationally) in their day-to-day business. However to perform such type of research demands a different set of methods and tools compared to observational research, or research with pre-acquired data.

3.2 Marketing: an unused toolbox

One field of academics that has focused most on how customers react and what they think is marketing. In the field of marketing many companies have understood that knowing your customer can increase your added value to them. Knowing your customer however, requires data. Tao & Yeh (2003) discuss in their paper on database marketing that even smaller enterprises can enhance their business by using their customer data. A good overview is created by Petrison et al. (1997) which, however outdated, shows that marketing has been successfully using database information to communicate with their customers for quite some time now. The field of database marketing lies within the Customer Relationship Management (CRM). The use of statistical techniques for analysing customer data, thereby providing information for marketing decisions is widely considered interesting although Verhoef et al. (2002) point out that economies of scale are essential to the success of these techniques.

However Secure Logistics has no existing database and relies purely on the obtaining of such data externally. The most logical way of obtaining data (considering there is no scanner data or data gathering protocol within the company) is through a customer satisfaction survey. These surveys have the aim of better understanding the customer and obtain higher profitability (Anderson et al. 1994; Fornell et al. 1996). Hallowell (1996) confirms that there is a correlation between customer satisfaction and customer loyalty, which in turn are correlated to profitability. The paper discusses that a customer's satisfaction is derived from

his/her value of the transaction between the firm and the customer. This forms an understanding of how much value added a company delivers and in what way can show how to adapt products (Cina, 1989). This better understanding can lead to new insights on whether measures are considered a positive feat, the level of compliance to measures and focus points for further research. Through a customer satisfaction survey basic notions can be observed of which are potential interesting topics for further research, but most of all give a direct image of the current products and stance of the company.

There are however downsides of surveys. Generally surveys tend to collect quantifiable data, however cannot be much in-depth. Outside of the fact that there are many requirements regarding the way questions are posed (unambiguous, concise, structured, no double-barrelled questions) the survey itself can be too lengthy (Parasuraman et al., 2006). By using a combination of tools, one can get both quantity and quality of data. Therefore to obtain more in-depth data, interviews are another tool that is widely used within marketing. Tuli et al. (2007) in their paper on rethinking costumer solutions used in-depth interviews to enhance their pre-collected data. Perry (2001) establishes in his paper on case research, that every tool has its purpose and as surveys tend to be more answering the 'what' questions an interview is used to focus on the 'why' questions. This clear distinction gives way to the usage of multiple methods/tools to obtain data and thus create a more complete picture. This distinction is re-enforced by Denzin & Lincoln 1994 in which it is discussed that "qualitative studies stress processes and situational constraints, whilst quantitative emphasize the measurement and analysis of causal relationships". All in all marketing shows to have multiple tools available to obtain information, which can provide guidelines for better products – also for Secure Logistics. By enhancing their products, Secure Logistics can consequently change the experienced trade-off between efficiency and security, enhancing the Rotterdam Area's competitiveness.

In this chapter it is established that a lot of research has previously been done on security in the logistics sector. However it is clear that there is a gap in contemporary literature. The fact that there is few to none research conducted on the current opinion of firms within the sector, which deal with measures on a daily basis is surprising. This together with the tremendous amount of observational research calls for a shift towards more multi-disciplinary approaches, in which from both within as outside the sector the impact of measures is researched. The lack of research among companies within field of logistics and security can be due to a lack of familiarity with the tools provided by marketing. Therefore a

short review of the toolbox of the field of marketing has been provided. This toolbox can bring the day-to-day business back into academics and can be combined with the observational research that is currently dominant. The next chapter will discuss the current situation of Secure Logistics, which will include a SWOT analysis with the aim to provide internal analysis as a basis for the survey, as well as a point to confront the empirical findings.

4. The Case of Secure Logistics

As the previous chapter focused on the academic literature and toolsets that are acknowledged in the literature, it is now time to step towards reality. This chapter discusses and analyses Secure Logistics through internal interviews, desk research and a SWOT analysis. It gives a clear picture of where Secure Logistics stands at what their aims are. This chapter serves as to better understand the reason for the problem and the research that is chosen to solve it.

Secure Logistics is a company founded in 2003 by DeltaLinqs responsible for the development, management and the administration of the XS-Key system. The system is an identification- and registration system based on smartcard technology, combined with biometric information. Secure Logistics is the daughter company of DeltaLinqs, which describes itself as representing

"The common interests of all the logistical and industrial companies in the Rotterdam port and industrial area [...] The organization is considered to be the focal point and spokesman of more than 700 registered companies and associations".

The fact that Secure Logistics is a daughter company of this Rotterdam based port community representative defines their strategy and goals. It has a non-profit aim to distribute their system (and corresponding products) as widely as possible, to ensure low costs and high usability for the users.

4.1 The Company

Secure Logistics currently has around 17 employees. The structure is quite informal, and has short lines to the top. There are two directors (of which one is the technical director). The personnel are mostly highly educated professionals and are working in IT operations/management. This is necessary due to the product delivered by Secure Logistics – the exchange of information through smartcards with computer systems and thus software. As a daughter of DeltaLinqs, it is still a financially independent organization, with close contact to a lot of customers – servicing their needs.

4.2 The Products

Secure Logistics in abstract sense delivers the secure exchange of information regarding the cardholder and the card acceptant. It facilitates the information on the cards, and verifies

this information through the computer system installed at the acceptant. With this verified information the acceptant can install different criteria with which they authorize access to their facility. The system used is called the XS-Key system. Within the XS-Key system there are three differentiated products: (1) the CargoCard, (2) the PortKey, and (3) the Digital Safety Passport. Each of these products is based on the combination of smartcard technology with biometric identification methods, however their target groups are differentiated. All cards contain personal information about its holder; about the company the holder is currently employed at, and biometric information of the holders right hand. Next to this, the Digital Safety Passport includes information on the holders' qualifications regarding working safely.

4.2.1 CargoCard

The CargoCard is aimed at delivering efficiency at the gate. The card can hold temporary data (route instructions etcetera). The goal of this specific card is to eliminate time used to check (primarily) truck drivers with cargo. Through a simple identification[6] method the card and system exchange information about the authorization of the cardholder regarding entry of the area. This can be done from the truck, eliminating time spent by the driver waiting for identification, and time used by the gatekeeper to check said driver.

4.2.2 PortKey

Security has become an increasingly relevant topic for a lot of companies. Different legislation since 9/11 has been put in place, leading to an extensive development of measures and systems to comply. One of these measures is the ISPS code previously mentioned. The PortKey complies with this code, by registration and identification of individuals entering the facility. It is aimed at repeat-visitors and simplifying the entry of facilities for them. This saves both parties time (by eliminating time taken for the registration of a guest pass), whilst guaranteeing a verification of authorization through the system. The PortKey however is only valuable when multiple companies within the network of the cardholder use the system.

4.2.3 Digital Safety Passport

The Digital Safety Passport is aimed at companies working with third parties that have a lot of individuals working and passing through a secured facility. A main example is the

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[6] By holding the CargoCard against a designated area, and inserting the right hand at the specified area.

maintenance stops at petrochemical companies such as Shell. When such a stop happens, Shell hires a contractor to help with the maintenance. However most contractors will not have enough employees by themselves, and as a consequence hire sub-contractors. To still be able to verify authorization of the many employees, a standardized card, including information of the holder, but also of their certificates and qualifications is useful. With this specific card, Secure Logistics also keeps track of expiration dates of the certificates. This eliminates the need for the card acceptant or contractors to manually check the qualifications of the employee.

4.2.4 The Earning Model

Secure Logistics earns its money without having the purpose of making profit. Therefore they aim to keep their prices low, and only charge for specific services. They are however financially independent, without currently making a loss. The table below show the different costs incurred on two different customer types: cardacceptant and cardholder.

	Cardacceptant	Cardholder
Production cost		Non-recurring
Subscription cost		Annual
Installation	Non-recurring	
License (per point)	Annual	
Software	Non-recurring	

Table 1: Costs per customer type

The two different customer types have different costs. Cardholders have to pay for the production cost of the said card, which is a single payment. After they obtained their card, they are charged annually for the subscription on the services of Secure Logistics. The cardacceptants have to pay for the installation of checkpoints (as a technician has to install the hardware), which are one-time costs. Next to this they pay an annual license fee per checkpoint (which is for maintenance and updating the system). Lastly they pay a one-time fee to obtain the software that goes with the hardware.

4.2.5 Aims

The different cards are aimed at different groups of users. The CargoCard has cargo transporters as users (primarily truck drivers), and has the aim to enhance efficiency. The PortKey has as users repeat-visitors, and has the aim to guarantee security within the facility. The Digital Safety Passport has the aim to guarantee safety for both the facility and

worker, by validating certificates and qualification – saving time compared to manual verification.

	CargoCard	PortKey	Digital Safety Passport
User	Truck Driver	Repeat-Visitor	Third-Party Personnel
Main Industry	Transport/Logistics	Port/Maritime/Logistics	Petrochemicals
Aim	Efficiency	Security	Safety

Table 2: Defined customers, industry and aim per product

4.3 The Customers

Secure Logistics currently has over 2500 customers, divided over three countries with at least one of the three cards provided by the company. Currently the clients can be divided by their location; namely the ports of Antwerp, Rotterdam and Amsterdam, but also by the industry they mainly operate in (within maritime operations, most companies tend to be active in more than one industry).

The majority of customers are within the container terminal industry, followed by inland terminals and container depots. This is quite straightforward as these industries are affected by the ISPS standard. What is quite surprising is the lack of customers within transport and logistics, as these industries tend to be focused on safety and on time reductions.

Next to this we observe that most of Secure Logistics' current customers are situated in the Rotterdam Port Area. As Secure Logistics is the daughter company of DeltaLinqs (the Port of Rotterdam community company) this is not very surprising. However the low amount of customers in Amsterdam or Antwerp is surprising. This might be caused due to the fact that there are social groupings that have frictions with Rotterdam. There has not been any research regarding why there are so little customers outside of the Port of Rotterdam.

Not all customers of Secure Logistics buy the same product. As there are three different products that serve different purposes, it is understandable that not all customers buy all products. In the case of Secure Logistics most of their customers buy the CargoCard as it is obligatory to enter most of the container terminals and port facilities (which is the source of most freight in The Netherlands), with the PortKey following and the new product (DSP) still in it's infancy stage.

4.4 Competitors

Competitors of Secure Logistics can be regarded as companies that also provide security and safety-measures with the help of biometric identification, following with exchange and provision of information. The main examples are Alfapass and SmartLOXS, which focus respectively on the Port of Antwerp and Schiphol Airport.

4.4.1 Alfapass

The Alfapass is an initiative from Alfaport Antwerp, CEPA and SEAGHA[7], to comply with the ISPS codes following from 9/11. According to their website[8] the main types of frequent visitors (and thus eligible for an Alfapass) are: port labourers, truck drivers, port facilities personnel, others (quay shipping agents, quay agents, water clerks, ship chandlers, and temporary visitors. The main idea behind the Alfapass is a shared identification card, which smoothens entry across the port for frequent visitors. It acts as a combination between the CargoCard (fast entry and identification) and PortKey (focussed on frequent visitors of the port).

4.4.2 SmartLOXS

The SmartLOXS Company was set-up by Cargonaut BV and 3BK Holding BV. Cargonaut delivers information and communication-technology and e-commerce services. Cargonaut is an independent company with multiple shareholders with the biggest being the Schiphol Group. The airfreight sector is the primary customer for Cargonaut BV. They are a member of the branch organisation Air Cargo Netherlands (ACN) and supply chain-wide solutions regarding information technologies, both in software and in consultancy. Their customers include shippers, hauliers, freight forwarders, handlers and airlines.

 3BK Holding is a consultancy company that is internationally operating on logistical services. SmartLOXS is aimed at servicing Schiphol Amsterdam Airport with a smart card and biometric identification combination similar to the XS-key concept of Secure Logistics and specifically the PortKey. The main difference is the central orientation of the system – the information used in the process and system are centrally stored, which gives less IT management at the customer instead of the decentral nature of the XS-key, but also creates problems for every customer if the central hub is stricken by an intrusion or jam.

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[7] Alfaport Antwerp is a federation of port-bound logistics companies, CEPA is the organization of social policy in the Port of Antwerp, SEAGHA is the IT and strategy and policy department of Alfaport.
[8]http://www.alfapass.be/opencms/opencms/nl/modules/faq/faqCat2/faqCat2_0001?uri=/nl/faqCat2.html&locale=nl (20th of May 2014)

4.4.3 Others

Outside of the alternatives that are very similar to the XS-key system, there are some alternatives that offer solutions to the same problem, in a different fashion. The main examples are rooted at NEDAP (N.V. Nederlandsche Apparatenfabriek). They describe themselves as

"*A manufacturer of intelligent technological solutions for relevant themes[9]*"

This is mostly experienced in their AEOS project. This specific system aims to centralize security systems into one specific software-driven server. It is build to host different types of measures (access control, intrusion detection, video management and locker management) and through one system to be easily upgraded and operated.

4.5 SWOT Analysis Secure Logistics

A good basis for strategy and direction of Secure Logistics is a SWOT analysis. By evaluating the strengths, weaknesses, opportunities and possible threats, Secure Logistics can map a way for the future, but also uncover its current position (Dyson, 2003). The SWOT analysis has been established both through interviews with the management of Secure Logistics as well as through analysing competition/product alternatives, and internal documents. The SWOT analysis is key to have a correct interaction of the vision of the Secure Logistics management with the external and internal environment (Houben et al., 1999). In this research it plays a part in establishing interesting topics for

Strengths	Weaknesses
Community Company	Single supplier
Reliable technology	Current technology
Proven technology	Trust-based
ISPS compliance	Understaffed
Customizable	Fragmented knowledge
Opportunities	**Threats**
Contractor industry	Alternative products
Growing cargo flow	(Alfapass/SmartLOXS)
Growing legislation	Limiting legislation
Adding functionalities	New technologies
Documentation	

Table 3: A SWOT analysis table regarding the company Secure Logistics

strategy, but also as the basis to obtain further information with the survey and interviews. With a more specific and organized understanding of Secure Logistics it is easier to see which direction is the right one considering their current products as well as the wish to

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[9] http://www.nedap.com/about-nedap/company-profile/ (July 14th 2014)

launch a new product. This SWOT analysis will later on (see chapter 5) be used as a source for comparison regarding the results of the survey and in-depth interviews. This combination of methods will create a more thorough base of analysis.

4.5.1 Strengths

As all companies Secure Logistics has its strengths. The fact that it is a community company, backed by DeltaLinqs (and thus the companies within the Port of Rotterdam) and a system that has proven to be reliable (XS-Key system that has been used since 1997) can be considered a strength that other companies may lack. Next to this the system is designed to be in compliance with ISPS code, and is customizable in a sense that it can be adjusted to integrate with existing software and hardware. The product strengths make it possible to deliver extra added value to customers, as it is possible to adjust your products to their exact demand, which is a good basis for flexibility. The backing by DeltaLinqs also proves a strength, as it guarantees usage of the CargoCard through their member base.

4.5.2. Weaknesses

The weaknesses of the company are mainly due to current staffing. With the DSP project in motion, there is likely to be a great rise in the number of customers. At the current staffing Secure Logistics has a difficulty maintaining quality level of service for the CargoCard and PortKey. This will worsen with the DSP rolling out. Together with this weakness, the knowledge base (both regarding the XS-key system, as well as customers and protocols) within the company is fragmented and is fixed in individuals. Another weakness is the fact that the supplier of biometric identification is the only one with the current used specifications. This means that if this specific supplier choses to change specifications of their system or price, Secure Logistics has no alternatives and is subject to these changes.

Lastly the website shows to be obsolete and uninformative. As this medium can alleviate a lot of pressure from personnel (as existing and new customers can find answers to their questions on a website) that now use their time guiding and helping clients, it is a weakness in its current form. Next to this, the procedures internally and externally for the application, production and use of the products as well as communication are non-existent or unclear. This makes it difficult to swiftly react on problems that may occur with the system and can inflict damage on how customers perceive the company.

4.5.3 Opportunities

There are opportunities for Secure Logistics in different fields. Internally there is possibility to structure and document the way customers are handled, establish importance of customers, and document how to work with different systems and processes. This will create an easier transition between current employees and new employees. This can also increase productivity, as not every problem has to be discussed with co-workers, but can be answered by internally established manuals and instruction booklets.

Other opportunities lay with the external environment, where growing cargo flows and increased legislation offer opportunity to sell more products, as well as adapting products easily to comply with new legislations. New functionalities may be added to existing products and the DSP, as DeltaLinqs offers a close connection to customers, which may have specific wishes. If it is possible to tailor to the customers' wishes, the likelihood of sales and thus existence becomes higher, as well as spreading the XS-key system to the rest of The Netherlands (which is one of the aims).

4.5.4 Threats

The threats that Secure Logistics is faced with lie mainly with competitors (or alternative solutions) as well as with changes in technology and legislation. The growth of technology can lead to an alternative to the XS-key system that might be cheaper, easier to use, or deliver higher efficiency gains. The same goes for the stricter legislation, which can make the system less valuable (not complying to new laws). However there is no possibility to look into the future, and thus to anticipate these threats and adapt to them.

The competitors are more visible threats, and can be anticipated. Alfapass and SmartLOXS are systems that are similar to the XS-key system. However Secure Logistics system offers services tailored to different users and different markets. Alfapass is limited to Antwerp, and can only be used to guarantee entrance. SmartLOXS is tailored to Schiphol Airport and Amsterdam Port, and most likely will stay there as well. However there are other alternatives that are not regionally bounded. An example is NEDAPs AEOS system. This system offers an integrated security system, which is based on own standards – which can comply with any type of internationally set legislation.

5. Data Obtainment & Analysis

This chapter starts out with explaining the specifications of the survey and in-depth interviews. These two main tools were used to obtain the knowledge that Secure Logistics was missing and required to smoothen out the rollout phase of their new product (DSP), but also to provide a direction regarding their strategy and corporate structure. Following this description an analysis of the different data from the survey and interviews will be provided. Lastly all three sources of analysis – SWOT, survey and interviews will be compared to provide a clear image of the current situation of Secure Logistics.

5.1 The Specifics: a survey and interviews

Firstly the specifications of the survey and interview are discussed. The questions are described as well as motivated. The survey has multiple goals namely; establishing a general view, giving customers the possibility to explain answers or notify problems and lastly to establish scores for Secure Logistics and their products. The interviews are aimed to get more knowledge regarding current problems with Secure Logistics. Next to this they serve to establish what the contemporary view on security measures amongst different companies is.

5.1.1 The Survey

The survey starts with the statement to which industry the respondent belongs, followed by statements about the importance of efficiency, security and safety, which consequently are followed by the actual measures taken with respect to these topics. To inquire further there are questions asked with regards to which type of measures are taken (gates, cameras, training[10]) with the possibility to enter 'other' if the list does not include all options. These questions serve as a background to see how companies in the logistics industry view these aspects of their services both in importance as in actual effort taken regarding efficiency, security and safety. The list of measures is included to get a notion of how broad the spectrum of initiatives on firm level is.

The second part of the survey discusses characteristics of the customer that are relevant to Secure Logistics. Here the respondents are asked to distinguish between being a cardholder or cardacceptant (company holding and using the card to enter, or the company that verifies

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[10] For the full list, see the appendix

the card to give access). They also had to declare which of the three products they use from Secure Logistics (CargoCard, PortKey or Digital Safety Passport). After this declaration the respondent gets statements regarding their satisfaction with key performance indicators of the different products that they use (and being guided past questions of products they do not use), established with the Business Development Manager of Secure Logistics. The statements are answered with five-point Likert scales ranging from 'completely disagree' to 'completely agree', with 3 being 'neutral'. The choice to use a five-point Likert scale stems from the exploratory nature of the survey. Likert scale statements have been verified and are easy to understand and analyse (Matell & Jacoby, 1971).

The choice for KPIs has been discussed with the Business Development Manager, which supervises the company side of the research. The KPIs were established as (1) the application process, (2) the user-friendliness, (3) efficiency added, (4) service, (5) price and (6) reliability. After each set of statements about a product the respondent was given the chance to give suggestions, comments or complaints. These open questions were added to get a deeper insight in the scores that were given – however these questions were made optional.

After the product satisfaction measurement, the overall opinion on Secure Logistics was gauged. This was done through three statements on the service (general satisfaction, the meeting of expectations, and the matching with the ideal service), after which the respondent was asked to describe the perfect service. This was followed by the Net Promoter Score question from 0-10. These statements were used to see if there were discrepancies between the individual product score and overall assessment of the companies. The meeting of expectations gives information on how the company is viewed before a bad or good performance, and the ideal service is something Secure Logistics as a community company strives for. The NPS is something the Business Development Manager was interested in, specifically as the image of a company boils down to this question.

5.1.2 The Interviews

The first set of questions in the interview are to get more information on the importance of efficiency, security and safety – how much action is taken towards these facets of business. Following on that they are asked how they compare to the others in the industry and how they see the future of these topics with regards to legislation, initiatives and technology. The interviewee is asked about where the pressure for increased safety and security comes from

(government, corporate worlds, society or customers). The last questions of the first section are about the competitive position of the company (and the Rotterdam area and the Netherlands) and how it is influenced by security and safety measures. These questions were chosen to give insight in how the companies experience the call for safety and security, and to see how knowledgeable they were about said topics. The reasoning behind putting this section first is to establish a broad awareness before obtaining specific information regarding Secure Logistics.

The second section of questions were chosen to give the customer the possibility to explain and go in-depth about the service of Secure Logistics – and the way the XS-key system has been implemented. The first question addressed the way such initiatives as the XS-key system is organized (community system, government or a commercial initiative). Following they were asked to describe a positive and negative experience with Secure Logistics and the pro et contra of the way Secure Logistics works. After this the respondents were asked what they would like to see added to the current services, or done differently, and which problems were encountered most often. Finally the interviewee was asked if they had suggestions on what could be done differently. All these questions delve deeper in understanding what goes wrong in the eyes of clients, as well as challenging the customer to think of improvements and adaptions that can be made. The interviews are considered to add to the basic understanding of the transport and logistics sector established by the survey.

5.2 The Data: Efficiency, Security & Safety

This section discusses the data obtained through the survey and the interviews. First the survey data will be discussed and analysed thoroughly. Different respondent segments will be discussed in light of their answers regarding both the efficiency, security and safety topics as well as their scores given to Secure Logistics and their products.

5.2.1 The Survey Respondents

A total of 2535 survey requests were sent by email to existing Secure Logistics customers. Out of these 2535 surveys, 227 (8.9%) surveys were started and 113 (4.4%) being completed. Of the respondents 76 (67.25%) said to be cardholder, 16 (14.16%) to be card

acceptant, and 21 (18.58%) to be both[11]. Next to this the CargoCard was the product mostly used with 91 (approximately 80%) respondents, followed by the PortKey with 22 (around 17.7%) users and the DSP with 2 users (close to 2.7%). Two respondents reported to have both a PortKey and CargoCard. The amount of respondents is divided over three main characteristics regarding Secure Logistics, product type, customer type and NPS score as can be seen from table 4.

	CargoCard	PortKey	Digital Safety Passport
Cardholder	59	17	2
Cardacceptant	15	1	0
Both	17	4	0

Table 4: division of respondents based on customer type and product type

The customers are also divided regarding the score they awarded Secure Logistics at the Net Promoter Score question. This is according to the system designed by Satmetrix Systems[12], which titles customers detractors if they award a 0-6, passives if they award a 7-8 and promoters if they award a 9-10. Without any other distinction there are 20 detractors, 73 passives and 20 promoters.

Industry	Respondents
Transport (containers)	82 (16)
Service/Construction	14
Chemical Industry	6
Logistics	4
Transhipment	3
Trade	2
Employment	2
Total	113

Table 7: Respondents per generalized industry

Regarding the division over industries it is less straightforward. The respondents were asked to fill in their industry without pre-defined options. This lead to somewhat chaotic responses that were later on divided into the main sectors shown in table 7. The respondents differentiated between transport by sea (6), road (3) and non-specified (72). However of the respondents that mentioned their industry as transport 15 differentiated themselves by mentioning 'container' transport. Service and construction includes multiple companies that structurally are seen at the port (garbage disposal, construction and rent, installation, inspection, carpenters, road construction etcetera). The 2 respondents in trade are a fuel- and lubricant trader and a vegetable- and fruit trader. The diversity of

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[11] An internal check has been performed on the respondents that stated their company, and if they were both. It seems that the respondents are not aware of the term as of those respondents only one was actually both a holder and acceptant.
[12] http://www.netpromoter.com/why-net-promoter/know/. October 1st, 2014.

respondents is expected as cardholders are companies that require access to facilities – hence the high amount of transport related customers. The other sectors are either related to the transport industry as well as companies that have facilities in the port or are related to construction or maintenance of these facilities. Among these industries the distribution of products can be seen in table 8. The majority of the CargoCard is settled with the transport industry (which is the natural target group of the

Industry	CargoCard	PortKey	DSP
Transport (containers)	75 (14)	9 (3)	0
Service/Construction	4	10	0
Chemical Industry	4	0	2
Logistics	4	0	0
Transhipment	1	2	0
Trade	1	1	0
Employment	2	0	0
Total	91	22	2

Table 8: The distribution of the different products among the industries indentified among customers.

CargoCard). The PortKey focusses also on the transport industry, but is also big among the service/construction sector (considering that they product focusses on frequent visitors of port facilities this is as expected).

These four sources of segmentation are used to gain better knowledge of the different wishes and views among the customers of Secure Logistics. The customer type, product type, NPS-score and industry can tell more about the scores and comments given regarding Secure Logistics their products and the general view on efficiency, security and safety.

5.2.2 Efficiency, Security & Safety the Importance

The first section of the survey contained questions regarding how the customers of Secure Logistics viewed efficiency, security & safety and how they acted on their views. In general it can be observed (see table 8) that the importance of time saving (purposefully called such because it is regarded as a measurable efficiency proxy), security and safety are considered important by companies. From the results it can be seen that especially timesaving and safety are the more important as their

	Importance Timesaving	Importance Security	Importance Safety
Totally disagree	0	0	0
Disagree	0	2	0
Neutral	5	16	10
Agree	53	50	42
Totally agree	55	45	61

Table 9: Frequency of scores in the Likert Scale (totally disagree = 1) regarding importance of timesaving, security & safety

minimum is higher (both have 3 as minimum whilst security has 2), the mean higher (4.44 and 4.45 respectively compared to 4.22) and the standard deviation is lower (0.583 and 0.657 compared to 0.756). It is evident that the importance is considered high among most respondents. With only 4.5% scoring neutral on the importance of timesaving, 16.2% give neutral or disagree for the importance of security and 9% for the importance of safety.

A division by customer type (cardholder, cardacceptant or both) does not show any major differences between the groups. All scores (neutral to totally agree) hold around the same percentage of the total respondents within their particular customer type. A division by industry shows that all means are above 4 for each topic – showing that each industry segment regards these topics as important. Moreover we can see that specifically transhipment, trade and employment find timesaving important (compared to other sectors), transhipment, trade and logistics value security the most, and the chemical industry, service/construction and logistics sectors find safety important compared to the other sectors.

If looked at which product the different customers purchase (CargoCard, PortKey or Digital Safety Passport) it can be observed that the CargoCard customers tend to prefer timesaving (with a

Industry	Importance Timesaving	Importance Security	Importance Safety
Transport	4.47	4.18	4.38
Transport (container)	4.38	4.00	4.13
Service/Construction	4.36	4.36	4.86
Chemical Industry	4.00	4.33	4.67
Logistics	4.50	4.50	4.75
Transhipment	4.67	5.00	5.00
Trade	5.00	4.50	4.50
Employment	5.00	4.00	4.50

Table 10: Means of scores in the Likert Scale regarding importance of timesaving, security & safety per industry

mean of 4.44) to security (4.20) or safety (4.37). For PortKey owners the emphasis lies with safety (4.77) compared to timesaving (4.50) or security (4.36). These observations make sense regarding the goal of the products (focussing on timesaving with the CargoCard, and safety with the PortKey). An interesting point however is the higher score of timesaving among PortKey owners, which can be explained through the fact that the majority of PortKey owners are cardholders (17 of the 22) – the persons going in and out the facility.

5.2.3 Efficiency, Security & Safety the Dedication

	Measures Timesaving	Measures Security	Measures Safety
Totally disagree	0	0	0
Disagree	0	2	1
Neutral	25	31	24
Agree	63	55	52
Totally agree	25	25	36

Table 11: The frequency of scores in the Likert Scale (totally disagree=1) regarding measures taken towards timesaving, security & safety

Next to the importance of such measures the respondents were also asked to report the actual perceived effort put into such measures within the company. In table 11 it can be seen that the majority still agrees, the conviction of the agreement is less strong. Measures towards timesaving are reported to be 22.5% as neutral, 29.7% neutral or lower for security and 22.5% as neutral or lower for safety. The discrepancy probably lies with the aforementioned consideration mentioned by Sheffi (2001) who discusses that not all measures that are wished for can be taken due to limited resources. Measures towards safety are considered taken the most with a mean of 4.09, followed by timesaving (4.00) and security (3.91). However timesaving has a minimum of 3 compared to 2 for both security and safety, indicating that among the respondents none disagreed with the amount of timesaving measures taken.

Observing the scores awarded for timesaving measures by the different customer types it can be seen that approximately 21.2% is neutral regarding the effort, 59.2% agreed to the amount and 19.7% totally agreed with the measures taken. Among cardacceptants 6.2% is neutral, 56.2% agrees to the amount and 37.5% totally agrees. Customers reported to be both are around 38.1% neutral, 42.9% agrees and 19% totally agrees. It can be seen that cardacceptants find the amount of measures taken more satisfying than the other two groups (as their scores are relatively a lot lower on neutral and higher on totally agree). The cardacceptants are generally the facilities – which have a generally fixed set of processes, making it easier to implement timesaving measures. This distribution can also be observed regarding measures taken for security and safety – which can be attributed to the same reasoning made previously, with facilities being less subject to extreme change, making it easier to manage and to implement process improvements.

If considered the scores per industry it can be noticed that the means are generally lower than those for importance. The biggest discrepancies are in the container transport sector and service/construction sector, with the biggest discrepancies in security importance versus

measures. A reason for the difference between importance and actual measures taken in security can stem from the trade-off between efficiency and security. As current news is constantly filled with reports about IS (Islamic State conflict – summer 2014) the notion of increased security requirements might affect the importance allocated to these measures. However as it is difficult to change or implement measures in such a short notion the actual experienced measures taken can be considered lower. The fact that the container transport sector and service/construction

Industry	Measures Timesaving	Measures Security	Measures Safety
Transport	4.08	3.98	4.05
Transport (container)	**3.75**	**3.56**	3.88
Service/Construction	**3.71**	**3.86**	4.14
Chemical Industry	4.00	4.00	4.50
Logistics	4.25	4.25	4.25
Transhipment	4.33	4.33	4.67
Trade	4.00	**3.50**	4.00
Employment	4.50	**3.50**	4.50

Table 12: Means of scores in the Likert Scale regarding measures taken in the topics of timesaving, security and safety

sector find timesaving and security measures taken less than their reported importance can be very much part of this trade-off in combination with the consideration that these companies are generally small with low capital.

The amount of measures perceived to be taken could also be seen per product type. If looked at the means of the scores given by the CargoCard owners it becomes clear there is no specific topic that shows to be more important (4.03 mean for timesaving, 3.93 for security and 4.03 for safety). This suggests that CargoCard owners tend to balance out their implementation of different measures. For PortKey owners the focus lies with safety measures (4.18 mean) versus timesaving (3.86) and security (3.82). Although only 2 respondents were Digital Safety Passport customers, it is worthwhile to mention that both for importance as well as actual effort their means were 5, showing that regarding safety they are fully committed (which is logical regarding the product they buy).

5.2.4 Efficiency, Security & Safety the Measures taken

Following the questions on importance and measures taken towards the topics of efficiency, security & safety, the respondents were inquired about the measures taken towards these topics. As efficiency is quite a general term and there is a broad spectrum of measures that can be taken toward this topic this was left out to keep the survey accessible and swift. The

pre-made list of options for security measures included: cameras, fences, entry-barriers, identification processes and guards. Next to these pre-given options the major list of options reported outside of the given list were: none (13), alarms (7), screening/control personnel (4), locks (2), trackers, dashcam, computer protection, safe cars and

Measures	Respondents
Cameras	59
Fence	71
Entry-barrier	20
Identification process	36
Guards	16
Alarms	7
Screening/control personnel	4
Locks	2
Others	5

Table 13: Security measures taken as reported by respondents

undisclosed. It is interesting to see that some respondents regard security important however mention that they undertake no measures at all. If taken a closer look it can be seen that these respondents are mostly within the transport and service/construction sectors and are cardholders. It can be assumed that these companies as reported have no facilities and thus no need for any security measures.

Next to measures on security there are measures on safety reported. In the pre-given options the respondents could differentiate between safety briefings, training, equipment tests, medical tests, and fire drills. Other measures reported were; none (9), attention (2),

Measures	Respondents
Safety briefings	41
Training	79
Equipment test	38
Medical test	36
Fire drills	39
None	9
Attention	2
Others	5

Table 14: Safety measures taken as reported by respondents

audits, personal safety equipment, computer protection, tire-tension & axel measurement and general pledge of secrecy regarding cargo. Just as with security measures, the companies responding to have no safety measures were in the transport business and cardholders – leading to the same conclusion, small companies without employees (sole proprietorships) tend to have no official measures taken towards increasing safety or security.

Overall it is seen that there is no single measure that has been implemented by all respondents. This could be due to the fact of the diversity of sectors, services and customer types. Next to this the importance of efficiency, security & safety has been established, even though most respondents report to put less effort in than what would be corresponding to their reported importance. This can be linked back to the

findings from the papers discussed in the theory review that report a trade-off between measures (Sheffi, 2001; Lee & Whang, 2003; Christopher & Rutherford, 2004; Close & McGarrel, 2004; Willis & Ortiz, 2004; Sheu et al., 2006).

This section has discussed the topic of efficiency, security & safety regarding importance attributed by the industry, but also how much dedication there is towards implementing measures and which of these measures are taken. All three topics are considered important but we clearly see that timesaving is valued most by CargoCard owners (which is the main goal of the product), and safety by PortKey owners (which is interesting as their focus was expected to be with security). When then looked at actual dedication it can be seen that safety is implemented most and cardacceptants put most effort in upholding the importance of the topics. The biggest discrepancy is between security importance and measures taken – again reinforcing the cost associated with these measures.

Following from this initial exploration of the efficiency, security and safety trade-off the next section will discuss the CargoCard through its key performance indicators (KPI) established together with the business development manager at Secure Logistics. It explores if there is a clear relationship between segments and the score attributed to the different KPIs.

5.3 The Data: The CargoCard

As the previous section discussed how the different segments view the importance and measures of the general topics of efficiency, security & safety, this section discusses the relationship between the different segments and the CargoCard.

5.3.1 The CargoCard: the respondents

This section discusses the scores of the CargoCard. Among the CargoCard customers there are 59 (64.8%) cardholders, 15 (16.5%) cardacceptants, 17 (18.7%) reported to be both, with a total of 91 customers. The CargoCard customers can also be divided by their NPS score, this gives us 14 (15.4%) detractors, 58 (63.7%) passives and 19 (20.9%) promoters. In table 15 it can be seen how these customers are distributed among the different industries.

Industry	Cardholder	Cardacceptant	Both	Total
Transport (container)	50 (9)	11 (2)	14 (3)	75 (14)
Service/construction	0	2	2	4
Chemical Industry	2	1	1	4
Logistics	3	1	0	4
Transhipment	1	0	0	1
Trade	1	0	0	1
Employment	2	0	0	2
Total	59	15	17	91

Table 15: Distribution of CargoCard respondents per customer type among the industries

5.3.2 The CargoCard: Customer types

In table 16 it can be seen in bold that the 'price' KPI scores considerably lower than the other KPIs. A reason for cardholders could be that they do not directly relate the benefits with the price paid (i.e. the customer becomes used to the time won through the product). For cardacceptants this can also be experienced as such, as they have a substantial annual cost, however all the small benefits (per truck or cargo) cannot be related to this substantial

KPI	Cardholder	Cardacceptant	Both	Overall
Application	3.97	4.27	3.71	3.97
User-friendly	3.98	4.20	4.00	4.02
Efficient	4.02	4.40	4.00	4.08
Service	3.88	4.27	3.76	3.92
Price	**3.49**	**3.33**	**3.71**	**3.51**
Reliability	3.81	4.27	3.88	3.90
Aggregate	3.86	**4.12**	3.84	3.89

Table 16: Means per KPI of the CargoCard, including a division per customer type, an overall CargoCard customer score and an aggregate score (an average of the means of the KPIs).

lump-sum cost. In general however cardacceptants show to be more satisfied with the CargoCard. Reasoning for this can be found in the history of the CargoCard and how Secure Logistics has treated cardacceptants. By implementing the CargoCard at big port facilities (terminals) where a large amount of truck traffic took place, the drivers were forced to uptake the CargoCard. Initially the CargoCard was set-up from the mind-set of terminal operators, to obtain a faster in- and output of cargo.

5.3.3 The CargoCard: satisfied versus dissatisfied

Next to the mean values the data includes information on the dissatisfied[13] and satisfied[14] customers. Regarding the application process 8.8% of the customers is dissatisfied versus 81.3%, whom are satisfied, regarding the user-friendliness this is 4.4% versus 73.5%, 1.1% versus 81.3% with the efficiency, 5.5% versus 80.2% regarding service, 12.1% versus 52.8% regarding price and 4.4% versus 75.8% regarding reliability. What is interesting is that only 2 cardacceptants report to be dissatisfied with a KPI (namely price); whilst among all other KPIs there are no dissatisfied customers among the cardacceptants. If looked at scores among the industries it shows that the only negative scores are among Logistics (2), Transport (6 of which 2 specialised container) for the application process. The same goes for user-friendliness (2 for Logistics, 2 for Transport) and efficiency (1 for Logistics). For price also Logistics (1) and Transport (9) show dissatisfaction, however also the Chemical Industry (1) reports dissatisfaction. Lastly reliability again has 1 negative respondent in the Logistics sector and 3 in the Transport sector. The satisfied customers are more dispersed with no clear outliers among the industries.

5.3.4 The CargoCard: Net Promoter Score groups

KPI	Detractors	Passives	Promoters
Application	35.7%	5.2%	0.0%
User-friendly	28.6%	0.0%	0.0%
Efficient	7.1%	0.0%	0.0%
Service	21.4%	3.4%	0.0%
Price	28.6%	10.3%	5.3%
Reliability	21.4%	1.7%	0.0%

Table 17: Percentage of dissatisfied customers per KPI of the CargoCard distributed between NPS-groups

Lastly the scores of the CargoCard can be segmented among the different groups, which are divided according the Net Promoter Score method. The detractors are expected to give lower scores as they (according to the NPS method) are generally negative about Secure Logistics. In table 17 it becomes clear that only for the 'price' KPI even Promoters show a negative opinion. In all other KPIs the groups behave according to the NPS with a higher negative share of respondents within the detractor group, followed by passives and then promoters. In table 18 one can observe the other side of the grouping, namely the satisfied customers. Again the distribution followed as expected that promoters have the highest share of positive customers, followed by passives and lastly detractors. It is interesting that in general it shows that all groups are to

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[13] Respondents rating 1 or 2 on the Likert Scale.
[14] Respondents rating 4 or 5 on the Likert Scale.

some amount satisfied. Price is the KPI showing most room for improvement, however reliability also shows to have less positive rating than expected. This shows that this is definitely something that can be improved.

All in all the data regarding the CargoCard shows that there is an overall positivity towards the product. KPIs that ask for special attention are the price and reliability of the product. This should be done targeting the Transport and Logistic industries,

KPI	Detractors	Passives	Promoters
Application	42.9%	84.5%	100%
User-friendly	57.1%	84.5%	100%
Efficient	71.4%	79.3%	94.7%
Service	42.9%	84.5%	94.7%
Price	28.6%	51.7%	73.7%
Reliability	42.9%	79.3%	89.5%

Table 18: Percentage of satisfied customers per KPI of the CargoCard distributed between NPS-groups.

which have shown to be most negative together with the cardholder customer type.

5.3.5 The CargoCard: The Comments

Next to the data customers had the possibility to comment on the product (positively or negatively). The comments provided by the respondents give an insight in the reasoning behind there ratings. Reoccurring comments regarding specific topics involving the CargoCard are listed below and can be considered as validation for the scores given.

- Imposed system
- Service
- Malfunctions
- Application process
- Image, attitude

The general sound is one of complaint, which could be due to a negativity bias (Baumeister et al, 2001). Some respondents feel the system is imposed – which might relate to the fact that they do directly feel cost (subscription fees), yet no direct benefits (time saved at entrances). Next to this there are some complaints of non-available service, an arrogant attitude and inflexibility. Also specific terminals tend to have more malfunctions than others, which leads to a nuisance for frequent visitors of those terminals. Lastly the application process is considered tedious, complicated, and time-consuming.

All in all the CargoCard has shown to be a product that on average scores positively. Regarding the KPIs the 'price' is considered the least appealing to the respondents. The reasoning behind this can be a discrepancy between benefits of the products and costs of the product. Especially cardacceptants are positive about the CargoCard – which can be explained through the historical events leading to the CargoCard (being set up as a product to diminish cues at terminals). Lastly the logistics/transport sectors are most negative, which is a major cardholder group. The comments suggest that the fact that the product is imposed is the major cause of this dissatisfaction.

The following section will discuss the same segmentation and analysis of the PortKey product. This specific product has different target groups and aims and gives other insight than the CargoCard.

5.4 The Data: The PortKey

As the previous section discussed the CargoCard the upcoming section discusses the PortKey. This product has a different aim – making life easier for the frequent visitors of the Port of Rotterdam.

5.4.1 The PortKey: the respondents

The previous section discussed the CargoCard as a product and how different customer segments regard the product to be (through six KPIs). It has been established that regarding the CargoCard the price and reliability score relatively low. This coming section will discuss how the PortKey performs. Among the PortKey customers there are 17 cardholders (approximately 77.3%), 1 cardacceptant (around 5%) and 4 respondents who are both (about 18.2%). Regarding the NPS distribution there are 5 detractors (about 22.7%), 16 passives (approximately 72.7%) and 1 promoter (around 5%).

Industry	Cardholder	Cardacceptant	Both	Total
Transport (container)	7 (1)	0	2 (2)	9 (3)
Service/construction	8	1	1	10
Chemical Industry	0	0	0	0
Logistics	0	0	0	0
Transhipment	1	0	0	1
Trade	1	0	0	1
Employment	0	0	0	0
Total	17	1	4	22

Table 19: Distribution of PortKey respondents per customer type among the industries

5.4.2 The PortKey: Customer types

In table 20 the means of the KPIs are displayed per customer type. It shows that in general the PortKey is considered a lot less satisfactory than the CargoCard. Although there is of course a smaller amount of respondents with a PortKey, the outcomes are still worth considering. What immediately grabs attention is the price score. It is well below neutral in all groups and also scores negatively in the overall range. It shows that pricing is an aspect of the PortKey that needs to either be adapted, or more benefits should be offered for the

KPI	Cardholders	Cardacceptant	Both	Overall
Application	3.35	2.00	3.25	3.27
User-friendly	4.06	2.00	3.00	3.77
Efficient	3.88	2.00	3.00	3.64
Service	3.53	2.00	3.00	3.36
Price	2.94	2.00	2.25	2.77
Reliability	3.59	3.00	3.00	3.45
Aggregate	3.56	2.17	2.92	3.38

Table 20: Means of KPIs for the PortKey divided by customer type, including an overall score (averaging KPI) and aggregate (averaging customer type scores

same price. As there is only one cardacceptant among the PortKey customers, there is no point in comparing the customer type behaviour with the CargoCard customers. Another outlier is seen in the user-friendliness, which scores well above average among cardholders, as well as compared to other KPIs.

5.4.3 The PortKey: Satisfied versus dissatisfied

Next to the mean values the data for the PortKey users includes information on the dissatisfied[15] and satisfied[16] customers, however due to the lower number of respondents with a PortKey the percentages are more extreme. Regarding the application process 27.3% of the customers is dissatisfied versus 50%, whom are satisfied, regarding the user-friendliness this is 9.1% versus 68.2%, 9.1% versus 54.5% with the efficiency, 22.7% versus 54.5% regarding service, 31.8% versus 13.6% regarding price and 18.2% versus 59.1% regarding reliability. Again here it shows that price is the least satisfactory KPI with only 3 out of 22 respondents scoring it above 3. If looked from the industry segments, it shows that generally the service/construction sector is most dissatisfied with only the efficiency KPI

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[15] Respondents rating 1 or 2 on the Likert Scale.
[16] Respondents rating 4 or 5 on the Likert Scale.

having less than 30% (or more) dissatisfied customers within this sector. The most likely reason is the limited usage of the card (i.e. once a year there is road construction or electric wiring maintenance). This leads to limited contact moments between Secure Logistics and the company. This limited contact can give a bias to negative experiences, as well as a lot of work for limited benefits.

5.4.4 The PortKey: The Net Promoter Score Groups

Lastly there is the division per NPS grouping. In table 21 it is interesting to see that user-friendliness and efficiency are not considered negative by all detractors, while some passives regard the application process, price and reliability unsatisfactory. This shows that the PortKey does have KPIs that perform well,

KPI	Detractors	Passives	Promoters
Application	100%	6.3%	0.0%
User-friendly	40.0%	0.0%	0.0%
Efficient	40.0%	0.0%	0.0%
Service	100%	0.0%	0.0%
Price	100%	12.5%	0.0%
Reliability	60.0%	6.3%	0.0%

Table 21: Percentage of dissatisfied PortKey customers per NPS group and KPI

although it has to be taken in consideration that there are limited respondents among the PortKey customers. In table 22 the satisfied customers are shown in percentages of their NPS group. Here it can be seen that the distribution goes as expected, outside of the price KPI. It is surprising that the one promoter does regard the price in a neutral fashion. Next to this of the passives only a small 20% regards the price as positive. Another interesting point is the positivity regarding user-friendliness and efficiency gained from the product. This shows that the product on its own is considered positive but the processes around it (application, servicing, price and reliability) are considered negative.

All around the data shows a mixed image of the PortKey. On its own the product is considered performing satisfactory as shown by the different divisions. However the processes surrounding the

KPI	Detractors	Passives	Promoters
Application	0.0%	62.5%	100.0%
User-friendly	20.0%	81.3%	100.0%
Efficient	40.0%	56.3%	100.0%
Service	0.0%	68.8%	100.0%
Price	0.0%	18.9%	0.0%
Reliability	0.0%	75.0%	100.0%

Table 22: Percentage of satisfied PortKey customers per NPS group and KPI

product are considered less positive. One hypothesis is the low amount of contact moments

between customers and Secure Logistics – consequently giving a negative experience a major part of all experiences with the product servicing etcetera.

5.4.5 The PortKey: The Comments

Comments mentioned regarding the PortKey product focused on the application process (which was considered time consuming and cumbersome), the website (obsolete and unclear), reliability (no hand scans or passenger checks as intended to accompany the product). These comments are in line with the assumed hypothesis, mostly considering the contact moments with Secure Logistics, which take place once every 3 years (application process and website).

The PortKey in general shows to be less satisfactory for customers. Especially the price is considered negative – showing that the balance between benefits delivered is worth the price paid. The fact that terminals (cardacceptants) do not use the PortKey according to protocol (neglect to scan) and have frequent failures in their system can be a reason for this. However user-friendliness of the product itself is considered high. The comments mention the application process and website that needs improving, but also the fact that the reliability is very low. This section discussed the PortKey considering the data from the respondents. An image is set of a product that works but needs a lot of refinement regarding servicing and other processes around the product. The Digital Safety Passport cannot be analyzed as the CargoCard and PortKey as it is not fully operational yet. Both respondents are cardacceptants that are working with Secure Logistics on the beta version of the system – with neutral answers on the questions considering the performance of Secure Logistics.

5.5 The Data: Secure Logistics beyond the products

Outside of the individual product scores the respondents were also asked to consider Secure Logistics as a company. They were asked 4 questions regarding their view on Secure Logistics: general satisfaction, the services' Secure Logistics offers meet my expectations, the services' Secure Logistics offers match the ideal service, followed by a question on what the ideal service entails. After the data handling, the ideal service that respondents reported will be compared to the services provided by Secure Logistics. Lastly comments regarding Secure Logistics as a company will be discussed.

5.5.1 Secure Logistics: Satisfactory?

In table 23 it becomes clear that the majority of the respondents are positive about Secure Logistics with 88 (77.8%) agreeing to be satisfied about the company. It is interesting that the majority of dissatisfied customers are cardholders (5 compared to 2 none cardholders).

	Cardholder	Cardacceptant	Both	Total
Totally disagree	3	0	0	3
Disagree	2	1	1	4
Neutral	13	1	4	18
Agree	51	12	14	77
Totally agree	7	2	2	11
Total	76	16	21	113

Table 23: The distribution of respondents' reaction on the satisfaction regarding Secure Logistics between the three customer types

The division can also be made regarding which product the customer purchases from Secure Logistics. Of the CargoCard customers 3.3% is dissatisfied whilst 82.4% is satisfied, this is 18.2% versus 68.1% of the PortKey customers and both DSP customers are neutral (due to the lack of experience with Secure Logistics). If looked at the industries it can be seen that Logistics (2 respondents) and Service/construction (3 respondents) are most dissatisfied, together with 1 in Employment and 1 in the Transport sector. All other industries report either a neutral or positive opinion on Secure Logistics. The positive customers are dispersed among the industries. Lastly the detractor group of the NPS method displays 6 out of 20 (30%) respondents to be dissatisfied. This is 1.4% in the passive group and none in the promoter group. This shows that the NPS is a valid segmentation method regarding the customers of Secure Logistics. On the other side it can be seen however that 25% of detractors, 86.3% of passives and 100% of promoters are satisfied.

5.5.2 Secure Logistics: fulfilling Expectations

Next is the question regarding expectations towards Secure Logistics' services. By fulfilling expectations that customers have, a positive experience is created. In table 24 the distribution of answers can be seen. It shows that expectations are mostly not met for the cardholders (displaying 6 disagreeing and 18 neutral responses). A key to meet expectations is to communicate these correctly. Without any clear or structured communication expectations are left to the customer to decide. It is seen that mostly cardholders have a higher expectation than is currently met, while still the majority of customers (70.1%) are positive about the expectations they have and what Secure Logistics provide. Of the

customers displaying a discrepancy between their expectations and reality 5 are CargoCard owners and 4 are PortKey owners.

	Cardholder	Cardacceptant	Both	Total
Totally disagree	3	1	0	4
Disagree	3	0	2	5
Neutral	18	1	5	24
Agree	43	12	12	67
Totally agree	9	2	2	13
Total	76	16	21	113

Table 24: The distribution of respondents' reaction towards expectations met by Secure Logistics, between the customer types

They are distributed over multiple industries (employment, logistics, service/construction and transport), which show that there is no specific industry that has less clear communication. This shows that communication towards all customers can improve regardless of industry. As expected the detractor group has most discrepancy (40% report expectations not being met), versus 1.4% at the passives and 0% at the promoters.

5.5.3 Secure Logistics: the Ideal service

Lastly the respondents were informed about their ideal services and how much Secure Logistics was similar to this ideal service. The reasoning behind this is to obtain information on which areas can be improved by Secure Logistics to approach the ideal service. In table 25 the distribution of responses can be seen. Again the cardholders show to be least

	Cardholder	Cardacceptant	Both	Total
Totally disagree	3	1	1	5
Disagree	7	0	0	7
Neutral	32	3	12	47
Agree	27	10	6	43
Totally agree	7	2	2	11
Total	76	16	21	113

Table 25: Distribution of responses among customer types regarding the similarity between Secure Logistics' services and the ideal service

positive. What is interesting is that a big part of respondents (41.6%) reports to be neutral regarding if Secure Logistics shows similarities with the ideal service. This can mean that either they do not believe in an ideal service, or find that the service is sufficient yet neither positive nor negative. Of the CargoCard customers 8.8% disagree with Secure Logistics approaching the ideal service, versus 18.1% of PortKey customers and both DSP customers reporting be neutral again. Mostly the transport sector, logistics sector and

service/construction sector mention a discrepancy between the ideal service and that of Secure Logistics. It is therefore advisable to see which problems these 3 specific sectors encounter, or which attributes the ideal service for them contains. Of the NPS groups, 50% of the detractors report that the service is not ideal, which is only 2.7% for passives none for the promoters.

If looked at what is considered the ideal service some characteristics keep returning. The comments conclude in that these points need to be changed:

- Application process is mentioned as too difficult and disordered
- Frequent checking is necessary
- Bigger area (Rotterdam & Area)
- Communication can be more friendly
- Secure Logistics should be reachable (24/7) through phone
- The website can be more clear
- Flexibility and out-of-the-box thinking can be improved.

This is in line with the previously mentioned issues regarding the PortKey and CargoCard, which have been focused mostly on communication and processes around the actual working of the products. It is good for Secure Logistics to strife and improve these aspects of their operations.

5.5.4 Secure Logistics: The Comments

Next to the possibility to give comments towards the products the respondents were also asked for comments, suggestions and advice towards Secure Logistics as a whole. Returning topics were (1) the way customers are treated (unfriendly and slow), (2) the fact that the products are not used as they are supposed to (not in combination with hand-scans which is needed to guarantee security), (3) terminals continuously keep using their own system instead of the XS-Key system and (4) the fact that the system is imposed and is unnecessary.

Overall it can be seen that Secure Logistics is considered a company that provides good services, but does have a lot of aspects that could use improvement. By addressing these points (added functionalities, better communication, reachability both in the website and by phone and flexibility) Secure Logistics can stay ahead of the curve and rollout their new product without any problems.

The survey has shown that efficiency, security & safety are topics that are actively thought about and acted upon – yet it did not have the possibility to uncover more in-depth information regarding competitiveness and cost balancing. The survey also discovered that the CargoCard was considered a more satisfactory product than the PortKey in overall rating. Both however were considered too pricy and complaints regarding both products were in the same direction (application process, website, reliability). The survey also discovered that both customer types (cardholder/cardacceptant) and product type groups (CargoCard versus PortKey) need to be a source for segmentation due to different interests and desires. Lastly the survey uncovered that Secure Logistics as a company has a good rating but serious points for improvement. The next section will discuss the interviews, which were held in addition to the survey to broaden the scope and gain more in-depth information.

5.6 The Interviews: broadening the scope

Around 30 respondents from the survey indicated to be available for further contact. Not all respondents had the possibility to answer to an in-depth interview on short notice. In the end 7 companies were interviewed either through phone or in person regarding the topics of efficiency, safety, security and the performance of Secure Logistics. Five of the companies interviewed were CargoCard customers, all being cardholders. The other two companies were cardholders that had the PortKey. The amount of cards among those companies was in the range of 2 to 150 cards, giving insights in smaller to bigger companies. All interviewees were told about the procedure (time and order of questions) and goal of the interview.

5.6.1 The Interviews: Efficiency, Security & Safety

The first question asked was regarding the involvement in efficiency, safety and security measures. The companies with more than 2 cards mentioned to take extra measures regarding safety of personnel, internal policies, process management (through ISO) but also checking personnel if they are qualified and proper for the job. Technical measures such as on-board tracking and board computers were also mentioned. The smaller companies mentioned not to take a lot of measures, as they did not have personnel – their argument towards not taking actions were anchored in a cost that was too high.

Considering their view on competition the companies did not have much insights in what other companies were doing, however they mentioned that mostly similar companies take

similar measures. They foresee that measures taken in efficiency, safety and security will only increase. Especially legislation regarding security and safety will be growing. Some companies mention that in this field the Dutch government and organizations strife to be ahead of the curve, but also the fact that companies want their goods delivered from point A to point B in a safe and secure ways plays a role. The bigger companies (more than 20 cards) mentioned to specialize more towards security and safety in their services/products. They had the clear opinion that this was an opportunity to find a niche-market, not having to compete with companies that had lower costs due to international differences. However the respondents also pointed out that the legislation currently is on the requirement side, not on the criminal law. Punishment is considered too low by one of the respondents, not discouraging theft of cargo or gasoline enough.

Pressure towards implementing measures for efficiency, safety and security came from different angles within different companies. Most mentioned the government towards safety, society and companies (clients) as driver for efficiency and insurance companies towards security. One respondents mentions the type of cargo they are transporting to be a driver for extra measures (for example clothing is easy to sell on the black market, and thus requires more anti-theft measures). One mentions internal pressure to perform while another mentions IMO and terminals to be their main source of pressure. It shows that pressure comes from many angles and not all companies feel pressured externally.

Following this topic, competitive positions were discussed – and how they are affected by security and safety measures. Most companies mentioned that it doesn't influence their position compared to direct competitors. However the two companies who did most to profile themselves as companies working safely and secure, found that it matters a lot to their clients that they are 'ahead of the curve' in such things. Smaller companies did mention that they fear international competition. When asked how they thought about this matter on a geographical scale (Rotterdam Area/Netherlands compared to other countries) they mentioned different things. Most respondents mentioned the corruptness of Eastern European countries and the strictness of the Dutch government with regards to certificates and diplomas. The fact that again the Dutch government is perceived as wanting to be the best in security and safety comes with a cost – Dutch companies are more expensive due to higher requirements – which affect their competitiveness. Bigger companies reacted to this by specializing, whilst smaller companies were unable to make investments towards

increased security – or unable to cut cost to still be able to compete to companies outside of the Netherlands.

All in all from the first section of the interviews it can be concluded that companies have to options regarding dealing with increased strictness and external changes. The smaller companies (without personnel) have shown to not take any actions, while middle-sized and bigger companies have decided to make enhanced security their trademark advantage. These actions show that measures can lead to different outcomes – either carrying the weight of increased requirements regarding security or one can turn it around to make it their profitable business. It however also shows that legislation and requirements are taken without consent and discussion with companies in the sector, smaller companies have less options in complying with measures, whilst their international counterparts have to deal with less strict requirements. The companies accepted the change, but feared for the inability to alleviate the costs coming from extra requirements. Having discussed the companies' positions on efficiency, security & safety the next section discussed their view on Secure Logistics and how their services and products were perceived.

5.6.2 Secure Logistics

After the questions regarding efficiency, security and safety in the industry the focus was placed on Secure Logistics and their services. First the unique construction of Secure Logistics (as a daughter of DeltaLinqs) was discussed. Most interviewees however did not know that Secure Logistics was a non-profit organization and a daughter of DeltaLinqs. The general reaction towards the construction was that it didn't matter to the interviewee if the delivery of the product was through a governmental, non-profit or commercial entity, as long as it was done properly (although some mentioned government as a more bureaucratic and thus less attractive option).

They were also asked to mention a positive and negative experience with Secure Logistics. The positive aspects were service provided by the service desk. Next to this the fact that the process of getting a card is quick and easy was considered a positive aspect. However the website was unclear and the requirements for a pass (file-types for pictures) were considered negatively. Activating a card (PortKey) was considered lengthy and cumbersome and the fact that the CargoCard's usage cannot be checked (lacking a logbook) were negative aspects. Lastly some trouble was experienced with an employee switching from companies' at which without notification the card paid by the employer was blocked.

Following on this the interviewees were asked to point out pro's and con's about the way Secure Logistics works. Most interviewees mention the same positive points that were recalled as positive experiences – service is regarded positive, similar to obtaining a card, however negatives are located at the card itself (not being traceable, expensive and inflexible) or the website (costing time to work with since it is unclear and cumbersome). Next to these remarks, it is mentioned that the fact that Secure Logistics is the only distributor of the products makes them arrogant and difficult. Lastly one interviewee mentions the focus on the port as a minor issue as his clientele is located more inland.

Following the remarks about positive points and negative points, the interviewees were asked to clarify what they think could be added or done better. Here different things were suggested that could add to the functionality of their products:

- A logbook (CargoCard), which makes it easy to see where the CargoCard is being used and at what times – this can make it easier for detachment agencies to keep track of their employees.
- A software package in the website that guides the user through adjusting the files that need to be uploaded (CargoCard & PortKey), this can save a lot of time for people that have no experience with converting file types and file sizes.
- Either set-up the card to a person or a company – as the company pays and the person uses it (CargoCard). An idea to facilitate this is an online database, in which the user pays for the card, and he can link it to a company – or a person can have a card per company. This is due to the fact that the company who pays currently is responsible for cargo put on the CargoCard even though it might be on a side-job of an employee.
- When a card gets lost it appears to be quite difficult to get a new card afterwards – since information from the lost card conflicts with the new application.
- If a card does not work the error notification should be clearer, giving away where the error is coming from, making it easier to solve.

The interviewees were then asked what the most common problems were with the products of Secure Logistics to detect any other discontents regarding the products. It is mentioned that losing a card can lead to a complex process of obtaining a new one – with two different log-screens being used with different passwords and usernames. Also requesting cards with foreign identification proves difficult – as well as being closed on the day after Ascension Day. Lastly when a card malfunctions it should be changed for free according to one of the

interviewees. To conclude the interview the interviewees were asked one more time if they had any suggestions. This to reveal any discontent that has not been mentioned in previous answers. Leading from this it was mentioned that the CargoCard could have an added functionality regarding passengers (whom currently have to wait at the gate of entrance). Also the fact that there is a focus on what bigger companies as customers say, a lot of things get arranged to their benefit instead of the industry as a whole. One comment was that the total card should be revisited (PortKey) as a photo is sensitive to fraud, as are other 'prints'. Mobile applications were suggested as an alternative.

The interviews were done to gain more insights in how the industry acts upon the pressure of balancing efficiency, security & safety, as well as to provide more insight in how the operations and products of Secure Logistics are regarded. They have proven useful in discovering how the companies react and view legislation, measures and pressure towards security & safety. There is a clear division between small and medium- to large sized companies. Smaller companies regard their position as fragile, especially considering international competition. They cannot bear the cost of increased requirements and feel the strict checking of certificates as a death-sentence towards their cost-competitiveness. Larger companies tend to jump into the niche-market and specialize in security & safety as a way to distinct from competitors. Pressure towards security & safety comes from both internal and external places and require companies to adjust their operations. Regarding Secure Logistics the interviews mostly added extra suggestions towards improving their business. It reinforced the opinion towards communication and processes surrounding the products (application process and service). Next to that the interviews provided some interesting functionalities that could be added to the current products.

The next section discusses a new SWOT-analysis – comparing the internally created SWOT in chapter 4 to a new one based on information and data collected from the customers of Secure Logistics.

5.7 SWOT-analysis: based on empirics

In this section a SWOT-analysis will be set-up with the results from the survey and interviews. This will then be followed-up by a comparison between the old and new SWOTs to obtain any differences and to be sure about obtaining a complete image.

5.7.1 Strengths

From the survey it can be seen that the strengths of Secure Logistics lie namely with the image that they have. The overall satisfaction is positive just as product performance. However this performance lie namely with the products their inherit characteristics – not with the processes surrounding it. Another strength is the card-delivery which is considered unanimously quick.

5.7.2 Weaknesses

The weaknesses established in the survey and interviews are plentiful. The communication (through website and phone) is considered rude, unclear, complicated and limited. Next to this the monopolist situation gives Secure Logistics a bad image. One of the major weaknesses in this is the limited contact moments. If one moment is below standard, it will be remembered more intensely due to the fact that positive moments cannot offset this one moment.

5.7.3 Opportunities

The opportunities of Secure Logistics lie with improving the product functionalities. Next to this adding a different strategy for cardholders/cardacceptants and different products could change the perception of arrogance as well as get rid of negative scores provided by these different segments. Regarding customer base the transport industry is by far biggest, suggesting possibilities with the other industries. Another opportunity lies with cross-selling the products. Only 2 of the respondents had both the CargoCard and PortKey. Lastly approaching the ideal service is one of the bigger opportunities for Secure Logistics.

5.7.4 Threats

The biggest threats for Secure Logistics lie with misuse of their products and system. Terminals were reported to be using their own system over the PortKey again – creating a situation in which the product becomes worthless. Next to this the products are not used according protocol (no biometric identification). Lastly the highly perceived price in combination with a competitor that might provide a better alternative can lead to customers to defect (the biggest threat).

5.7.5 Comparing internal and external SWOTS

If looked at the SWOT in chapter four, it can be seen that the strengths mentioned are invisible to the customers – considered a given. The new SWOT displays strengths in how the company and products are rated and the fact that Secure Logistics meets the expectations. Lastly an operational strength is the swift card delivery. Regarding weaknesses it can be seen that the weaknesses from chapter four are the fuel behind the weaknesses perceived by the customers – being understaffed and having fragmented knowledge can lead to bad communication and not enough capacity to adjust this communication (website or telephone). This automatically leads to bad service and consequently a bad image – which cannot be changed without increasing contact moments that are positive.

Strengths Overall satisfaction Product performance Meeting expectations Card delivery	**Weaknesses** Communication Malfunctions Image Service Contact moments
Opportunities Outside transport Segmenting customers Adding functionalities Ideal service	**Threats** Terminal Home Systems Misusage XS-Key Leaving customers

Table 26: A SWOT-Analysis of Secure Logistics based on survey and interview responses

When looking at opportunities it becomes clear that there are some similarities. Both internally and externally the addition of functionalities is recognized. Also going outside current industries (transport) towards others (contractor) correspond with each other. The threats also show similarity. Alternative products are a threat although internally these are considered different companies – not the systems used by the cardacceptants. Another new threat is the fact that cardacceptants use the product faulty, which raises questions with cardholders. Lastly the disparity between benefits and costs experienced by customers (as well as continued inconvenience due to malfunctions) can leave to the very direct threat of leaving customers.

Now it has been established how the internal and external research have resulted in different information. The next chapter completes this thesis by rounding up all information, discussing limitations and the next step to be taken regarding future research both for Secure Logistics as the academic world.

6. The Complete Picture

This last chapter provides the concluding parts to this thesis. First the research will be discussed through the initial research questions. This will be followed by a small reflection of the complete image (combining survey, interviews and SWOT-analysis) and the limitations of this research. Lastly the next step to be taken will be discussed.

6.1 The Research process

The research started with the goal to obtain knowledge from the customers of Secure Logistics. However to do so a firm basis of knowledge was required to be able to relate any findings and to acquire tools to obtain this knowledge. This started with a discussion of the state of the contemporary literature regarding security in the transport & logistics sector. It showed that academic papers proliferated after 9/11 into multiple main themes. The researches focussing on the observation of measures taken by governments and their (numerical) consequences were plentiful. Also the complexity of security in transport & logistics, considering the extensive number of actors was a main topic. Next to this, the literature focussed on the balance between efficiency and security & safety together with the costs (and whom to bear it) associated with security & safety measures. All in all the literature did fail to see the question of efficiency versus security & safety from an industry point of view. This is not surprising, as the tools to reach and communicate with the companies on an academic micro-level are not commonly used within the logistics and transport-researching world.

Through marketing we found that there are multiple tools to obtain knowledge. Database mining is mentioned as the perfect way to get to know how to address your customers – however Secure Logistics had no pre-existing database. To create a database customer satisfaction surveys are commonly used. However surveys have some downsides namely no flexibility, no in-depth information and no option to explain questions. To immediately obtain workable information for Secure Logistics in-depth interviews were added to be able to discuss results from the survey.

Consequently it was needed to research Secure Logistics – the survey needed to be built with a clear image of who Secure Logistics is and what their products are. Through internal interviews, desk research and the reading of documents it became clear what Secure Logistics was; a daughter of community company DeltaLinqs based in the Port of Rotterdam.

They provide access cards enhanced with biometrical identification focussed on two groups: transporters of goods (CargoCard) and frequent port visitors (PortKey). The customers can be divided into two groups – the acceptants of cards and the holders of cards. By understanding the aim and existence of Secure Logistics better, the survey and interviews could be constructed.

Through the survey and interviews it was discovered that the customers of Secure Logistics find efficiency, security & safety very important and that they try to act on it. However the research has shown that there is indeed a trade-off as discussed in the literature and that smaller companies are unable to bear the costs incurred by increased security. There is a sincere fear among companies regarding the disparity in strictness internationally. However the respondents also see possibilities by using increased security as a way to distinguish themselves from competitors. All in all valuable views were obtained – showing that more research towards this direction is advisable.

Towards Secure Logistics the respondents have shown to be positive, yet with a lot of comments on what can be improved or added. The CargoCard is considered as good product with only minor discontent regarding the price. The PortKey is considered good in its core, but with too many other issues. This shows that Secure Logistics has to be weary for competitors, as they are currently considered sufficiently good, but not good enough to ward off any competitors that might surpass the quality of their products and services.

6.2 Bringing together the pieces

The SWOT analyses performed have shown some clear points for improvement, opportunities to grasp and threats to handle. The strengths are all considering the companies' products, proven and customizable. The opportunities and weaknesses are all about internal organization – no documentation, functionalities that have not been added, understaffing, fragmented knowledge and dependency on one single supplier, as well as key figures in the organization with extensive crucial knowledge. Opportunities lie with changing external situations, being able to grasp these situations require flexibility and the possibility to work without problems. The threats are considered alternative products – meaning that as soon as they offer better value for money, your customers are at risk to default. They have also shown that internally different views hold than with customers. A lot of operational processes show room for improvement and communication needs to be improved to remove threats and seize new opportunities.

The academics addressed that there is a balance between efficiency and measures taken towards security and safety. This was supported by the survey, in which there was a small discrepancy between the importance that was attributed to all topics, yet execution of measures towards these topics seemed less extensive. The interviews added to this by discovering two distinct moves companies could make (specialise or do nothing) considering new legislation and requirements. The fact that smaller companies were unable to do so, asks for new discussion on how legislation and requirements are developed. Pressure to improve security & safety lie mainly with the government, however costs are borne by the companies. To improve international competition this should be discussed more thoroughly with the industry.

Both the CargoCard and PortKey are considered positive as a product, but operational processes around the product were rated more negatively. This is in line with the strengths found through the SWOT, reporting a good technology but weak operational efficiency of Secure Logistics. There was no clear distinction between industries, yet cardholders seemed to be more negative. This view on the products was continued in the general perspective on Secure Logistics. Both the survey and interviews addressed the application process, website, reachability and functionalities of the product as points to improve. A lot of these improvements are easily made with additional staff, clearer distribution of knowledge and documentation of information.

All in all it seems that the initial picture sketched with the desk research and SWOT have shown to be valid. Both survey and interviews confirm and strengthen that Secure Logistics have some to undergo some changes in processes and operations, especially considering the new product rolling-out. In the next section there will be advise on both the next step for academic research regarding this topic as well as the next step for Secure Logistics.

6.3 Limitations

Although the research has gained some valuable insights for Secure Logistics and the academic world there are some major limitations within this research. The survey could have been more extensive towards customer characteristics, which could be added next. This would have made it possible to make a comparison geographically – giving more insights in the competitiveness between locations. Next to this knowing the size of the companies would have provided more and quantifiable information towards the actions of different sized companies.

6.4 The Next Step

Both academics and Secure Logistics can take away from this thesis. As the interviews discovered that companies have not many options in reacting to legislation, even though it affects their competitiveness it is a good next step to discover what the interaction between government and industry is. So far academics have focussed on observing from outside, but to improve competitiveness and the balance between efficiency, security and safety there needs to be a better view on the interaction between government and industry. When this interaction is more clearly researched there is room for progressing improvements within these interactions. Another suggestion is to research how companies actually make decisions towards the much academically discussed trade-off between efficiency and the other measures.

For Secure Logistics there are many suggestions previously mentioned. In general the survey has shown that there is a clear distinction between cardholders and cardacceptants regarding their opinions. In the future it is wise to implement a Customer Relationship Management (CRM) program to track customers. With this program it will be possible to clearly structure data and define what customers want without surveys and interviews. Next to this internal structure can add to the efficiency and productiveness of employees. This should be done through documentation, sharing information internally and hiring more staff to alleviate pressure from other employees. Communication is key in obtaining more information from customers (to establish database marketing). More contact moments and communication can create a better product and service, as well as increase satisfaction among customers – consequently establishing more financial certainty through happy and loyal customers.

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