KYMENLAAKSON AMMATTIKORKEAKOULU

University of Applied Sciences

Master's Degree Program in International Business Management

Miia Peri

CARGO AND INFORMATION FLOW BETWEEN PORT RELATED PARTIES

Case: "What kind of information and documentation it requires when transit container from third party country enters to Finnish port by vessel and continues further to Russia by road shipment?"

Master's Thesis

2011

ABSTRACT

January 2011

Kymenlaakson Ammattikorkeakoulu

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The main objective of the study was to create a description of the cargo and information flow between port-related parties for Kotka Maritime Research Centre's needs. The second purpose was to find out how eCustoms innovations and new regulations affect forwarder companies and Customs' actions.

The theoretical framework consists of the supply chain management from the informational point of view, discussion about SCM itself, significance of information technology for SCM and the possibilities of RFID technology for SCM. The second chapter of theoretical framework consists mainly of transit traffic and its' current situation.

The empirical part was based on the description of port related parties, their position in SCM and the processes which they deal with. This part was for Kotka Maritime research Centre. The independent study was based on eCustoms functions and development. The target was to find out the bottlenecks between Customs and forwarder companies and their common programs.

ABSTRACT

CONTEXT

APPENDIX I

1 INTRODUCTION AND OBJECTIVE OF THE STUDY

This research has been done as a part for the project Mobile Port (MOPO) in which the main purpose is to create a "pilot centre" for the port of Kotka to serve its' customers and port users. The project is coordinated by University of Turku, Centre of Maritime Studies and will be carried out from 2009 to 2012. It is funded by Tekes, Cursor Ltd, Port of Kotka Ltd, Kymen Puhelin Ltd, SE Mäkinen Ltd, Steveco Ltd, Suomen 3C, Transpeltola Ltd and VR Cargo. In this research the best ways of delivering information, handling documents, improving business practices as well as custom-related services were studied and also improved together with port stakeholders. All these factors are considered necessary for the ports to keep competitive advantage. Port community system architecture, infrastructure and different models were analyzed and planned for Port of Kotka to strengthen the ports' activities and make the traffic movements more fluent. The pilot center would act as "air traffic center" for cargo movements of the port and facilitate the information flow related to port operations and customs declarations, decrease rush hours and accidental risks and also create more services and added value for port users.

This research is a study on how information flow in and between port-related parties works. My task as the author was to describe a case where a container from third parties arrives at Kotka port by a vessel and continues its route further to Vaalimaa border as a road shipment. The main purpose was to describe how the information flow between different parties of the chain goes and what the cargo movement in general is like. Furthermore, regarding the information flow chain it was studied how the new regulations for electric customs clearance will affect information flow and what it requires, for example, from forwarding firms and how they should get ready for the new actions electric customs clearance. The empirical part consists actually of two parts. The first was the study to the Centre of Maritime Studies to be one of the cornerstones for developing a pilot centre. The second was a survey of the forwarder's point of view where Customs' new regulations and transit traffic's conti-

nual change was in a big role. A benefit of different port community systems was discussed as well. The supervisor from Kotka Maritime Research Center's side was Professor Ulla Tapaninen and I was cooperating with researcher Antti Posti.

From Merikotka's point of view the first request for this research was the subtitle of this research plan, which has been edited to concern transit traffic because of my personal experience in this field.

2 STRUCTURE OF THE STUDY

2.1 Theoretical Framework

Theoretical framework was first built on the basis of the supply chain management, paying attention mainly to information flow between supply chain's parties, the use of new technologies and managing risks. In this part current references was used, mainly starting from year 2000, but also some basic studies from earlier years were used.

The second part consists of road transportations in port operational environment and discusses findings of the earlier researches from this field. It describes what kind of port community systems (PCS) are used in Europe, their information flow, including Portnet used in Finnish ports.

2.2 Case Study as a Research Strategy

As per Yin (2003:1) case study researches are one of the most challenging of all study methods in social sciences. Case study is used in many situations, to increase our knowledge about individual, group, organizational, social, and political and all related issues. The case study method allows investigators to retain the holistic and meaningful characteristics of real–life events – such as

individual life cycles, organizational and managerial processes, neighborhood change, international relations and the maturation of industries.

When doing case study research you have to take consideration the following questions; How to define the study? How to determine the collected data? What should be done with collected data? After these questions have been considered, research can be designed and data collection started. Data that have been collected can be analyzed and finally reported, show in the results which have been founded.

The goal of case study is to avoid gross misfits. In other words, when one type of strategy is planned to be used but another is really more advantageous the case study is preferred in examining contemporary events. In this case the relevant behaviors cannot be manipulated. The case study relies on many of the same techniques as historical study but in addition to this it has two sources of evidence not usually included in the historian's reports; direct observation of the events being studied and interviews of the persons involved in the events. (Yin, 2003: 2).

In this thesis, the empirical part consists of the researcher's own work life experience in port where the writer has been working for a forwarding company as traffic co–operator for transit business doing forwarding, transporting and warehousing tasks.

Interviews of terminal operators, shipping lines/agents and Customs' NCTS representatives of Kotka, Vaalimaa and Lappeenranta have been conducted to make the study more reliable than relying solely the writer's own experiences. As a conclusion there have been gathered the evidences of this case study and conclusion has been made on the basis of the results found.

2.3 Change Management in Organization's changing environment

The importance of change management in today's changing environment has been widely investigated. While the need for successful change management

is intensively announced by "expert" consultants the outcome for some time has not been successful. (Saka 2002: 1).

It is known that people are mostly resistant to change of any sort. This is especially true in the case of transformational change climate. Many factors occur, such as the fear of the unknown, habit, the possibility of economic insecurity, threats to social relationships, and failure to recognize the need of change. The difference is between how the organization looks at present and how it is expected to look after the change has been taken place. The influence of change is especially relevant if the aspect of a leader differs from the existing organizational culture. The managers acknowledge the need for a change in management beliefs and values in order to support the new cultural reality represented by quality. (Almaraz,1994: 10 – 11).

As per Cockman, Evans & Reynolds (1999: 38 – 38) when working with self – directed work teams the role of change agent is to help create a culture within the team in which problems, ideas, difficulties in working together and blockages to effectiveness can be discussed openly in a collaborative, honest and supportive way. The group will need some help to clarify their expectations of each other, they need a contract. The contract includes agreement of such issues as who is responsible for what; how they deal with problems, how they work with internal customers and suppliers, and how they work together. Contracting is an opportunity for the group to discuss and define how they intend to manage their relationships with each other and with the manager. A self– directed change agent consulting team will give each other feedback; they will continually work on examining where we are going, they will share the observations and after all they are justified to say no and refuse the responsibility.
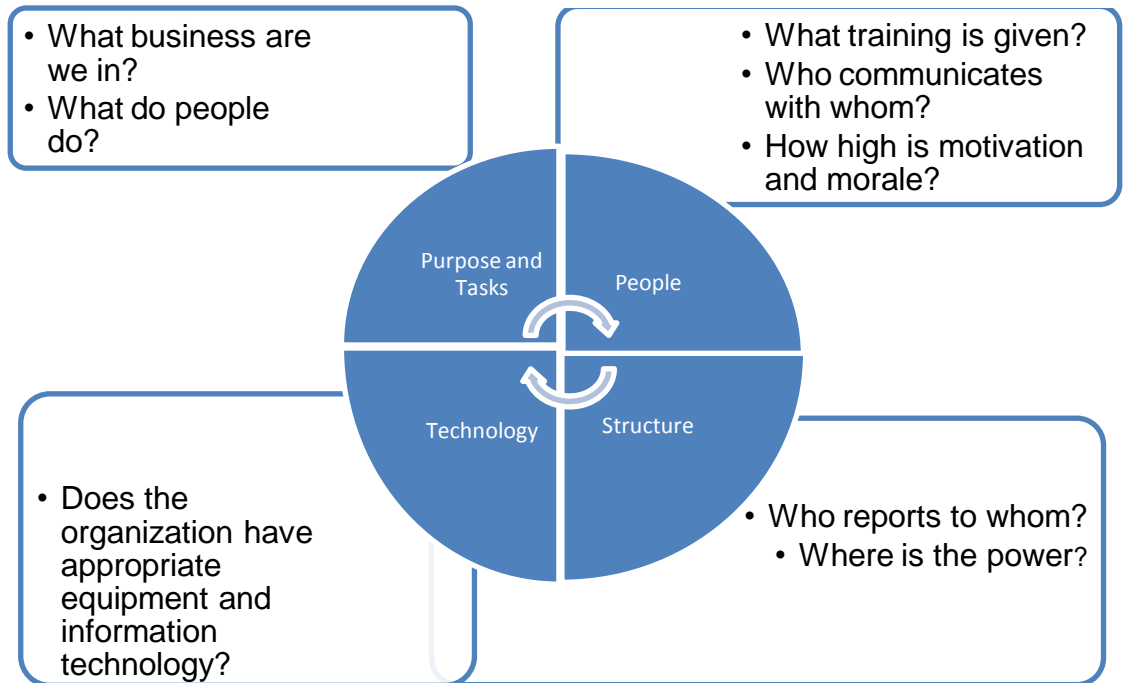
Figure 1: Organization Diagnostic Model (Cockman et al, 1999: 57).

Figure 1 demonstrates a firm which includes purposes and tasks, people who are working at it, technology and the structure of the firm i.e. how things are done and by whom. The organization diagnostic model can be considered a very important tool for using change management tool inside the firm and it also gives practical starting point to the constant development and learning new issues in today's changing environment.

Näsi & Neilimo (2006: 111 – 112) refer to development and improvement of the total collective built by a human being. The authors discuss an organization's orientation to its environment. As a phenomenon, the term is old, but when clearly articulated, it is quite new. Improvement of the total collective includes two terms: organizational learning and learning organization. When learning, the first one guarantees success to the organization and the second guarantees ability for organization to change its actions as per the requirements of environment. Möller et al (2004: 89) point out the net of innovation and its essential purpose of keeping up the balance between new and already existing knowledge and know–how. This emphasizes the developing of already existing knowledge when achieving new innovations.

Issues pointed out by Näsi & Neilimo (2006) and Möller et al. (2004) requires a lot from the management level in every organization. Nieminen & Tomperi (2008: 201) remind that the management level and employees are sharing same impression that most of the biggest problems Finnish organizations are facing are related to basic management of organization. As per the employees managers are not able to back up the subordinates as much as needed and as per the management level employees are not able to catch the problems related to their work as good as it would be required. When the internal communication is not working and the goals of work are unclear, the problem blocks are easily caused. The entity will be working only after different divisions are developed at the same time with the same relation to each other. Järvelin et al (1992: 117 – 118) lists following elements which include to management by results:

- defining the requirement of results
- setting the goals in every level of organization
- examining the achievement of goals
- motivating
- emphasizing the planning and placing the future as future perspective.

In the above list the responsibility of actions is mostly addressed to the management level; in the long run managers are responsible for the effectiveness of team. The examining of achievements can be done inside the team and only reporting to higher level would be required.

2.3.1 Conclusion

As a result it is described how information and cargo flow and what different agents need to make their part in the chain to make it act fluently. It would be also remarkable to find where the bottlenecks are. It was highly important to find out how electronic customs clearance supports the information flow. It is very significant to note that persons who were chosen as interview parties were those who have been dealing with information flow in their everyday work, people who are so called "row workers". One of the most important parts

of the empirical part was to describe the current situation and the actions which have to be considered from the point of view of the forwarder company-ing case where electric customs clearance is coming more wide-spread/popular and also requires more from the user companies.

2.4 Previous studies

Three studies have been made by the Centre of Maritime Studies University of Turku; TUKKE–Tuoteseuranta satamasidonnaisessa kuljetusketjussa, 2009, Satamasidonnaisten logistiikkayritysten tietotarpeet, 2007, and Traffic flows in Finnish Gulf of Finland Ports, 2009. None of these researches includes dis-cussion about functions related to transit cargo customs warehousing or elec-trical customs clearance procedures, even though all these include discussion about transit cargo in general.

Tedim International Coordinating Committee (ICC) has acted as commis-sioner of investigation "FIRUCASE", 2005–Case study investigation about transportations crossing Finland–Russian border. In this investigation the main keywords are foreign trade, transit traffic and customs clearance. Even in this study there is no discussion about electric customs clearance. The conclusion was the developing the border crossing procedure to be quicker and more activated. (Sirkiä et al, 2005).

Smith (2003/2004) made a research for the Erasmus University of Rotterdam in the field of MSC Maritime Economics and Logistics. There are mentioned the Port community systems which are used in port of Hamburg, Rotterdam and Antwerpen. The study has been finalized in 2004 and doesn't include the developments which may have been taken place in past six years.

Rinta–Keturi and Auvinen (2004) from EDI Management Finland have made a study published by FITS publications assigned by Ministry of Transport and Communication regarding the use of InfoQuay as a drivers' info point be-tween the bottlenecks of transportations. The main objectives of the project 'Infolaituri – InfoQuay' were to define the concept to provide an information

service to truckers (both domestic and international), including the description and contents of the service, the cost analysis, the earnings logic for the operator as well as to develop a prototype of the service. The implementation of the InfoQuay starts with a pilot phase where 3 local pilots will be implemented. The basic infrastructure of the system and the main services (maps, guides etc.) will be implemented by the local needs and requirements. The result of the pilots will be the InfoQuay internet and extranet service, mobile service and the local information boards, called City Totems. The pilot phase will be implemented by Infomedia Suomi Oy. (Auvinen & Rinta–Keturi 2004: 6). Unfortunately this study was also issued 2004 and the latest news about the development has not been officially published. As per all the latest information this project was completed to the pilot phase and the implementation phase actually could not be taken to use because the project did not get any earning possibilities (Rinta–Keturi, 2010). Juopperi, KyUAS, 2009 made her BBA thesis regarding Risks is shipping containers in route Singapore – Kotka via Hamburg.

Long (2009) from Maritime Cargo Processing Plc has made a study regarding Port Community System (PCS). As per the study, ports are the natural bottlenecks in the transportation chain and Port Community Systems have played important role to make the movement of cargoes more efficient. . With Port Community System and Single Window concept the benefit both in trade and Government can be achieved. Long (ibid.) argues that the main emphasis will be the reduction of the number of paper documents as far as possible. The shipping lines and agents, forwarders, customs and other government authorities, transport operators and the ports/terminal operators are reliant on information from each other to perform their functions effectively. He says also that the success of the system is that it was "designed for the users by the users and one of the main causes for delay was the processing of customs declarations." (Long ibid, pp. 64)

PCS should deal with major operational processes; it must not duplicate the functions which are already used efficiently, provide for the electronic ex-

change of data, including manifest information. A lot of firms that had already invested heavily in the systems of their own have started their opinion that they were not willing to jeopardize their investments. Eventually they managed to receive actual benefits and a large amount of paper documents were replaced through the use of PCS. The system has proven to reduce the overall amount of clerical work and allows controlled access by all appropriate members of the port community. One of the goals is also that the major members of the community agree their common interests and accept a common action plan to achieve the required development. The system is now operating in the ports of Felixstowe, Harwich, Ipswich, Immingham, Hull, Teesport, Tyne, Grangemouth, Aberdeen, Glasgow, Liverpool, Bristol, Thamesport, the Medway ports and Tillbury and also approximately 70 inland clearance locations (Container Freight Stations). (Long, 2009: 63 – 67).

Rodon & Ramis-Pujol (2006) have made a case study of Port Community Systems in Spanish port community. They introduces ePortSys which would envision a scenario where ePortSys would a) capture the information produced in any exchange within the community, thus avoid the need to retype data, substituting paper, and reducing the errors and processing costs; b) centralize the community information; and c) provide transparency and real – time information to facilitate the track & trace of goods and implement inefficiencies.

Hilmola and Szekely (2006) have made a research report of logistics development in Finnish and Swedish companies with respect of Russia and four Asian Countries. The report has been made in 2006 and there were a lot of references to Kilpeläinen study issued 2004. From this year the transit traffic has changed a lot. From 2003 to 2010 transit traffic has had great increase but also suffered from remarkable decrease in cargo units.

3   INFORMATION ORIENTED VIEW OF SUPPLY CHAIN MANAGEMENT

3.1 What is Supply Chain Management?

Skjøtt-Larsen & al (2007) describe supply chain as a concept of closely coordinated, co operative networks which are competing with other networks. The focus is on managing processes using necessary activities of other firms to fulfill the processes. As a result, no organization can be good without expanding reach and ease to access to information and communication technology. This perspective is necessary not only for growth, but survival in the struggle for global markets. Management of global supply chain means process of supply, production and distribution that makes other strategic objectives possible. Traditionally a supply chain includes sources of material resources, and the organization of processors, distributors and users. They point out that a supply chain involves supporting enterprises to provide transport, communications and other specialized functions. As per Porter (1985) the underlying framework of SCM is the value chain. Porter described a series of primary activities that add value to output of the firm. These are inbound logistics, operations, outbound logistics, marketing & sales and services. The primary activities are supported by external purchased inputs, technology and human resources. They also require management and include strategic direction and planning, operational planning, finance, accounting and quality management. A value of the chain is embedded in a larger stream of activities that Porter calls value system. The value system can be a simple sequence of upstream and downstream value chains or it can be a complex network of related value chains. (Skjøtt-Larsen & al, 2007: 17 – 19).

Burt & al (2003: 6) uses the term "World Class Supply Management" explaining companies that compete in an existing or impending global environment. This philosophy requires change driven by upper management to shift decision – making processes from an internal department or single company focus forward optimization of the supply chain. World class supply chain management is an ever–moving target that focuses on supply chain process im-

provement and requires development and management of institutional trust. It also involves purchasing but is far more strategic. A world class supply manager is not departmentally or internally focused, but concentrates on proactive improvement of processes with the long–term goal of upgrading the competitive capability of the firm and the firm's supply chain.
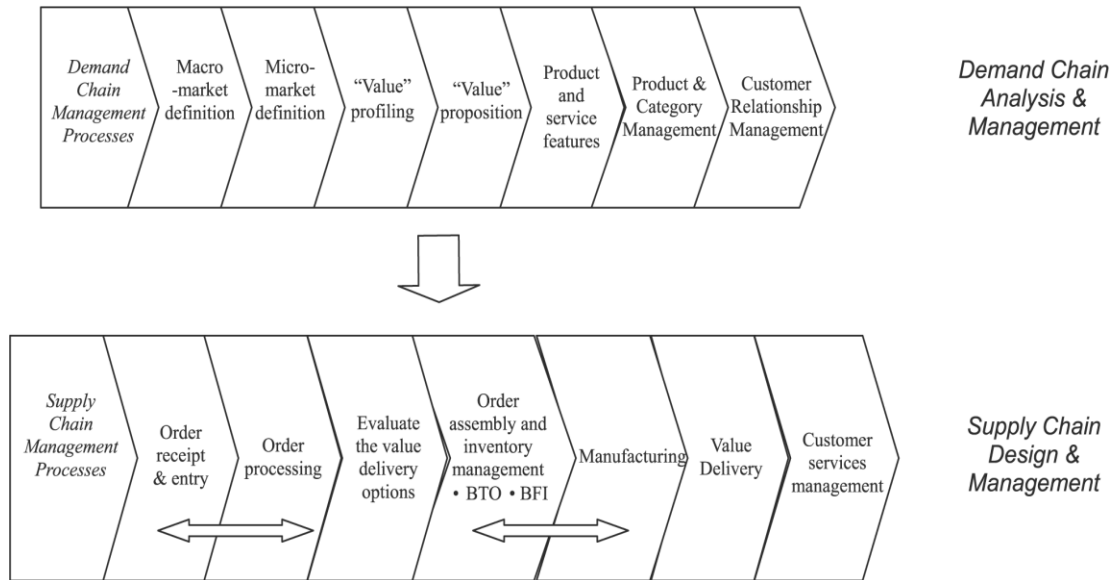
Figure 2: Demand and supply chains as components of value chain. (Walters & Rainbird, 2004: 470)

Walters & Rainbird (2004) discuss the demand chain and supply chain. It is clearly specific to organizations and situations, where some broad features can be identified. Figure 2 presents the identified basic components of the demand and supply chain. It should be emphasized that the characteristics identified are intended as generic processes. A particular process may become more focused on some situations, and the other processes may be replaced with other features more relevant to the business model of that specific firm.

As per Van Weele (2005) supply chain management relates to the way in which materials processes are managed within the company. The term relates also to the way in which the external material processes are managed. It is

able to differentiate between the outgoing materials flow and incoming materials flow. Logistics and supply chain management aim to counterbalance the shortcomings and functional thinking by focusing on those processes trough which customers can be better served. (Van Veele 2005: 205 – 206). Kärkkäinen et al (2008: 265) classify SCM in their study as the practices and processes aiming for effective and efficient flow of materials and information between a company and its immediate suppliers and customers. Christopher (2005) defines supply chain management as follows: "The management of upstream and downstream relationship with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole." Even if the focus of supply chain management is upon the management of relationships in order to achieve a more profitable outcome for all parties in the chain. Christopher also argues that supply chain management should really be termed "demand chain management." He explains this by reflecting to the fact that chain should be driven by the market, not by suppliers. Value chain activities can be categorized into two types–primary activities (inbound logistics operations, outbound logistics marketing and sales, and services) and support activities (infrastructure, human resource management, technology development and procurement). (Christopher 2005: 5, 13).

Simchi–Levi et al (2004: 42 - 44) introduces push–based and pull–based supply chains. In a push–based supply chain the production and distribution decisions are based on long–term forecasts. It takes much longer for a pus – based supply chain to react to the changing marketplace. This may lead to inability to meet changing demand patterns and obsolescence of supply chain inventory as demand for certain products disappears. In a pull–based supply chain production and distribution are demand–driven so that they are coordinated with the customer demand rather than with forecast demand. In pure pull system, the firm does not have inventories at all and only responds to the specific orders. As per Simchi–Levi et al (2004: 42 – 44) pull systems lead to:

- decrease in lead - times through the ability to better anticipate incoming orders from retailers,

- decrease in inventory at retailers because inventory levels increase with lead-times,

- a decrease in variability, in particular, variability faced by manufacturers due the lead–time reduction and

- decreased inventory at the manufacturer due the reduction in variability.

Authors also add that these advantages and disadvantages of push and pull supply chains have led companies to look for new supply chain strategy that takes advantages of the best of the both. They call it push–pull supply chain, where some stages of the supply chain, typically the initial stages, are operated in a push–based manner, whereas the remaining stages are operated by pull–based strategy. The halfway between these stages is called push – pull boundary. Simchi–Levi & al (2004: 44) explain this strategy more closely by the following sentence*:*

> "Consider the supply chain time line: the time that elapses between procurement of raw material, i.e., the beginning of the time line, and the delivery of an order to the customer, i.e., the end of the timeline The push – pull boundary is located somewhere along the time line and indicates the point in time when the firm switches from managing the supply chain using the push strategy to managing is using a pull strategy."

3.2 The Value of Information Technology for the SCM

The purpose of this chapter is to introduce the meaning of information technology to the organizations and direct smoothly to the RFID technology and its usage which is discussed in chapter 3.3 and 3.4. Information sharing (Slack et al, 2004: 470 – 471) is very important in the business life. If none of the actors had an overview of what was happening thorough the chain and ended up to wild fluctuation which could be corrected with information which is available. Value chain sensibly tries to transmit information thorough the chain so that all the operators can monitor the true demand free of hard fluctuations and distortions. Information regarding supply chain problems or shortages can be

transmitted down the chain so that downstream customers can modify their schedules and sales plans accordingly. Slack et al (2004) adds also that one significant improvement would be to make information on current demand downstream in the supply chain available to the operations upstream. Electronic point–of–scale (EPOS) attempts to do this and data from checkouts of cash register is consolidated and transmitted to the warehouses, transportation companies and supplier manufacturing operations that form its supply chain. Also, Edi and its benefits in sharing information and helping to organize the economic order quantities shipped between operations in the supply chain have been under discussion.

Turban et al (2002: 98 – 102) introduce strategic information system (SIS). It is a descriptive structure that helps us understand and classify the relationships among strategic management, competitive strategy and information technology. Authors mention five different frameworks in the field of information; Porter & Millar's framework, Wisemand and MacMillan framework, Bakos and Treacy framework, McFarlan's application Portfolio Analysis framework and Customer Resource Life Cycle framework. In this study the focus will be on the Porter and Millar's framework. As for the other frameworks, only the core point will be explained. In Porter and Millar's framework (Turban et al, 2002: 98 – 102) competition has been affected by IT (Information Technology) in three vital ways:

- Industry structure and rules of competition have changed as result of new information technologies.
- Organizations have outperformed their competitors by using IT.
- Organizations have created new businesses by using IT.

Based these conclusions Porter & Millar developed a five – step framework that organizations can use to exploit the strategic opportunities it creates.

Step 1	•Assess of information intensity of each link in each of the organization value chains.
Step 2	•Determinine the role of IT in the industry structure.
Step 3	•Identify and rank the ways in which IT can create competitive advantage & •How particular links of the value chain might be affected by IT.
Step 4	•Investigate how IT might bring new businesses, with following questions: • what information generated by the businesses should be sold?, •what IT capacities exist to start a new businesses?, •is IT capable to produce new items related to the organization's current products?
Step 5	•Develope a plan for taking advantage of IT.

Figure 3: The five–step framework of Porter & Millar (Turban & al, 2002: 98 – 102).

In figure 3 Porter's & Millar's five–step framework is introduced. In step 1 the intensity is high and it implies greater opportunity if the customers of suppliers are highly dependent on information. In step 2 the organization needs to know how buyers, suppliers and competitors might be affected by and react to IT. Step 3 includes finding the ways and step 4 includes the questions how organizations can compare the productivity of IT usage. In step 5 the advantages should be business–driven rather than technology driven. The basic idea of Porter & Millar's framework is to determine how specific IT applications can smooth the various links in the value chain. Framework relates to information intensity of products value chain to the information consent of the product. (Turban & al, 2002: 98 – 102).

Wiseman and MacMillan (as quoted in Turban & al. 2002) added four important strategies to Porter's & Millar's framework; innovation, growth, alliance and time. They created a matrix in which the seven defense strategies are the rows and the columns are "suppliers", "customers" and "competitors". The cells in the matrix are to direct the IT applications. Each cell in the matrix iden-

tifies the available IT strategies for an external industry force. *Books and Tracy's* (as quoted in Turban et al.) framework concentrates on competitive advantage which sources are caused by five specific items: search–related costs, unique product features, switching costs, internal efficiency and inter organizational efficiency. *McFarland's Application Portfolio Analysis Framework* has been developed on 1984. Organizations can analyze their mix of existing, planned and potential information systems. The framework can be viewed as four – cell matrix; high potential, key operational, strategic and support. To high potential cell there are applications that may be important in achieving future business success (intelligent systems/HR planning). Key operational cell consist of applications upon which organization currently depends on for success (inventory control, assets receivable and personal duties). In strategic cell there are applications which are critical for future business strategy for example e- procurement, extranet and enterprise resource planning. Support cell in this matrix includes applications that are currently valuable and desirable for business success. This classification is done according to current and future contributions as perceived by management level. *Customer Resource Life Cycle (CRLC) framework* focuses on the relationship with customers. The idea is that an organization differentiates itself from its competition in the eyes of the customer. CRLC postulates that the customer goes through 13 fundamental stages in the relationship with a supplier and that each stage should be examined to determine whether IT can be used to achieve a strategic advantage. For example, businesses that do not share information will have to carry additional inventory to buffer them against uncertainty. If an upstream supplier cannot see what is happening at the downstream end of the pipeline it will have to be forecast rather than demand driven.

As per Skjøtt–Larsen et al (2007: 99) SCM is more than managing the flow of goods, therefore managing information is essential for process, planning and control. Firms also add that IT has changed business operations trough the flow of information, control over operations remote in distance and across organizational boundaries, and by automation of processes. It as well shapes

the future development of the supply chain with Internet technology, which currently offers fast and easy ways to transmit complicated information and has considerable future potential. Christopher (2005: 179) calls the concept of extended enterprise as a "common information highway". The use of shared information enables cross–functional and horizontal management to become reality. He adds that even more importantly it is information shared between partners in the supply chain that makes possible the responsive flow of product from one end of the pipeline to another. The IT solutions now exist to enable supply chain partners to share information easily and at relatively low cost. A major benefit that flows from the greater transparency is that the internal operations of the business can become much more efficient as a result. Successful companies use the information and information technology to improve customer responsiveness. (Christopher, 2005: 181).

Kärkkäinen et al (2007: 269) discuss Information Systems (IS) in SCM and state that the benefits for its use are reduction of the costs of operational processes (reduction of manual work), improvement of information quality by eliminating human errors, and speeding up the transfer of information between organizations. Van Donk (2008: 309) adds that no large business exists without having some kind of ERP systems or using EDI; email and internet are common for almost every company; while new technologies such as RFID emerge. However, he also asks what type of ICT fits to the characteristics of specific supply chains. What are considered to be limits of information systems? What are seen as advancements in ICT and what is the relevance for SCM – how could the information systems help in achieving supply chain integrations? The effect and influence of ICT is both as an inspiration for new businesses and as an enabler of a fast flow of information to support operations and supply chain management is clear. Still we know relatively little about the relationship between SCM and ICT.

3.3 The background of RFID Technology

RFID (Radio Frequency Identification) is a general name for techniques which operate on radio waves and which are used for observing, identifying and in-

dividualizing of products and causes. The technology is based on recording the information into RFID tag and its' wireless reading with RFID reader with the help of radio waves. (RFIDLab Finland ry). Myerson (2007: 43) also explains that RFID tags can be programmed to send, receive, and modify data and they may contain protocols on who can read part of the data. The readers can be either mounted on a surface or something which can be waved in the air with more flexibility in orientation than is possible with barcode technology.

As per RFID Journal's information Radio Frequency Identification is the next wave in the evolution of computing. It can be considered a technology which connects objects to Internet, who can then be tracked, and companies can share data of them. As per the article its concept is to be very easy; placing a transponder a microchip with an antenna on an item and then using a reader, a device, with one or more antennas reading data off the microchip using radio waves. The reader passes the information to a computer and the data can be used to create business value. There exists many different types of RFID systems and installing them and using them to produce data which can be used for cutting out the costs or adding efficiency can be challenging. By choosing the right type of RFID system is important, also, working with an experienced system integrator to make sure the system is installed and configured properly. (RFiD Journal2010).

As per Myerson (2007: 9) supply chain with RFID technology is a global network of integration hubs of suppliers and clients whose task is to create, track and deliver RFID- tagged finished products manufactured from raw materials and semi – finished parts to multiple destinations from multiple supply sources. He also explains how the supplier may serve as the primary or coordinating supplier or the secondary supplier which depends on the raw materials and semi – finished products parts.

In libraries, RFID technology can be used for example for loaning, access controlling, inventories and logging into computers. Using RFID technology libraries can replace barcodes and the stickers of loss blocking and the RFID tag can be attached to library cards with micro chips. This model only identifies

the elements of the materials, not the elements for indentify the person. RFID tag planned for library use consists of the following elements; necessary parts, structured and non- structured parts. Necessary part includes for example the way to use, the volume or person number and the country and library identification of the owner library. This part is in read–only form. In a structured expansion there can be information like order number which is needed when purchasing materials. These are agreed between libraries and deliverer and can be re–written if necessary. In non–structures part there are information which differs from international definitions. This is because compatibility of the tag with all programs has to be verified. (Finnish Libraries RFID Working Group, 2005: 27).

Myerson (2007; 43) adds that the degree of programmability is contingent on how much power the passive RFID readers can generate to the tags, and the active and semi–passive RFID readers can wake up tags. He also explains that the more power the tags can have or are able to receive, the more possibilities there are for programming read/write capabilities of a reader. Myerson (2007;39) discusses the numerous substantial reasons for RFID technology such as the urgent need to close the information gaps in the closed – loop supply chain of the firm in order to expedite turnaround time of cases and pallets. The firms have felt that if the technology is good enough, the demand for it will increase, and technology deployment will drive the prices down. Myerson (2007:1) also points out the advantages of RFID technology over bar – codes and other automated data collection technologies and reliability in heavy moisture, noisy, or dirty environments, and greater flexibility in reading the tags in a wider scanning area.
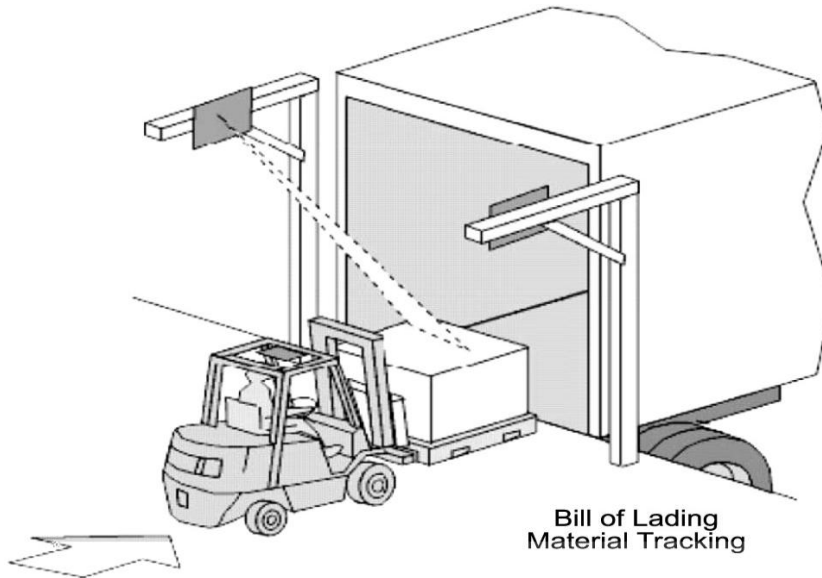
Figure 4: RFID tags identifying a pallet of trade items (Attaran 2007: 251)

In figure 4 there the use of RFID technology is demonstrated. In this case, when loading palletized cargo to trailer RFID reader reads the tag attached to pallet and all necessary information of its content is being stored to IT- systems. The information is being used in Bill of Lading of the cargo and unit.

3.3.1 Starting RFID technology as a Supply Chain Tool

As per Myerson (2007: 77 - 78) the following steps should be considered before starting the use of RFID technology as a SCM tool, the steps are; Pilot Studies Stage, Logistics Project Stage, Organizational Operations Stage, Logistics Visibility Stage and finally Optimized level. The most important issues in pilot stage in sensing the environment. At this stage the organization undergoes a pilot case study of implementing and executing the infrastructure. If this stage is not planned properly, it shows that the management level is not mature enough. This performance depends on the capabilities of individuals or teams and varies with their job skills and knowledge. Logistics project stage there will be seen in the study part has been planned a successfully tested. In order to achieve effective process project and management controls must be installed. Eventually at this stage the controls are necessary to prevent unauthorized changes to the process, practices and policies. This requires some

kind of project configuration policies, based on how the team interacts with its' shareholders. Organizational operations stage consists of practices that develop integrated systems. This should undergo organization-wide training program which is implemented to ensure the staff and managers have the knowledge and skills required to fulfill their planned roles in the logistics management system. This includes the readiness criteria in documentation, inputs, standards, and procedures for performing the logistics of RFID- based supplies, verification mechanisms, outputs and destination criteria. At the logistics visibility stage the organization establishes the metrics to test for the logistics visibility from one point to another in the supply chain. This allows the process of developing logistics with the acceptable measured limits. When limits exceed, action is taken to correct the problem. At an optimized level the whole organization is focused on continuous process improvement. The most important act at this stage is the cost/benefit analyses of new technology in sense to improve the process of the development in the field of logistics visibility. The development process should be continually evaluated using new technologies and methods.

Attaran (2007: 251 – 252) lists some of the critical success factors that could influence RFID adoption for more companies are;

- top management involvement,
- partnership with competent technology providers,
- integrating RFID into the existing IT architecture of a company,
- integrating the data collected by RFID systems with a company's back–office business software,
- determined which factors should be incorporated into their RFID systems,
- coordinating the receiving, manufacturing, warehousing and shipping operations once information from RFID is shared across the enterprise and plant floor and
- proper staff training.

In Attaran's study the RFID has been founded to be the most recent prolific technology that provides supply chain collaboration and visibility. The RFID system solutions will increase corporate ROI and also same time improving retail supply chain communication. When RFID is handled properly, the technology can result in an evolutionary change with the real–time supply chain management. There are found a variety of issues outside the technology itself such as marketing problems, false promises, security and privacy considerations and at the end the lack of standards. Attaran writes the use of RFID in the industry of shipping and distribution it enables suppliers accurately to determine the location of a pallet, to track the route cycle through the supply chain and to make routing decisions.

As per Spekman & Sweeney (2006: 747 – 748) the technology has been around in different forms for more than two generations, and the behavior of radio frequency physics follows well–known laws of science that are both predictable and repeatable. They write the key critical aspect of the deployment to be testing, testing and testing, not to forget the using the scientific methods, not trials and errors. As per Spekman, Sweeney & Patrick it makes sense to:

- Conducting side – by – side comparisons among reader and tag vendors.
- Testing all representative stock–keeping units prior to deployment. The material, shape and number of items in the box can be different in the RFID field. One successful reading of a pallet of a product does not guarantee successful installation of readers, antennas, and other parts of the system.
- Understanding the physics of the environment must be before deploying RF system and deciding which hardware to use in RFID network.
- Selecting the correct platform to be sure the infrastructure is right in the beginning.
- Conducting carefully and knowing the RFID applications are relatively new and inoperability among parts of the systems as well as the connection to the firm's enterprise software is quite possible.

- Understanding the law issues.
- Planning for maintenance of the system. RFID becomes more mission–critical and deeper embedded to the manufacturing stage, failure of system components becomes less and less tenable. RFID in the field of warehouse environment becomes more challenging due the lack of trained technical resources in remote locations. It is important to create a support and maintenance contract with the definitive service.

As per Attaran (2007: 251) RFID is not a solution, it is an enabler that allows firms to change their supply chain process for the better. It is not a new technology but the application of RFID technology to supply chain is new. There can be seen a lot of discussion about standardization of RFID. As per the GRIFS (The Global RFID Interoperability Forum for Standards) RFID Standards Database there can be found 127 published standards in the different field of applications and 48 standards in the state of development. Two global retailers, Wal – Mart and Metro, can be seen as RFID–innovators and drivers for this revolution. As per Skjøtt & al (2007: 127 - 128) Metro started its first pilots back 2000, and had a major launch in 2004 with their "Future Store" concepts, which introduces the new way to operate a retail business based on RFID technology. They are not using RFID in the stores but at all stages within the total supply chain. Wal–Mart started their program in 2004 with 150 stores and clubs in and around one of their largest logistics centers in Dallas, Texas. The aim was to test the effects of RFID by tracking items from manufacturers to distribution centers and then to stores. By October 2005 the following effects were found; reduction of out of stock items by 16 % and RFID items were replenished three times faster than non–tagged items. It made also possible to reduce manual orders by 10 %. By 2007, Wal–Mart is expected to have 600 suppliers benefiting RFID. Wal–Mart has succeeded in developing its' RFID usage. Roberti writes in RFID Journal's article that Wal–Mart is tagging men's jeans and basics (sock, undershirts and underwear) using radio frequency identification tags based on EPC (Electronic Product Code) global, second generation ultrahigh frequency (UHF) standard. They are planning to improve inventory accuracy and inventory availability. The advantage of EPC

RFID tags is to receive goods to the inventory more quickly and accurately and reduce errors when picking and shipping goods. Some of the suppliers are tagging items already, the rest are requested to tag by the end on the year 2010.

Tags are embedded to the hangtags, labels or exterior packaging printed with EPC global seal. EPCs will not be associated with any personally identifiable information to protect customer privacy. Wal–Mart will read tags as goods arrive to stores' loading docks, when they move from the back to the store to the sales floor. RFID hardware and software systems have been developed, in addition to telling which items need to be replenished it also shows when items are on the wrong shelf or missing from a shelving unit. In a nutshell tagging is based on the business benefits for both Wal–Mart and its' suppliers (Roberti 2010: 1 - 3). As a conclusion for the future Skjøtt & al (2007) state that the ability of RFID to identify individual items allows process control to become granular, to control these items through production and distribution processes. They consider this may carry customization to a new level. Wal–Mart has surely proved this.

4   TRANSPORTATION INFRASTRUCTURE AND TRANSIT TRAFFIC

As per Murphy & Wood (2008: 135) transportation can be defined as the actual, physical movement of goods and people between two points. They consider transportation as pivotal to the successful operation of any supply chain because it carries the goods, as they move along the chain. There are many participants transportation influences or is influenced by. *Transportation costs* are directly affected by the location of the firm's plants, warehouses, vendors, retail locations and customers. *Inventory requirements* are influenced by the mode of transport used. The *transport mode* selected influences to the required package type. *Order management technology* encourages maximum consolidation of shipments between common points and enables companies

to give larger shipments. *Customer service goals* can be reached by type and quality of carrier and carrier service selected by the seller. International transportation (Mäkelä & Mäntynen 1998: 83) takes place when transported unit is shipped outside Finnish borders. International transportation can be divided to the EU's internal transportations and EU's external transportations. These transportations are mainly organized by sea transportations and road & train transportations to Russia. Widgren et al (2000: 43) classify transit traffic as a traffic flow between two countries via third country. Transit cargo is not bought to transit country, not customs cleared to transit country and those are not listed as foreign trade goods at transit country. When discussing transit traffic there can be used term "Gateway–position". Gateway i.e. transit position means country's natural benefits mostly depending on good traffic connections and logistics infrastructure compared to other countries' international transport actions.

In this study the modes of transit transportation described are sea transportation, train transportation ad road transportation, more specific their current volumes by statistics. More than 80 per cent (Lumijärvi 2009: 8) of the foreign trade in Finland is transported by sea and Finland can be seen very dependent on maritime transport. The main challenges consist of the shallowness of the Danish straits that restricts ship size and ice consolidations in the Gulf of Finland. In Finland there are more than 50 ports, the biggest are connected to railway network in addition to road connections. The good and frequent liner connections from Finland to Europe are the benefits of Finnish ports. Ports are classified both import and export–oriented, or in balance, and have different ownership statues. In Finland the rail gauge is the same as in Russia (Sundberg 2009: 66) and enables Finnish railway network a straight connection to Russia and eastern European railways as well as to Far East through the Trans - Siberian railway. There are four Customs points at the Finnish border for transit rail traffic; Vainikkala (Lappeenranta), Imatrankoski, Niirala (Tohmajärvi) and Vartius (Kuhmo). General cargo is being transported to Russia mainly through Kouvola and Vainikkala. In addition to these the only international train connection in western Finland is the train ferry connection between

Finland and Sweden in Turku port. In this study the main emphasis on train traffic is based on transit traffic analysis. The international road transportation crosses borders mostly at Vaalimaa and Nuijamaa borders. The transit traffic to Russia continues from ports by road and it consists mainly of consumer goods.

Ministry of Transport and Communications is cooperating with Russia at both bilateral and EU level, Finnish and Russian ministers meet every year. The ministry is involved in the work of the Finnish–Russian Intergovernmental Commission for Economic Cooperation. It's working group on transportation deals with issues such as road and maritime transport between Finland and Russia, cooperation with aviation and increasing the efficiency of border and customs procedures in rail transport. Their work is carried out in meetings of joint commissions and working groups. As per the Ministry of Transport and Communications (2010) the cooperation between Finland and Russia is based on treaties and the main partners are;

- Russian Ministry of transport and Communications,
- The Russian federation authorities(responsible for road, maritime, rail transportation and aviation),
- Russian's regional administration (responsible for the rail castor of Russian railways, RZhD) and
- Russian representations in Finland (embassy, trade representation).

The Ministry aims for improving the transport connections between Finland and Russia and the particular attention is paid on growing freight traffic volumes by road, which constitute a majority of the cross–border goods traffic. In this program Finland is committed to complete Helsinki–Vaalimaa motorway E18 by the end of 2015. The government is active in efforts to solve the traffic problems at Finland–Russia border. EU and Russia both wish to ensure the smooth and efficient flow of traffic. This is proofed by choosing the border–crossing station Vaalimaa–Torfjanovka on the FIN–RUS border to be one of

the pilot projects in the development of border–crossing stations between the EU and Russia. (Ministry of Transport and Communication).

4.1 Russian main Transportation routes between EU countries

This chapter concentratesd on transit traffic between Russia and other IVY countries via Finland and the transport corridors which compete with Finnish transit corridors. The basic elements of Finnish transit corridors are ports (Kotka, Hamina, Helsinki, Kokkola, Turku). Transportation between ports and Russia take place with rail or road shipments. In addition to them there are air freight transit goods arriving to Finland and which are further delivered mainly by road shipments to Russia. (Widgren 2000: 43).
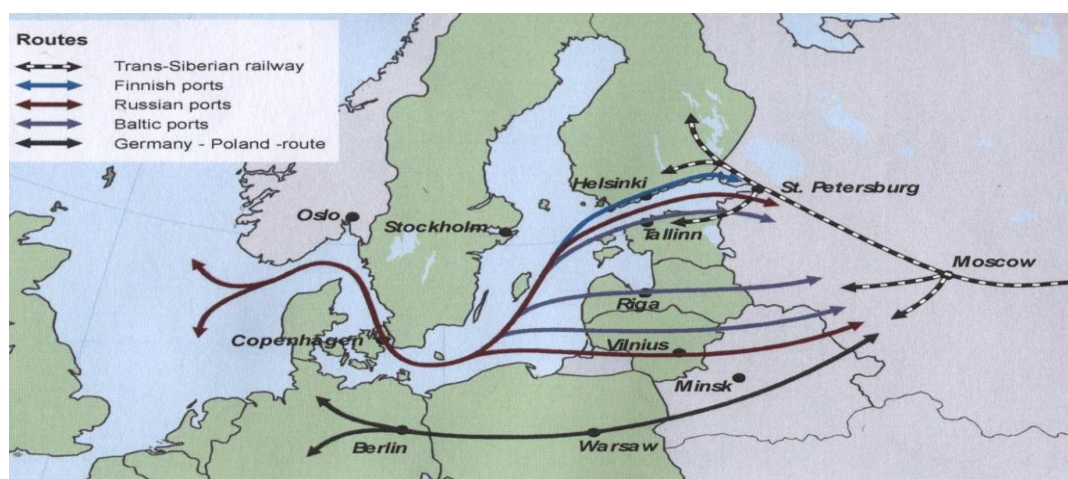
Figure 5: Main transportation routes between EU and Russia in comparison. (Lautso et al, 2005).

Lautso, Venäläinen, Lehto, Hietala, Jaakkola, Miettinen, & Segercrantz, (2005: 52) lists German – Poland route, route through the Russian ports and route through Baltic port competing with Finnish transit corridors.

German–Poland route connects TEN-network to the Eurasian corridors of Russia (Trans–Siberian railway and North–South corridor of Russia). The route has great national significance in Russia and Belorussia. The multimodal Eurasian corridor which consists of the railway, road, water way can be used. It has a connection to inland waterway network to Russia. The greatest prob-

lems in the railway sector are transshipments in Brest and therefore the auto-matic rail gauge transfer system of wagons is being developed. For road shipments there are long waiting times at the Belorussian–Polish border. In Figure there can be seen the routes which pass German and Poland.

Route through the Russian ports has significance for transport. This route is the most important foreign trade route of Russia together with the ports of Fin-land and the Baltic countries. Its multimodal corridor provides a connection to the main centers of Russia. There the Eurasian network (Siberian railway and national corridors) can be used as well as inland waterway network. This route has a great connection to main pipelines to Russia. The most significant prob-lem is location of the great port of St. Petersburg within the metropolitan area. The navigation conditions are difficult especially in winter which causes envi-ronmental risks. Extension of Primorsk oil port, construction of the Vysotsks port of the Lukoil and development of Ust Luga port are seen as most impor-tant development projects. In Figure 6 can be seen the routes through Rus-sian ports.
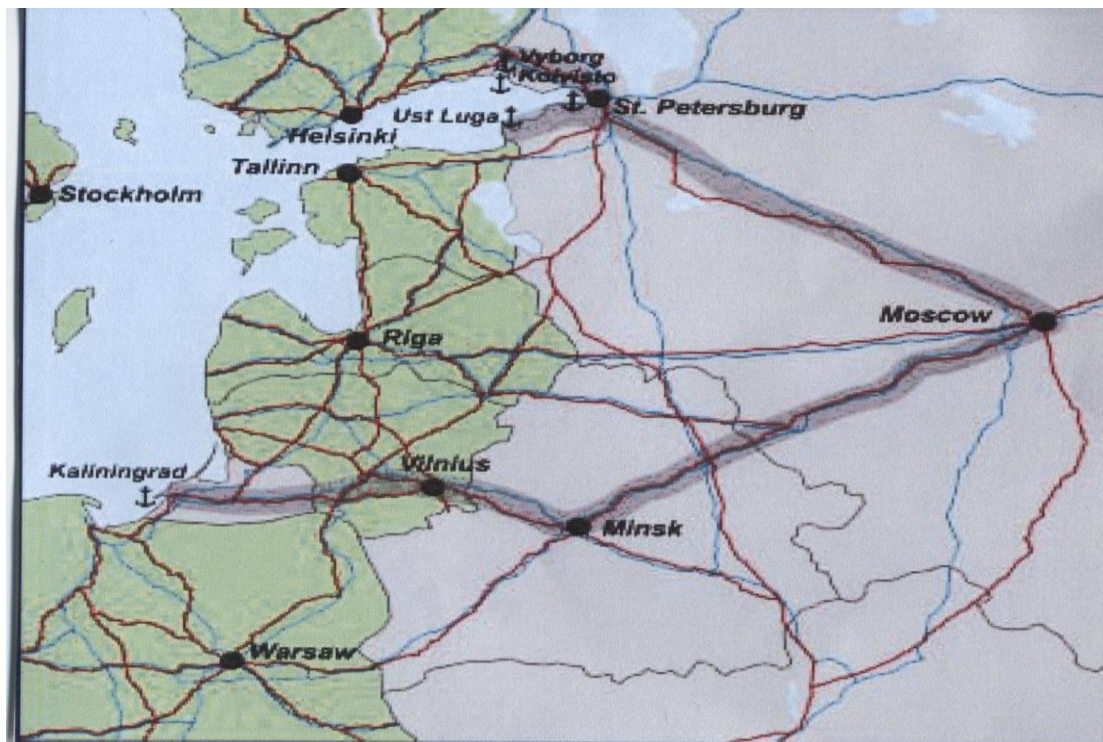
Figure 6: Route through Russian ports. (Lautso et al, 2005).

Route through the Baltic ports consists of competent ports with regard to geographical location and navigation. The route has good ground transport connections to Russia and its multimodal corridor is mainly oriented to serving transit traffic to Russia and other CIS- countries. The largest product groups are dry and liquid bulk. The transport mode of ro–ro (roll on–roll of) acts important role. The developed ports are efficient in transport of bulk cargo but the transportation of containers is less developed. The main development project is the construction of a deep–water port at Sillamäe. In figure 7 there can be seen the routes through Baltic ports.
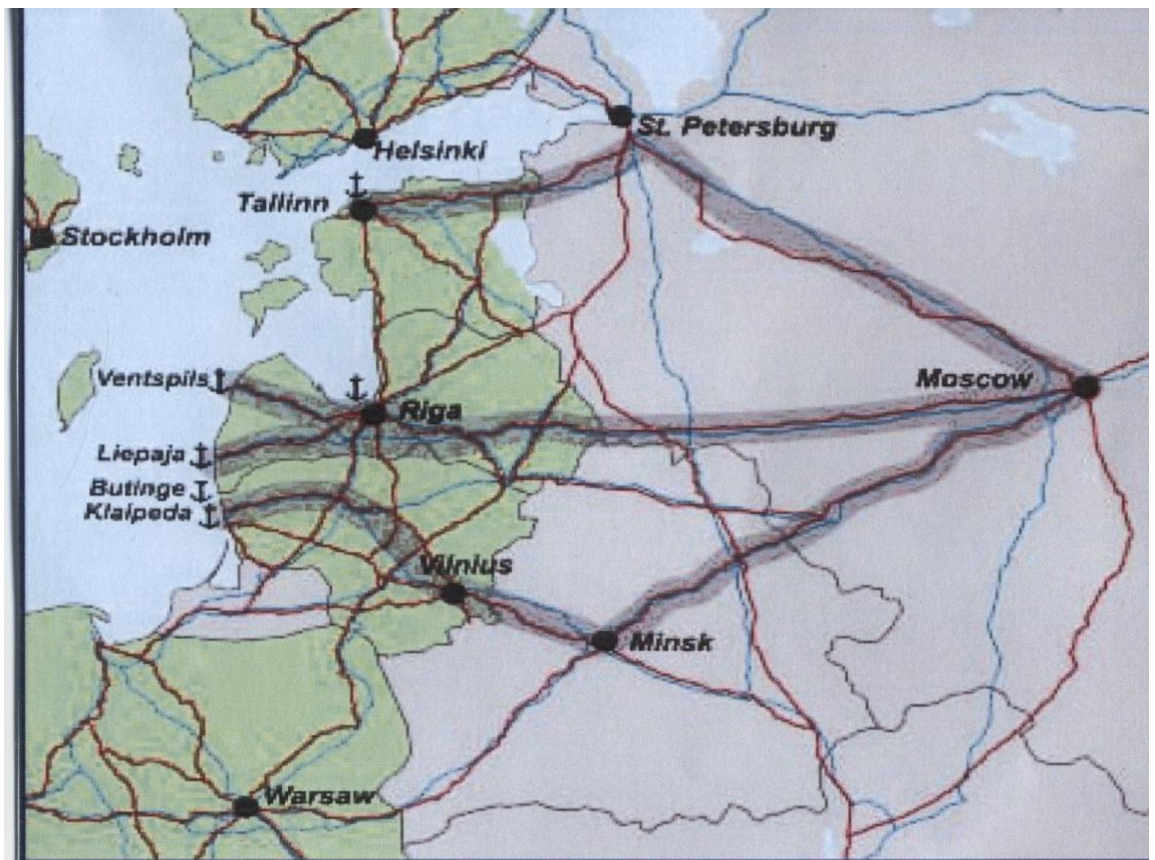
Figure 7: The routes through Baltic ports (Lautso et al, 2005).

Route through the Finnish ports has the best line services to the core areas of Europe. It has efficient ports with high environmental and safety standards.

The highly developed ground transport connections to Russia and its Eurasian connections brings remarkable benefit for this route. The multimodal corridor is oriented to demanding transport operations i.e. handling of containers, handling of hazardous chemicals and ro–ro transport. In addition to upgrading of Moscow–St. Petersburg–Finnish border–road connection, having rail capacity almost maximum, investments in the St. Petersburg–Vyborg railway, increasing the speed between Moscow and St. Petersburg the E18 motorway can be seen core benefit for Finland. The Finnish routes can be seen in following figure 8.

Figure 8: The route through Finnish ports (Lautso et al, 2005).

Transit traffic has regional and economical significance to South–East Finland, to the ports of Kotka and Hamina and to the cities of Kouvola and Lappeenranta. It has also regional consequence to port of Hanko which is the most important import port for cars. Via Turku port flow Russian transit traffic to Sweden and from Sweden. Transit traffic is important employer to these re-

gions. (Hernesniemi et al. 2005: 33). After the merger of Hamina and Kotka ports to HaminaKotka Satama Oy, benefits have been promised for stakeholders i.e. the people living in Kotka and Hamina region. There is place for industry and the industry area and logistics services are five time larger than compared to areas in Helsinki, Vuosaari region. This should make Hamina–Kotka region more competitive in handling transit traffic. (Kymen Sanomat, 2010a). The transit traffic of Port of Kotka and Port of Hamina together was a half of the transit traffic of whole Finland, approximately 3, 1 million tons. (Kymen Sanomat, 2010b.)

Hernesniemi et al (46 - 48) describes corridors by using the names and the cities of the corridors.

- Corridor 1 (PE1): "Via Baltica": Helsinki (Finland) – Tallin (Estonia) – Riika (Latvia) – Kaunas (Lithuania) – Warsaw (Poland).
- Corridor 2 (PE2): Berlin (Germany) – Minks (Belorussia) – Moscow – Nizhniy Novgorod.
- Corridor 9 (PE): Helsinki (Finland) – St. Petersburg – Moscow – Kiev (Ukrainian) - Bucharest (Romania) – Alexandropoulos (Greece).

PE1: The European corridor connects Finland and Baltic countries to Poland by sea and further to Middle–Europe. The bottle neck for this route is the change in rail gauges in Poland border. The Russian truck traffic can come also from St. Petersburg and Pihkova crossing EU customs border to Estonia and Lithuania and continue the delivery further to other Via Baltica main route to Middle–Europe. In practice this route won't be used in Russian freight transportations.

PE2: European corridor Moscow–Minsk–Warsaw–Berlin connects Russian and Middle–European rail–and road traffic. Russia and Belorussia has common customs zone, but the flow of goods slows remarkable at Belorussian–Poland border. In addition to these the Belorussian officials are often accused for the losses of cargoes. In rail traffic in this border crossing point the railway

gauge changes and slows the seed of trains and causes the change of bogey or re–loading of cargo. In a nutshell this is the most direct route from Middle–Europe to Moscow.

In addition to these routes there are corridors of Estonia, Lithuania, Latvia, Kaliningrad and St. Petersburg. To compare the competence of these routes these should be tested with different transport modes from Russia to Middle–Europe and from Middle–Europe to Russia using different variables like freight dues, delivery times, possible damages and losses. The clear indicator of competence is the total amount of transit traffic.

4.2 Current Volumes of Transit Traffic in Finland

In this chapter the situation of transit traffic during year 2009 will be described. Also, the chapter discusses the facts which caused the economic downfall in Russia and which would raise the Russian economy back to the normal level. The traffic modes described are sea, rail and road traffic.

During year 2009 via Finland to Russia was transported 1744 million kilos of transit goods, which was 54 percent less than year 2008. During October-December 2009 via Finland to Russia was transported a bit more transit goods than during July–September 2009. Mostly this increase was affected by the transportation of passenger cars, which was, however, far less than in year 2008. The export transit of machinery and equipments was 273 million kilos, which was 40 percent less than year 2008. Transit export of cars was diminished for 78 per cent and the amount was left to 248 million kilos. The transit export of provision goods was cut down to 35 per cent with the amount of 215 million kilos in 2009. The products of chemical industry were transported via Finland was only one fifth compared to last year (2008) and the amount was left to 153 million kilos. The export transit of textiles, clothes and shoes was one fourth from 2008 with amount of 146 million kilos. In transit traffic to East the total value in 2009 was 53 percent less than 2008 and was left to 14.4 billion euro. (Tullihallitus, 2009). The downturn of world's economic

situation will keep the quantities of transit traffic below the earlier high levels from the past years (BOFIT- Venäjä ryhmä, 2010: 1).

As per Pietiläinen (2009) the economic crises in Russia were affected following matters:

- very high interest level,
- the bad condition of payment transactions,
- the re–organizing of credits for large companies by Russian Federation,
- the fear of devaluation and
- the decrease in oil and metal products which in turn resulted in decrease of export income.

It is forecasted the rise from this economic downfall will take much more than the rise in 1998 in Russian export. If the oil price is and stay approximately in USD50/barrel Russia will therefore recover more quickly than the other European countries. The recovery, however, requires the stable situation of rouble, stable development of oil price and the recovering of international financial markets (Pietiläinen, 2009).

Product	Import Tonns	Export Tonns
Raw wood	105	---
Saw products	920	4 633
Paper mass	104	17 138
Paper and Board	2 072	34 712
Plywood	1 908	1 861
Malm	140	2 495 899
Metal	267 099	4 5401
Oil	322	89 816
Coal	---	---
Fertilizer	---	342 097
Chemicals	36 584	1 412 147
Raw material	12 539	10 864
Corn	---	---
General Cargo	1 048 723	90 546
Other Goods	194 202	54 285
Total	1 681 718	4 599 399

Figure 9: The transit traffic by sea transportations by products/tons both in export and import in year 2009 (Vuositilastot ja aikasarjat, 2009).

In above figure 9 it can be seen that during 2009 the largest import cargo group was general cargo with 1 048 723 tons and largest export cargo group was malm and chemicals. In total the export tons were much more than imported tons.

Full wagons dispatched from Finland
- **22 598 units**
- Via Vainikkala, Imatrankoski, niirala and Vartius
- During year 2009

Full wagons arrived to Finland
- **190 946 units**
- Via Vainikkala, Imatrankoski, Niirala and Vartius
- During year 2009
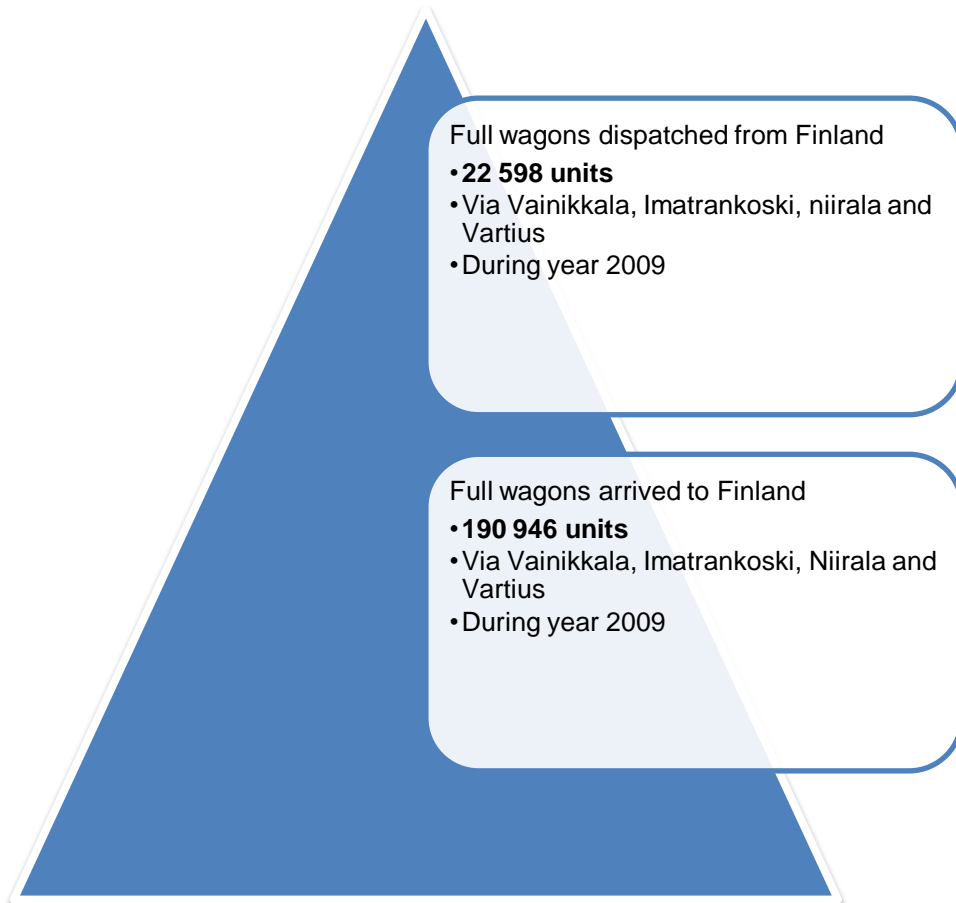
Figure 10: Total transit railway traffic units for full wagons which have been dispatched from Finland and arrived to Finland in 2009 (Finnish Railway Statistics, 2010).

Figure 10 presents the total transit traffic tons for full wagons which have been dispatched from Finland to Russia trough eastern border and which have arrived from Russia to Finland via eastern border. Border crossing points have been Vainikkala, Imatrankoski, Niirala and Vartius. There have arrived

190 946 wagons from Russia and dispatched 22 598 units to Russia. The statistics are based on year 2009 traffic amounts.

Year 2007	•Imatra	101 300 tonns
	•Nuijamaa	137 500 tonns
	•Niirala	24 500 tonns
	•Vaalimaa	221 700 tonns
Year 2008	•Imatra	110 200 tonns
	•Nuijamaa	153 500 tonns
	•Niirala	26 400 tonns
	•Vaalimaa	230 200 tonns
Year 2009	•Imatra	42 500 tonns
	•Nuijamaa	68 200 tonns
	•Niirala	23 000 tonns
	•Vaalimaa	175 500 tonns
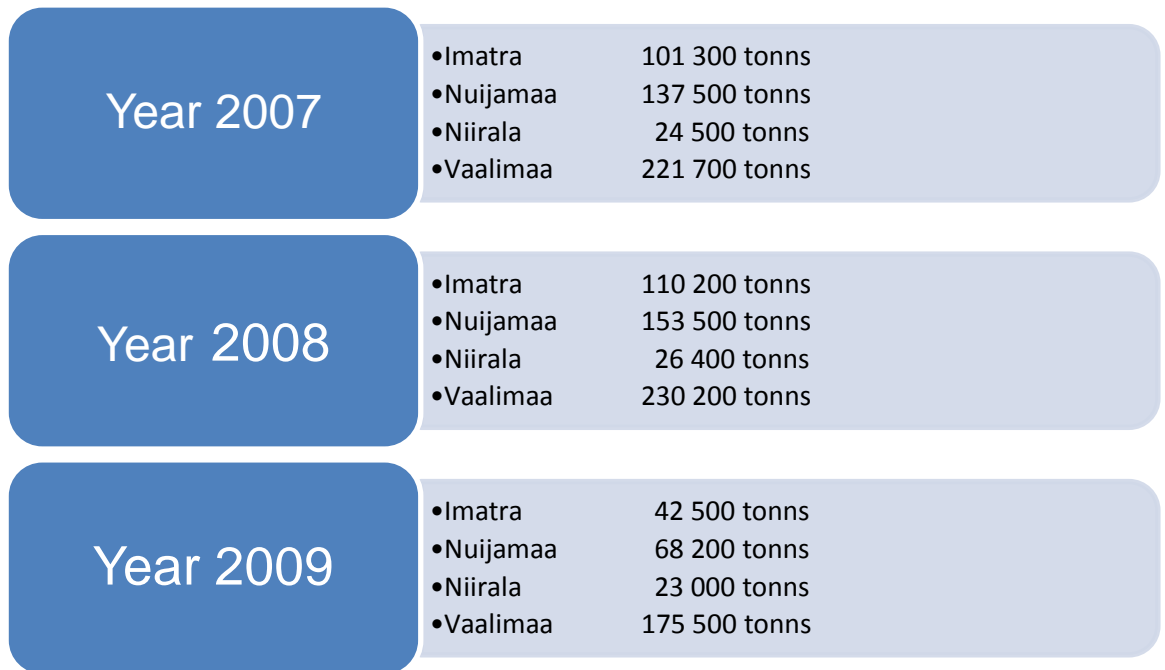
Figure 11: Statistics or truck traffic vie eastern borders as per truck/year during years 2007, 2008 and 2009 (Tullihallitus, 2010).

Above in Figure 11 is shown statistics in transit traffic for road shipments. As the main emphasis of empirical part of this study was concentrated to transit road shipments, above is mentioned the volumes of truck traffic in years 2007 – 2009. It was the highest in year 2006 and lowest in year 2009. The most trucks crossed border at Nuijamaa and Vaalimaa, thus they can be said to be the two most used border crossing stations.

In 2008 via Vaalimaa border was delivered both import and export transit cargo for 1 178 989 tons and from January 2010 to September 2010 there were transported 1 193 101 tons of export and import transit goods (Poutiainen, 2010). From these figures it can be forecasted that transit road traffic has started to rise again. ILP–Group Ltd's chairman Timo Petäjä has the same in-

sight stating that the global economic situation suffered from some minor set-backs during the summer, although the general trend is improving slightly, with the Russian economy in particular showing signs of recovery (Petäjä, 2010).

As a conclusion it can be said that the year 2008 was the 'golden year' for transit traffic, year 2009 was the worst due the economical crises and finally the year 2010 has been acting as recovery era for all transit traffic sectors. As per the latest information the demand for transit traffic services has been increasing and seems that the volumes are reaching the 'golden years' again. This can be considered to be very important, especially when the route through Finnish ports is able to proof its core benefits for the suppliers and final customers of supply chain. There cannot be forgotten that transit traffic is the significant employer and the remarkable investments at Finnish ports are the signs of true commitment.

5 PORT RELATED PARTS IN CARGO FLOW

The main purpose of this chapter is to introduce the parties of port related supply chain, their main tasks and their dependency of each other. In figure 10 are mentioned the core parties which are included in this case study. The most important parties for the supply chain are shipper, shipping line, forwarder, terminal operator and customs. In figure 11 are shown the indirect parties of the supply chain i.e. trucking companies, Port of Kotka and final client (receiver of the goods). The common co–operation among core and indirect parties of the supply chain makes the cargo- and traffic flow as fluent as possible.

The description of the duties and job descriptions of each party in this chapter is based on the final report of TUKKE (Pulli & al, 2009). In addition to this source there is information based to interviews on different stakeholders of the cargo and information flow and the information based on personal working experience on the field of transit cargo handling and forwarding. The following

figure 11 presents the parties whose actions are described and whose information flow have been studied.
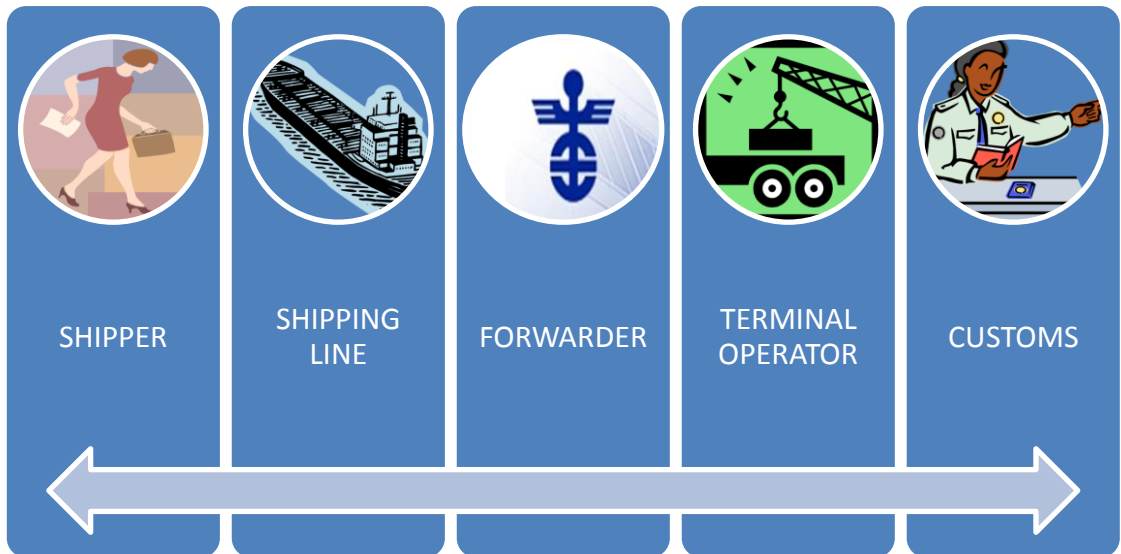

Figure 12: The core parties of the Supply Chain.

Figure 13: The indirect parties of the Supply Chain.

This chapter also includes a description of the documents and procedures the supply chain parties are using. In transit business there are a lot of documents

which are used and even more if there is used warehousing services for transit cargo. The source for explanation of transit documentation dictionary is on the behalf of writer's work experience. The main purpose is to create a clear impression to the reader of the study who act and how in the information and cargo flow.

5.1 Shipping Line

Tarja Tellqvist (2010) from Teamlines Finland explains that Shipping Line is a part of the chain who informs its consignees (i.e. Forwarders) about coming shipments when vessels are approximately two days far from Finland. First are sent arrival notices and after all information are manifested and permanent, the release note will be sent to consignees and it authorizes forwarders to act as the agent of the container. If there is need to make some corrections to release notes it should be asked from shipping line, they will make it and they are also responsible to advice corrected manifest information to all parties which are involved in this chain. Shipping Line's agents in Finland will receive the manifest information from their agents in the port of departure (Hamburg/Rotterdam) and they will receive it further from ocean shipping line's agents. Shipping Line will send the manifest to the terminal operators and to Customs from which they can check how much there is cargo in every vessel. This helps the terminal operator people to plan the unloading time and capacity of people for unloading.

5.1.1 Release note

Release note is the official paper which shipping line will send to its agent (forwarder) in order to authorize the party to have a right for the cargo. In release note there can be found all necessary details of the cargo, loaded unit and destinations (Tellqvist, 2010):

- port of destination,
- vessel's date of arrival (ETA = Estimated Time of Arrival),
- the name of the feeder,

- container number(s) and size,
- container tare weight,
- total package amounts and total cargo weight and
- cargo description.

The release note is the most important valued paper which allows the consignee to act as agent for specified cargo.

5.1.2 Terminal Advice

The forwarder will fill the terminal advice when its' customer is willing to pick the container from container terminal and have it to be dispatched from Finland directly or to have the goods to be unloaded to the warehouse. Terminal advice should mention the information of container to be picked such as container number, size, weight, tare, the customs document by which it will leave from port and the destination of shipment. To have the container released, the terminal advice should be sent to terminal operator's releasing department along with all other required documents.

5.2 Forwarding companies

Forwarding companies are in close cooperation with all port related parties; shipping lines, different departments of terminal operators, customs, trucking companies and warehouse keepers. Some of the forwarding companies are having their own trucks, warehouses etc. but some will still outsource those from third parties. The duties for forwarder companies are considered to be very wide. The most important tasks are transportation of goods, warehousing, customs clearance and other tasks asked by client. The forwarding company combines different stages of transportation, schedules the shipments as per orders, draws up and handles the documents as per orders, makes sure that all goods are to be delivered in proper condition and efficiently to consignee. The wideness of the task of forwarder companies depends on what kind of agreement is to be made and how much services it includes. It can be a small customs document or a full packet service. (Pulli, H., & al, 2009: 93).

5.2.1 Customs' Warehouse

Type C customs warehouse is the most often used warehouse type for transit goods. It is a private customs warehouse and only the administrator of the customs warehouse (warehouse keeper) can store goods in it. The goods do not have to be his property, they can also be stored on the behalf of others. The warehouse keeper will remain responsible for customs for the goods kept in storage. Goods can be stored for an unlimited period of time and the warehouse keeper has to keep stock accounts and all deposits and removals need to be entered in the stock accounts. (Dutch Customs Administration).

5.2.2 Incoming number

Every incoming transit shipment will get its' own incoming number for whole lot. The computer system of forwarder/warehouse will usually give the next free number. This is the common number which will be informed to the customers and customs. The lot will be under this same incoming number as long as it will leave the warehouse totally. Incoming number is the most important identification pattern for everyone and it can be also seen in every loading report when goods are to be loaded from warehouse.

5.2.3 Unloading report

Unloading report is to be made when shipment will arrive to warehouse. Unloading report will be sent to the customer and the unloaded goods will be also seen in stock report addressed to the customs every month. In unloading report can be seen following details;

- vehicle/container from which goods have been unloaded,
- seal number which has been removed from transportation unit,
- incoming number,
- unloading date,

- total unloaded package amount and weight and
- cubic meters for the whole lot/for every different part of the lot and
- Cargo description.

In my opinion especially cubic meters and weight are important for example when planning the loading of the goods. By this information there will be right size of truck for the goods and most probably it helps to avoid the over-weight.

5.2.4 Loading report

A loading report is to be done after transportation unit has been loaded. Loading report can consist from one or several lots of incomings. The loading report will be sent to customers and is prove that loading has been completed and goods will be taken off from new stock reports. In a loading report the following details can be seen;

- transportation unit goods have been loaded into,
- seals which have been attached,
- loading date,
- total loaded goods, weight and cubic meters and
- Incoming numbers from which having loaded.

Loading reports will be always attached to the page of TIR Carnet which is meant for local Customs.

5.3 Terminal operator

A terminal operator is a stowing based actor in port area whose principal tasks are the loading of goods and transportation units to vessels or to other transportation units and unloading from vessels or other transportation units and other logistics actions inside port area. A terminal operator transfers the containers it has unloaded from vessel to container terminal. They are also requested by the order of forwarder to transfer container from container ter-

minal to forwarder's warehouse and return back the empty ones to depot. (Pulli et al, 2009; 93). In Kotka, Mussalo port there are three different terminal operators; MLT–Multilink Terminal Oy Ltd, Finnsteve Ltd and Steveco Ltd (Port of Kotka, 2010).

Terminal operators are in close cooperation with vessel services. Vessel service companies are terminal operator's agents will take care of the tasks with Customs and will give to the terminal operators the unloading permission. Terminal operators will receive a manifest from shipping line, which are sent by EDI message. Cargo plan of the vessel is to be received from shipping line's feeder department. In cargo plan there can be seen where import containers are loaded and where export containers should be loaded. It is specified on the basis of ports; containers from Antwerpen are loaded into different part of hold than the containers from Bremerhaven. During the unloading procedure all containers are tallied and seals checked. After unloading has been completed, the unloading result should be given to customs. If there are differences compared to manifest information there will be asked manifest correction from shipping line. In case that seal numbers are different than in manifest it will be also reported to customs. (Kokko, 2010).

Containers at Multilink Terminal Ltd will be piled so that there will not be more than two containers in one pile. This makes the container picking procedure more easily and reduces the waiting time for truckers. (Kokko, 14.1.2010).

5.4 Customs

The principal task for Customs is taxation. Customs protects the society by preventing the import and export of illegitimate goods and prevent together with other authorities the national and international criminality. Finnish Customs is divided into five different customs areas; Southern, Eastern, Western, Northern and Aland area. (Pulli, H. et al, 2009: 93). Kotka–Vaalimaa region belongs to Eastern area and its' places of business are Hamina, Imatra, Kotka, Kouvola and Lappeenranta. In Kotka the main Customs is situated very near to the other port related parties in port building Merituuli. The Cus-

toms in Kotka are in close cooperation with the border Customs when trucks are between these two customs points.

5.5 Port of Kotka

Port of Kotka is an important factor in the Finnish import and export traffic. It is located near the capital city, near forest industries and very close to Finnish–Russian border. It has good road, railway and ocean connections. In addition to these there are regular feeder lines to different European ports. Port of Kotka is divided to three areas; Kantasatama, Mussalo and Hietanen. (Port of Kotka). Port of Kotka is using Visy – Gate access control system in all the cost centers. Visy Oy's approach is practical. Visy systems are designed to match the access and area control needs of customers. Since the company was founded in 1994, the culture has focused on innovation for the gate automation market. As a result, Visy Oy is a market leader in IT solutions for its chosen sectors. With much enthusiasm, Visy Oy is steadily growing and expanding their customer base. The service is used in port of Kotka. When the truck is coming to port to pick its cargo the Visy system will check the access permit of a truck with the use of truck plates or with the use of RFID tag. On the basis of the identity information the gates will be opened and the truck will be directed to right driving line and to the right loading place. When truck is exiting from port area Visy system directs truck to right exiting line (for example to the road to customs or to the road which fully exists from port area). When everything is in order the gates will be opened and truck will freely exit from the port area. (Visy Oy, 2010).

5.6 Trucking companies

Trucking companies act as most important parties in the cargo flow. Their punctuality will affect two main areas; their arriving to loading place(s) and their direct moving from local customs to border customs. For local shipments the legislation requires to use Finnish trucking companies but for shipments to Russia the Russian trucking companies are often used, mainly because of the profitability issues. Information flow of trucking companies'

comes from the party who has ordered transportation. This can be the ship-per, the end customer or the forwarder company (both in Finland and Rus-sia); in every situation forwarder company is the main source of information for trucker. (Pulli et al, 2009).

The parties discussed in this chapter and the documentation procedures de-scribed in this chapter are described as detailed as possible. This is because in transit business there is needed much more documentation than usual EU- cargo requires. The IT systems that chapter's stakeholders use have been programmed properly so that it is fluent to report to customs, take in-coming numbers and make the bookkeeping for customs warehouses.

6 CUSTOMS RELATED TERMINOLOGY

The information in this chapter is based on the Customs' official websites, the interview of the Lappeenranta customs head Veijo Alatalo and the memos of the meetings during year 2010 between customs and its clients. The main purpose is to explain how electric customs procedures affect the information flow. The aim is as well to find possible bottlenecks which Customs' innova-tions arise inside and outside customs, among the customs' clients. This chapter is the core case study chapter which study material has been ga-thered as mentioned above.

6.1 Electrical Customs Clearance

Electrical customs clearance has been continuing its' growth. More electrical databases are used for documentation and the traditional way is passing away. The aim of electrical customs clearance is to increase the speed of in-formation flow and decrease the actual inserting of basic information of the case at the customs. When forwarder has inserted information at his/her computer and have those confirmed by customs will the same information reach several parties and make the procedures more smoothly. Customs will maintain the new coming issues in Customs' web sites.

6.2 eCustoms

There is going on a wide development project in EU, whose main objective is to develop Customs operations in the EU. The development project includes the innovation of customs codex in total and related eCustoms project (electrical customs, eCustoms). The progression of eCustoms and the content of implementation will be defined in the future and the development of national operation environment in electrical point of view. (Tullihallitus, 2010).

The development work aims that by the middle of the year 2010 whole EU customs environment will work electrically. Paper based procedures should be used only in exception cases. After it is ready eCustoms will cover all actions in businesses of import, export, transit, warehousing and processing. Customs refinement requires not only the refinement and simplification of customs legislation but also strengthen the customs administration work and developing the information systems in all member states. Companies which are on the field of export business the refinement means the developing of their policies towards electric actions. eCustoms offers possibilities to empower companies' actions to be more competent. Commission supervises electrical customs program with the strategy plan of several years called MASP = Multi Annual Strategic Plan. The project will come true by agenda in stages which will last until 2013. (Tullihallitus, 2010).

6.2.1 How eCustoms will ease the operation of Companies?

For companies the electrical customs will give possibilities to customs declarations electrically not depending of the time and place. They are also able to act the best way considering their business and logistics point of view. Also running errands at customs it will be minimized. eCustoms project is very wide and the time line reaches ten years period of time. There will be expenses for companies when moving towards new technology and the way to act. In an electrical environment where it is possible to utilize advanced tech-

nology it is also possible to quicker the procedures of announcements re-
markably and the waiting times will be decreased. (Customs memo material).

Finnish Customs is involved in all steps of preparations and is situated in sev-
eral decision making authors in EU. In preparation steps it is possible to affect
solutions so that the needs of Finnish economic life are taken to consideration.
The Customs will also utilize the wide customer network in their developing
project. The specialists are willing to receive proposals and thoughts about the
issues that should be considered in the developing process. (Tullihallitus,
2010).

6.2.2 The current situation with electric Customs.

Eastern Customs environmental survey and taxation department representa-
tive Veijo Alatalo has been interviewed and he has answered to following
questions;

1. What kind of problems the interfaces of different procedures cause and
   how those come up?
2. Has there been problems regarding NCTS TIR customs clearance at bor-
   der or Finnish/Russian side?
3. When it would be concrete to get rid of the folder of paper TIR Carnet?
   What makes it difficult?
4. How does the 1.11.2011 compulsory safety information notices be related
   top transit transportations which leave Finland as road shipment?
5. What are the basic problems which occurs from the customs clearance
   centre's point of view?

Above questions have been answered in the point of wiev if those have
caused problems which have been dealt more widely with Customs and its'
clients.

There are a lot of interfaces between different procedures and part of the in-
terfaces is out of use. For every project of electric customs clearance belongs
to several phases. Interfaces between different programs have been taken to

the use phase by phase. Between transit customs clearance and import clearance system (NCTC – ITU – interface) taken to use 2009 has a feature which enables the giving of import notification in advance if there has been opened customs clearance procedure which can be founded from EU's NCTS system. In December 2009 an interface between export and transit customs clearance (ELEX – NCTS interface) was taken to use. This enables the releasing order of export declaration leaves only after the procedure of transit customs clearance has been ended if the export goods have been transferred to the transit customs clearance procedure. This procedure removes the ending of export clearance manually at Customs service desk.

Interfaces and their implementation have proved to be very technically challenging and especially the function of ELEX – NCTS interface has had problems during December 2009. In addition to technical problems of the Customs' the users of notifications are not familiar with the procedure of filling in the new notifications. In practice this means that all necessary information is not properly filled when goods are to transfer under export procedure. If the MRN for example is missing from the export declaration the author of export declaration will not receive confirmed exiting message. This causes additional work.

There is required electric customs notification for TIR- Custom's clearances on the basis of the legislation in EU. Only official document will still be TIR Carnet. In customs' point of view this will not cause concrete problems that both old paper version and new electrical version have been required to issue for almost two years now. There has been run a pilot program between EU and Russia where EU transmits a part of the information of electric customs clearance to Russia via Brussels and the Russian customs utilizes this information in their own systems. The results are not in use yet, therefore it is not yet sure if this has speeded up or slowed down the lead time of TIR clearances at Russian customs. The electrical customs clearance for TIR transportations is the internal requirement of EU and it aims to electrify the customs clearances which enter the EU area. The customs clearances are supposed to be all electrical by the end of the year 2013. TIR contract is an international agreement

where EU is one participant and the amount if the other participants are approximately 70. The objective of the international TIR agreement is to proceed with the same time table with all participants. It is clear that the large amount of participants and the fluctuation of readiness changes a lot between countries and slows the procedure. At the moment NCTS TIR is EU's own internal decision for its own customs area.

1.11.2011 it becomes compulsory to give a safety information notice of the goods arriving in the EU area. Safety information is given to Finnish customs' AREX program with a different notification which name is general announcement of arriving. If goods come by TIR Carnet separate notification will not be needed to issue. In this case the electrical customs clearance notification which includes safety information has been given before entering to Finland. Safety information includes approximately 10 points of new information compared to original TIR announcement.

Similarly, on 1.11.2011 it becomes compulsory to give all safety information about the goods which exit from the EU. If goods arrive in the EU under export declaration, all information is in order and additional safety information won't be needed to give. This is because export declaration has required safety information from 1.9.2009 otherwise it cannot be accepted. If goods arrive at the border under transit customs clearance (typical transit situation with road shipments) it includes the safety information. In case safety information from shipment I missing, the person who is responsible for the transportation (or some other author) is responsible for giving the electrical notification to customs' electric system (AREX). This is called general notification of exiting. Transit goods cannot leave from EU before customs has received these added information and confirmed it.

The notifications of import, export and transit are different. From customs point of view the main problem with these notifications is that these will not be filled properly and it causes additional clarification. Typical mistakes are giving the notification within the required time and the use of customs codes which are not is use anymore. Problems caused to clients are usually IT- related. This

happens when new solutions or some part of the solutions are taken to use. It cause rush and delays in network and lack of personnel in case of temporary high need of customer service. When notification s is stuck due the IT- system information via phone is asked more often. (Customs' memo material).

Especially these new regulations from 1.11.2011 have taken a lot of Alatalo's time. In the meeting of customs forwarding clients Alatalo has presented AREX instructions for clients, updated AREX general instructions and the version changes in description of messages.

6.3 Authorized consignor (EDI shipper)

EDI shipper is export company or forwarding company (registered client), who itself gives announcements to Customs in their own system, having a proper IT readiness. This procedure is subjected to license and it can be got from the government of Customs. To act as an authorized consignor is possible when dealing with import, export and transit goods. The most valued benefits are the automatic identifying of the actor in charge, the possibility to utilize other software's information, the rapid handling of announcement, no customs visiting at place of departure and electrical communication along with filing. (Tullihallitus, 2010).

6.4 TIR- customs procedure system

The aim for TIR (Transports Internationaux Routiers) is to make sure goods continuous movement along with transportation route. The basic requirements are confirmed transport units which are equipped with TIR- plate. There should be international guarantee system for customs and taxations which will be given by Suomen Kuljetus ja Logistiikka SKAL ry and International Road Transport Union (IRU), maximum guarantee amount is 60 000 RUR/TIR Carnet. TIR Carnet will act as control document in departure, transit and destination countries. All the inspection and sealing procedures which are applied in departure country should also apply in transit and destination countries. Guar-

antee companies and TIR users should be approved to the court of this procedure. (Tullihallitus, 2010).

TIR Carnet is to be filled in manually, starting from 1.1.2009 electrical announcement should have been given before presenting TIR Carnet and other documents at the customs of departure. The information for electrical announcement is searched from TIR Carnet, CMR (waybill) and from other possible transportation documents. A forwarder or the export company cannot act as an authorized consignor and therefore there is always a Customs visit at the departure Customs. Information is given by forwarder who acts as EDI-sender and the owner of TIR Carnet (Transport Company) is responsible for the rightness of information and for following the rules. (Tullihallitus, 2010).

In TIR Carnet the most important information are the place where customs procedure will be started, countries (departure and dispatch), number of truck and trailers, package amount, cargo description and cargo weight. In the bottom there is a place for total package amount of the shipment and the customs place at destination country. The electrical customs procedure system will send to the party who has issued announcement, the reference number. This reference number has to be stated in departure customs along with TIR Carnet, goods and transport vehicle. The officer searches the announcement from software system and compares it to stated documents and prints transit accompanying document to be attached to TIR Carnet. (Tullihallitus, 2010).

6.5 Transit Accompanying Document

Transit accompanying document is an official paper for transit cargo movements. This is used in T1 and TIR customs clearances. In this document there can be founded information like: shipper, receiver, package amount, cargo weight, transport vehicle with trailer numbers, description of the goods, the place of issue and the place the shipment is to be dispatched and customs procedure ended. In the top of right side there can be seen a bar code and MRN number. (Alho, 2010).

6.6 T1 document

T1 is a transit document which should be issued for transit goods when those are to be shipped from customs warehousing outside local area (for example from Kotka to Vaalimaa, Kotka to Vilnius). When the shipper is an EDI-sender, it is able to do the T1 electrically and print the document accompanying transit himself and there is no requirement to visit the local customs. When loading goods to truck and sending those by T1 the authorized consignor's seals have to be used for the sealing. The attached seals can be seen in T1 document. (Alho, 2010).

6.6.1 MRN- number

MRN, Movement Reference Number is a reference number by which all done procedures are combined in electrical systems. It is approved in the releasing order. MRN number can be like *09FI000000000001T6*, where the first numbers indicate the year, next letters the country where the reference number has been issued & confirmed. Letter T in the end of the reference is the status for transit cargo. When the forwarder, customs or the receiver of the goods types the MRN reference to its system they can easily see all the information which has been inserted under the reference. (Alho, 2010).

6.7 ELEX- export procedure

The European Union has one common export system, which enables the message communications between national export systems. The Finnish ELEX system is one of the national systems. The basics for ELEX are; eCustoms (EU wide), the refreshment of EU legislation and guarantee the safety issues during transportation chain. ELEX has been mandatory from 1.11.2009 and the announcement includes the safety information. After export documentation has been confirmed each shipment will receive its own EAD (Export Accompanying Document) which can be compared to transit accompanying document and MRN number. (Tullihallitus, 2010).

6.8 AREX, safety information

Arex is a new procedure for giving safety information when exporting and importing of goods. It has started 14.12.2009 and is a compulsory act starting from 1.11.2011. There is need to give pre – advice to customs about safety information as operator, goods, freight and route, for example (Tullihallitus, 2010):

- transport route,
- the codes of dangerous goods,
- the terms of payment and
- Written description of goods or to inform the first four numbers of codes.

Arex applies to all goods which arrive in the EU area or exit from EU area. The AREX safety information hasn't been taken to the use yet, even though the personnel at customs are trained for it. In exportation of goods as road shipment the AREX procedure won't be used because the ELEX procedure and transit customs documentation includes the safety information AREX requires. (Tullihallitus, 2010).

6.9 IMA- documentation

IMA customs document is a warehousing related document for cargo transfer for transit goods between warehouses inside local customs area. Warehousing procedures are done manually and therefore the IMA document issued by forwarder should be confirmed by the Customs. Usually customs only stamp it with date stamp. The main information includes the party who makes the document, the name and address of the receiver warehouse, total package amount, total weight, cargo description, unit/container number, warehouse identification number, procedure code and the signature of warehouse keeper who is going to receive the shipment. The information of this chapter is based on my own work experience.

7 BACKGROUND OF CARGO MOVEMENT

The information of this chapter is fully based to own working experience. Additional consultation has been received from colleague from Moscow office who is responsible for Far – East traffic.

A container feeder vessel of shipping Line's arrives at Kotka port and anchors to dock area. Unloading of containers will be started soonest all premises are in order for the procedure. Shipping Line will inform consignee marked in their manifest (in this case forwarders) approximately two days before vessel will arrive to Finland about their part of the goods in vessel. Firstly will be sent arrival notices and after that or at the same time release notes which entitle consignees to move container/s.

When goods are planned to move further to Russia there are two ways in road transportations; first option is that the container will be lifted on truck's platform straight from the container field without opening it and without taking off the shipper's seals. The second option is to transfer the container from the container field to the warehouse yard, take off the shipper's seals, unload all cargo to warehouse, return empty container back to container field and load the goods to truck and have the truck sealed with warehouse owner's seals. In these cases there will be used either truck with container platform (for straight containers) or a tilt truck (for goods handled via warehouse). First the procedure for direct containers is described. Second the procedure when good are handled via warehouse.

In both cases the first information flow regarding the cargo flow starts with the container booking procedure for example from Far East. First will be given the shipper's contact information to the forwarder's agent in Far East, along with the information of the cargo, container size (20'/40') and when the goods should be ready for loading. Forwarder will request the agent to contact the shipper and book the container with specific shipping line, as per agreed contract to Kotka. After the agent in Far East has informed the cargo is ready or not, the intended vessel and other related details. After container has been

loaded to vessel, there agent will give manifest information along with Bill of Lading copies to the forwarder. In Bill of Lading copies forwarder can see the shipping time; eta port of Europe and eta Kotka. When eta Kotka date is near may the forwarder ask from the shipping line's Finnish agent the exact arrival date before receiving the actual release note.

7.1 Direct container to Russia

Usually the forwarder is requested by the customer to organize transit container to Russia. Before any actions for trucking order etc. are done forwarder will have to make sure she/he has all necessary documents. The shipping line informs their consignee's (forwarders) about coming containers by arrival notices/release notes.

Before any organizing regarding the shipment is to be started forwarder will have to require invoice/packing list details from client in case she/he is able to check all the clients information are same such shipping line has informed. After TIR Carnet's information has been confirmed the next action is to finalize TIR Carnet, fill in the terminal advice and send the pre – advice to customs. In pre – advice should be founded the information as per release note and in addition to these there should have been mentioned the number of TIR Carnet and the number of commercial invoice. The copy of the filled TIR Carnet, completed terminal advice and release note are to be faxed to that department of the terminal operator's releasing that has the container. Release reference number is to be faxed back to forwarder from terminal operator's releasing department and given to the driver with all his other documents.

A driver will go to the container terminal, have his terminal advice and reference number shown to the personnel in terminal and container will be lifted on truck's platform and driver will enter to customs' parking place with his combination. He visits inside Customs to have his TIR carnet opened and to have customs' printed transit accompanying document with MRN number. After all has been successfully done, the customs' personnel will attach cus-

toms seal to container and the driver is free to exit the port area and continue his way directly to border.

7.2 Goods handled via warehouse

7.2.1 Container transfer related procedures

First the goods will be unloaded from the feeder. After forwarder has received a request to dispatch goods to Russia and release note for cargo is in order she/he will start appropriate actions. First there is need to do prepare required customs documents. If container has been in port less than 45 days, there is need to issue IMA customs document which customs has to approve with their dated stamp before it is valuable. If goods have been in port more than 45 days there is need to issue T1 customs document. If the forwarder company acts as an authorized consignor it is able to do the documentation using customs electrical systems, have the approval message from customs with MRN number and finally able to print the transit accompanying document itself. Otherwise the forwarder gets only MRN- number as an electric message and has to go to customs to have it opened.

After all with customs documentation is in order, there is need to fill the terminal advice of required terminal operator and send all along with the release note to cargo releasing department. After release reference number has been received from releasing department, it has to be sent a transfer request to terminal operator, to have container transferred from container terminal to warehouse yard. Usually this request has to be done well in time; usually the day before unloading is to be taken place. At warehouse yard there are mentioned places, like container place 1 – 10, A – D etc. These places have to me mentioned in the transfer request. There is also possibility that the forwarder's warehouse is outside port area and for transfer there is need to use trucking company. This is because terminal operator uses vehicles which are not allowed to drive in official roads. In this case it is very important for forwarder to inform port of Kotka gate personnel about incoming truck's plate numbers in addition to the incoming time.

7.2.2 Unloading related procedures

Before unloading of goods will take place, there is need to send pre – advice to customs and mention in it when the approximate unloading time for goods will take place. This has to be done in case if customs is willing to come to supervise the unloading and check the goods. When unloading starts the container seals will be checked and taken off. After unloading is finished, goods will be re – checked and the result is to be informed to the forwarder who inserts goods to the system and prints out unloading report. If the goods match with original information of the quantity, the forwarder is requested to issue terminal's unloading report, where is mentioned package amount, cargo description, seal numbers, date and in the bottom the signature of warehouse keeper. If there have been some missing collies or there has been proven to be major difference in weight it has to be mentioned in terminal's unloading report. If it turns out that more packages have been founded that has been originally informed, a new customs document should be issued for the extra cargo. Finally, one copy of terminal unloading report, customs' part of the customs document and possible "additional customs document for extra cargo" should be attached and pass to customs warehouse supervisors, no later than one day after unloading has taken place.

If there has been issued T1 customs document for the cargo, the ending of the document will be made electrically. The specific MRN number will be searched from electrical database and the customs procedure will be acknowledged to be closed. One copy of transit accompanying document will be passed to Custom's supervisor team, in the top of right side there will be added the transit incoming number so that Customs' supervisors can combine all the relevant information of one unloaded shipment.

7.2.3 Loading related procedures

Loading will take place usually right after the unloading has been finished; this procedure is called direct re – loading. After goods have been equally loaded as per the customer's instructions, truck doors will be closed and sealed with

warehouse keepers' seals. After sealing has been completed and the driver released from warehouse area, the driver will go to the forwarder's office to pick his documents. Warehouse workers will inform forwarder all the necessary details such as; loaded amount of packages, truck number along with all trailer numbers and seal numbers which have been attached.

7.2.4 Transit documentation

After forwarder has received all necessary documents from warehouse she/he will start preparing loading report. Before the forwarder is able to finalize documents she/he should have correct commercial invoice and packing list (if needed) and the final confirmation from customer's side. There should be done pre – advice to customs where forwarder should mention following details;

- departure date,
- truck register number along with trailer register numbers,
- loaded package amount and cargo weight,
- cargo description,
- number of commercial invoice and
- Number of TIR Carnet.

There is a need to issue CMR (waybill) and fill the TIR Carnet as per the info in commercial invoice. TIR Carnet has to be filled both manually and electrically. Companies which act as authorized consignors are able to issue all TIR carnet's information to customs electric database and have the MRN number for the shipment after Customs has approved the shipment. Documents will be passed to the driver and he is requested to go to the local customs to have his TIR Carnet opened, have his truck sealed by customs seal and to have customs' printed transit accompanying document along with all his other documents. After customs procedures are done, the driver is free to exit the port area and continue directly to border Customs.

7.2.5 Procedures at Border Customs

The customs who has opened TIR Carnet informs the border customs about coming truck. Driver with his truck has to be there under given time. At border truck will be checked, driver will give all his documents to customs officer. Border customs will fill and take their page of the TIR carnet and check the marked details are in order and driver can continue to Russian side. Transit accompanying document will be ended at the border but TIR carnet will remain open until it reaches the place of the destination.

8 RESULTS AND THE FUTURE INSIGHT

8.1 Results of the Research

There were interviewed parties in information flow and as a result there hasn't been founded any major lack of the information. Forwarders receive their information from their cooperation parties and do not find it difficult if some info has to be re – checked. Maybe this is because they have got used to the way everyone in the chain acts and, after all, every new change is considered to be difficult in the beginning. The time required to getting familiar with new issues is limited. The main problem has been experienced when electric customs clearance has been started and when the new adjustments have been turned to be compulsory. As per the information of the memos between customs and its clients the strategic problems have turned out to be the lack of transition time. The clients of the Customs have felt they are forced to use new systems even though those are not yet fully working. Forwarders feel they act as test parties when developing new clearance system to use. This is partly true, but without testing the new steps of development there won't be reached any benefit.

Electric customs clearance depends remarkably on the ability to be constantly ready for electric operations and does not allow a lot of break downs. As per client of Customs there have been difficulties of customs to inform about break downs during nights and weekends. One of the major disadvantages at the

moment is that the old procedure and new one are going one upon another and makes forwarders and customs officers do the double work.

The supply chain parties are used to working as they have worked and consider receiving missing information easily for example by phone calls. The problems keep arising when new system or regulations are taking to use, most of the problems are as follows;

- readiness of IT systems (brake downs, programming problems),
- the double work of transition phases,
- problems in interfaces between new and old systems and
- Lack of strict instructions & constant extending of interface time.

As per the survey of one forwarder office, they consider at the moment that for example the old manual TIR Carnet procedure would be still the easiest way to work with transit traffic documentation when dispatching goods to Russia. At least they consider that there should be one or the other way in use, not both, especially when there is no clear deadline given when the old system would be totally abandoned.

The info center in port from Vaalimaa border customs considered it a good idea. Vaalimaa customs would advise about possible accidents between Russian and Finland borders, the area from which the ministry of Finnish road systems do not report. Vaalimaa customs hopes to receive information about office hours of forwarder companies. This is because sometimes there is need to re – check information from the forwarding company. Every forwarding company has their own working hours, some will be closed during office hours and some have extended their working hours due the customer service reasons. When a truck has been sent to the border during office hours it might be crossing the border only in the evening time. If nobody from forwarding firm can be reached, usually the forwarder will receive the information only on next morning. The driver is stuck in the border, the delivery will be postponed and the waiting time for transportation will be possible. Therefore it would be ap-

preciated if the information of office hours of each forwarder company would be available at Vaalimaa customs. That's also the reason why the forwarder companies have extended their working hours.

It can be said that there are no giant problems at the moment but additional information and the fluent way of receiving additional information are always welcome. Maybe the current economic depression does not make the firms support the new developments as it may have supported for example during years 2006 – 2007 when the transit business was healthy and cargo quantities much more high than now.

The information centre has received a positive feedback it can be figured out of the members who have funded the project. Infolaituri project fall down to the implementing phase and this causes pressure also to the authors of Mobile Port- project; the success depends on how they manage the implementing phase. To the implementing phase affects the financial situation of the firms (who can afford to invest to this development) and the volumes of traffic flows. As per the information of the transit traffic current volumes, the pilot center might not be wise to plan totally on the basis of transit traffic.

8.2 Future Prospects

As per Pulli et al (2009; 119) the ideal situation between port related parties is that there is used several identification- and tracing models at the same time. The ideal tracing system for cargoes is identification system which uses both bar code and RFID technique and offers the information of the deliveries of the goods in the different phases of the supply chain and enables the updating of the cargo movement. The main information port related parties needs is the ETA (Estimated Time of Arrival) and the information can be received or checked easily from internet (shipping Lines' internet services for containers and the PortNet services for vessels). As a matter of fact the shipping line Maersk Logistics and IBM have been utilizing RFID- technology in tracing the containers. The companies have developed a system called Tamper - Resistant Embedded Controllers (TREC). By the help of the system the shippers of

the containers can trace their units in real time. The purpose of this system is to strengthen the safety issues and make the steering of cargo flow more fluently. The system registers the opening and closing procedures of the containers doors, and sends the emergency message when needed.

In my opinion RFID technology cannot be used in procedures which are linked to customs actions requirements. The innovations customs is undergoing at the moment requires so much from clients both physical and operational level. The requirements RFID technology brings to this subject would be just too much. On the other hand the use of RFID technology in cargo movements would be useful. The use would ease the information availability between supply chain parties and the exact cargo description would reach forwarders in the office when scanning the cases in warehouse during unloading. This would ease the forwarder's work when processing transit documents to the cargo and when informing clients about incoming shipments. Pulli & al (2009: 107) points out that when using RFID technology the information is being updated only the specific reading points of supply chain. This will not bring any benefit if clients are willing to know the current location of the cargo – i.e. it cannot be said if shipment has just left from the shipper or is near port gates. RFID can increase the exact information of the core cargo, but if there is need to trace the shipment and share the information between the parties involved, it requires RFID tagging to containers or other units.

Maybe the current situation with the fusion of Hamina and Kotka port to common port of Haminakotka Satama Oy there should be use for developed and very modern system in traffic and cargo steering. Drivers should be instructed very well where the loading place for cargo is and if the access permits to port areas will be the same. Even if ports act as one joint port they are still located physically in two different places approximately 30 kilometers from each other. There is need for intelligent information systems in this case and there would be also very significant use of reaching and sharing the information in a proper manner. The interfaces of electric customs clearance and the interfaces of coming common actions between two different ports and all the port operators

might cause confusions. The ports have always had their own ways to act and it takes time to approve common practices. In the field of this changing environment and in the phase of enormous changes there is just need to concentrate to the core function of services and core fulfilling of traffic volumes. This might cut the implementations of smaller projects and force the firms to concentrate their core businesses first.

Nevertheless it cannot be forgotten that the routes via Baltic ports and the routes via Russian ports are competing with the routes via Finnish ports by hard hand. Even though the safety matters, fluent cargo movement and regular liner traffic are the benefits for Finland, the Baltic ports are really competing with us. Russian ports have their difficulties in navigating in large St. Petersburg environment and the road conditions leading to Ust –Luga port are in bad condition. It might slow down the delivery of goods and cause accidents for trucks i.e. tire problems. Some clients have even changed the routes for the financial reasons but returned due to safety and due the fluent cargo movement. If transit traffic will not be rising up with its volumes again the companies are forced to focus to the other business actions and all the members in supply chain are requested to do their best to save the volumes of transit cargoes in the routes via Finnish ports.

8.3 Conclusion: Change Agent as the Future Development Tool

The companies in port related supply chain are all undergoing the difficulties that new implementations with eCustoms and the fusion of the Hamina and Kotka ports have been arising. To the changes it is always difficult to prepare in advance and the changes always manage to surprise the actors; with the rapid speed they are facing companies, IT- systems are not ready, personnel have used to old habits and do not feel like learning something new which affects to be very difficult in the beginning. The changes just have to accepted, without accepting the new operation modes the companies will be left aside and after all they are the ones to suffer – suffering for not accepting the changing environment.

This chapter consists of discussion how the forwarder companies are able to prepare themselves to the changing environment of eCustoms. Usually new compulsory actions bring along tasks. Tasks are addressed to the team leaders who are responsible for team members and the fact that team members are aware of what is happening and organize additional training if needed. As Cockman et al (1999: 53) state:

"In general, it is about what has to be done and why. It is important that all members of the team, departments or organization have a clear understanding of what the task actually is. It is important for an organization to have a clear mission statement. People need to know what business they are in, what goals are to be achieved and how success will be measured". These statements can be considered for use when companies are trying to solve the new coming situations with modern developments.

One good decision would be that forwarder companies will have to choose a change agent. The change agent would be responsible for the new era of eCustoms. The person would be responsible for this field only. The task would be to find out the IT possibilities for eCustoms requirements, be in contact with customs personnel and on the behalf of the knowledge she/he will educate the forwarders inside the forwarding company. It happens very often that in addition to the 'normal' work, forwarders have to find out the new regulations and requirements these new notifications require. This easily takes much time and the basic work duties (especially customer service) will suffer.

Organization diagnostic model (introduced in page 10) could be the model which can be used by change agent in forwarding companies. There has been taken to consideration all the important channels which change agent should use. In case of readiness to the eCustoms the most important parts of the channel are purpose and tasks, technology and the structure. Too often there are everyone in the row of forwarders finding out new solutions and the situation will end up everyone is working by different way in the same organization. However, the IT- programs requires information to be inserted properly, but mistakes still occure and this causes failures in electric

messages; those won't be smoothly reached the Customs programs and forwarders keep receiving failure messages.

Usually (especially in SME companies) it arises negative reflections if colleague from same level will receive a responsibility which is a different kind than the other co – workers have. Therefore it would be useful if the responsibility of Change Agent would be divided to all forwarders. It would be on one's responsibility for approximately two – three months and addressed to another after that. Then the ordinary work could be divided among the others and it would not arise any sour feelings among the colleagues. It would be desireable if foreman would take the responsibility as a Change Agent but in the long run it wouldn't be wise. The foreman has other responsibilities which ties her/his time and she/he might miss the praxis of everyday forwarding cause she/he won't be doing it daily.

The Change Agent- group consists approximately from four – five persons and the duty will be rolling and changed after two – three months. The names of the persons would be given to customs and they all would be on Customs' pst list, in case that the current respondant would be ill/absent the important messages will reach the substitutes.

The Change Agent- group should have companies IT- support in cooperation in case there is innovations which ties a lot of resources (money) and would not bring the benefit in the same respect. This might end up to the situation that some innovations that eCustoms require will be outsourced from the other supply chain parties. The IT- support and the top level of the company should also act as the reporting target if there will occure serious problem situations like the program the firm is using cannot be used as per the eCustoms' requirements.

In the long run, the membership of all team mates is the most important corner stone for the succeed in the changing environment we are living in. It is the total supply chain management we have to remember, where the top management holds the significant tools in motivating personnel to work

towards the common goal. IT programs are changing, almost everything is changing and we have to approve the changing environment and educate ourselves both as human being and as a significant part of supply chain tool. Everything we already know well, can be absolutely taken advantage when learning new habits where averyone in organization participates commonly.

8.4 Current Status of MOPO- Project

In the end it has to be said something about the MOPO- project because this study is party related to it and it also made possible for this study to come true. The current economic situation is not supporting the project in the best way, but there are several firms of funding the project and as per the report of Posti et al (2010) there only negative insight for this project was the safety issues information centre might bring, not the financial difficulties which authors were prepared to. In their report the (ibid. 36) the most significant bottlenecks in information flow between port related parties were the effects of old habits ('paper office', phone and fax), the bilateral communication between two authors,waiting hours for trucking companies and the problems between Finnish and Russian border. They succest the developing of Single Window solution where the IT- programs of Finnish and Russian border crossing points would be combined. It would be very difficult because there will not be only border crossing matters to be taken into consideration but there are different requirements in documents such as TIR Carnet where Finland requires 23 information blocks and Russia 64. These matters might make it difficult to proceed to electical data transmission. Finally I was partly relieved and partly surprised that the bottle necks Posit et al have found were almost the same I did and therefore supported by Development Project Thesis.

As per Tapaninen (2011) the piloting phase has not been started yet. There will be arranged a middle – seminar for mobileport project 3.2.2011 and as per the agenda there will be a presentation about piloting the information centre and the future developing by project specialist Niko Jurvanen from

Kymenlaasko University of Applied Sciences. (Mobiilisatama–Mobile Port–MOPO, 2010). I really hope the project is able to provide the services it has been prepared for.

Bibliography

Almaranz, J. 1994. Quality Management and the Process of Change. Journal of organizational Change Management. vol. 7, No. 2, available, http://www.emeraldinsight.com.xhalax-ng.kyamk.fi:2048/search.htm?PHPSESSID=dcpj6djpitu4fgcpp8lc2gapp4&ct=all&st1=change+management&fd1=all&mm1=all&bl2=and&st2=&fd2=all&mm2=all&bl3=and&st3=&fd3=all&mm3=all&ys=all&ye=all&ec=1&bf=1&cd=ac, 17.12.2010

Attaran, M. 2007. RFID: an Enabler of Supply Chain Operations. Supply Chain Management: An international Journal. Vol. 12/4, pages 249 – 257, available www.emeraldinsight.com/1359-8546.htm, 16.10.2010

BOFIT Venäjä – ennuste 2010 – 2012. 29.9.2010. Bofit Venäjä ryhmä. Suomen pankki, BOFIT – Siirtymätalouksien tutkimuslaitos, saatavilla http://www.bof.fi/NR/rdonlyres/7EB16BAE-E6D4-41F1-9ACB-F97A20470313/0/bve210.pdf, 13.11.2010

Burt, D.N., Dobler, D. W. & Starling, S. L. 2003. World Class Supply Management. The Key to Supply Chain Management. 7th Edition. New York: The McGraw – Hill companies, Inc.

Christopher, M. 2005. Logistics and Supply Chain Management. Creating Value – Adding Networks. 3rd Edition. Dorchester: Pearson Education Limited.

Cockman, P., Evans, P. & Reynolds, P. 1999. Consulting for Real People. A client – centred approach for change agents and leaders. McGraw – Hill Companies, Inc.

Data analysis. 2005. The pros and cons of RFID. Strategic Direction. Vol. 21. No. 5. pp. 24 – 26, available http://www.emeraldinsight.com.xhalax-ng.kyamk.fi:2048/journals.htm?issn=0258-0543&volume=21&issue=5&articleid=1463779&show=html, 16.10.2010

Dutch Customs administration, available http://www.douane.nl/english/, 7.1.2010

Eriksson, P & Kovalainen, A. 2008. Qualitative Methods in Business Research. London: Sage Publications Ltd.

Finnish Libraries' RFID Working Group, 2005. RFID Data Model for Libraries. Finnish Data Model, available http://www.kansalliskirjasto.fi/attachments/5kSvIrHoj/5kXbVnVS7/Files/CurrentFile/RFID-DataModel-FI-20051124.pdf, 16.10.2010

Finnish Railway Statistics 2010. Statistics of the Finnish transport Agency, available, http://rhk-fi-bin.directo.fi/@Bin/79731142acc5adce7043fda003ec0ff7/1289641838/application/pdf/3922638/Finnish_Railway_Statistics_2010.pdf, 13.11.2010

Hernesniemi, H., Auvinen, S. & Dudarev, G. 2005. Suomen ja Venäjän logistinen kumppanuus. Liikenne- ja viestintäministeriön SVULO- loppuraportti. Elinkeinoelämän tutkimuslaitos ETLA. Sarja B 209. Helsinki, Taloustieto Oy.

Hilmola, O–P. 2008. Fourth International Logistics seminar: Co – operation among Transportation Modes in Northern Europe. Kouvola: Lappeenranta University of Technology. Faculty of Technology Management. Department of Industrial Management. Research report 200.

Hilmola, O & Szekely, B. 2006. Logistics Development in Finnish and Swedish Companies with Respect of Russia and Fours Asian Countries: Traffic Flow and Warehousing Analysis from Current Situation And Likely Development Trends. Research Report 175. Kouvola: Lappeenranta University of Technology. Department of industrial Engineering and Management.

Järvelin, K., Kvist, H – H., Kähäri, P. & Räikkönen, J. 1992. Palveluyrityksen laadun kehittäminen. Gummerus kirjapaino Oy. Jyväskylä.

Järvensuu, A. 2009. Improving Information Value Chain in Sales and Operations Planning. Master of Science Thesis. Tampere University of Technology. Degree Programme in Information and Knowledge Management.

Kärkkäinen, M. 2003. Increasing Efficiency in The Supply Chain for Short Shelf Life Goods using RFID Tagging. International Journal of Retail & Distribution Management. Vol. 31. no. 10. pp. 529 – 536, available www.emeraldinsight.com/0959-0552.htm, 16.10.2010

Kymen Sanomat. 2010a. Pelkkiä asiantuntijoita ei tarvita satamayhtiön hallitukseen.10.11.2010.

Kymen Sanomat. 2010b. Porvoon Kilpilahti öljyineen on yhä suuri ulkomaanliikenteen satama. 10.11. 2010.

Kärkkäinen, M., Laukkanen, S., Sarpola, S. & Kemppainen, K. 2007. Roles of Interfirm Information Systems in Supply Chain Management. International Journal of Physical Distribution & Logistic management. Vol. 37, No. 4, pp. 264 – 286, available www.emeraldinsight.com/0960-0035.htm, 29.10.2010

Lautso, K., Venäläinen, P., Lehto, H., Hietala, K., Jaakkola, E., Miettinen, M. & Segercrantz, W. 2005. Transportation Connections between the EU and Russia, current Status and outlook for the Future. Ministry of Transport and Communications.

Long, A. 2009. World Customs Journal 2009, available http://www.worldcustomsjournal.org/media/wcj/-2009/1/Long.pdf, 21.1.2010

Lumijärvi, T. 2009. Traffic Flows in Finnish Gulf of Finland Ports. The Centre of maritime Studies, in University of Turku.

Lysons, K., Farrington, B. 2006. Purchasing and Supply Chain Management. 7th Edition. Harlow: Pearson Education Limited.

McLaren, Tim S. & Vuong, David C.H. 2008. A "Genomic" Classification Scheme for Supply Chain Management Information Systems. Journal of Enterprise Information Management. Vol. 21, No. 4, pp. 409 – 423, available www.emeraldinsight.com/1741-0398.htm, 29.10.2010

Ministry of Transport and Communication. Transport and Logistics, available http://www.lvm.fi/web/en/47, 9.11.2010

Murphy, P.R., Wood, D. F. 2008. Contemporary Logistics. 9th Edition. New Jersey: Pearson Education, Inc.

Myerson, J. M., 2007. RFID in the Supply Chain. A Guide to Selection and Implementation. Florida: Auerbach Publications.

Mäkelä, T. & Mäntynen, J. 1998. Kuljetukset Logistiikan osana. 2. korjattu painos. Tampereen Teknillinen korkeakoulu, Tampere.

Möller, K., Rajala, A. & Svahn, S. 2004. tulevaisuutena liiketoimintaverkot. Johtaminen ja arvonluonti. teknologiatellosiiden julkaisuja, nro. 11/2004. Teknologiainfo Teknova Oy. Tampere.

Nieminen, T. & Tomperi, S. 2008. Myynnin johtamisen uusi aika. WS Bookwell Oy. Porvoo.

Näsi, J. & Neilimo, K. 2006. Mitä on liiketoiminta – osaaminen. WS Bookwell Oy. Juva.

Port of Kotka, available www.portofkotka.fi, 12.1.2010

Poutiainen, M. 26.10.2010. Liikenneraportti 2010, Vaalimaan raja. Email material.

Pulli, H., Posti, A. & Tapaninen, U. 2009. B196. TUKKE – Tuoteseuranta sa-tamasidonnaisessa kuljetusketjussa. Publications from the Centre for maritime Studies. University of Turku.

Nurminen, T. & Kallikoski, S. 2007. RFID- tunnistuksen parhaat käytännöt kuinka toteutan onnistuneen RFID- projektin, saatavilla http://www.rfidfinland.com/drupal-6.12/sites/default/files/RFID-tunnistuksen%20parhaat%20k%C3%A4yt%C3%A4nn%C3%B6t.pdf, 6.10.2010

Petäjä, T. 2010. After a Hot Summer let's push on to the End of The Year, available http://www.ilp-group.fi/eng/article_page.php?loc_id=15, 17.12.2010

Pietiläinen, T. Finnvera Oyj Venäjällä ja ajankohtaista Venäjän rahoitusmark-kinoista. Pietari 5/2009. Presentation material.

Posti, A., Häkkinen, J., Hyle, J. & Tapaninen, U. 2010. Satamayhteisön Infor-maatiokoeskus tiedonvälityksen tehostajana. Turun yliopiston merenkulkualan koulutus- ja tutkimuskeskuksen julkaisuja. B175. Turku.

RFID Journal, The Basics of RFID Technology, available http://www.rfidjournal.com/article/view/1337/1, 6.10.2010

Roberti, M. 2010. Wal-Mart Relaunches EPC RFID Effort, Starting With Men's Jeans and Basics. RFiD Journal, available http://www.rfidjournal.com/article/view/7753/3, 28.1.2011

Rinta – Keturi, I. & Auvinen, S. 2004. 'Infolaituri – InfoQuay'. Infomedia Suomi Oy, available http://virtual.vtt.fi/virtual/proj6/fits/julkaisut/hanke8/fits38_2004.pdf, 27.9.2010

Rodon, J. & Ramis – Pujol, J. 2006. Exploring the Intricacies of Integrating with a Port Community System. 19th Bled eConference, available http://www.bledconference.org/proceedings.nsf/Proceedings/27EB687BB011E5F8C1257180002F7620/$File/02_Rodon.pdf, 21.1.2010

Saka, A. 2003. Internal change agent's view of the Management of Change Problem. Journal of Organizational Change Management. Vol. 7, No. 2, available http://www.emeraldinsight.com.xhalax-ng.kyamk.fi:2048/search.htm?PHPSESSID=dcpj6djpitu4fgcpp8lc2gapp4&ct=all&st1=change+management&fd1=all&mm1=all&bl2=and&st2=&fd2=all&mm2=all&bl3=and&st3=&fd3=all&mm3=all&ys=all&ye=all&ec=1&bf=1&cd=ac, 17.12.2010

Sirkiä, A., Lehtinen, J., Hiljanen, H., Pajunen-Muhonen, H., Löfgren, P., Winqvist, B. & Segercrantz, W. (2005). Tapaustutkimus kuljetuksista Suomen ja Venäjän rajan yli (FIRUCASE). TEDIM-julkaisut, saatavilla http://www.tedim.com/default.asp?file=970, 17.12.2010

Sjkøtt–Larsen, T, Schary, Philip B., Mikkola, Juliana H. & Kotzab, H. 2007. Managing The Global Supply Chain. 3rd Edition. Copenhagen Business School Press.

Simchi – Levi, D., Kaminsky, P. & Simchi – Levi, E. 2004. Managing The Supply Chain. The Definitive Guide for The Business Professional. New York: The McGraw – Hill Companies.

Slack, N., Chambers, S. & Johnston, R. 2004. Operations Management. 4th Edition. Harlow: Pearson Education Limited.

Smith, S. 2003/2004. A comparison of Port Community System. A framework to compare Port community Systems and an application to the Port Community System of Hamburg, Rotterdam and Antwerpen. Erasmus University of Rotterdam in the field of MSC Maritime Economics and Logistics.

Spekman, R. E. & Sweeney II, P. J. 2006. RFID: from Concept to Implementation. International Journal of Physical Distribution & Logistics Management. Vol. 36, No. 10, pp. 736 – 754, available www.emeraldinsight.com/0960-0035.htm, 16.10.2010

Sundberg, P. 2009. Suomen kaupan ja teollisuuden rakenne kuljetusten näkökannasta. Publications from The Centre of Maritime Studies. B163. University of Turku.

Tullihallitus, Tilastoyksikkö. 9.2.2010. Itään suuntautuva maantietransito vuonna 2009, saatavilla http://www.tulli.fi/fi/tiedotteet/ulkomaankauppatilastot/transitokatsaukset/2009/trans2009/index.html?bc=1493, 13.11.2010

Turban, E., McLean, E & Wetherbe, J. 2002. Information Technology for Management. Transforming Business in the Digital Economy. 3rd Edition. New York: John Wiley & Sons.

Van Donk, D.P. 2008. Challenges in relating Supply Chain Management and Information and Communication Technology. International Journal of Operations & Production Management. Vol. 28, No. 4, pp. 308 – 312, available www.emeraldinsight.com/0144-3577.htm, 29.10.2010

Van Weele, A.J. 2005. Purchasing & Supply Chain Management. Analysis, Strategy, Planning and Practice. 4th Edition. London: Thomson Learning.

Visy Oy, 2010, saatavilla www.visy.fi, 14.12.2010

Vuositilastot ja aikasarjat, saatavilla http://portal.fma.fi/sivu/www/fma_fi/tietopalvelut/tilastot/tilastotaulukot/ulkomaan_meriliikenne/vuositilastot_aikasarjat, 3.11.2010

Walters, D & Rainbird, M. 2004. The Demand Chain as an Integral Component of the Value Chain. Journal of Consumer Marketing. Vol. 21. Number 7, pp. 465 – 475, available www.emeralinsight.com/0736-3761.htm, 22.10.2010

Widgren, M., Kaitila, V. & Arkonsuo, H. 2000. Transitoliikenne ja välityskauppa Venäjälle. Elinkeinoelämän tutkimuslaitos ETLA, Sarja B 163. Taloustieto Oy, Vantaa.

Yin, R.K. 2003. Case Study Research Design and Methods. 3rd Edition. Applied Social Research Method Series. Vol. 5. Thousand Oaks: Sage Publications.

Interviews

Alatalo, Veijo. Lappeenranta Customs. 20.1.2010, 15.5.2010 & 23.11.2010

Husu, Päivi. Hamina Customs. 7.1.2010

Kokko, Jari, Multi Link terminals Oy Ltd 14.1.2010

Laakkonen, Taina. Customs Centre, Vaalimaa Customs. 4.2.2010

Lindström, Piia. Traffic coordinator, ILP – Logistics Oy. 18.1.2010

Rinta – Keturi, Irmeli. Senior Consultant, Talent Pertners Group. 22.1.2010.

Sissi, Mona. Steveco, Releasing Dpt. 8.1.2010

Tapaninen, Ulla. Professor. Kotka Maritime Research Centre. 11.1.2011.

Tellqvist, Tarja. Customer Service Supervisor, Teamlines Finland Oy. 14.1.2010

Miia Peri   APPENDIX I

18.1.2011

QUESTIONS USED IN CASE RESEARCH

In this appendix the questions which have been asked the parties of the supply chain are presented. The main target group is Customs (Veijo Alatalo and his interviews from substitutes) and forwarders (who use the services of eCustoms). Interviews have been done by email because the lack of personnel at Customs in the middle of the innovation of eCustoms.

Below are listed the questions to Veijo Alatalo (which have been originally presented in Finnish):

Question 1: What kind of problems he interfaces of different procedures cause and how do they come up?

Question 2: Have there been problems regarding NCTS TIR customs clearance at border or on the Finnish/Russian side?

Question 3: When would it be realistic to get rid of the folder of paper TIR Carnet? What makes it difficult?

Question 4:How the safety information notices affect to transit transportations which leave Finland as road shipment?

Question 5: What are the basic problems which occur from the customs clearance centre's point of view?

Below are listed the questions for port related parties (forwarders):

1. Are there remarkable bottlenecks in the information flow regarding your supply chain? If yes, what?
2. Does the innovation of eCustoms make your work more difficult? If yes, how?
3. What are the main problems when dealing with the Customs and when starting with new commandment of eCustoms?
4. Do you easily receive all the information needed? If not, where is the lack of information?

Memo of meetings with Customs and its' client groups have been used (for what?). Questions the client groups have been asked have been listed in these memos. The questions dealt with the Customs and what client groups have been considered to be bottlenecks. Above are presented questions which were used in this case research.