Analysing Bottlenecks in the Logistics flow of Finnish Freight Forwarding Companies

A study on efficiency and optimization

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Analysing Bottlenecks in the Logistics flow of Finnish Freight Forwarding Companies. A study on efficiency and optimization.

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Abstract:

Bottlenecks within the freight forwarding industry, which disrupt the smooth flow of goods, may results in delays, increased costs, and dissatisfied customers. Therefore, this study aims to identify these bottlenecks in sea transportation of selected freight forwarding companies in Finland and suggests potential improvements in efficiency and optimisation. The chosen method is qualitative with an inductive approach where common ground theories and themes are identified and organised in the analysing process. Data is collected from four open-ended, semi-structured interviews with sea freight experts from respective companies. From that, the author seeks to answer the research questions by thematising and evaluating the received answers. The main findings are categorised based on the three-flow model in logistics. In information flow, delays, errors, and added costs are the effects caused by a non-universal and non-standardised information system. Material flow bottlenecks remain in the difficulties in tracking shipment's status and congestions at ports. In capital flow, fluctuated freight rates and potential money risk when operating with certain partners are considered to be challenging for freight forwarders. According to these bottlenecks, suggestions for efficiency and optimisation improvement are given, with an emphasis on the development of information flow by utilising AI and recent technology in the field. The results are somewhat surprising and unexpected, as there were few previous studies regarding this specific transport mode to compare with. Due to its limited scope in focusing only on sea freight, the work offers good opportunities for future studies in risk management of other modes such as air, road, and railway transport in Finland as well as other Nordics countries.

Keywords:

Logistics, freight forwarding, sea transportation, Finland, bottlenecks, improvement.

Contents

1 Introduction

Statistically, the Finnish international trade turnover makes up to a third of Finland's GDP (Statistics Finland, 2024), with imports and exports account for 82.4% of its GDP in 2023 (*World Development Indicators | DataBank*, n.d.). In the same year, 96.9% of imports and 94.4% of exports measured in weight were shipped by sea; while road & rail and other transportation mode like mail and air only account for less than 6% (Finnish Customs, 2024). Consequently, this industry of exports and imports become an important aspect of stabilizing the cycle of the country's economic development.

With the rise of technologies and automotive devices, the need for an efficient movement of goods in freight forwarding companies is growing rapidly. As regions become more interconnected and integrated, international flows of goods will also increase, further driving growth in the international freight forwarding sector (Manners-Bell, 2017). A much debated question is whether these businesses are well-prepared and are ready to deal with bottlenecks arise from the service they provide. Bottleneck, in other word, congestion, between stages of the logistics flow is a leading cause for delays in goods transportation from supplier to end-customer, associating with an increased risk of cost inefficiency. Therefore, this situation calls for a need of research, which investigates and analyses the main causes of these bottlenecks in order to improve the efficiency in businesses' logistical flows.

This study is set out to assess the effects these challenges have on the overall operation performances in representative companies that were selected for the interview, and later suggest potential solutions to ensure that forwarding companies in Finland are able to maintain their competitive edge in the industry. Due to practical constraints and limitation on previous studies, this work cannot provide a comprehensive review of all forwarding companies locating in Finland. Hence, the analysis formed by collected data from in-depth interviews will be considered as an objective assessment from the author, with a look from the eyes of a freight forwarder.

1.1 Problem statement

In the everchanging global trade context, customer's expectation for a seamlessly process and guaranteed delivery time is even higher than ever before. However, despite the advances in digitalization and innovative automation, bottlenecks within this industry arise, disrupting the effort of keeping a smooth flow of goods from the supplier until it reaches the end-customer. A bottleneck may result in delays, increased costs, and eventually a dissatisfied client, which can be considered as the worst "nightmare" for a service provider in a market where speed and reliability are paramount.

1.2 Aim of the study

The aim of the study is to identify main bottlenecks in the sea transportation operations flow of selected freight forwarding companies in Finland, and later on explore opportunities for efficiency and optimization improvement. This research seeks to answer the following questions:

RQ1: What are the main bottlenecks for Finnish forwarding companies, and how do they affect operational performance?

RQ2: What are the potential solutions to mitigate these challenges and improve the efficiency of the logistics flow?

1.3 Demarcation

This study focuses on the region of Finland, with a scope of research on imports and exports activities that are included in the operations flow of the companies. Three flows are discussed, which consist of information flow, material flow, and capital flow. However, considering how sensitive information about capital flow would be, any kind of confidential information regarding the company and their customer would be kept privately and excluded from this study.

Not all modes of transportation are taken into consideration, since the range of the study would be too vast to explore and deeply conduct. Hence, this work only focuses on sea (or maritime) transportation mode for a more precise research. According to recent statistics, there are around 350 to 380 forwarding companies operating in Finland (Finnish

Freight Forwarding and Logistics Association, n.d.-a), which makes it impossible to conduct a study that covers all currently active companies in the region. Therefore, the target group of this research is a selection of four prominent companies that vary in scale in order to achieve a wider perspective on their diverse bottlenecks and solutions.

The reasons for narrowing the scope of work to a specific area varied, but in general, it forms boundaries that the researcher chooses in order to make the study more focused and manageable (Kornuta & Germaine, 2019). It is to ensure that the project remains feasible in terms of restricted time to research, availability of resources, and accessibility of data. Moreover, by concentrating on one region, the author can thoroughly investigate specific challenges and opportunities unique to that area without offering an overly broad perspective.

1.4 Definitions

FIFFLA - Finnish Freight Forwarding and Logistics Association, has around 70 member companies, which is in charge of a major part of the Finnish logistics services regarding exporting and importing (Finnish Freight Forwarding and Logistics Association, n.d.-a).

NSAB 2015/2000 - General Conditions of the Nordic Association of Freight Forwarders, sets forth the freight forwarder's and the customer's rights and obligations towards each other, including the freight forwarder's liability under various applicable transport law conventions valid from time to time (Nordic Association of Freight Forwarders, 2016).

EDI – Electronic data interchange, an electronic exchange of business documents between trading partners which allows for the secure, automated exchange of vital information such as purchase orders (PO), invoices, etc (SAP, n.d.).

BL(s) – Bill(s) of Lading, this function under three categories i.e., as a receipt for goods shipped, as evidence of the contract of carriage, and as a document of title (Wilson, 2010).

WCAworld – The world largest network of independent freight forwarders, connecting over 12,000 member offices in 195 countries worldwide (WCAworld, n.d.).

JCtrans – The leader of international logistics B2B platform, with a global freight forwarding community of over 11,000 paying members. Its mission is to help global

freight forwarding companies achieve sustained profitability in their business (JCtrans, n.d.).

2 Theory

There is a relatively small body of literature that is concerned with the challenges forwarding companies have been, or are, facing within the waterway transportation, specifically in the Finnish region. By contrast, a considerable amount of literature has been published on bottlenecks in rail and road or intermodal mode of transport in the European transport network, most notably is the conceptual study of bottlenecks by Witte et al. (2012), which was used as a premise for the development of this work's aim. On the other hand, a worth considering scientific research on different classifications of the bottleneck definition in operations management by Mukherjee & Chatterjee (2006) also shows a good big picture of the variety in defining bottleneck based on different purposes.

In order to initially understand the concept of a freight forwarding company, this chapter further provides information on the operation components that play an important role in the company's logistics flow as well as legal regulations which maintain the fairness and transparency between a freight forwarder and the buyer.

2.1 Flows of logistics – services of forwarding companies

2.1.1 Material, Information, Capital flow

As a whole, supply chains are best described as flows. The study conducted by Shah (n.d.) argues that designing and managing these flows creates the term "supply chain management". There are three main flows included in this chain: material (or goods), information, and capital (or finance) (Shah, n.d.). In essence, the study by Rahman & Qureshi (2007) indicates that the material flow involves the movement of goods from the supplier to the customer, which also applies to any returns of goods from the customer or service needs. The information flow consists of the communication regarding orders and status updates of delivery. The capital flow is the movement of funds, includes credit terms, payment schedules, consignment, and title ownership arrangements (Rahman & Qureshi, 2007). The following diagram illustrates how these flows connect to each other.

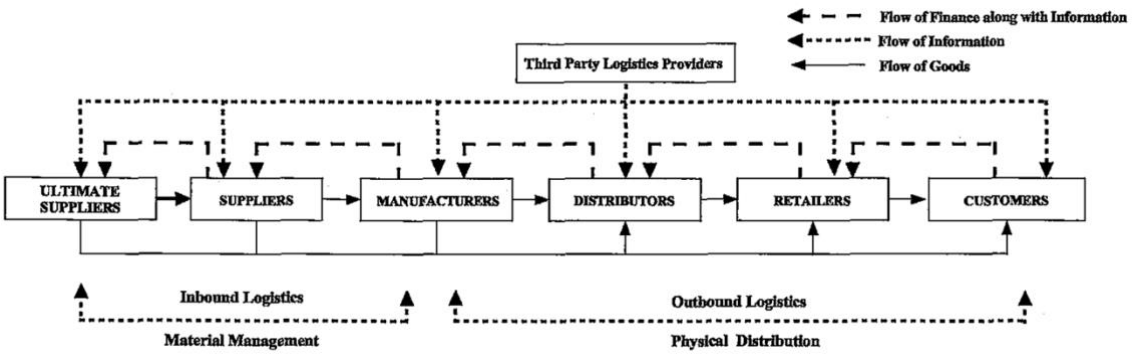

Figure 1. The Supply chain Process (Rahman & Qureshi, 2007)

These operation flows were made to be more effective, efficient, and faster thanks to the recent development of E-commerce. Therefore, business's material and finance flows are effortlessly managed with this real-time updated information flow (Shah, n.d.). The three flows indicate how they are closely linked to each other and are inseparable in supply chain management.

2.1.2 Services and operating models of forwarding companies

According to Ritvanen et al. (2011), the basic operations of freight forwarding companies include logistics services that are traditionally associated with the forwarder's operations, such as customs declaration, international transports/ collections arrangement, and delivery services related to international transports. Nowadays, however, a much broader package of services is being offered by these companies, which involve several different logistics services as illustrated in the following diagram (Ritvanen et al., 2011).

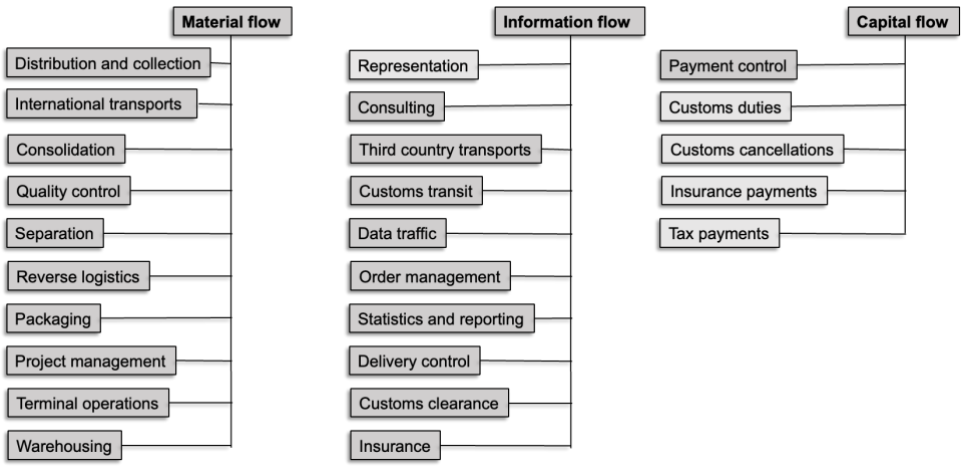

Figure 2. The forwarder is the brain of the international flows – a figure by Anders von Bell (Ritvanen et al., 2011)

With these new offerings and flows division, the work of a freight forwarder is now less complicated and manageable, engaging in the development of quality services offered to the customers. A more diverse service system contributes to its company's competitive advantages in this fast-growing logistics industry.

2.2 General Conditions of the Nordic Association of Freight Forwarders (NSAB 2015/2000)

Within the Nordic economic region, forwarding companies follow the industry's own regulations NSAB (General Conditions of the Nordic Association of Freight Forwarders), unless otherwise agreed. The first version of the regulations is NSAB 2000, which went into force as of June 1st, 1998, setting out the base rights and obligations for freight forwarders and customers those who applied. The latest updated version is the recent NSAB 2015, published on October 29th, 2015, and came into effect as of January 1st, 2016 (Finnish Freight Forwarding and Logistics Association, n.d.-b).

This twenty-nine-paragraph set of regulations acts as a helpful tool assisting freight forwarders in their work. The regulations are well written with detailed explanation to be considered as a regulatory framework in every company to which these rules apply. In general, these principles declare how a forwarder must proceed with their tasks, how they may and may not act in different contexts, and who is in responsibility in specific situations. When it comes to a scenario that a conflict between a buyer and a forwarder occurs, NSAB comes in handy in suggesting a reasonable solution for both sides (Nordic Association of Freight Forwarders, 2016).

3 Method

The choice of research method is based on what is already known about the topic, what the research questions are, time and resources availability, and the "philosophical underpinnings" of the author (Saunders et al., 2019). Regardless of the method for the study, choosing and employing a suitable data-collection technique is also crucial in aiming for the main objectives of the study (Ahmed et al., 2016). In order to best achieve the aim of the study for this thesis, two research methods, quantitative and qualitative, are

taken into consideration in the decision stage of choosing the right type to proceed throughout the work.

This chapter therefore justifies the choice of research method, how it is used to approach the aim of the study, the collection and analysation stage of data, and concerns regarding validity, reliability, and ethics of the applied methodology.

3.1 Choice of method

The aim of this thesis is to find appropriate answers to the research questions mentioned in the first chapter, in such identifying the bottlenecks and finding potential solutions for future improvement in maritime transportation. Quantitative and qualitative approaches were taken into consideration in the beginning when the author started to form the title for this research.

On one hand, finding the right companies and having a big enough number of respondents willing to participate in a quantitative survey is considered to be a hard to achieve task. Besides, not being able to reach saturation from the amount of answers received would also be a disadvantage for a smooth research process. Consequently, quantitative method is disregarded, and a qualitative approach is chosen as the choice of method for the thesis work.

Qualitative research differs from quantitative in its nature of emphasizing on words rather than collection of quantity of data (Bryman, 2012). With data collected from interview sections being the primary data, as “expensive and time-consuming” as it is (Bryman, 2012), the end results are all worth it when valuable insight of the respondents are captured and analysed to find answers to the research questions. Moreover, secondary data such as published articles, scientific research, and statistics are also used as an assist tool for a more complete result. Overall, a qualitative method associates well with the goal of this thesis, not to test what is already known, but to explore patterns and develop on the knowledge gained from the interviews.

3.2 Respondents

A purposive sampling model, also known as judgment sampling, is applied in the stage of choosing respondents for the interviews. In a qualitative research, this model of sampling is based on the researcher's judgement when deciding on the sample elements because he or she believes that they represent the target population. The sampling size should be enough to reach saturation at the analysation stage, for qualitative approach, a small number of cases is considered sufficient (Hair et al., 2020).

In this case, the selected respondents are based on the author's criteria for finding answers to the research questions. Relatively, they are experts with knowledge within the field of logistics, especially in maritime transportation, and are employed in a Finland-based freight forwarding companies that are members of FIFFLA. Their positions in the representative companies should be manager, director, specialist or high administrative role in sea freight, as to assure the answers collected will be from quality and reliable sources.

Afterwards, requests for a one-hour interview are sent to several maritime experts through email. The content of the email includes a brief introduction to the study's title, aim, scope, and the anonymity of the interview. Furthermore, an explanation on the type of interview, questionnaire guide, the time range as per participant's preference, and platform that the interview takes place are also mentioned in the second email after the participant has agreed on taking part in the research process. In attachments are interview guide with more detailed information regarding the study and questionnaires for preparation, as well as a form of consent that is signed by the author and the interviewee on the use of the data collected.

3.3 Questionnaire - Interview guide

In order to achieve the best outcome from the interviews, it is important to choose the right way of conducting an interview. According to Myers (2020), there are three types of interview, summarized in the table below. After considering all the options, semi-structured interview is chosen as the method for conducting interviews to collect the most compatible data to answer the research questions.

Table 1. The characteristics of interviews (Myers, 2020)

Types of interview	
Structured interview	Pre-formulated questions are used, the order of the questions is followed strictly, and some cases within a specified time limit. It requires considerable planning in advance.
Semi-structured interview	The interview is consistent, some pre-formulated questions are used but does not have to be strictly followed. During the session, improvisation of new questions might emerge.
Unstructured interview	Very few or no pre-formulated questions are used. Usually there is no time limit, and the interviewees are free to share what they want. New questions may have to be invented on the spot for improvisation.

According to the interview guide with specific questions can be found in Appendix 1, the questions are all open-ended so that the answers received will be insightful enough for the analysing stage. Moreover, the respondents would also have the chance to generate ideas and build up on the answers they gave previously, not to mention further questions would also spring in their mind which help cover any missing part of the interview. Follow-up questions, where the respondent is asked to give a more concise explanation to the answer given previously, are necessary to lead to further elaboration (Brinkmann & Kvale, 2018) and gain as much constructive data as possible. However, one of the common mistake when preparing the questions in advance is that leading questions might appear without the writer's knowledge. It is essential to avoid these kind of questions by paying a close attention when forming the questions, making the interview more completed and nonbiased.

The structure of the interview questions is divided into four sections, starting with an introduction to the interview for the respondent, following up with the opening question to have a brief understanding of the person's role in the company. The third part of the interview is the core questions, divided into four separate sections according to the theory chapter, mentioning the three main operation flows and potential improvements for efficiency and optimisation. At last, when main data has successfully been collected, the interview comes to an end with closing questions and an appreciation of the interviewer to the respondent for taking part in the interview.

3.4 Research approach

According to Hair et al. (2020), the basis for inductive reasoning and theory development is provided through the process of data gathering for grounded research. As mentioned in the previous section, the primary data used for this qualitative study is collected from semi-structured interviews conducted with selected participants. While searching for suitable respondents, an interview guide draft with necessary details regarding the research was formed and then forwarded to the corresponding supervisor for approval. After the draft was approved with essential edits from the author, it was sent to the selected candidates along with a consent form (see Appendix 2) for data used in the study after an agreement was reached in the first "Request for thesis interview" email. Time schedule for a one-hour interview was discussed and chosen as the respondent's preference. All meetings were agreed to be arrange via Zoom, an online meeting platform, for the convenience of both sides. In the beginning of the interview, the interviewer informed and reassured the interviewees about the aim of the study, anonymity of identity, and how the data is treated during the process of analysation.

The respondents were selected based on their position at Finnish freight forwarding companies. Their working title are sea transportation operators/ managers, in which the author would be able to gain reliable insights into the industry and seek for solutions to the research questions. The interviews were carried out mostly during daytime in Finnish time zone as the interviewees' preference in October 2024. Everyone was kindly asked to have their camera on during the interview for a better observation on expressions and behaviours. A permission for recording and how it would be transcribed for further usage of study was also asked beforehand. Only important information that serves the main purpose of the research questions gained from their answers are kept and used as references for this thesis.

3.5 Analysis of the data

In qualitative research, the researcher has to choose which approach he or she would use in analysing collected data. The two approaches are deductive and inductive approaches. According to Azungah (2018), on the one hand, deductive method uses an organising framework with themes included for the coding process and is applied in the analysis in

foreseeing certain core concepts that will appear in the data. On the other hand, inductive approach refers to the way of primarily using raw data to come up with concepts and themes. By thoroughly going through the data, the author assigns different codes to different paragraphs as concepts unfold that are relevant to the research questions (Azungah, 2018).

In this study, an inductive approach is conducted by the author to process the primary data gathered from the interviews. Common grounded theories and themes are identified when comparing answers received from the interviewees. Even though the availability of huge amount of data that is generated from the collected material seems overwhelming, choosing the right way to manage and reduce the amount of irrelevant data is an essential step before digging deeper into analysing. In this case, coding, the act of assigning a label to a paragraph and classifying it into a certain category (Myers, 2020), is a suitable method to retrieve and organise the available data for a faster process of analysing.

Data collected from the interviews were transcribed within a couple of days with the consent of the interviewees on the usage of data for further studies. With the help of online technology tools, the transcriptions for each interview were finalised. The process continues with the author's work of coding and thematising data into same categories that are compatible with the purpose of research questions. At the end of the process, challenges are identified, and possible solutions or potential improvements are presented in the Results chapter of this research.

3.6 Validity and reliability

According to Brinkmann & Kvale (2018), validity of in scientific research refers to the truthfulness, the correctness, and the strength of a statement, pertains whether a method investigates what it is aimed to investigate. Meanwhile, reliability relates to the coherence and trustworthiness of collected data; given in a different research scenario, if another writer follows the same steps and uses the same methods, he or she will achieve the same results as wished. When combining these concepts together, the study would be considered as authentic, reliable, and trustworthy.

In this thesis, given its purpose of exploring bottlenecks within the industry and striving to find possibilities in enhancement, a valid method of research was chosen, which is qualitative. The reliability of the study is guaranteed upon a careful selection of trustworthy professionals as participants, coming from a background full of experiences and knowledge in the field. Moreover, they all play a major role in their respective companies, ranging between field's manager and director, which makes them the perfect candidates to reach for needed data.

3.7 Ethics

Throughout the process of an interview investigation, potential ethical issues and concerns should be considered from the start until the end discussion (Brinkmann & Kvale, 2018). Ethics, defined by Wiles (2012), is the "branch of philosophy which addresses questions about morality." In qualitative research, conducting personal interviews may bring up problems concerning ethics of the study. To prevent uncertainty, raise by the participants, having the necessary permission through signing a consent form and through verbal agreement on the willingness to share information that will be used as main data for the research purpose is crucial. Confidentiality of identities, conversation recordings, and possible sensitive information are protected and kept privately only to the authorised parties who have the restricted access to these data.

4 Results

This chapter presents the findings of the study, which have been obtained from semi-structured interviews with representatives from four prominent freight forwarding companies in Finland. The structure of the results is closely linked with the theories and models demonstrated in chapter two, in which the flows of information, material, and capital are used as a foundation to introduce key collected data. The four respondents are labelled as Respondent A, B, C, and D. In each sub chapter, a table is also presented as a short summary of the main idea gathered from each interviewed participant.

4.1 Bottlenecks and Effects

The bottlenecks in each logistics flow regarding sea freight and their corresponding effects are sorted and main ideas from each respondent are shown in Table 2 below.

Table 2. Bottlenecks and their effects in each logistics flow

	Information flow	Material flow	Capital flow
A	Bottlenecks: - No standardised messaging system (EDI is not utilised) - Uncompliant stakeholders Effects: - Time-consuming -> delays - Uncertainties -> errors	Bottlenecks: - Short time window -> intense cargo flow - Limited information/ tracking of arriving cargo Effects: - Hard to manage the process if data is missing	Bottlenecks: - Cost & quality competition between businesses - Customer's requirements & decisions Effects: - Company's success in negotiating with customers
B	Bottlenecks: - Communication gaps between partners - No automatised system - Security concerns Effects: - Delays, mistakes in process - Decrease customer satisfaction - Higher/ unexpected costs	Bottlenecks: - Congestion at ports - Difficulty in tracking cargo - Equipment availability Effects: - Delays and difficulty in schedule estimation - Hidden costs - Decrease customer satisfaction	Bottlenecks: - Money risk when operating with small/ new global partners - Fluctuated freight rates -> chance in reduced profits - Delays in payments Effects: - Difficult to fix - Reduce company's negotiation power with partners
C	Bottlenecks: - Non-universal information interfaces - Paper Bills of Lading (BLs) Effects: - Time-consuming -> delays - Risk of missing documents - Friction -> loss of productivity	Bottlenecks: - Finland geographical location - No ocean ports Effects: - Added transit time -> delays - Added costs -> decrease in company's reliability - Risk of damage	Bottlenecks: - Cost differences depend on the nature/ value of the cargo - Customer's way of operating their logistics supply chains Effects: - Customer's decision in choosing suitable partners
D	Bottlenecks: - Passive/ manual tracking tools - Finnish customs is not link to the system Effects: - Delays, changes of schedules - Higher costs	Bottlenecks: - Suez Canal situation - Current economic situation: decrease in demand for container - Strikes, political issues -> last minute changes Effects: - Great impact on schedules, equipment, goods forecasting - Added transit time & costs	Bottlenecks: - Fluctuated freight rates, difficult to forecast - Seasonal short of vessel capacity -> increase in costs Effects: - Loss of profits - Extra workload, possibility in not having enough staff

4.1.1 Information flow

Regarding information flow, all of the respondents mentioned how big of an impact their managing systems have on the streamlined flow of information. The same bottleneck is identified among all interviewees, being how a non-standardised, non-universal, non-automatised, and passive system could have a major effect on the way information is distributed among partners. Other concerns were also discussed, for example uncompliant stakeholders, security concerns, the use paper bills of lading (BLs), and how the Finnish customs is not linked to the corresponding system of the company.

> *"There is no automatized communication system where information flows automatically from partner to partner which causes everybody to do so much manual work…there might be mistakes in communication and this might create some surprises." (Respondent B)*

> *"Security concerns regarding what data can be shared with full, and how to ensure the safety of sensitive information and data since there is quite a lot of sensitive data going on in the shipments as well as invoices and documentation." (Respondent B)*

> *"One sea freight specific information bottleneck is the bill of lading…if those actual hard copy documents go missing, then it's quite complicated." (Respondent C)*

In the discussion of their effects on the information flow, all of the respondents showed their heeds to delays in the process, meaning how time-consuming it would be if the flow is not streamlined enough. Moreover, most of them mentioned how these bottlenecks might create uncertainties such as errors and mistakes in managing important data, which in the end results with higher or unexpected costs for the business. Other impacts are also considered regarding a decrease in customer satisfaction and loss of productivity because of friction created in the process.

> *"And when there are delays, customer satisfaction decreases. So, lots of complaints sometimes." (Respondent B)*

> *"Those issues create some friction in the process and loss of productivity and all this interfaces between different parties." (Respondent C)*

4.1.2 Material flow

When discussing about the material flow in sea logistics, respondent A and B debated the difficulty in limited information or tracking of cargos' departures and arrivals, while most of them also suggested several notable bottlenecks within the flow. These include intense cargo flow, congestion at transshipping ports, geographical location of Finland, the Suez Canal situation, as well as the current economic situation.

"Delays can multiply if there is congestion at the one port and we miss one connection, then there are always more and more delays." (Respondent B)

"Thinking about Finland specific, the main bottleneck comes from our geographical location. We do not have any ocean ports in the country, so all containerized transports need to use a transshipment port somewhere in Europe like Rotterdam, Hamburg, or Antwerp." (Respondent C)

"One thing that is impacting quite a lot is the situation in the Suez Canal. Basically all the container vessels are going to the Cape of Good Hope, and it has an impact on the schedules, on the equipment, also on the forecasting like when the shipments are arriving here." (Respondent D)

Speaking of the effects these issues have on the material flow of physical goods, most of them shared their same opinion on the potential of added transit time and hidden added costs, which might result in the downturn of customer satisfaction of company's reliability. Respondent A and B also mentioned the difficulty in managing the process and estimating shipment schedule. Besides, a minor impact of the risk of cargo being damaged is also worth considering.

"…they increase transit time, and they reduce our reliability. I think these are two main and then there might be additional cost. Cost is always important in logistics because nobody wants to pay extra." (Respondent D)

"Schedule estimation is tough, and it is difficult to estimate the final costs of the shipment since there might also be some hidden costs." (Respondent B)

4.1.3 Capital flow

The challenges of capital flow in ocean freight transport within the Finnish region are identified near the end of each interview. Respondent A and C pointed out the matter of cost offered by the company and how that would affect the customer's decision in choosing their compatible partners to work with. Meanwhile, other half touched on concerns regarding fluctuated freight rates, which has become difficult to forecast, with the possibility of reduction in profitability. On the other hand, each respondent had their own opinion on other factors that create bottlenecks in the money flow, noticing the quality competition between businesses, money risk when operating with small or new global partners, cost differences depending on the nature or value of the cargo, and seasonal shortage of vessel capacity which leads to increase in costs.

"Then of course, freight rates, they sometimes change suddenly. As a result, there might be some additional costs or additional fees…" (Respondent B)

"There can be some stakeholders or players that cut corners and use some cheap methods or substandard methods or techniques or technology that can affect

competence, and it will of course lower the costs…but I think you still have to compete with quality." (Respondent A)

"Last time it happened was in the summertime when there wasn't enough capacity in the market to get all the containers moving and, of course, the rate started to rapidly increase." (Respondent D)

The effects these bottlenecks have on the flow of money vary, while there was a common tacit agreement on their influence on company's success in negotiating with customers and operating partners among most participants. Furthermore, respondent D mentioned there would be a loss in profits due to added costs, along with the occurrence of extra workload within the responsible department.

"Additionally, if there are big capital flow issues, it perhaps reduces companies' negotiation power with the service providers." (Respondent B)

"It means, of course, extra work, and part of the time we have to plan our resources correctly also." (Respondent D)

4.2 Potential solutions

Potential solutions for improvement in the efficiency and optimisation of three main logistics flows as well as the overall logistics flow in maritime transportation are gathered, and the results are shown as per Table 3 and Table 4 below.

Table 3. Potential solutions for improvement in each logistics flow of sea transport

	Information flow	Material flow	Capital flow
A	- Utilise AI in the systems - Automatization -> offering accurate and efficient process	- Systems development - Co-work with customers - Provide better prognosis of goods situation	- Provide good customer service and information flow - Increase accuracy of estimations - The good players will invest
B	- Automatized shift system -> up-to-date shipment's status	- Communicate and collaborate with partners - Risk management strategies	- Being part of the freight forwarding network (WCA, JC trans) to reduce money risk
C	- Electronic BLs - Utilise blockchain technology	- Focus on information flow - Optimise the choice of reliable shipping lines/ services for customers	- Understand customers' business and requirements and provide them the best option
D	- Be more interlinked with partners - Utilise automatized systems	- Discuss & offer the customer alternative transport options in case of market disruption - Keep the customer aware and up to date	- Plan available resources correctly - Provide the customer suitable rate options -> reduce the risk of money loss

4.2.1 Information flow

With the fast growing of new technology in today's scenario, utilising Artificial Intelligence (AI) and the use of automatized managing systems is crucial for a more streamlined flow of information. This statement was also mentioned by most of the interviewees, they supposed that with the application of automatization in the flow, it would be beneficial for companies in offering their customers a more accurate and efficient process while keep them up to date with the shipment's status. Additionally, respondent C highlighted the importance of electronic BLs created using blockchain technology, and its impact on the overall speed of productivity.

> *"There could be space for AI because those systems are steering the key processes and I still believe that automatization, meaning robotics, will come very soon…and the systems should be very sophisticated in order to optimize the driving process of a driver at the yard." (Respondent A)*

> *"And if electronic BL becomes more widespread then hopefully someday, we can get rid of the paper BLs." (Respondent C)*

4.2.2 Material flow

When getting asked for what improvements could be done to enhance the efficiency of the material flow, everyone taking part in the interviews agreed that co-work, communicate, and collaborate closely with the customer to offer them the most optimal service are the best way in maintaining good partnership between the business and the buyer. On the one hand, respondent A and D mentioned that it is also valuable to focus on developing the information managing system in order to provide better prognosis of goods' status and keep the customer up to date. While on the other hand, respondent B suggested the benefit of developing risk management strategies that are also useful in managing the flow of goods.

> *"I would still develop the information systems. I would develop them with the customer in the manner that also helps the customers own business. So, helping our business, helping the customer." (Respondent A)*

4.2.3 Capital flow

Costs are considered one of the most important elements in the decision stage of the customer. In order to maintain the business with them as well as to gain profits for the

company, respondent A, C, and D referred to the significance of good customer service and understanding of the customer's requirements to provide them suitable options of services. This accounts for a reduction in risk of money loss and keep the company competitive in the global market. Moreover, respondent B mentioned joining as a member of international freight forwarding networks like WCA or JCtrans is an advantage for gaining trustworthy partners and reducing money risk in case of payment missing from the customer.

> *"I think the important thing for us as a forwarder is to know our customers, know their business and their requirements so we can find the best option to sell them."*
> *(Respondent C)*

Table 4. Potential improvements to enhance efficiency of the overall logistics flow of sea transport

	Suggested improvements
A	- Develop the overall traffic management - Optimisation should be done at a larger level (lead organisations making adjustments) - Possibilities for advisory systems -> make better decisions for certain situations
B	- Develop an integrated platform for all carriers - Improve customer service -> maintain relationships with all partners - Risk management plans
C	- Increase overall productivity by improving the tools, processes, and staff trainings - Possibility to build better technological tools (blockchain technology, etc.)
D	- Utilising new technology to be more digital - Improve information flow -> information moves more freely & digitally - Be able to track things digitally and automatically in several case scenarios

4.2.4 Efficiency and Optimisation

In general, all of the interviewees shared the same opinion on the application of technologies in developing the information management system and head to a more digitalized and automatized industry. Each of them mentioned different ways and benefits of implementing technologies into the flow of information.

Interviewee A suggested there would be possibilities for advisory systems for masters on board, passage planning, and fleet management in which help traffic manager make better decisions according to predicted situations in certain hubs. Interviewee B specified a hope for the development of integrated platform for all carriers and partners that all details and information needed could be obtained without any difficulty. Interviewee C raised an opinion on the possibility to build better technological tools to assist on cost

competitiveness in the global market. To end with, interviewee D mentioned the utilisation of new technology to strive to a more digital future where information would be able to move more freely, and everyone would be able to track things digitally and automatically in several case scenarios.

> *"There's a lot of talk about AI these days, it's quite a fancy topic, but maybe something like that could improve the prediction for the sea freight transit times and lead times and all that, because that is a little bit tricky." (Respondent C)*

Other than utilising technologies in developing necessary systems, there come some other suggestions that are also worth mentioning. Interviewee A mentioned optimisation should be done at a larger level than at company level, for example major organisations taking the lead and adjusting regulations in deep sea vessel or windows for ports, through that the overall flow would be optimised. Furthermore, a suggestion for future studies suggested by interviewee B referring to risk management strategy is also helpful tool for all freight forwarders if they want to act fast and correctly in different circumstances.

5 Discussion

This chapter provides the discussion and interpretation of empirical results by discussing their significance and making comparison with proposed theories presented in chapter 2. Moreover, a discussion of the method used to collect data for this study is also presented in the later part. The aim of this study was to identify main bottlenecks in the sea transportation operations flow of selected freight forwarding companies in Finland, and later explore opportunities for efficiency and optimization improvement. The research questions are stated again as to find out whether they are answered through the collected data or not. The research questions are as follow:

RQ1: What are the main bottlenecks for Finnish forwarding companies, and how do they affect operational performance?
RQ2: What are the potential solutions to mitigate these challenges and improve the efficiency of the logistics flow?

5.1 Discussion of results

This study is mainly based on the theory of the three-flow in logistics, in which the model is used as a base to build interview guide and section the empirical findings according to their categories in the Results chapter. Therefore, this section presents the analysis of data collected from the interviews by discussing its relation to theoretical framework mentioned in chapter 2 and how the three flows significantly affect each other in operational chain. From the analysis, the author is able to evaluate the answers for the proposed research questions, in which identify bottlenecks and their effects in Finnish freight forwarding companies, and furthermore, suggest potential solutions for improvement in efficiency and optimisation.

5.1.1 Information flow

In the results regarding information flow, a non-universal and non-standardized system among all parties was found to be the reason causing delays, errors, and mistakes which unintentionally increase overall costs. It is unexpected yet compelling to see all of the respondents shared the same opinion on how they perceive this bottleneck and its effects within this flow. These results are in agreement with those obtained from the book written by Shah (n.d.), claiming that with the help of real-time updates of the goods status, other flows are, therefore, managed timely and more effortlessly.

Referring to the figure by Anders von Bell (Ritvanen et al., 2011), the mentioned bottleneck of a non-integrated system may have an effect on the work of consulting, third country transports, customs transit, data traffic, order management, and delivery control. The effects remain being unable to consult with the customer due to the delays of information transmission and the limited information available when transporting through a third country. Moreover, with the data traffic being overloaded, it might affect the flow of goods being able to pass customs transit, also causing more delays and difficulty in order management. As a result, the freight forwarder who is in charge of controlling the movement of the delivery would stumble upon these challenges and have to spend more time and effort to be on track.

The solutions for this bottleneck are then proposed by the respondents, with all answers suggesting the utilisation of new technology such as AI, automatized system, and

electronic BLs into the process of handling the flow of information. These possibilities are believed to create a more accurate and efficient working process as well as increase the speed of productivity within the respective department. These results support evidence from previous observation by Rahman & Qureshi (2007), suggested that EDI and Internet nowadays allow a more efficient information exchange between partners (e.g., suppliers, manufacturers, distributors, customers) using an industry-standard EDI messaging system. As a result, much faster speed, higher reliability, better control, and minimized costs are obtained.

5.1.2 Material flow

Surprisingly, the answers received from the respondents varied due to their different perspectives of perceiving the flow of physical goods as a whole. While half of them, respondent A and B, argued the significance of difficulty in limited information or tracking of cargos' status, respondent C and D mentioned different bottlenecks such as congestion at ports or Finland's geographical location, from which they perceived based on their working experiences. Most of them agreed that other than the difficulty in process management, added time and costs are the main effects caused by the mentioned bottlenecks, to which, in the end, decrease customer satisfaction. These results further support the idea of Shah (n.d.) on the importance of how a good information flow, which provides updates time to time, can influence the management of a smooth material flow.

Referring Anders von Bell's figure (Ritvanen et al., 2011), the mentioned bottlenecks within this flow may also appear in a freight forwarder's daily tasks of goods distributing and collecting, international transports, reverse logistics, and terminal operations. With the bottleneck lying in the difficulty in limited tracking information of goods, it greatly affects the process of distributing and collecting the shipments from point to point. Not to mention, the reverse logistics flow from the customer back to the seller might happen if the goods are received damaged, which increase waiting time and initial costs for the shipment. Congestion at sea ports would greatly affect the work of a terminal operator, which build up extra work for the worker and decrease the usual productivity. Furthermore, due to the special geographical location of Finland, no ocean port could be built, resulting in a big usage of transhipment ports in Europe. This factor creates longer

transiting time and higher cost since the cargo needs to be unloaded from the first vessel and loaded on to the main vessel before continuing its journey to the final destination.

There appeared a common agreement by the respondents in suggesting potential solutions to these bottlenecks. All of them stated the significance of co-working, communicating, and collaborating with the customers in order to keep them up to date and optimise the provided options in choosing the suitable services for their shipments. When working with the customers, it is necessary to follow the agreed regulations, especially the guided NSAB 2015/2000 when transporting goods within the Nordic area, while still provide profitable solutions to them and to the company. Not only when unexpected situations took place, but also when everything went smoothly with no problems occurred, anticipating and being well prepared for any possibilities that might happen are beneficial in every way.

The variety of this finding gives the author a possibility to observe a wider picture of Finland's current freight forwarding situation, where not only one bottleneck exists, but also, in reality, many factors are there and have been there to be considered and improved. It also shows how strongly every flow is connected to each other, for instance, without an optimised information handling process, there would still be risk of manual work, difficulties in cargos' tracking, and unpredictable schedule estimation. As a result, it could be assumed that a developed information flow is equal to a more streamlined flow of material in the overall supply chain.

5.1.3 Capital flow

Similar to what have been discussed regarding the material flow, answers collected for the analysis of capital flow also varied among the respondents. Respondents A and C mentioned a bottleneck occurred in the decision stage of the customer when selecting their suitable partners or service providers due to cost differences. Respondents B and D shared their thoughts on the problem of unstable freight rates along with the chance of profitability deduction. Furthermore, each of them also had their own opinion about other things that could be notably considered as bottlenecks in the financial flow, such as quality competition, money risk when working with smaller partners, or shortage of vessel capacity. This discrepancy could be attributed to the respondents' different

background knowledge, experience, and how different businesses operate. For this reason, the author is able to obtain a more diverse view on how different professionals view their work in financial management and evaluate from their companies' ways of operation.

Despite the diverse data regarding capital bottlenecks, discussing about the effects, all respondents shared the same assumption on how these bottlenecks could have a major effect on the company's negotiation power in the global market. There was also a consistency in suggesting possible solutions for these challenges. Most of the respondents agreed on the power of developing good customer service and its benefit of reducing the risk of money loss. One interesting finding is suggested by respondent B, mentioning the advantage of joining as a member of international freight forwarding networks like WCA or JCtrans to gain trustworthy partners and reducing money risk in case of unexpected, elongated payment terms. It could be said that cost is one of the most important factors for both the customer and the company in deciding which partners would be the most cost-efficient to work with. Staying cost competitive in this everchanging market while still managing to offer quality service for the customer are considered to be an effective way of minimizing financial bottlenecks.

Referring to the presented figure by Anders von Bell (Ritvanen et al., 2011), in certain task like payment control, these bottlenecks would have an influence on the work of an in-charge freight forwarder. Considering the unstable of market rates that a freight forwarder could not control the constant fluctuation, instead, taking control over mandatory payments and deadlines would be a feasible task in minimizing money risk for the company.

These results also reflect those of Rahman & Qureshi (2007) who found that capital flow is much likely affected by the integration of information flow. Moreover, by collaborating physical and financial supply chain, in other words, material and capital flows, it is possible to identify cost-reduction and revenue-enhancement advantages, which open the door to revenue-generation opportunities (Rahman & Qureshi, 2007). This further suggests that firms are able to optimise working capital while simultaneously improve service quality by leveraging real-time information updates to respective partners.

5.1.4 Efficiency and Optimisation

In the last section of the interview, questions regarding potential improvements for efficiency and optimisation in freight forwarding company were asked. As expected, all of the respondents shared their similar opinions on the impact of new technology on the development of information management system across departments. An advisory system in which would be helpful for traffic managers making certain decisions was suggested by respondent A. An integrated platform among carriers which allows easy information access was mentioned by respondent B. Technical tools for assistance in schedule forecasting and cost analysis were given out by respondent C. A suitable technology system to track things more digitally and automatised was proposed by respondent D. All of these suggestions are worth considering in finalising a condensed answer for the second research question, which is one of the main purposes in conducting this research.

In previous study by Rahman & Qureshi (2007), the benefits of e-collaboration integration tools were proven to be compelling for all parties involved in a transaction, which includes sellers, buyers, and also solution providers. When discussing the benefits of integration, the authors provided a figure of efficient tools (see figure 3) that is well aligned with the proposals gathered from the interviewees and further confirms that their suggestions are comprehensively advantageous for the improvement of efficiency and optimisation in freight forwarding companies.

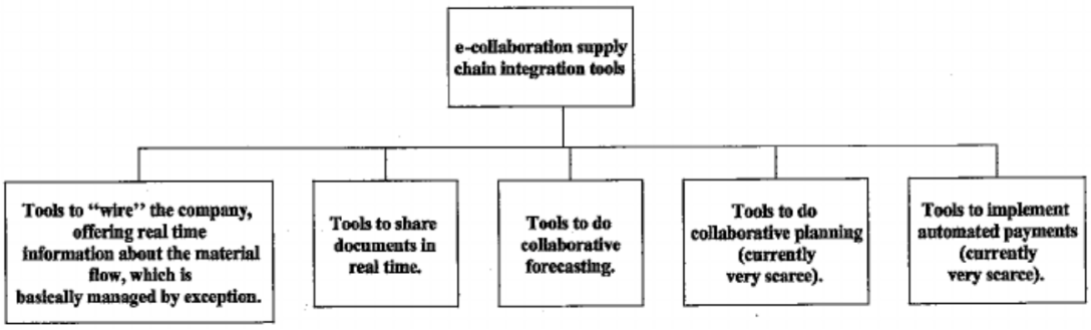

Figure 3. e-Collaboration Supply Chain Integration Tools (Rahman & Qureshi, 2007)

Tools to "wire" the company, offering real time information about the material flow; tools to share documents in real time – align with respondent B's proposal for an integrated platform where information is easily accessed at any time. *Tools to do collaborative forecasting* – align with respondent C's suggestion for technology tools that

assist in schedule forecasting and cost analysis. *Tools to do collaborative planning* – align with respondent A's idea of an advisory system to help with planning and decision making of traffic managers. Lastly, *tools to implement automated payments* – align with respondent D's hope for a more digitalised and automatised operational process in the near future.

Overall, an implication of these results is the possibility that recent technology could and should be used as a solid foundation for the development of information flow. Consider how closely the three flows link to each other in an operation chain, the improvement of information flow would also have a major impact on the material and capital flows. A digitalised and automated information platform paves the way for a smoother flow of physical goods and a lower risk of revenue reduction. In the end, it is all about finding an accessible way to help freight forwarding businesses in Finland stay competitive in the global market.

5.2 Discussion of method

This thesis's process of collecting data was conducted using semi-structured interviews with prominent professionals from freight forwarding companies based in Finland. As expected, the chosen method has done its best in assisting the author achieving the initial goal of gaining needed information from the interviews. The process went mostly well as planned because initially, five companies were considered to be able to receive a good amount of data. Due to certain factors, such as no response received, or representatives could not have a suitable time for the interview, the author was only able to reach out to four companies and received their agreement to take part in the interviews. Fortunately, the four respondents have given out such valuable insights and a good amount of knowledge that were enough to reach saturated results and serve the purpose of the interview.

Regarding difficulties, some technical issues when using an online meeting platform occurred due to a few of the respondents being unfamiliar with the platform. However, the problems were solved within the beginning of the meeting, and everything went smoothly not long after. Overall, all respondents showed their cooperative attitude throughout the interviews and gave a wide variety of constructive answers through the

perspective of a professional forwarder with years of experience. Most of them were prepared before the interview tool place as the interview guide was sent out beforehand. This was good to make them feel comfortable during the interviews and the author was also able to gain as many insights as possible in a shorter amount of time, rather than in a non-prepared interview that might be prolonged unintentionally.

Furthermore, reliability and validity of the study were maintained in a good manner. Regarding reliability, the respondents were carefully selected ensuring that they are experts with enough years of experience in the field. All of them play important roles in their respective companies, being manager, director, specialist in sea transportation. Discussing about validity, the author was also able to draw answers to the research questions using a valid qualitative method and, from that, guarantee the truthfulness and correctness of the results.

Another view is a factor that may have influenced the reliability and validity of the research, which is leading question. Initially, during the supervisor check-up, one question in the interview guide was found to include leading words. The supervisor then suggested a change in the way of forming the question so that it would be able to help the author achieve a more reliable and truthful answer from the interview. This issue, if not addressed correctly, might have caused certain impacts on the reliability if this study. Thanks to the supervisor's advice, the question guide was still preserved to its fullest after considering the changes.

Overall, the chosen qualitative method as a whole was still believed to be the most suitable approach to conduct this study. This method has assisted the author throughout the long process of finding convincing answers to the research questions. The evaluation of the results was also less challenging since the chosen method was conducted correctly, which transformed a huge amount of information into a set of transparent and saturated data. The author believes that with this method, other writers who have a similar research topic, or just simply want to achieve the same goal, it would bring out the most suitable and desirable result for the study.

6 Conclusions

For years, sea transportation has always been an important mode of transport that accounts for more than 90% of cargos imported into and exported outside of Finland. With the rise of technology, freight forwarding companies have found the need to shift themselves to a more automated flow of operations. During the transformation, bottlenecks were inevitable due to the pressure of customer's expectation and requirements for a more efficient movement of goods. Hence, this thesis was set out to assess the effects these bottlenecks have on the operation performances and later give out suggestions for potential improvements of efficiency and optimisation in Finnish freight forwarding companies.

The results obtained from this study presented the main bottlenecks occur within each logistics flow. In information flow, the bottleneck remains in a non-universal and non-standardised system across parties, resulting in delays, unexpected errors, and hidden costs. Suggestions for improvement within this flow stating the importance of a more streamlined process of information by utilising AI and developing automatised systems. In material flow, the bottlenecks include difficulties in tracking the cargo's status, congestions at ports, no ocean ports due to Finland's location, and the current situation in Suez Canal, causing added time and costs to the movement of goods. Potential solutions for improving the flow of goods specified the work of maintaining good co-work, communication, and collaboration with the customers as well as focus on developing information management system to keep up with the status of the shipment. In capital flow, the main bottleneck is mentioned to be fluctuated rates that might lead to a reduction of profit and its influence on the customer's decision in selecting suitable partners. Other considerable challenges include money risk when operating with smaller or new partners and shortage of vessel capacity that leads to higher costs. Potential ways to solve these problems are to maintain good customer service and join international freight forwarding networks to gain trustworthy partners and reduce the risk of money loss. All in all, a much specific suggestion for improvement in efficiency and optimisation is to focus on the development of information flow by utilising technology application into the flow to gain a harmonised operational flow.

Overall, it can be claimed that the author has achieve the initial goal of this thesis with research questions being answered. Moreover, the author believes that these findings as well as their correspond analysis can be used as an additional tool in assisting future studies in the same field.

6.1 Limitations of the study

Although the process of maritime transportation has been running smoothly ever since the booming of international trade, this study is still supposed to contribute a small part to the development of freight forwarding industry within the region of Finland. Sea freight is a field that requires consistent and long-term studies in order to completely cover its complex issues in different businesses. The findings of this study were only analysed upon the collection of interview data from four prominent freight forwarding companies, in which might not be vast enough and only be valuable at the current time period. In order to evaluate future development of the whole freight forwarding industry in Finland, or other Nordics countries, further specialised research should be conducted regarding this specific field. With a longer time period and a bigger sample of interviewed participants, a wider view of this industry would therefore be perceived, and the study might be able to cover other modes of transport such as air, road, and railway transportation as well.

6.2 Suggestions for further studies

Considering the impact of this thesis has on Finnish freight forwarding industry, further research might as well be suggested for a more thorough perspective of sea, and other modes, transportation as a whole. To deal with aforementioned bottlenecks, a study on risk management strategies in freight forwarding companies would have a good influence on assisting the freight forwarder in their work. Another potential proposal would be a centralised study on the utilisation of technology in the development of information flow in Finnish freight forwarding companies, from which this thesis has mentioned the major impact information flow has on the other two flows in the operation chain. To end with, sustainability issues seem to be growing fast among every industry. A study on sustainable development in each mode of transport would be helpful for Finnish companies to be ahead of the trend and stay competitive in the international trade market.

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Appendix 1

INTERVIEW GUIDE

The thesis

Title: Analysing Bottlenecks in the Logistics flow of Finnish Forwarding Companies: A study on efficiency and optimization.

This thesis is carried out by the author who is pursuing "International Business" study program, majoring in Logistics. The aim of the study is to identify main bottlenecks in the sea transportation operations flow of selected freight forwarding companies in Finland, and later on exploring opportunities for efficiency and optimization improvement. This research seeks to answer the following questions:

RQ1: What are the main bottlenecks for Finnish forwarding companies, and how do they affect operational performance?
RQ2: What are the potential solutions to mitigate these challenges and improve the efficiency of the logistics flow?

With data collected from the interviews being the primary method, it will be used as a main source to analyse the challenges freight forwarders face, as well as to make suggestions for future improvement. Secondary data such as books, articles, and statistics will also be considered in order to gain brief understandings of the matters.

The interviews are recorded and referenced as a source of the thesis. However, sensitive information like the original recording, name and position of the interviewees, name of the corresponded companies will only be available to the author, the supervisor, and the thesis assessor.

The respondents

The respondents are selected based on their position at Finnish freight forwarding companies. Their working title are sea transportation operators/ managers, in which the

author will be able to gain insights into the industry and seek for solutions to the research questions.

The original recording and transcription of the interview will be treated as a confidential data without any open access as they are sensitive information to the corresponding companies. Before the interviews take place, a consent form will be sent out for the interviewees to sign, stating the goal of the study; the respondents' permission in the use of collected data; the information regarding how the interview will be recorded and confidential handling of collected data; the right of the interviewees to refuse to answer or withdraw the consent; the right of the interviewees to contact the researcher or the institution for further questions about the study.

The interview

Place and date of the interview: online, xx.10.2024
Company: anonymous
Name of the respondent: anonymous
Position of the respondent: anonymous

The questions

Introductory:

- Welcome the participant and provide a brief overview of the research topic
- Explain and assure the interviewee about confidentiality of the interview
- Request permission to record the interview

Opening questions:

Self-introduction: "Can you briefly describe your role and responsibilities in your company?"

Core questions:

1. Information flow

- "What are the main challenges or bottlenecks in the flow of information within sea logistic operations, both internally and with external partners (e.g., shippers, ports)?"
- Follow-up: "How do you think these issues impact the overall process?"

- “What kind of systems or technologies do you use to manage information flow?”, “Do you see any potential for improvement?”

2. Material flow

- “What are the main challenges in managing the material flow (physical goods) in sea transport operations?”
- Follow-up: “How do they affect the efficiency of the operations in general?”
- “How would you handle these issues in the material flow, and what impact do they have on overall operational performance?”
- Follow-up: “What effects would they have on customer satisfaction and lead time?”

3. Capital flow

- “How do financial constraints or capital flow issues (e.g., cost management, freight rates, customs fees) create bottlenecks in sea transport operations?”
- Follow-up: “Do you think problems related to capital flow have a greater effect than the other two flows mentioned above?”, “How so?”

4. Efficiency and Optimization

- “Based on your experience, what potential solutions or improvements would you suggest to enhance the efficiency of the overall logistics flow in sea transportation?”
- Follow-up: “Do you think these solutions are significant enough to improve overall performance?”, “Are there any practices or suggestions for future studies that you believe could be helpful and be implemented into the industry?”

Closing question:

- “Is there anything else you would like to add that we haven’t been able to cover regarding this topic?”
- “Feel free to share any additional thoughts or insights that may not have been addressed in the main questions.”

The ending

The author thanks the participant for their time spent and for sharing insights that greatly contribute to the research.

Appendix 2

Place and date

Informed consent for thesis

The project title: “"Analysing Bottlenecks in the Logistics flow of Finnish Forwarding Companies. A study on efficiency and optimization."

One of the aims of the project is to develop and study main challenges in the sea transport operation flows of selected freight forwarding companies in Finland.

This will be executed as a bachelor’s thesis study.

The aim is to identify main bottlenecks/ challenges in the operation (material and information) flows of selected freight forwarding companies in Finland, and later on exploring opportunities for efficiency and optimization improvement. The focus scope is on sea (maritime) mode of transportation.

The ethical guidelines of the Finnish Advisory Board on Research Integrity will be adhered to:

- Participation in the study is voluntary.
- The privacy of the participants will be respected.
- This study is anonymous. We will not be retaining any information about your identity.
- All information is treated confidentially. No personal information about the participants will be published.
- The names of the participants will be changed and any information revealing their identity will be removed from the published materials.
- The records of this study will be kept strictly confidential.
- The data will be protected. Only the researchers who have a legitimate basis for processing the research data should be permitted to access it.
- The data from this study will be analysed during the fall semester of 2024, follow-up studies in future are planned and for that reason the data will be archived on secure servers as a way to compare results.
- All information about the study will be saved on secure servers and no cloud-based systems will be used. All in accordance with GDPR.

The findings presented in scientific publications and at seminars and conferences.

Kind regards,
My Do

Agreement on Informed Consent

Research: Student's bachelor's thesis studying bottlenecks in the operations flows of Finnish forwarding companies.

• I have received, read, and understood the information given to me about the research and its goals.
• I have received sufficient information on the gathering, processing, and reporting of data.
• All answers and other divulged information will be treated as confidential and individual interviewees will not be identifiable from the final research report.
• All the gathered information will be securely erased after the research report has been published.
• I am aware that the interviewer is recording the interview in order to improve the reliability of the research.
• I understand that the interviewer may contact me after the interview in case clarifications are needed.

I hereby consent to being interviewed in accordance with the above (the interviewee signs):

Signature
_____

Name and contact information
_____

I hereby promise to treat any information divulged by the interviewee in accordance with the above (the interviewer signs):

Signature
_____

Name and contact information
_____

Time and place:
Helsinki, xx/10/2024