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PROCESS DESCRIPTION FROM CUSTOMER SERVICE TO INVOICING

– Case: FinnLink Traffic

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BACHELOR'S THESIS | ABSTRACT

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Quality and quality management is in a larger part in organizations operations. Clients and customers are demanding quality management systems and standards from their suppliers.

This thesis was commissioned by Finnlines Plc, FinnLink traffic. Purpose of this thesis was to build process description from customer service process. Processes were limited in cargo booking, check-in, traffic guidance and vessel loading and invoicing. This process description will be used when applying ISO 9001 –standard in future. The same process description was meant to be implemented in NordöLink in Malmö-Travemünde service.

Process description was built by getting to know in different tasks during thesis workers training period, by doing the work itself and conducting non-predefined open questions. Secondary goal for this thesis was to create comprehensive understanding how ro-ro shipping operator is functioning in daily basis. In addition, goal was to open up theoretical background for quality management and about quality management systems.

The goals for this thesis were fulfilled. Process description for FinnLink traffic was built on wanted level. At the moment of completion of this thesis, this process description was not implemented in NordöLink. In addition, this thesis introduces elements that are present in daily operations in ro-ro –shipping operator company. Finally this thesis suggest some improvement suggestions for FinnLink Traffic, that needs to be taken into consideration before applying for ISO 9001 standard. One of these suggestions is establishing proper quality measurement system.

KEYWORDS:

process description, process, quality, transportation, maritime transportation, IMDG, portnet

OPINNÄYTETYÖ (AMK) | TIIVISTELMÄ

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PROCESS DESCRIPTION FROM CUSTOMER SERVICE TO INVOICING

Laatu sekä laatujohtaminen ovat nykyään yhä suuremmassa osassa yritysten toimintaa. Asiakasyritykset vaativat omilta toimittajiltaan laatujohtamisen järjestelmiä, sekä standardeja.

Tämän opinnäytetyön toimeksiantaja on Finnlines Plc, FinnLink liikenne. Opinnäytetyön tarkoituksena oli rakentaa prosessikuvaus asiakaspalveluprosessista. Prosesseiksi rajattiin rahtivaraus, lähtöselvitys, kenttäliikenteen ohjaus ja aluksen lastaus, sekä laskutus. Prosessikuvausta tarvitaan tulevaisuudessa hankittavaa ISO 9001 standardia varten. Sama prosessikuvaus oli tarkoituksena ottaa käyttöön pienin muutoksin NordöLinkille, Malmö-Travemünde –linjalle.

Prosessikuvaus rakennettiin tutustumalla eri työtehtäviin opinnäytetyöntekijän harjoittelujakson aikana tekemällä työtä, sekä suorittamalla vapaamuotoisia haastatteluja FinnLinkin Naantalin toimipisteessä. Opinnäytetyön toissijaisena tarkoituksena oli luoda katsaus ro-ro –operaattorin päivittäisestä toiminnasta. Tämän lisäksi tarkoituksena oli avata teoreettista taustaa laatujohtamisesta sekä laadunhallintajärjestelmistä.

Opinnäytetyön johtopäätöksissä todetaan, että opinnäytetyölle asetetut tavoitteet ovat täyttyneet. FinnLink liikenteelle saatiin rakennettua halutun tason prosessikuvaus, jota ei kuitenkaan ole otettu käyttöön NordöLinkille opinnäytetyön valmistumisen ajankohtana. Tämän lisäksi opinnäytetyö esittelee tärkeimpiä seikkoja, joihin törmää päivittäisessä ro-ro-varustamotoiminnassa. Viimeisenä opinnäytetyössä esitetään kehitysehdotuksia FinnLink Liikenteelle, joita tulisi ottaa huomioon ennen ISO 9001 standardin hakemista, kuten laadun mittareita.

ASIASANAT:

prosessikuvaus, prosessi, laatu, kuljetus, merikuljetus, IMDG, portnet

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1 INTRODUCTION

1.1 Thesis background and goals

This thesis is done for Finnlines PLC, FinnLink Traffic. Finnlines PLC is one of the leading ro-ro shipping operators in Baltic Sea and the North Sea and FinnLink Traffic is operating Naantali – Kapellskär service. This thesis focuses on FinnLinks' process description all the way from cargo booking, check-in, traffic guidance, vessel loading to invoicing. Goal for this thesis is to have correct and valid process description for FinnLink Traffic and possibly for NordöLink, Malmö. This process description will be used when applying for new ISO 9001 standard for FinnLink and possibly for NordöLink. Secondary goal for this thesis is to have comprehensive understanding about how ro-ro shipping operator is functioning and what elements are included in day-to-day operations. Besides this, goal is to have understanding about quality management and theory behind processes.

1.2 Thesis execution

Theory part of this thesis consists of maritime transportations in Finland, vessel types and liner shipping. Passenger services are excluded, because this thesis focuses on cargo side of liner shipping and because FinnLink operates in cargo side. There are also chapter that gives a comprehensive understanding about transporting of dangerous goods by sea (IMDG), and the relieves that are applied in Baltic Sea area and brief glance in to vessel notifications out to authorities. Dangerous goods are explained thoroughly, because it is important part of all FinnLink's operations and they are essential to acknowledge every time dangerous goods are transported by sea. Theory part is constructed in the way that reader has some kind of understanding about the field of operations, where the shipping operators are functioning. Because this thesis is about process description, there are also chapter that gives an idea about different types of process descriptions and theory behind processes. In addition to this, thesis will undergo

some theory behind quality management, quality control and ISO 9000 –standards.

Empirical part of thesis is about process description that is made for FinnLink traffic. Thesis is conducted using qualitative research method, because process description was made by following, doing the work itself and by few non-predefined open questions. These questions are not written down, or presented in this work.

1.3 Finnlines PLC

Finnlines PLC is a leading shipping operator that offers ro-ro and passenger services in the Baltic sea and the North Sea. Finnlines PLC is part of the Grimaldi Group that is one of the largest Ro-ro service operators in the world. Finnlines ro-ro operates from Rauma, Uusikaupunki, Turku, Helsinki and Kotka harbours. From these ports company has services to Russia, Estonia, Poland, Germany, Denmark, Great Britain, Netherlands, Belgium and Spain. These services are operated with 10 modern ro-ro vessels, and they are transporting trucks, trailers, containers, break bulk etc. Besides Finnlines ro-ro, there are five different links that provides liner services between different ports. (Finnlines annual report 2014, 12.)

HansaLink has continuous liner service from Helsinki to Travemünde that is operated with three Star-class RoPAX vessels. HansaLink has six departures from both ports per week and voyage takes about 30 hours. (Finnlines annual report 2014, 12.)

NordöLink handles liner service from Malmö to Travemünde with four RoPAX vessels. This service has 19 weekly departures from both ports, with average of 110 000 loaded lane meters per week. (Finnlines annual report 2014, 12.)

FinnLink is operating in Naantali-Kapellskär route with 2-3 clipper-class RoPAX vessels. With this fleet FinnLink offers 19 weekly departures from both ports. Voyage takes only eight hours. Service runs also via Långnäs (Ocean) port, which enables Tax-free sales onboard. (Finnlines annual report 2014, 12.)

Picture 1. Finnlines linemap 2014 (Finnlines annual report 2014, 13).

Services from Russia are operated by TransRussiaExpress (TRE) that runs from St. Petersburg to Lübeck. TRE offers one departure per week, from both ports. (Finnlines annual report 2014, 12.)

Finnlines PLC owns 78,5 % from Intercarriers, that is offering services from Saimaa and some Russian inland ports with small-tonnage vessels. (Finnlines annual report 2014, 12.)

Table 1. Top 5 lane performance of the Baltic operators (Baltic ro-ro & Ferry Yearbook 2013, 17).

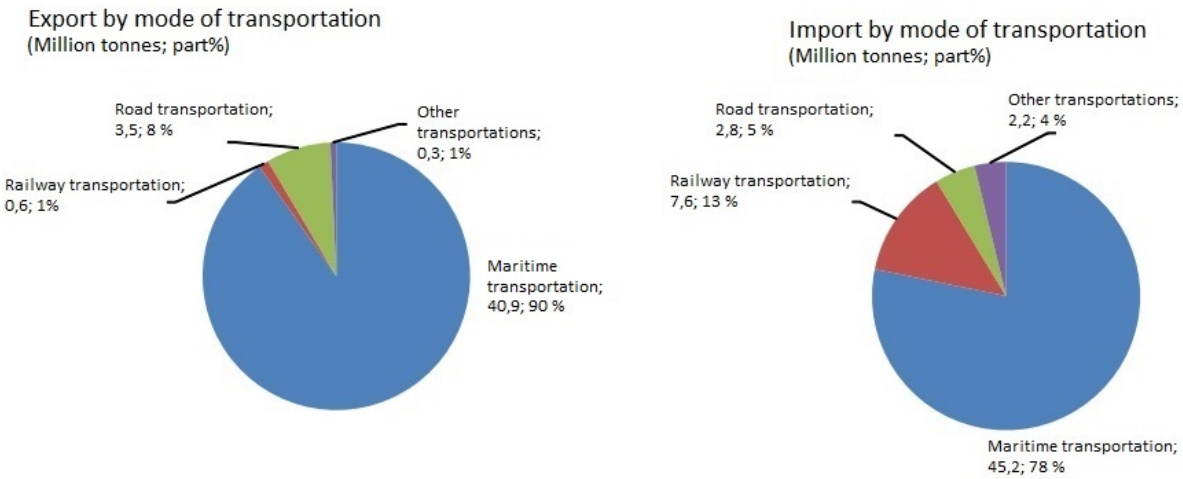
Operator	Type	Lane performance x1000
Finnlines	ferry/ro-ro	258,560
DFDS Seaways	ferry/ro-ro	205,435
Transfennica	ro-ro	121,005
Stena Line	ferry	110,094
Tallink/Silja	ferry/ro-ro	53,140

Table 1 lists top five ro-ro/RoPAX –operators in Baltic sea area. Table shows that Finnlines is clearly in the top of the list, when measuring operations in lane performances. HansaLink and NordöLink has the best lane performance numbers from the year 2012. HansaLinks' lane performance was 68,320 km and NordöLinks' 32,780 km. (Baltic ro-ro & ferry yearbook 2013, 12.)

Finnlines has a fleet of 22 high quality ro-ro and RoPAX vessel. Fleet consists of 13 ro-ro vessels and 9 RoPAX vessels. All vessels has 1A or better ice classification. 4 RoPAX vessels has installed exhaust scrubbers and 10 ro-ro vessels has installed scrubbers. (Finnlines annual report 2014, 50-51.)

2 FINNISH MARITIME TRANSPORTATION

Finland is a small economy that is dependent on its foreign trade. According to old proverb, “Finland is an island” and that is the reason why almost 80% of Finnish foreign trade is transported by sea. In year 2014 78 % (45 million tons) of foreign imports and 90 % (41 million tons) of foreign exports were made by sea. It is obvious that functioning and regular maritime transportations are vital condition for Finnish economy. Picture 2 illustrates export and import situation according to mode of transportation in year 2014. Blue sections illustrates maritime transportations. (Pöllänen ym. 2005, 40; Tapaninen 2013, 24; Tulli 2015; Meriliitto 2016.)



Picture 2. Export and import according to mode of transportation (Tulli 2015, translated in English).

For the last decade, unitized cargo units have increased and today they form about one quarter of the overall amount of transportations. Unitized cargo units are usually containers, trailers and railway wagons. Trailers and trucks are typical forms of transportation in Finland and the portion of these are high, compared to containers that are used mostly in outside the European –oriented transportations. Figure 1 illustrates the amount of Finnish foreign transportations and share of unitized cargo from 1981-2012. (Tapaninen 2013, 24; Promoting Foreign Trade Transports 2016.)

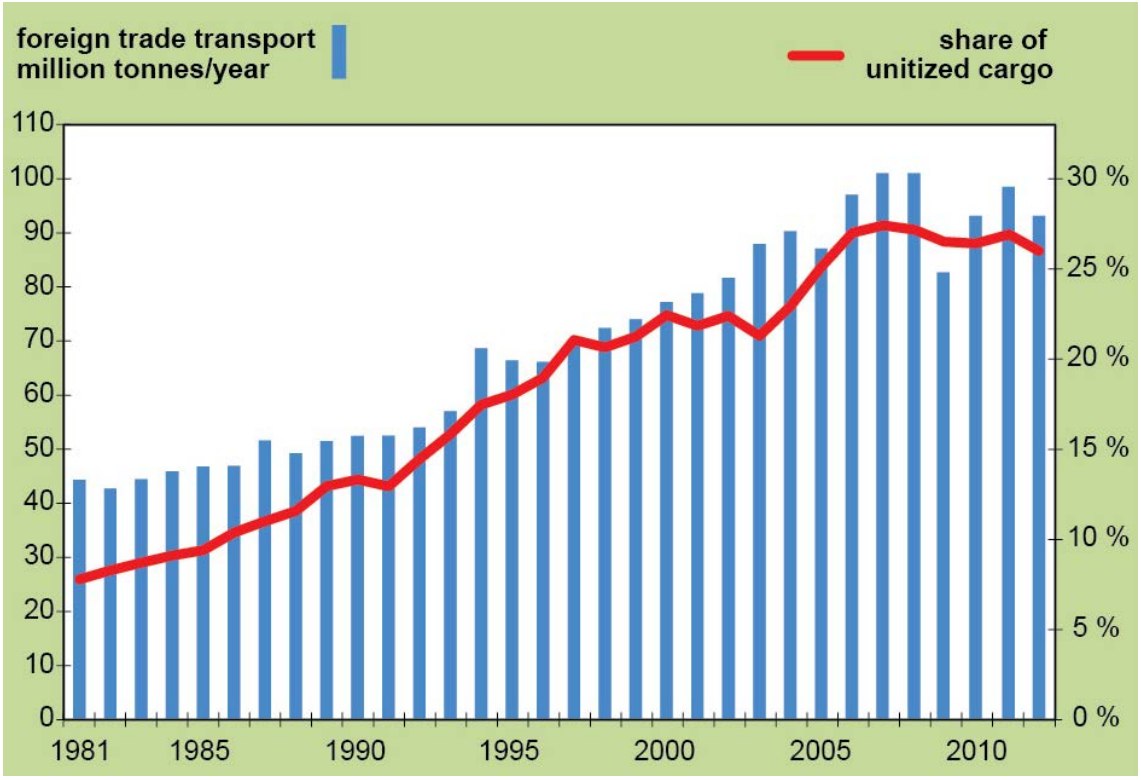
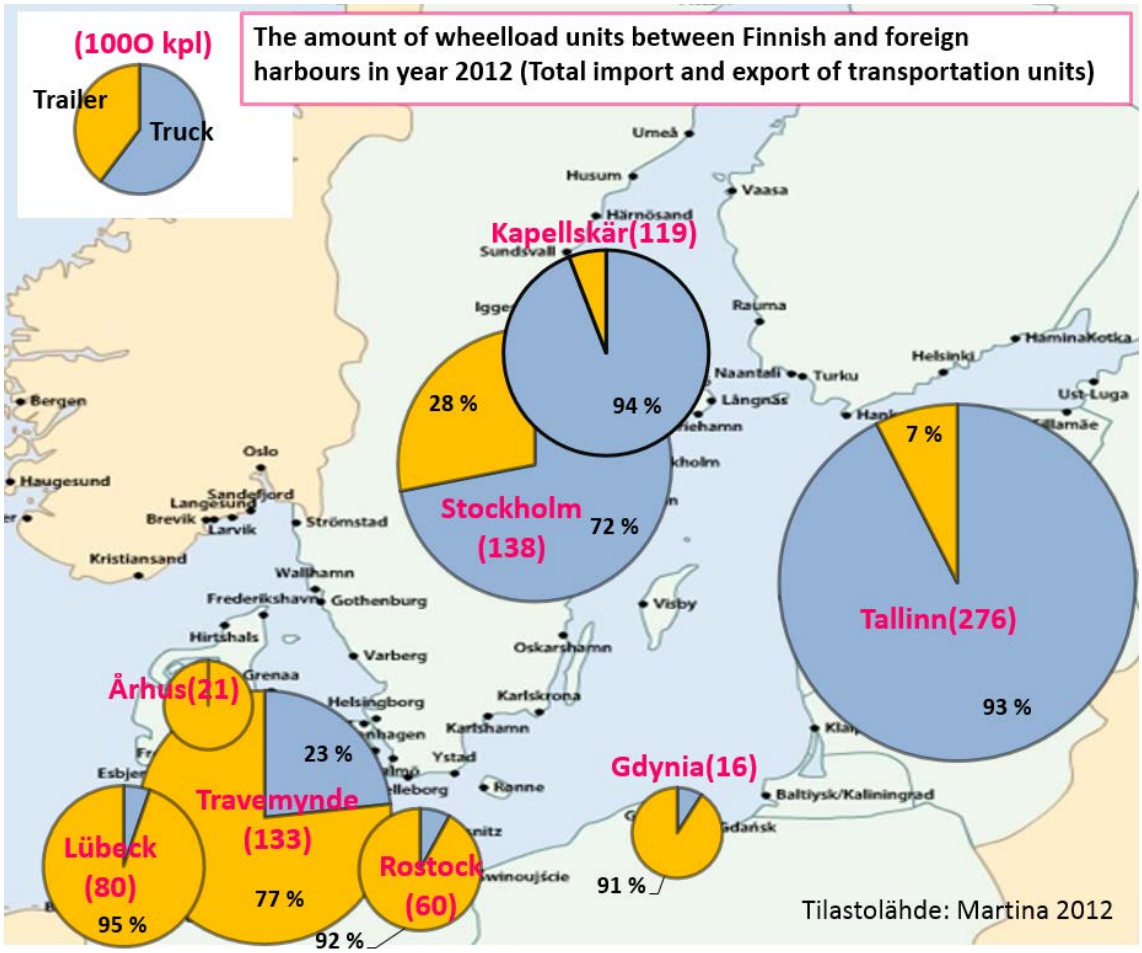


Figure 1. Amount of Finnish foreign transport and the share of unitized cargo between 1981-2012 (Promoting Foreign Trade Transports 2016).

One vessel can transport several unitized cargo units that contains variety of different goods. Most used unitized cargo units between Finland and Sweden are combination vehicles. Biggest unitized cargo (containers) ports in Finland are HaminaKotka, Helsinki and Rauma. When talking about wheel load unitized cargo units, biggest ports are Helsinki, Hanko, Naantali and Turku. (Tuomala 2012, 44; Tapaninen 2013, 47; Pöyskö ym. 2015, 12.)

Picture 3 shows how foreign import and export is divided between transportation units in different harbours in Baltic area in 2012. As seen in picture 3, trucks are dominating transportation amount towards Tallinn, Stockholm and Kapellskär. Most transportations to Germany is done with trailers.



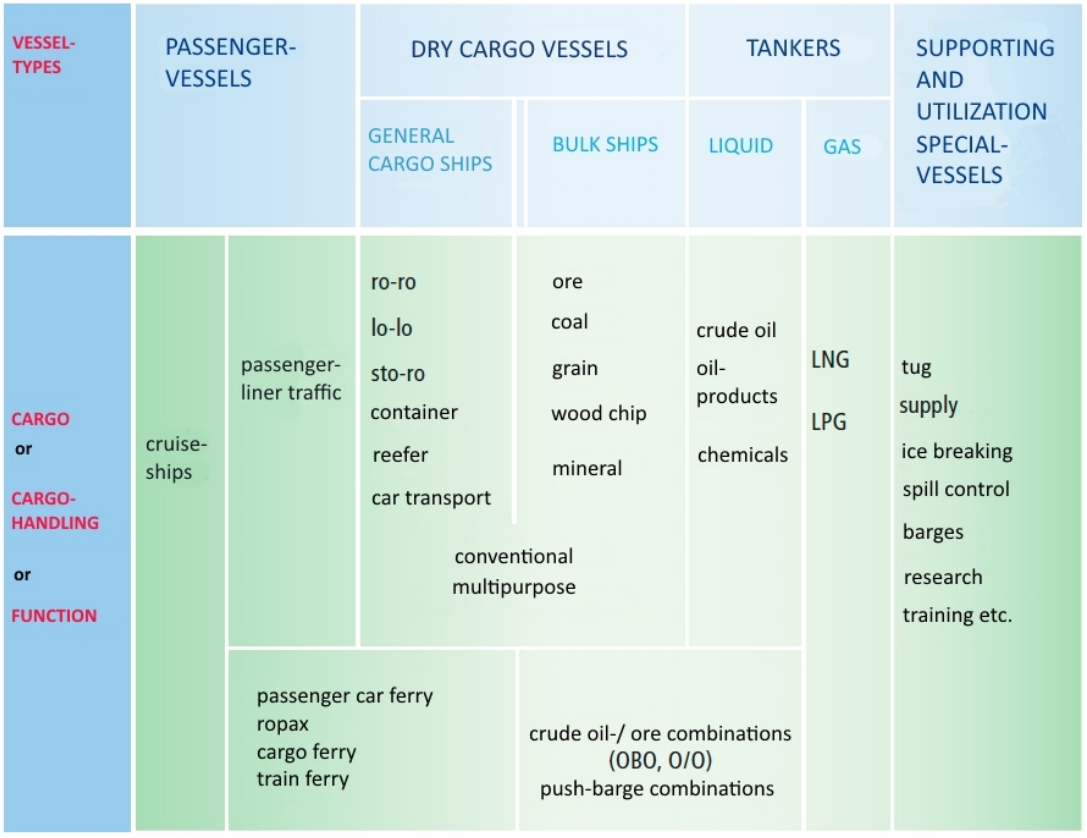
Picture 3. Total amount of imported and exported transportation units from Finnish harbours (Jalkanen 2016. Translated in English).

Different solid and liquid bulk loads, such as coal, oil and chemicals, compose other transportations. Exported and imported goods vary between each other. Export from Finland are dominated by major forest, metal and machine industries where as imports consists of different raw materials, energy products and consumable goods. (Tapaninen 2013, 24-25.)

Finnish industrial and trading transportations are dependent of maritime transportations and there are no substitutive or competitive form of transportation. Most important transportation routes are Scandinavian route through Sweden, Baltic Sea crossing lines, Baltic route and routes through Russia. Russian route is mainly on-land route. Almost all these routes are partial or completely done by sea. (Pöllänen ym. 2005, 24-27.)

2.1 Vessels

Vessel types can be divided in different ways in to different groups. One way is to divide vessels by their area of operation: fresh water vessels, coaster vessels, ocean vessels and deep-water vessels. Other ways to divide vessels are by use (passenger, bulk, tanker and special vessels), by cargo (bulk, break bulk, container etc.) or by ownership (private fleet, tramp or liner carriers). The number of passengers are also used to define is vessel passenger or cargo ship. If vessel takes 12 passengers, it can be considered as a cargo ship and if it takes over 12 passengers, it is considered as a passenger ship. Picture 4 shows a table where vessels are divided by use. (Wood ym. 2002, 89-90; Pöllänen ym. 2003, 94-95; IMO 2016a.)



Picture 4. Vessels divided by use (Ritvanen ym. 2011. Translated in English).

Cargo ships can be divided by transported goods or according to handling unit in to dry cargo vessels and tankers. Dry cargo vessels can be divided in to general

cargo ships and bulk ships. According to cargo handling method, general cargo ships can be divided in to ro-ro and lo-lo vessels. (Pöllänen ym. 2003, 94-95.)

Conventional vessels transports bulk goods and break bulk goods. These vessels are loaded and unloaded by using lo-lo-method (Lift on, lift off) by vessels own cranes or with harbour cranes. Lo-lo vessels hulls are built as a box-like, so cargos horizontal movement can be minimized. (Pöllänen ym. 2005, 108.)

Containers entered in to world of maritime transportation in 1966, when few American shipping companies began container shipping with normal bulk vessels. Container ships developed soon after that. Hull of container ship is built with special cellular system, where containers are stacked. On the weather deck, containers are stacked and lashed on to deck. Container ships loading and unloading is based on lo-lo method, where harbours need to have own cranes that has capacity to lift 30-40 tons, or harbour has a special container cranes. (Pöllänen ym. 2005, 111.)

Bulk carriers transports mainly dry goods, such as ore, coal and grain. Bulk carriers usually has only one cargo deck. Liquid goods are transported with tanker ships. These ships are loaded using pipelines, powered by pumps. Tanker ships transports oil, fuel, chemicals etc. (Pöllänen ym. 2005, 112-113.)

Ro-ro-vessels

Ro-ro-vessels (Roll on-roll of) are loaded with wheel load units either by driving or by towing. Transportation units are 40-80 tons unitized cargo units that are roll-trailers, containers, trailers or vehicles. Units are loaded from dock via vessels stern, bow or side ramps. Ro-ro is very competitive loading method because vessels loading is fast. This means that time spent in port stays short. Weakness of ro-ro method is that vessels whole cargo capacity cannot be utilized, because there are empty space between transportation units. In picture 5 trailer is being loaded to vessel by tow master. (Wood ym. 2002, 105; Pöllänen ym. 2005, 108-109; Tapaninen 2013, 50.)

Picture 5. Trailer being loaded in to ro-ro vessel by tow master (Finnlines 2015a).

One sub-method of ro-ro cargo handling is storo-method (Stowable ro-ro). In storo-method usage of vessels cargo capacity is much more efficient than in normal ro-ro-method. In storo-method cargo is towed in to vessel with roll trailers, where cargo is stowed and lashed tightly on vessels deck, using forklift or some other machinery. Empty roll trailers are transported back from the ship during voyage. Storo method is slower than ro-ro, but during long voyages, storo is more profitable, because vessels cargo space is used much more efficiently. (Karhunen ym. 2004, 204; Pöllänen ym. 2005, 109; Tapaninen 2013, 50.)

Capacity of ro-ro vessel is announced in lane meters. This indicates total length of vessels cargo decks. Width of one lane is 2,5 – 3,0 meters. Speed of typical ro-ro-vessel varies between 16 – 22 knots and length of vessel varies between 120 – 240 meters. RoPAX (Roro and passenger) is also one type of ro-ro vessel. RoPAX vessels became more general at the end of 1990's and they transport passengers and normal ro-ro cargo. Typical RoPAX vessel can take 200 – 800 passengers and 10 000 – 20 000 tons of cargo and they are 120 - 190 meters long. RoPAX vessels speed varies between 17 – 28 knots, so they are little faster

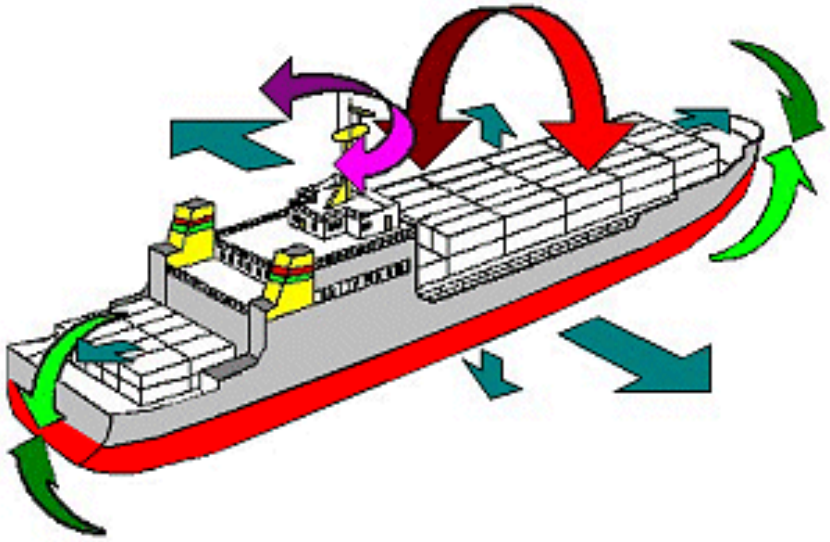
than normal ro-ro vessels. RoPAX vessels does not offer any entertainment facilities on board, like cruise ships does. Picture 6 shows cross cutting of normal ro-ro-vessel. (Karhunen ym. 2004, 197-204; Logistiikan maailma 2015.)

Picture 6. Cross cut of normal ro-ro-vessel (Finnlines 2015b).

Loading of ro-ro-vessel is done by using vessels stern, bow or side ramp. Ramp and weather gate are watertight. In bigger ro-ro vessels there are several cargo decks and they are connected with ramps or elevators. Roll trailers and trailers are towed in to vessel with tow master, seen in picture 5. Combination vehicles are loaded by driver. Commonly used unitized cargo units are roll trailers, containers, trailers and vehicles. (Karhunen ym. 2004, 203-207; Pöllänen ym. 2005, 108; Tapaninen 2013, 97.)

2.2 Loading and vessel safety

When transporting cargo by sea, it is directed by different strengths and directional forces. Largest force directed to cargo comes from vessels transverse floating that is called rolling. Picture 7 illustrates forces that are generated every time vessel is moving. (Tuomala 2012, 64.)



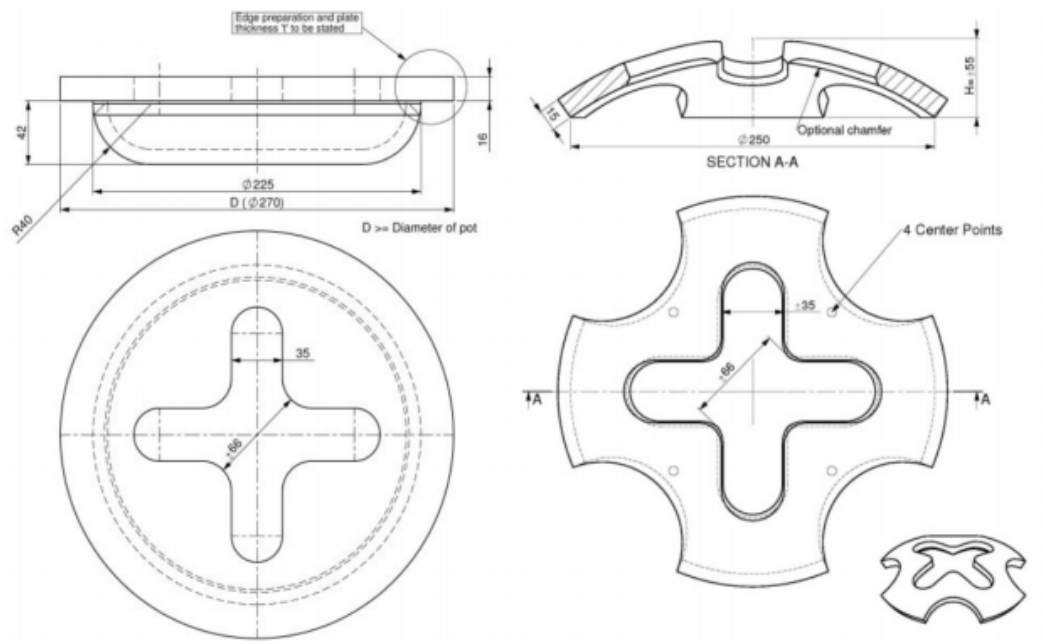
Picture 7. Directional movements of vessel (Container handbook 2016).

All cargo needs to be secured and lashed according to worst predicted circumstances. Vessels rolling angels can be tens of degrees depending maritime area, weather and vessel. All transportation units are lashed on to vessels deck from lashing points. Insufficient cargo securing may compromise vessel safety. Vessels deck officers may refuse to load inadequate transportation units according to maritime laws. Lashing requirements are determined in national maritime legislation. (Tuomala 2012, 53.)

Before vessel can be loaded, cargo space needs to be properly inspected. Cargo decks needs to be even and in order. Loading personnel needs to know what is cargo decks loading capacity (tn/m^2). In addition to this, cargo space must be applicable for the cargo and it needs to be clean and dry. There should not be any residues from previous cargo, e.g. oil. (Tuomala 2012, 45.)

Ro-ro cargo is loaded and unloaded by wheels, either by driving or with tow master. Normal ro-ro cargo is e.g. trailers, trucks, buses and cars. Other cargo, like containers and paper rolls can be loaded on roll trailers that are loaded with tow masters. Roll trailer is low loading platform that is equipped with wheels. Vehicles, trailers and roll trailers are loaded and lashed on to vessels deck with load straps

or chains from lashing points, and wheels are secured with chocks. Transportation units can be lashed on to vessels deck by using clover-shaped holes that are called “elephant foot”, seen in picture 8. (Tuomala 2012, 50-52; 75.)



Picture 8. Elephant foot lashing system (Tuomala 2012, 75).

Passenger cars and motorcycles needs to leave gear and parking brakes on. Camper cars must turn of the gas supply before entering the vessel. Loading is done by help and instructions of vessels deck hands. If vehicle has need for electricity, it can be attached on to vessels electrical system. 20-40 ton trailers are lashed on to vessels deck with four pairs of lashing points. In addition, trailer is laid on a trailer horse that is placed about 1,3 meters behind trailers king pin and wheels are secured with chocks. In low wave height area (LWHA) there are some reliefs in unit securing. For example, FinnLink traffic allows only two securing points per side of transportation unit. (Tuomala 2012, 51-54; FinnLink 2016, 7.)

Vessel safety

Vessel safety is regulated by SOLAS convention (International Convention for the Safety of Life at Sea) that was established in 1914, just after Titanic’s fatal accident. SOLAS is maintained by IMO (International Maritime Organization). Main

purpose of SOLAS convention is to improve vessel safety, like vessel structure and equipment like engines, electrical equipment, fire safety, rescue arrangements, navigational safety, crew training etc. SOLAS convention regulates also cargo securing. This means that vessels must have cargo-securing manuals, and all cargo must be secured according to IMOs Code of Safe Practice for Cargo Stowage and Securing. (Pöllänen ym. 2005, 54; Tapaninen 2013, 121; IMO 2016b.)

2.3 Liner shipping

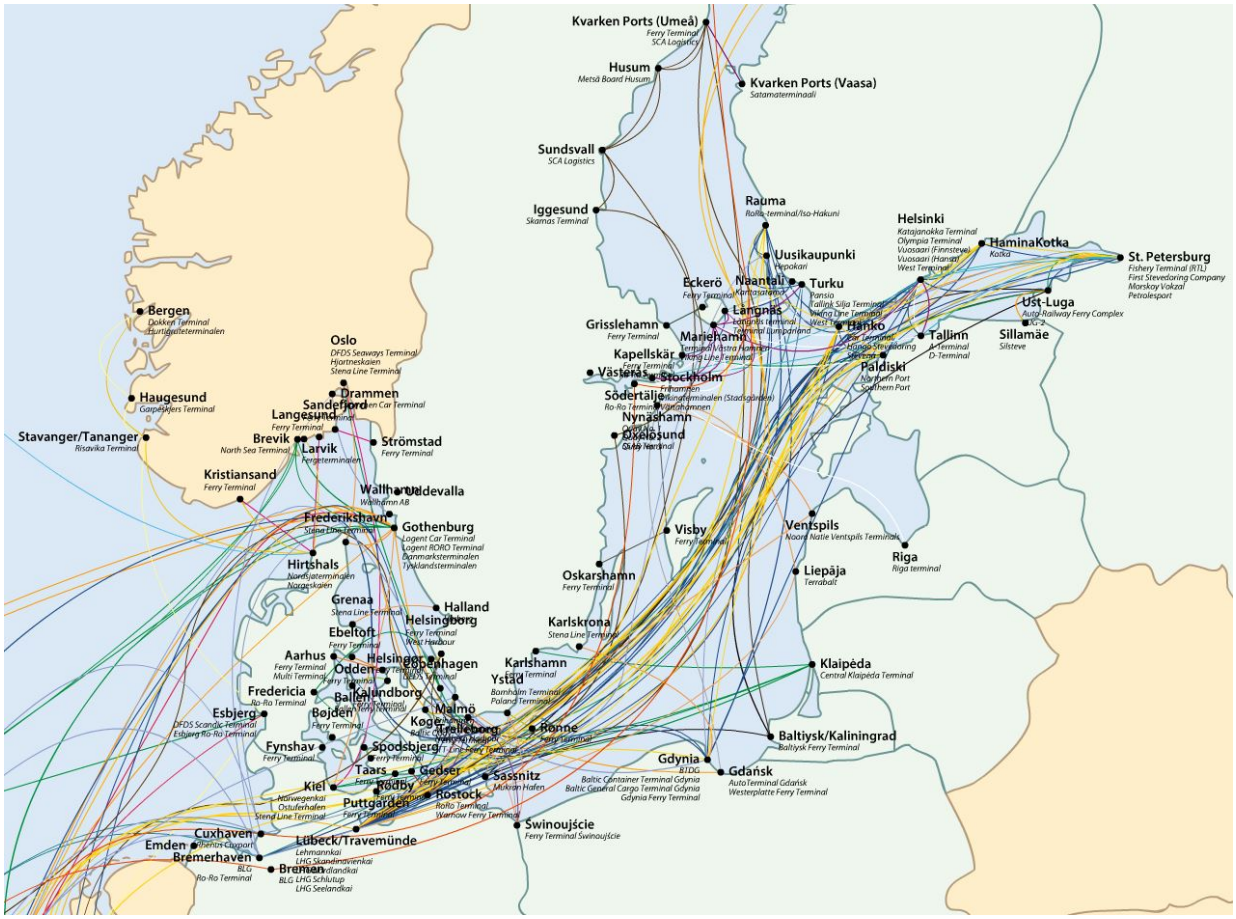
In liner shipping pre-defined vessels are sailing on pre-defined route with schedule. Line is serviced with strict or directional schedules. When running with strict schedules vessels arrival and departure times can be estimated within an hour, or within few minutes. This service is commonly ran between two ports. In case when running with directional schedules there are several ports of loading and ports of discharges, and all of these ports may not be visited. Schedule is known within a few days or a week. (Pöllänen ym. 2005, 117.)

Typical vessel used in liner shipping, transports cargo and passengers. These vessels are known as passenger ships, or RoPAX-vessels (Ro-ro and Passenger). If vessel carries more than 12 passengers, it is classified as a passenger ship according to SOLAS convention (Safety of life at sea). Picture 9 shows typical RoPAX-vessel. These vessels transports passengers, vehicles, trucks, trailer units, containers and trains. (Pöllänen ym. 2003, 104.; Pöllänen ym. 2005, 54; Private statement 09.03.2016; IMO 2016a.)

Picture 9. Typical RoPAX-vessel (Finnlines 2015c).

Vessels cargo space is available for all customers to book. Party that is in need for transportation service, places a booking request for cargo space by contacting shipping company, or the agent defined by shipping company. Vessels will depart either the vessel is fully booked, or not. (Pöllänen ym. 2005, 117.)

There are approximately 117 passenger-car ferries in the Baltic Sea area, with average gross tonnage of 27 147, and 61 ro-ro vessels with average of 21 630 gross tonnage. Gross tonnage figures vessels total capacity. It is used e.g. in determining maritime payments etc. This is total of 178 vessels sailing in 110 different liner services. Picture 10 shows Baltic Sea area and different liner services from different vessel operators. There are 35 operators in Baltic Sea area; 22 operators are providing ferry services and 15 operators are providing ro-ro services. DFDS Seaways, Finnlines, Tallink/Silja and TT-line are providing both passenger services and ro-ro services. (Karhunen ym. 2004, 195; Baltic ro-ro & Ferry yearbook 2013, 14-24.)



Picture 10. Baltic Sea area with different lines (Baltic transport journal 2016).

Travel times in Baltic Sea area varies between Scandlines' Øresund crossing, that takes only 20 minutes, to Finnlines' TransRussiaExpress' 60 hours voyage. There are 71 Baltic ports in 21 different locations that are handling ro-ro and RoPAX vessels. Baltic Sea area has two main ro-ro lanes that are between Germany – Sweden and Germany – Finland. (Baltic ro-ro & Ferry yearbook 2013, 21-29.)

2.4 Naantali-Kapellskär route

Naantali is located just 15 kilometers from Turku. Port of Naantali handles bulk- and unitized cargo. The amount of unitized cargo is one third of overall cargo transported from Naantali. Over a half of all unitized cargo traffic between Finland and Sweden is transported via Naantali, which makes it the biggest and one of

the most important unitized cargo ports in Finland. FinnLink traffic is operating liner service between Naantali and Kapellskär with 2-3 clipper-class RoPAX vessels, with average of 2 200 lane meters per ship. Service runs via Långnäs in Åland, which makes tax free sales possible onboard. Picture 11 shows liner service map between Naantali and Kapellskär. (Pöyskö ym. 2015, 12;33.; Naantalin kaupunki 2016; Port of Naantali 2016; Finnlines 2016d.)

Picture 11. Liner service between Naantali-Kapellskär (Finnlines 2016e. Simplified).

General cargo and unitized cargo amounts are steadily increasing through 2000-2010. Port of Naantali is exporting and importing more cargo, than its closest neighbor, Turku. Estimates for Naantali shows increasing cargo amounts. Table 2 shows import and export amounts between four different lines, in time period 1.1-31.1.2016. (Lappalainen. 2013, 17-18; Liikennevirasto 2015a, 17.)

Table 2. Import and export numbers between four different lines, 1.1-31.1.2016 (Liikennevirasto 2016).

	Import				Export			
	Trailer	Truck	PAX car	Buses	Trailer	Truck	PAX car	Buses
Naantali-Kapellskär	177	4091	207	0	177	3286	283	0
Helsinki-Stockholm	503	738	2272	44	610	833	2813	41
Turku-Stockholm	713	3253	5213	70	656	3216	6064	67
Vaasa-Holmsun	0	293	701	7	0	400	797	7

In year 2015 import amount in Naantali was 51 316 trucks and 1 659 trailer units. Export amount was 50 685 trucks and 2 491 trailer units. (Liikennevirasto 2016.)

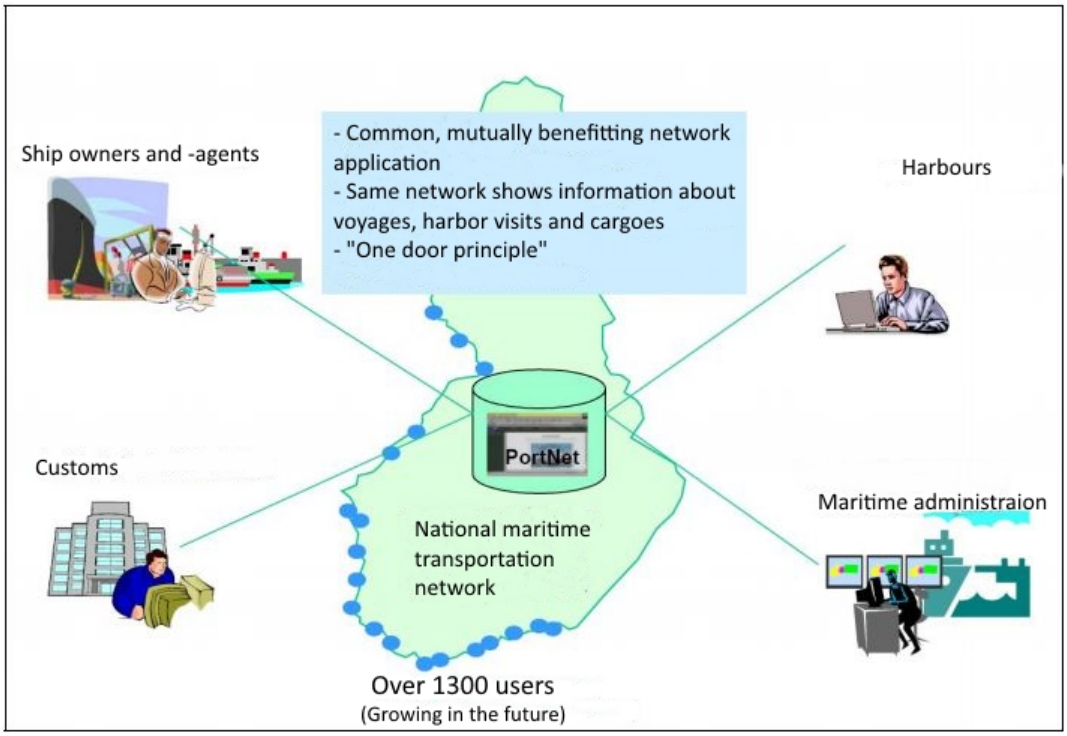
3 PORTNET

Portnet is database for harbour traffic, where following information is inputted from all harbour visits in Finland either in web or as (UN/)EDIFACT (the United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport) -announcement.:

- Vessel information
- Cargo manifest
- Hazardous cargo manifest
- Vessels waste announcement or permit of exception

(Posti ym. 2010, 37-39; Liikennevirasto 2015b; UNECE 2016.)

Portnet benefits its stakeholders with e.g. financial benefits, like working hour savings, increase of profitability, equalized procedures, automatisation of procedures, decrease of information errors etc. The core of portent consists of sharing maritime information between vessels representative, customs, harbour and maritime authorities. Picture 12 illustrates the basic concept of portnet. (Posti ym. 2010, 37-41.)



Picture 12. Basic concept of Portnet (Posti ym. 2010, 38. Translated in English).

Main users for portnet are shipbrokers, custom authorities, harbours, maritime authorities, coastal guard and forwarding operators. (Posti ym. 2010, 38.)

During the first arrival or embarkation to or from Finland, vessels operator, agent or master must provide following registration information to Portnet: name of the vessel, call sign, IMO number of the vessel, vessels nationality and vessels net and gross tonnage. (Tulli 2016.)

Arrival notification

When vessel arrives in any Finnish harbour or in place of anchoring, vessels representative must make notification of arrival that includes information required by fairway due legislation and information considering time of arrival. Vessels representative must confirm given information. Arrival information must be given 24 hours prior to vessels arrival. If voyage is less than 24 hours, notification of arrival must be given when vessel departs from previous harbour. In case when port of arrival is unknown or it has changed during the voyage, notification of arrival must

be given as soon as it is available. Vessel arrival must be verified within 2 hours. (Tulli 2016.)

Arrival notification includes following information, notifications and manifests: general information, fairway due notification, vessels security notification, vessel and cargo waste notification, hazardous material notification, crew and passenger lists and manifest considering vessels warehouse and crews belongings. (Tulli 2016.)

General information includes e.g.: vessel information (Vessel name, initial and IMO number (if given)), port of arrival, previous port of loading, next port of arrival, information about is vessel loading and/or discharging, harbour location, cargo information etc. (Tulli 2016.)

Departure notification

When vessel departs from any Finnish port or place of anchoring, vessels representative must give and confirm notification of departure. Departure notification includes information about is vessel loading, preliminary cargo information and estimated time of departure. This information can be given with arrival notification. Departure notification also includes information about hazardous material and crew and passenger lists. Actual time of departure must be given in Portnet within 2 hours of departure. (Tulli 2016.)

4 INTERNATIONAL MARITIME DANGEROUS GOODS CODE (IMDG)

This chapter goes through International Maritime Dangerous Goods Code (IMDG) thoroughly, because it is important to acknowledge it, and because it goes through the whole FinnLink process from cargo booking to invoicing and because FinnLink transports by far the most dangerous goods between Finland and Sweden. Besides this, knowledge considering IMDG in crucial for the vessel safety. It is also essential, that all parties involved in any phase of transportation chain understands the essentialness and importance of IMDG; what information consignor needs to declare and why and what needs to be taken in to consideration when shipping dangerous goods by sea. This is the key for safe dangerous goods transportation from all the way from consignor to consignee. These regulations benefits only when all involved parties understands the relevance of these regulations, and operates according to these. (Dangerous Goods Management Finland Oy 2008, 2; Private statement 09.03.2016.)

It is also important to understand IMDG code, because it regulates the amount of passengers that vessel can take and what kind of dangerous goods can be loaded on board, and where. The maximum amount of passengers is defined from vessels overall length. IMDG code states, that vessel can take 25 passengers or 1 passenger / 3 meters of overall vessels length. Greater number is directive. Baltic Sea memorandum of understanding (chapter 4.3) sets passenger amount by 1 passenger / 1 meter of overall vessels length. Number of passengers defines what kinds of dangerous goods can be loaded on to vessel. This information can be seen from stowage tables, shown in table 3. (Dangerous Goods Management Finland Oy 2008, 22-23; Private statement 09.03.2016.)

Table 3. Part of stowage table for m/s Finnclipper (Private statement 09.03.2016).

Finnlines
a Grimaldi Group company

FinnLink Naantali-Långnäs-Kapellskär

FINNCLIPPER PASSENGER SHIP, **maximum 188 passengers**

according Memorandum of Understanding for the Transport of Packaged Dangerous Goods on Ro-Ro Ships in the Baltic Sea

Finnclipper departures
Naantali at 21:45 and Kapellskär at 09:15

Class	Deck 1, 3 och 5	Deck 7 ON DECK
1.1 – 1.6	X	X*
1.4S	P	P
2.1	X	P
2.2	P	P
2.3	X	P

Table 3 shows IMDG classification of dangerous goods, and vessels decks. X stands for not allowed and P stands for Permitted. This table shows that m/s Finnclipper can take maximum of 188 passengers, so she can load certain dangerous goods in certain way. This is because m/s Finnclipper is 188.3 meter long vessel. If the amount of 188 passengers is exceeded, there are restrictions for IMDG classes 2, 5 and 8. Stowage tables for maximum 188 passengers and over 188 passengers are visible in appendix 4. (Finnlines 2016d; Private statement 09.03.2016.)

In the year 2012, 16 Finnish harbours handled dangerous goods according to Portnet analysis. Total amount was approximately 820 000 tonnes, of which exports accounted 53% and imports 47%. Biggest amount of packaged dangerous goods transported was class 3 flammable liquids that accounted for 31% (255 666 tonnes). The next most transported was class 9 miscellaneous dangerous substances and articles accounted for 25% (204 327 tonnes). Class 8 corrosive substances accounted 23% (186 542 tonnes). (Posti ym. 2013, 10.)

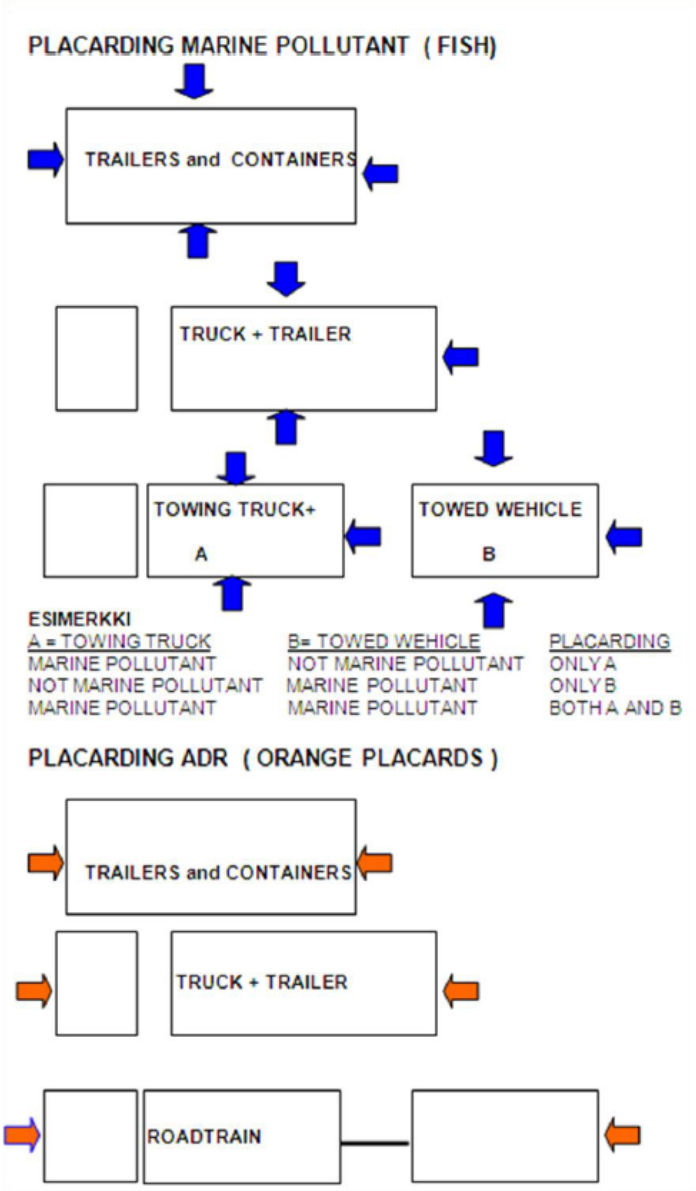
Ro-ro vessels transported about 52% (424 449 tonnes) of total amount of packaged dangerous goods from and to Finnish ports in year 2012. Passenger car ferries transported 27% (217 075 tonnes) and container ships 14% (111 193

tonnes). The rest were transported with different bulk vessels. (Posti ym. 2013, 13.)

According to transportation unit, containers accounted for 41% (336 955 tonnes) of all packaged dangerous goods transported from and to Finnish ports in year 2012. Mostly used container was twenty-foot equivalent unit (TEU). 33% (271 558 tonnes) were transported in trucks and vans, 16% (132 520 tonnes) in trailer units. The rest were transported in unknown transportation units.(Posti ym. 2013, 13-14.)

4.1 Dangerous Goods

Dangerous goods are substances that can be solid, liquid or gas and they can be hazardous towards environment, humans, property or other organic beings. These goods are e.g. radioactive, oxidizing, toxic and easily flammable or exploding goods. These hazardous substances are used in e.g. industrial processing of different goods, like paper and pharmaceutical goods. Dangerous goods are transported either as bulk or packaged in containers, trailers or tanks. If transportation unit is loaded with dangerous goods or marine pollutant goods, it needs to be marked properly. Picture 13 shows how transportation units should be marked. (Tapaninen. 2013, 114; FinnLink 2016 8-9.)



Picture 13. Placarding regulations (FinnLink 2016, 9).

Dangerous goods are categorized in different ways. IMDG-classification (International Maritime Dangerous Goods Code) is used with packaged part shipments. IMDG is almost the same as ADR (The European Agreement on the International Carriage of Dangerous Goods by Road) in road transport or RID (The International Order for the Carriage of Dangerous Goods by Rail) in railway transportation. There are only some minor differences. IMDG defines e.g., how different dangerous substances are to be loaded on to vessel. (Tapaninen 2013, 115; Dangerous Goods Management Finland Oy 2014, 2.)

4.2 IMDG code classes

Purpose of IMDG code is to divide dangerous goods in to nine different classes, where each substance is divided according to its characteristics and properties. Table 4 shows the IMDG classes and their names. (IMO 2016.)

Table 4. IMDG class table (IMO 2016c).

IMDG Class	Name
1	Explosives
1.1	Mass explosion hazard
1.2	Projection hazard but not a mass explosion hazard
1.3	Fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard
1.4	No Significant hazard
1.5	Very intensive substances which have a mass explosion hazard
1.6	Extremely insensitive articles which do not have a mass explosion hazard
2	Gases
3	Flammable solids
4	Flammable solids
4.1	Flammable solids, self-reactive substances and desensitized explosives
4.2	Substances liable to spontaneous combustion
4.3	Substances in contact with water, emit flammable gases
5	Oxidizing substances and organic peroxides
5.1	Oxidizing substances
5.2	Organic peroxides
6	Toxic and infectious substances
6.1	Toxic substances
6.2	Infectious substances
7	Radioactive substances
8	Corrosive substances
9	Misc. Dangerous substances and articles

Every time dangerous goods are transported in a vessel, IMDG-code, issued by International Maritime Organization (IMO), must be obeyed. Exception for IMDG usage is so called Baltic Sea Memorandum of Understanding (MoU). (Dangerous Goods Management Finland Oy 2008, 2-3.)

4.3 Baltic Sea Memorandum of Understanding

Baltic Sea Memorandum of Understanding (MoU) is valid only in area of the Baltic Sea and its border goes through Skagen to Lysekil. The main point of Baltic Sea MoU is to apply ADR and RID specifications with IMDG code onboard ro-ro vessels in Baltic Sea area. This means that tasks considering about packaging, marking, documenting and loading of dangerous goods is made easier. From shipping company's perspective, this means reliefs e.g. in unit stowing and segregation. These relieves can be exploited best in low wave height area (LWHA), because certain rules of Baltic Sea MoU apply only to LWHA area. This requires that shipping company has approval from seafaring authorities, proper vessel inspection and staff training for ADR/RID applying. Staff must also recognize IMDG code. Unit segregation rules can be seen in table 5. 1 = "Away from", 2 = "Separated from", 3 = "Separated by a complete compartment or hold from", 4 = "Separated longitudinally by an intervening complete compartment or hold from", x = "The segregation, if any, is shown in the Dangerous Goods list.

Table 5. IMDG segregation table (Environmental resource center 2016).

CLASS		1.1 1.2 1.5	1.3 1.6	1.4	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
Explosives	1.1, 1.2, 1.5	*	*	*	4	2	2	4	4	4	4	4	4	2	4	2	4	X
Explosives	1.3, 1.6	*	*	*	4	2	2	4	3	3	4	4	4	2	4	2	2	X
Explosives	1.4	*	*	*	2	1	1	2	2	2	2	2	2	X	4	2	2	X
Flammable gases	2.1	4	4	2	X	X	X	2	1	2	X	2	2	X	4	2	1	X
Non-toxic, non-flammable gases	2.2	2	2	1	X	X	X	1	X	1	X	X	1	X	2	1	X	X
Toxic gases	2.3	2	2	1	X	X	X	2	X	2	X	X	2	X	2	1	X	X
Flammable liquids	3	4	4	2	2	1	2	X	X	2	1	2	2	X	3	2	X	X
Flammable solids (including self-reactive substances and solid desensitized explosives)	4.1	4	3	2	1	X	X	X	X	1	X	1	2	X	3	2	1	X
Substances liable to spontaneous combustion	4.2	4	3	2	2	1	2	2	1	X	1	2	2	1	3	2	1	X
Substances which, in contact with water, emit flammable gases	4.3	4	4	2	X	X	X	1	X	1	X	2	2	X	2	2	1	X
Oxidizing substances (agents)	5.1	4	4	2	2	X	X	2	1	2	2	X	2	1	3	1	2	X
Organic peroxides	5.2	4	4	2	2	1	2	2	2	2	2	2	X	1	3	2	2	X
Toxic substances	6.1	2	2	X	X	X	X	X	X	1	X	1	1	X	1	X	X	X
Infectious substances	6.2	4	4	4	4	2	2	3	3	3	2	3	3	1	X	3	3	X
Radioactive material	7	2	2	2	2	1	1	2	2	2	2	1	2	X	3	X	2	X
Corrosive substances	8	4	2	2	1	X	X	X	1	1	1	2	2	X	3	2	X	X
Miscellaneous dangerous substances and articles	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Low Wave Height Area is area, where wave height doesn't exceed 2,3 meters, more than 10 % in a year. In LWHA area, segregation levels 1 – 2 are not applied in transportation units internal, or the separate segregation. Map of Baltic Sea MoU/LWHA is in appendix 1. (Dangerous Goods Management Finland Oy 2008, 4-26; Dangerous Goods Management Finland Oy 2014, 3.)

4.4 Transportation classification of dangerous goods

The variety of dangerous goods is big and it involves lots of different substances and goods with great amount of dangerous features. This is the reason why classification system is created to separate different goods. These classification systems are based on the following:

- Goods that are in the same classification, has familiar dangerous features
- Goods can be only in one classification
- Possible sideline dangers

- Classification is always made according to the most dangerous feature of substance
  (Dangerous Goods Management Finland Oy 2008, 9.)

4.5 UN numbers and packaging groups

UN number is worldwide known system, which helps to identify dangerous goods all around the world. UN number is four-digit code. For example, “UN 1230” tells that this substance is methanol. (Dangerous Goods Management Finland Oy 2008, 9)

Classification of dangerous substances describes only the grade of danger. This is the reason why almost all dangerous goods transported with vessels, are sorted in packaging groups (PG) that describes the degree of danger:

- PG I Highly dangerous goods
- PG II Middle-dangerous goods
- PG III Low level dangerous goods

Packaging group classification is not used in IMDG classes 1, 2, (4.1), 5.2, 6.2 and 7. (Dangerous Goods Management Finland Oy 2008, 9)

When shipping of dangerous goods is committed by following IMDG regulations, shipping operators can ensure that vessel and passenger safety is guaranteed. This requires that all personnel have proper training for IMDG and ADR/RID regulations.

4.6 Multimodal Dangerous Goods Form

Multimodal dangerous goods form is a transportation document that must be filled in correct order. When declaring dangerous goods, basic content is, in the following order;

- UN-number

- Proper shipping name
- Classification and possible division
- Packaging group (if substance has one)

These four points must be filled in the order, mentioned above, e.g:

UN 1779, FORMIC ACID, CLASS 8, PG II

In addition, depending on the substance, following information may be required: net weight (explosives), flashpoint, if substance is hazardous for ocean “Marine pollutant” information must be presented, if transportation unit is empty, but it is not cleaned “Empty Uncleaned” need to be presented. If transporting community waste, “WASTE” must be declared. Some substances in classes 4.1 and 5.2 monitoring and alarm temperatures must be announced, or when transporting salvation equipment’s, “Salvage packaging” needs to be announced.

Shipper needs to confirm multimodal dangerous goods form with his or hers vouch and signature, that all announced information is correct. (Dangerous Goods Management Finland Oy 2008, 19.)

5 QUALITY

5.1 Quality management

The basis of quality management comes from Japan and it is based on practical experiment. The basic idea in Japanese quality management model was to explore how different techniques and principals can be implemented in organizations operations. One of these principals was customer-oriented approach that aimed to react quickly on customers needs. Quality is a factor that pleases customers and it can be implemented in organizations, by creating error preventive processes. Customer needs must be taken into account all the way up in organizations administration. Quality management is based on facts, measured information and customers need. (Silén 1998, 38-39; Lecklin 2002, 69-70.)

Quality management is operating model that aims to build quality-emphasizing and quality-engaged organization. The main goal is to build quality containing operation processes that allows error and fault-free operations. This model aims to short lead times that in turn, speeds up the organization operations. Whole organization should pledge in quality management model. One way to achieve this, is to see all people in organization as one big social entity. This allows organization to examine how different people experiences different parts and phenomenon inside the organization. (Silén 1998, 51; Ritvanen ym. 2001, 150.)

5.2 Six elements of quality management

Quality management can be divided in to six basic elements that are: basic values, vision, mission, strategy, strategic quality goals and quality politics. Organizations basic values are beliefs and principals that gives guidelines for all organizations actions. Vision is organizations own image of the future. Common vision goes 10-15 years from the present. Good vision is inspirational and motivational and it creates faith in organizations future. Mission defines organizations goal(s) and it gives answer to such questions as: “Why this organization exists?” or “Who

are our customers?". Strategy gives organizational frame that helps organization to achieve its mission. Strategy answers such questions as: "What is the core knowledge?" or "What are the success factors?". (Lecklin 2002, 37-41.)

Strategic quality goals defines requirements and goals for products, services and actions. Strategic quality goals are measured by pre-defined and agreed measurements that includes financial goals. Quality politics communicates organizations basic values that transforms in to actions. Quality politics is, according to ISO 9000 –standard, the highest politics set by management, that applies in to customers needs and requirements. This means that organization needs to pledge in fulfilling the requirements and in to continuous improvements. Quality politics also sets the framework for setting the quality goals. (Lecklin 2002, 42-43.)

5.3 Quality management system and ISO 9000

Quality management system is one of many management systems that aims for quality. Most known quality management systems are ISO 9000 and EFQM (European Foundation for Quality Management). This thesis will focus on ISO 9000 and ISO 9001 –standards, because they are relevant for this thesis principal. (Moisio ym. 2001, 10; Ritvanen ym. 2011, 53; Pesonen 2007, 50.)

ISO 9000 contains the basic principles and vocabulary of the standard. They are based on commonly known principles and methods. (Suomen standardoimisliitto 2016a, 21). ISO 9001 includes clear demands for operations. These demands helps organizations to increase customer satisfaction and they encourages organizations towards process relative management. ISO emphasizes for understanding and fulfilling requirements, process performance and its recognition through results and continuous improvement through measurements. (Silén 1998, 17; Suomen standardoimisliitto 2016a, 31; Pesonen 2007, 74,-75.)

ISO 9001 –standard aims to clarifying quality management with the help of process model and it emphasizes customers needs and demands. Customer needs to be basis of process. The result of process should be evaluated and measured

by customer satisfactory. ISO 9001 requires responsibility of organizations highest management. Visible quality management, future oriented operations and continuous improvement must be visible in organizations operations. Standard – like process model emphasizes for resource management, personnel improvement, infrastructure and improvement in work community. (Lecklin 2002, 341; Pesonen 2007, 75.)

ISO 9001 places four main demands for organizations:

1. Operations must be specified and documented for some parts
2. Operation needs to be according specifications and they are documented with pre-defined basis
3. Efficiency of operations provides information; There are measurements and results
4. Operations are guided and improved with results

All these four main demands must be documented. (Pesonen 2007, 81.)

ISO 9001:2015 is the newest standard by ISO and it was released September 23 2015. There are some major improvements for the old standard. New release emphasizes e.g. politics and strategy of quality management systems must be implemented as a solid part of organizations business strategy, management must be committed and take part in quality managements, risk oriented approach must be the basis of decision making and the basis for the standard is process oriented. (Suomen standardoimisliitto 2016b.)

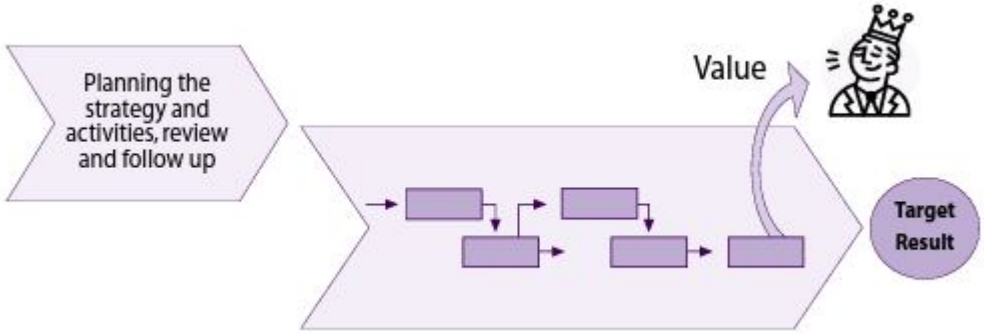
5.4 Quality measurement

Measurement is requirement for operations improvement. Measurement helps organization to determine has it met the goals or if not, to analyze why not. The amount and character of measurements are variable. Quality measurements needs to be strategy oriented. In addition of financial measurements, there should be customer, process, and personnel improvement measurements. (Nygren ym. 2011, 44.)

In the field of logistics, measurement is statistical, where measurement is settled with quality in relation to organizations own, or customers goals. Targeted quality levels needs to be agreed between companies and parties operating in the supply chain and measurements and key figures must be clearly specified. One good measurement describing supply chain efficiency is reliability of deliveries. Bad reliability is directly connected with customer satisfaction. (Nygren ym. 45-46.)

6 PROCESS THINKING

Any change, improvement or action can be perceived as a process. Business process is a process that concentrates on organizations actions. Good and functioning process begins from customer and ends in customer. Process consists mainly from actions, resources and artifacts, where performance is attached. In addition, feedback and its exploitation is important part of the process. The basic belief in process thinking is that value to the customer is created by chain of events that can be called as process. Picture 14 shows the basic idea in value oriented process thinking. (Laamanen 2001, 19; Laamanen & Tinnilä 2009, 121; 52.)



Picture 14. Value oriented basic process (Laamanen & Tinnilä 2009, 52).

Process begins with the idea, that there are something continual that can be easily modelled and developed and it can be agreed. Good example of process is manufacturing industry, where process consists of product flow inspection. In this example processes can be procurement, manufacturing, testing, warehousing and delivery. This is because they are clear and subsequent processes and they can be easily modelled as a supply chain that ends in a satisfied customer. (Laamanen 2001, 19-22; Laamanen & Tinnilä. 2009, 121.)

6.1 Process management

The basic idea of process management is that when organization creates enough value to the customer, in relation to costs, there are possibility for financial success. Process management itself means strategy-based renewal of core processes that leads to increasing of organizations performance. In process management, organizations guidance and organizing is done based on core processes. These core processes can be e.g. customer management or supply chain improvement. However, process management itself is not process definition or description, but they are requirements for process management. (Kinkki & Isokangas 2002, 300; Virtanen & Wennberg 2007, 113; Laamanen & Tinnilä 2009, 10.)

Process management is operation management from strategic point of view. This should be visible in process management, process descriptions and process naming. Prerequisite for process management is that organizations strategic goals are clear enough. Organizations mission, vision and strategic goals and requirements sets requirements for the processes that guides the identification and specification of processes. (Virtanen & Wennberg 2007, 114.)

Process management is the key for organization to be successful in the future. There are some basic practices that are included in process management. One practice is that organization needs to fulfill customers needs comprehensively. Organization also needs to have focus on continuous improvement. There are also need to improve quality and lead times as well as minimization of expenses. Organizations management should view the whole organization as one refinement chain that has solid and advanced collaboration between different processes, where information is divided without any barriers. (Kinkki & Isokangas 2002, 300-301.)

6.2 Process identification

First point when identifying processes is to have understanding about organizations goals and objectives. In order to start identifying processes, core processes needs to be clearly identified. The beginning of process identification is to understand core processes, but the basis for all processes should be customer. (Virtanen & Wennberg 2007, 116-118.)

Process should always begin from customer and end in to customer. That is the main point. Second point when identifying processes is, that besides the customer, processes begins from planning and ends in evaluation. This allows continuous improvement of processes. Third point is to classify the wanted process: Is it product, service, customer, main, core, supporting, key or management process. Organizations field of business defines the process, more or less. Is the wanted process product development process or customer service process? Besides these, organizations supporting processes needs to be defined, because they create conditions for effective operations. Supporting processes can be e.g. HR or IT support. (Laamanen 2001, 58-58; Virtanen & Wennberg 2007, 116-119.)

When wanted processes are identified, they need to be named. Correctly named processes helps to understand the goals, purposes or results of the operation. In addition, processes needs to be described in pre-defined level as a clear process map. Good process map contains about 15-20 process. (Laamanen 2001, 58-64.)

6.3 Process description

Process description is one way to model, understand, analyze and develop organizations operations. It also functions as a tool of communication. Good process description includes critical elements of wanted processes and it describes associations between different actions. It is also a tool for understanding the whole picture of organization and it helps achieving wanted goals. In addition,

good description is short, understandable and logical and it is made according to agreed frame. (Laamanen 2001, 75-76; Laamanen & Tinnilä 2009, 123-124.)

There are six good points that needs to be considered when creating process descriptions. These six steps are: 1. coverage, 2. customer needs and their requirements, 3. objective, 4. feeds, products and services, 5. process flow chart, 6. responsibilities. (Laamanen 2001, 89-94.)

Coverage

First step is to determine where wanted process is applied, and where it begins and where it ends. This determination gives a clear picture about what is being described. Coverage can be related to products, customers or actions. It is crucial that starting and ending points of process is determined, and they should be identical with the process map, that is to be done later. (Laamanen 2001, 89.)

Customer needs and their requirements

Second step is to determine processes customers and interest groups, and how they use processes products and what kind of requirements they set for the product or service. The simplest way to determine who is the customer, is to determine customer as the receiving party of the final product. (Laamanen 2001, 89-90.)

Objective

Third step is to determine objective, or the purpose for the process. At this point processes success factors and measurements needs to be also determined. Process objective determination can be approached from the organization strategic point of view. One example of explicit objective can be organizations cost leadership. (Laamanen 2001, 90-91.)

Feeds, products and services

Fourth step determines feeds, products and customers of the process. This step may be the easiest way to start process planning, because products and services may be easy to understand. When products and services are understood, it is usually easy to determine the customers and their needs. It is crucial to clearly

construe organizations products so that the main idea about products or services does not drift away. (Laamanen 2001, 91-92.)

Process flow chart

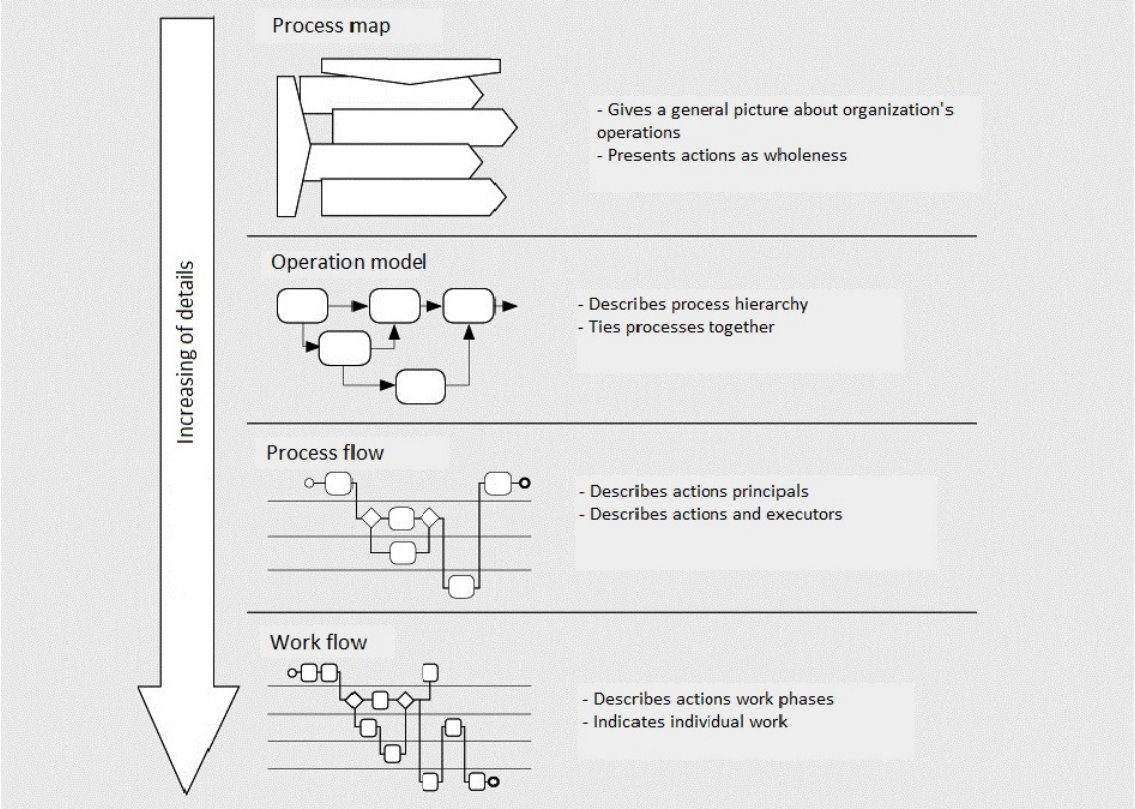
The fifth step is best to start when we have determined confining, purpose, customers, requirements, products and core performance of the process. With this information, it is easy to demonstrate critical elements of process that are important to model in process flow chart. Good process flow chart is clearly built and it is short enough. (Laamanen 2001, 92.)

Responsibilities

Sixth step determines processes central roles and related task and responsibilities. In addition to this, it is also advisable to determine main rules of the process. Purpose of this step is to describe, in verbal level, all the actions in the process so the peoples involved has understanding about their own roles. (Laamanen 2001, 93-94.)

6.4 Levels of process descriptions

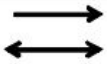
When creating process description, the basis is to know in what level description is wanted and for what purpose. Process description should only provide the necessary and relevant information, such as resources used in process, personnel and methods. Descriptions can be made in different levels, where the details varies. There are four different levels that are process map, operation model, process flow and work flow. Picture 15 shows these four different levels. (Laamanen & Tinnilä 2009, 123-124; JHS 2015, 6.)



Picture 15. Process description levels (JHS 2015, 6. Translated in English).

It is not always necessary to present processes in all four levels. This means that levels can be consolidated or presented in particular level. Accuracy and details of description increases, when moving from the top towards the bottom of the table, presented in picture 15. (JHS 2015, 6.)

Process description charts has variety of different ways to announce activities etc. OMG (Object Management Group) has announced BPMN-notification (Business Process Modeling Notation) that gives suggestions for symbols used in different charts. Symbols in picture 16 are recommended in process flow –level. (JHS 2015, 10-11.)

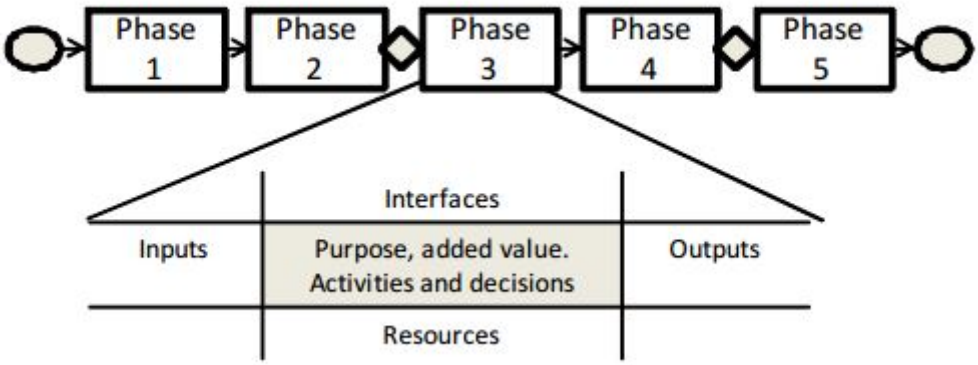
Symbol	Meaning
	Start or finish
	Activity or process
	Material or information flow (can be shown with different line colors/styles)
	Decision point
	Document
	Information system/data storage
	Inventory
	Data
	Delay

Picture 16. Process description key symbols (Martinsuo & Blomqvist 2010, 15).

Decision point is used when there is need for decision in process. Decision point is provided with question that can be answered with simple “yes” or “no”. Process divides in different directions, according to the answer. Material or information flow shows actions execution order with solid line, where arrow shows actions movement direction. (JHS 2015, 11-12.)

6.4.1 Process map-level

Process map level describes organizations operations and it is the highest level of process description levels. It presents the big picture of organization and its function is to present the whole organization as one whole process. This level does not describe associations and boundaries between different processes. Process map-level describes the most important core and supporting processes. Core processes describes organizations goals and the ways to achieve these goals. Picture 17 shows one way to make a rough process map-level description, where all relevant information is illustrated in a simple way. (JHS 2015, 7.)



Picture 17. Rough process map level description (Martinsuo & Blomqvist 2010, 13).

When creating process map, the following points needs to be taken in to consideration: organizational structure, guiding processes, core processes, supporting processes, information providers and determined customers. The main idea for process map –level is to understand the whole picture of operations. It also functions as a tool for external communications and tool for decision making. (JHS 2015, 7.)

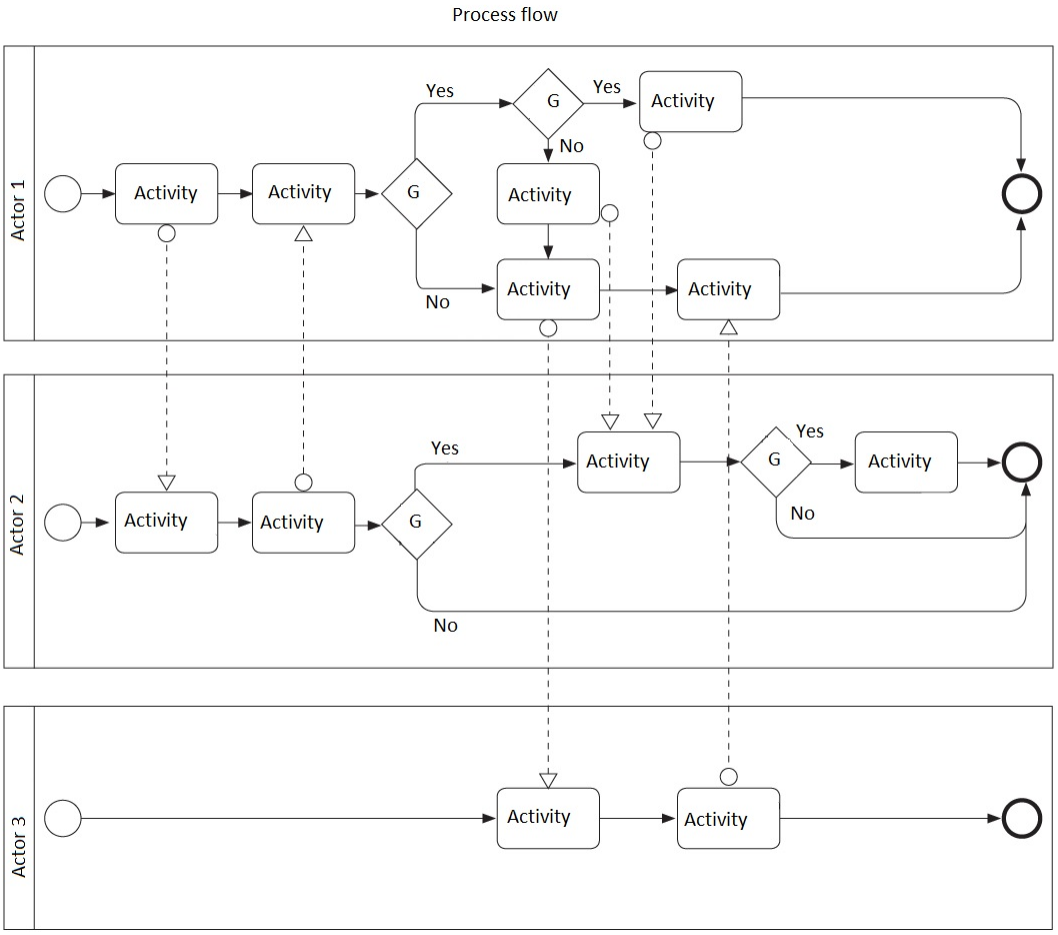
6.4.2 Operation model-level

In operation model level organizations operations are described more closely than in process map level. This level describes processes as sub-processes, where owners, target values and indicators are defined. In addition, this level presents associations between processes, interactions and process boundaries towards other environments. (JHS 2015, 7-8.)

In operation model description sub-processes are named and numbered and ownerships and responsibilities of processes are determined. This level also determines targeted values, measurements and success factors. Besides this, operation model –level description illustrates interactions and connections between sub-processes, working environment, customers and background systems. (JHS 2015, 8.)

6.4.3 Process flow-level

In this level, operations are described more closely, than in operation model – level. Process flow level describes the phases, actions and corresponding actors of operations. This is ideal level to bring up current problems of present operations. Processes and sub-processes are divided in to actions, tasks, sub-tasks and operations according to pre-defined accuracy. According to this, resources can be attached in description. Picture 18 shows an example of process flow map.



Picture 18. Process flow chart (JHS 2015, 9. Translated in English and simplified).

Sub-processes, actions, tasks, inputs and their purpose is described in process flow level. Interactions between sub-processes and services are described, and

processes, sub-processes and actions are numbered hierarchically, or in some other distinct level. (JHS 2015, 8-9.)

6.4.4 Work flow-level

In work flow-level, actions and operations are described with more accuracy than in process flow-level. This level describes operations guided tasks and interactions between tasks, by numbering actions, tasks, sub-tasks and operations hierarchically. This level describes task boundaries according to pre-defined customers, interest groups and background systems. Purpose is to describe actions, tasks, sub-tasks and operations feeds and information and their final results.

This level can be used when there is need to improve particular process or to produce working instructions for process. In this kind of a case, it is crucial to present connections between different tasks, contents and their movements on detailed level. On this level, process is described step-by-step. (JHS2015, 9-10.)

These four levels, mentioned above, are only one way to describe processes. It is possible to combine all these four levels and construct a mixed-type process description level. Process map, operation model, process flow and work flow levels are good guidelines, but they can be mixed.

6.5 Process measurement

Prerequisite for process guidance and management is process measurement. Processes outputs, inputs and process performance are good examples of what can be measured. Measurement can be calculated value, perception or result of inspection. They can be economical and non-economical, strategic, tactic and operative as well external and internal measurements. Primary goal for measurement system is to advance process guidance and continuous improvement. (Lecklin 2002, 170; Pesonen 2007, 154; Martinsuo & Blomqvist 2010, 22; Ritvanen ym. 2011, 101.)

In order to get correct measurement results, measurement tools needs to be in order. The main principal is that measurement tools must be monitored and calibrated so the needed measurement accuracy can be achieved and maintained. In addition for technical measurement tools there are certain requirements for reliability and accuracy of other measurements. Good requirements for process measurement can be:

- Reliability
- Unambiguity
- Understandability and accessibility
- Fairness
- Inexpensiveness
- Fastness
- Essentialness (Lecklin 2002, 171-173.)

Good measurement is clear and there are no ambiguity. There cannot be too many measurements, only few that describes essential and important elements of process. Measurement usage needs to be inexpensive. Good measurement is also future oriented. Good amount of measurements are 2 – 5 pcs/process, but this varies between companies, industries and goals. (Lecklin 2002, 173; Pesonen 2007, 186; Ritvanen ym. 2011, 103-104.)

7 PROCESS DESCRIPTION EXECUTION

Assignment for this thesis was given in November 2015 by FinnLink traffic. The idea was to create comprehensive process description for FinnLink traffic and possibly for NordöLink, in Malmö, that is used when applying for new ISO 9001 standard. This process description is written in English, as required by employer. Therefore thesis worker decided to write whole thesis in English, so the thesis and it appendices would be equal.

Data for process description was collected using qualitative research method. Basically this means that thesis worker was introduced to different phases of process by following and doing the work itself. Most of the work phases were introduced for thesis worker during 8 months of service in FinnLink traffic. Besides of following and doing the work, open inquiries was used without any pre-defined basis. These inquiries was used to deepen the idea about different phases of the processes.

Process descriptions content

FinnLink traffic provided the layout and the wanted level for process description. Process description was made by using given power point template. Because there are no previous process descriptions for FinnLink traffic, it was decided that first process description should be made in the first level of process description, “the process map level”. This was because FinnLink did not want to have too exact process description; this is to be done later.

Process description itself contains process scope, success factors, process data and interfaces to related processes, process map for whole process, individual process descriptions for each area of processes, supporting processes, responsibilities and process follow ups / KPIs (Key Performance Indicator). Gatlas-system is repeated several times in process description. Gatlas is ERP (Enterprise Resource Planning) system that handles all the information considering the day-to-day shipping operations.

Process scope page tells the idea about the process description. It defines what the description is for and who the customers of the process are. Process scope page also lists five objectives for the process that are:

1. To enable fast, reliable, service oriented and accurate handling for all customers shipments
2. Delivering correct invoices, on time, to ensure optimal financial outcome
3. Efficient vessel capacity control and utilization of port operations
4. Sales support
5. Ensuring profitability of the services

Success Factors page lists all the critical elements that are included in FinnLink traffic that ensures the level of customer services in different areas of operations. These areas are general management, booking, check in & traffic guidance and invoicing.

Process data and interfaces to related processes page shows parties and actions that are related to each other. Process begins from input and its related parties, goes through all processes and their contribution parties to output and its utilizators.

Process description pages begins with process map that describes the whole process from targeted handling times to financial profitability. This gives the idea of the whole process. Besides this, all parts of process are described in their own levels. These processes are booking, check-in, loading and invoicing.

Supporting processes page shows all supporting parties that constructs the whole process. These supporting processes are i.e. IT, Line management, HR, Port operations etc.

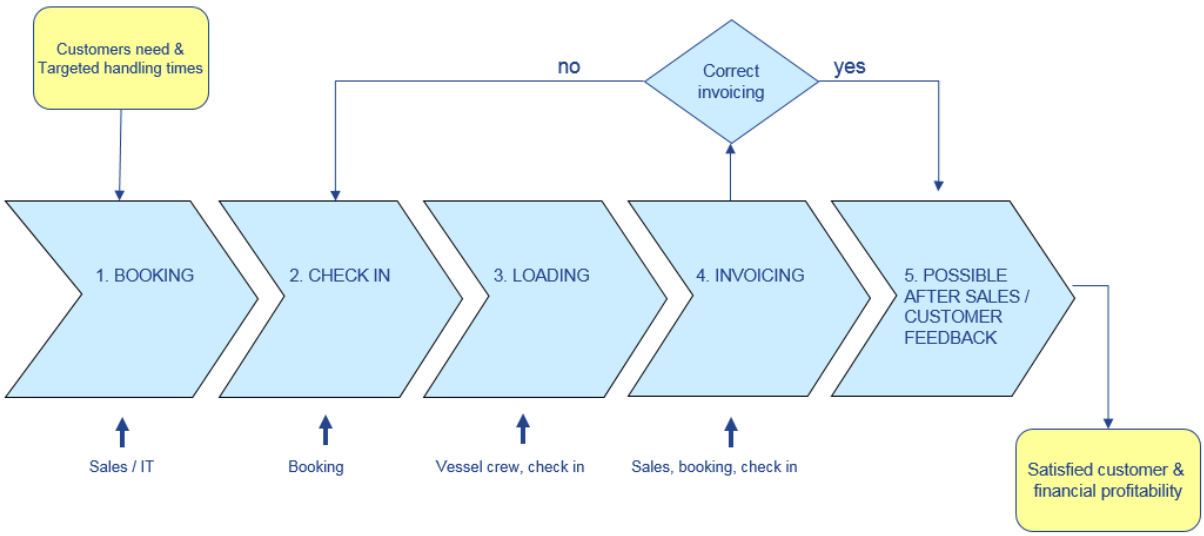
Process responsibilities page lists briefly the main responsibilities for booking, check-in, traffic guidance (loading) and invoicing.

Process follow-up / KPIs lists briefly how this process is followed up by management. It indicates different ways from different perspectives; Customer perspective, process perspective, financial perspective and development perspective.

The whole process description contains 13 slides and it is in appendix 2. Chapter 8 contains detailed explanation about process description from cargo booking to invoicing.

8 PROCESS DESCRIPTION FROM CARGO BOOKING TO INVOICING

According to given process description template, first thing was to define the whole process itself. In this case, the whole process covers all sub-processes from booking to invoicing. There are five different sub-processes. Picture 19 illustrates the process map of the whole process from targeted handling times to financial profitability.



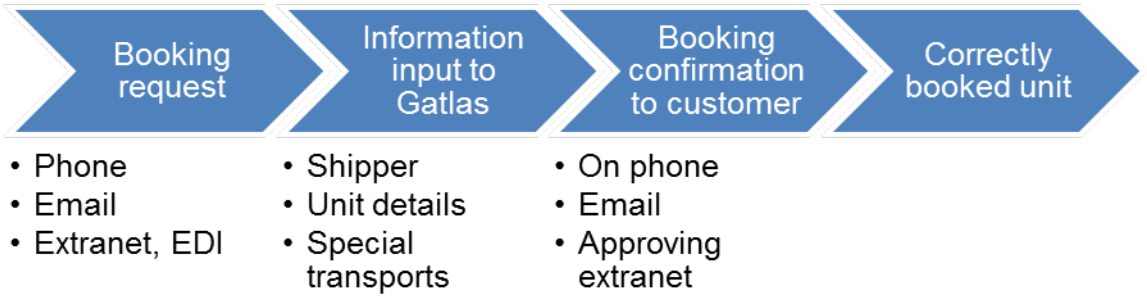
Picture 19. Customer service to invoicing, process map.

The whole process begins from customers need & targeted handling times, given by management. First part of the process is the booking. The booking receives and handles customers booking requests. Second part is check-in. In this part, customers transportation units are checked-in for the departure and all documents etc. are handled. Third phase is loading phase. This includes all port operations, like discharging, vessel loading, traffic controlling etc. Fourth phase is invoicing. Invoicing is almost the end of process, where invoices are sent to customers, and if needed, dunning is made. Fifth phase is non-visible part of the process. In this part, after sales and customer feedback is handled. This is for

ensuring customers satisfaction for the provided service. This whole process culminates in satisfied customer & financial profitability.

8.1 Cargo booking

Cargo booking is the first phase of the whole process. It begins with customers booking request, after that the wanted information is inputted in to Gatlas-system. In the third phase of booking process, customer receives booking confirmation and the result is correctly booked unit. Picture 20 illustrates the whole booking process.



Picture 20. Cargo booking process map.

Customer has few options how to place cargo booking; It can be made by phone, email or using extranet. Extranet is a service for customers where they can place booking request with computer, and wanted information is automatically transferred in to Gatlas-system. When booking request is received by booking personnel, information is inputted in to Gatlas. When placing a booking, customer must provide shipper information and all the unit details. These details are freight payer, unit length, registration number, number of drivers, need for electric connection, waste booking or if unit is oversized.

If unit has dangerous goods customer must provide correctly filled multimodal declaration form and/or form for dangerous goods booking. These forms can be found from FinnLink Traffics home page. Appendix 3 shows how dangerous

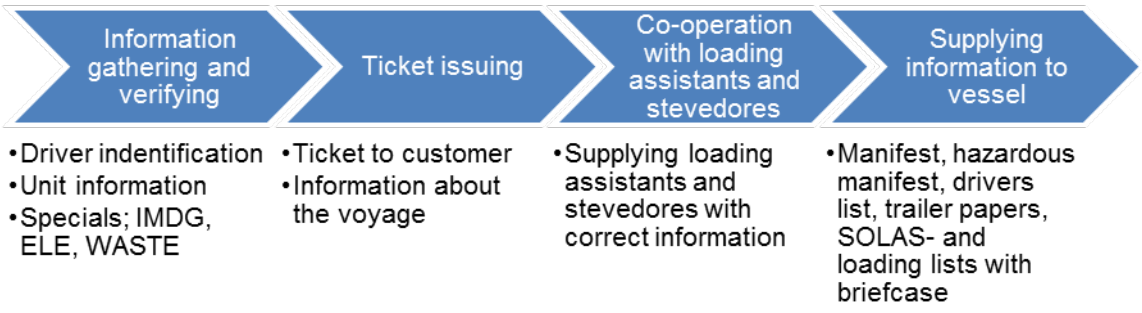
goods must be declared in multimodal dangerous goods form, according to Dangerous Goods Management Finland. In case of oversized unit, booking personnel needs to have approval from vessels chief officer or master.

When all correct information is inputted in to Gatlas, booking confirmation is sent to customer. This is done via phone at the end of booking request, by email or by approving the extranet alert. Result of this booking process is correctly booked unit.

Besides just handling the booking requests, booking personnel also constantly monitors vessels capacity, and makes sure that vessels are not over booked. Cargo booking personnel in Finland handles only bookings from Finland to Sweden and Åland.

8.2 Check-in

Check-in is the second phase of the process. Besides the check-in work itself, check-in is supporting party for cargo booking. Check-in personnel also creates, confirms, modifies or cancels bookings, especially during evenings and weekends. Check-in also provides customers with Finnlines Driver's card that can be applied by customers. Picture 21 shows process map of check-in.



Picture 21. Check-in process map.

First part of the check-in process is information gathering and verifying. These are driver identification from driver's license, passport or other identification method. Unit information, such as registration number and length is also verified.

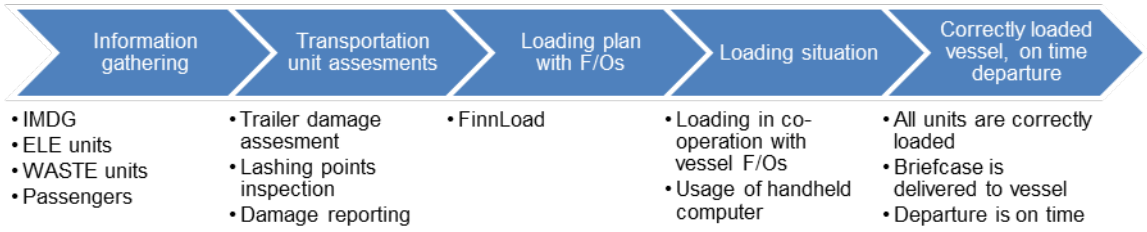
If unit is booked as dangerous goods, check-in personnel verifies that driver has all the needed documents and the information is correct. After this personnel must check what kind of dangerous goods are loaded, and should it be loaded on the weather deck, or can it be loaded in to inner decks. This is checked from stowage tables that can be seen in appendix 4. After all the information is verified, customer receives ticket, and unit is marked as checked-in.

Check-in personnel is in constant co-operation with loading assistants and stevedores, supplying correct and on time information about cargo. When voyage is closed, check-in personnel provides documentations about the cargo to vessel in a briefcase. These documents are cargo manifest, driver list and hazardous manifest. Passenger side check-in provides SOLAS-list, cabin manifest and passenger list.

After the departure, check-in sends information out to authorities, harbour and Portnet using Gatlas. Authority information’s are manifest out to authority and dangerous goods to authority. Besides this, customs receives driver list and Finnload list and harbour receives hazardous manifest. If vessel is loaded with dangerous goods, this information is sent to Kapellskär. Portnet is provided with previously mentioned manifests to authority. Besides this, check-in personnel confirms the actual time of departure and amount of transportation units and number of passengers and crew.

8.3 Loading

Loading personnel main task is to perform Ro-PAX vessels loading according to vessels first officers instructions and to make sure that vessels are loaded correctly. Loading process has five main points and picture 22 illustrates process map considering the loading process. Besides these five main points, loading personnel also handles all ships mail and deliveries from/to vessel.



Picture 22. Loading process map.

First phase of loading process is information gathering about the departure. Loading personnel gathers the following information:

- Total amount of cargo in meters
- Trailer information
- Hazardous material/WASTE information
- Amount of electric units
- Cargo to/from Långnäs
- Amount of passengers

This information is printed out from Gatlas-system and provided in to vessels chief officer and purser, when vessel arrives in port.

Second phase of loading process is transportation unit assessment. This means that when transportation unit, usually trailers, are left to port for loading, they are inspected for any damages and that they have proper lashing points. If personnel finds any shortages, like damages, damage reports are drafted and unit is photographed.

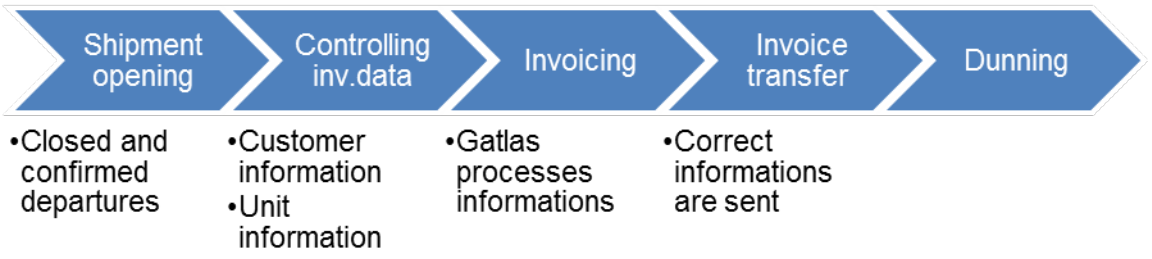
Third phase in loading process is loading planning with vessels first officers. Loading personnel provides updated information about the cargo, so first officers has the latest information available. Usually vessels crew checks updated information by their own from Gatlas. Loading personnel receives information about the loading, usually just for the first few units.

Fourth phase of loading process is the loading situation itself. Loading is done by constant co-operation between check-in personnel and vessels first officers. Usually vessels chief officer handles loading of decks 1 and 3, second officer handles loading of decks 5 and 7. Loading personnel uses handheld computer during the loading that has especially built in program from Leanware.

Fifth and final phase in loading process is correctly loaded vessel that departs on time. This means that all booked units are correctly loaded in to vessel, and ships mail, the briefcase, provided by check-in personnel is delivered to vessel.

8.4 Invoicing

Fourth part in this whole process description is invoicing. Besides creating and sending invoices, invoicing personnel handles new customer openings in to Gatlas-system, and creates special price agreements for customers. Invoicing personnel also calculates volume based bonuses to customers. Invoicing process has five steps and they are illustrated in picture 23.



Picture 23. Invoicing process.

First phase in invoicing begins with shipment opening. This requires that wanted departure is closed and confirmed by check-in personnel. Second part is controlling invoicing data. In this part invoicing personnel checks that customer and unit information are correct. If there are need for any corrections, invoicing personnel contacts with check-in or booking personnel if needed. Third phase in invoicing process begins when all customer and unit information are corrected. After this, Gatlas-system begins processing information. When all information is processed,

phase number four begins, with sending the correct information and invoices is transferred and sent to customers. Fifth and final part of invoicing process is dunning, if needed. Invoicing personnel controls all the payments and dunning activity.

9 FINAL CONCLUSIONS, SUMMARY AND SUGGESTIONS

Topic for this thesis was to build process description for FinnLink Traffic, and possibly for NordöLink all the way from cargo booking, check-in, traffic guidance and vessel loading to invoicing. Secondary goal for this thesis was to create a comprehensive information package about what elements are included in day-to-day operations in ro-ro shipping company.

Process description was built with pre-defined accuracy that was given from management. Agreed accuracy was to create description on process map-level, because it was the first ever built process description for FinnLink, so thesis employer did not want it to be too accurate. The reason why this process description was needed is because FinnLink is applying ISO 9001 –standard in near future. Process description was made in the late 2015, and it contains 13 pages. The whole process description is available to read in appendix 2.

Secondary goal, set by thesis worker, was to create package about what elements are included in day-to-day operations in ro-ro shipping company. This thesis goes through briefly Finnish maritime transportation markets, different vessel types and definition for liner shipping. Portnet is also explained, because it is mandatory to use in Finland. Thesis also undergoes briefly IMDG (International Maritime Goods Code), because it is visible in every single partial process in FinnLinks daily operations. Besides this, quality and process thinking was opened up, because they are relevant information when building process descriptions.

The final output was 13 pages of needed process description and also good glance in liner shipping world. In the future there might be demand for more close-up process description, if there are need to improve FinnLinks operations. At this point NordöLink in Malmö has not implemented this process description in their operations. This means that maybe in the near future NordöLink needs to implement this process description in their operations, with some minor changes. There are also work to do, when implementing written process description in to

organization, so all personnel would follow it, and senior management will acknowledge the quality management systems in their daily operations.

Suggestions

At the moment of completion of this thesis, there are no specified quality measurements. Process description mentions some key performance indicators in appendix 2, page 13, but these are not relevant when talking about quality measurement, excluding customer feedback statistics. This thesis suggests that before applying for ISO 9001 standard, FinnLink needs to implement new quality measurements, like reliability%, on time departures%, amount of complaints%, amount of satisfied customers%, job well-being%, non-attendance% and amount of false invoicing etc. The old measurement systems should be used with side of these new ones. These measurements needs to be done with continuous, constant phase. Some of the measurements should be measured on a monthly basis and they need to be written down.

Before applying for ISO 9001 standard, there is need for quality handbook for whole personnel in FinnLink traffic. This means that all requirements, guidelines and goals are written down, and whole personnel, on land and sea, acknowledges and commits with the new quality system. This handbook needs to be done by appropriate person who commits with quality system. This same person should also perform quality measurements. Quality handbook and measurements building are also great topics for a new thesis.

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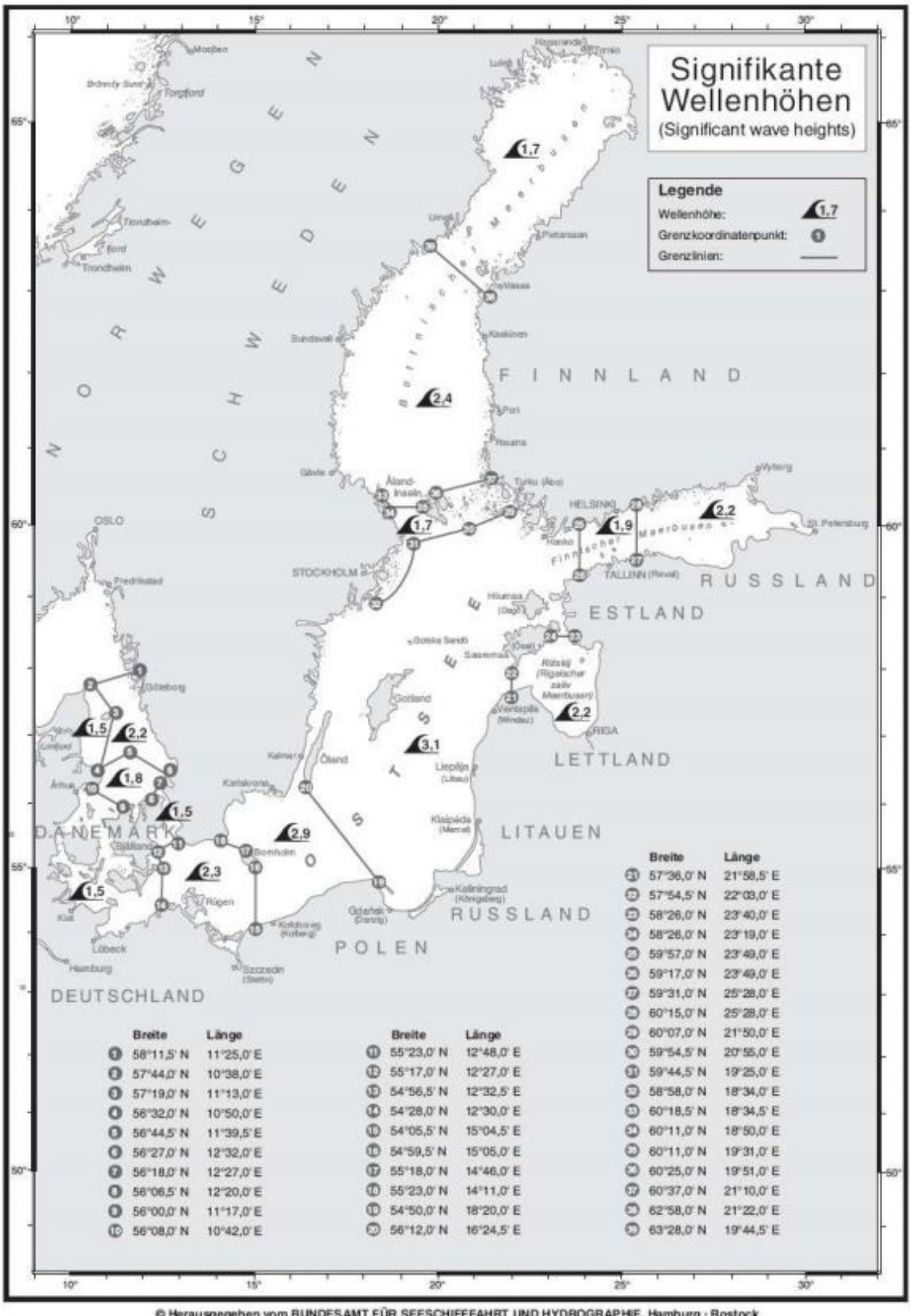
Map of Baltic Sea MoU/LWHA



Process description from customer service to invoicing

FinnLink Traffic /
Customer service to Invoicing

Finnlines
a Grimaldi Group company

Process Description

Freight Customer Service and Invoicing

Sami Vesala
Version 1.1
1.3.2016

Process Scope

Scope of the process

Process scope: Operational freight customer service from freight booking and unit shipping to receiving an invoice, on FinnLink Naantali-Kapellskär route

Customers of the process

1. Freight customers
2. Private customers
3. Truck drivers
4. Public customers

Objectives of the process

1. To enable fast, reliable, service oriented and accurate handling for all customers shipments.
2. Delivering correct invoices, on time, to ensure optimal financial outcome
3. Efficient vessel capacity control and utilization of port operations
4. Sales support
5. Ensuring profitability of the services

Finnlines
a Grimaldi Group company

Success Factors

Critical elements

General management activities

- Development of customer service concept to correspond to customers expectations, needs and perceptions within management guidelines – through follow up and case studies

Booking

- Professional sales and service oriented staff handling bookings
- Time efficient handling of the customer request
- Correct data on time
- Capacity control and monitoring
- Updated knowledge of Dangerous Goods legislation
- Handling of non conformities, e.g. schedule changes, delated departures

Check in and traffic guidance

- Service oriented and time efficient handling of the process
- Professional personnel with excellent problem solving capability, also under pressure

Invoicing

- Good knowledge of sales and operational process
- Time efficient handling of the process and customer requests
- Management guidelines

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Process data and interfaces to related processes

Input

- Customers need for service
- Operational and economical targets
- Sales agreements

Related parties and processes

<= Group management

Process phases

1. Booking
2. Check In
3. Loading
4. Invoicing
5. After sales / Customer feedback

Contribution by

Booking staff
Check in staff
Loading assistants and vessel crew
Invoicing staff
FinnLink staff

Output

- Satisfied customer
- Correctly shipped and invoiced customer unit
- Financial profitability

Utilized by

=> customers, freight market, legal entity

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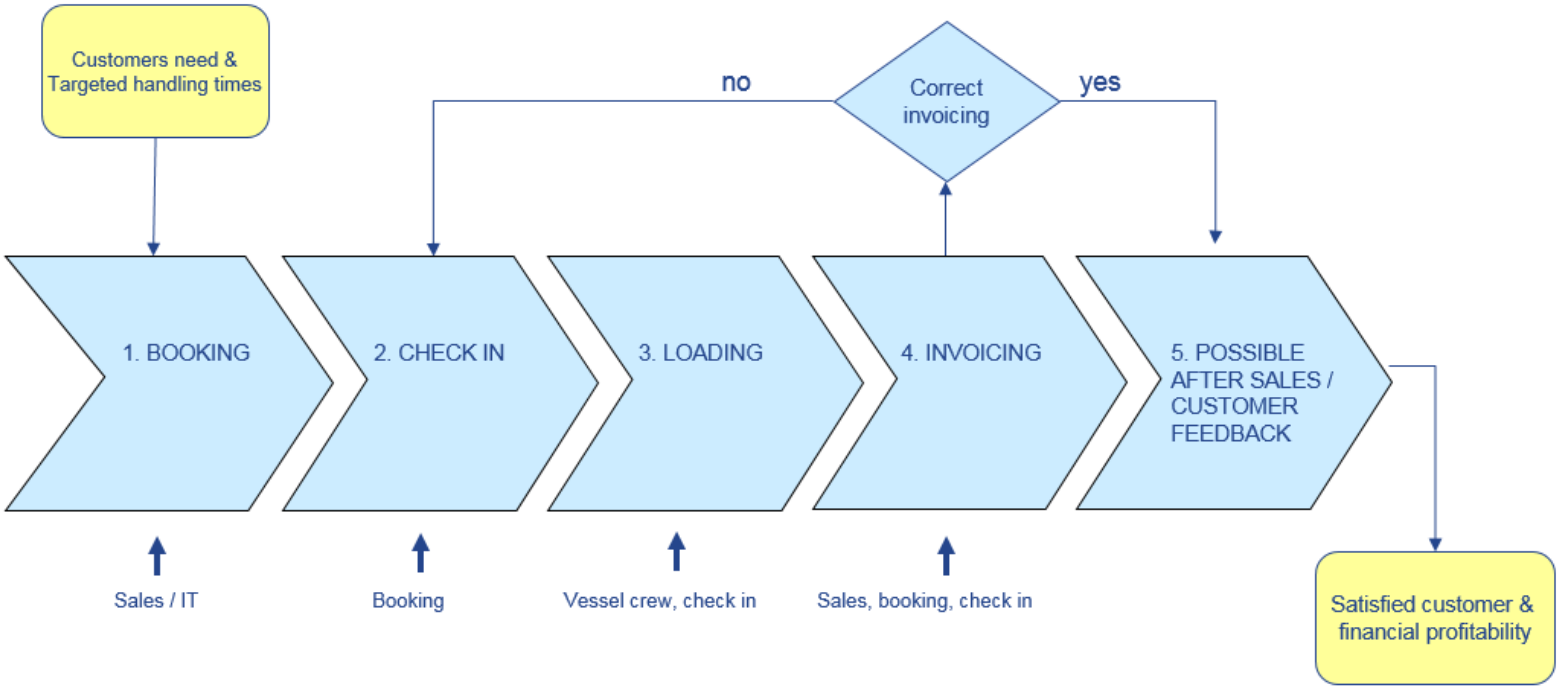
Customer Service to Invoicing, Process Map



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Booking

Cargo Booking

- New booking or allotment booking
- Information to Gatlas or approval of extranet alert. In case of special transportations, approval from vessel officers
- When booking information is correct, booking confirmation is sent to customer
- Creates, confirms, modifies or cancel bookings
- Capacity monitoring/utilization
- Payments over the phone with credit card or payments before departure
- Special transports, ele/imo bookings, waste bookings

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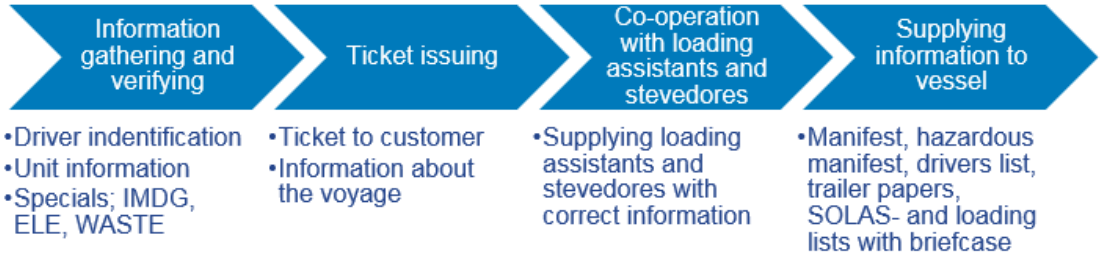
Check- in

Check- in

- Creates, confirms, modifies or cancel bookings
- Capacity monitoring
- Waiting list handling
- Providing Driver cards
- Payments over the phone with credit card or payments before departure
- Verification of the units and driver information
- After voyage closing documents to (manifest, drivers list, hazardous manifest, SOLAS- and loading lists) vessel officers
- Information out to authorities, harbour and Portnet.



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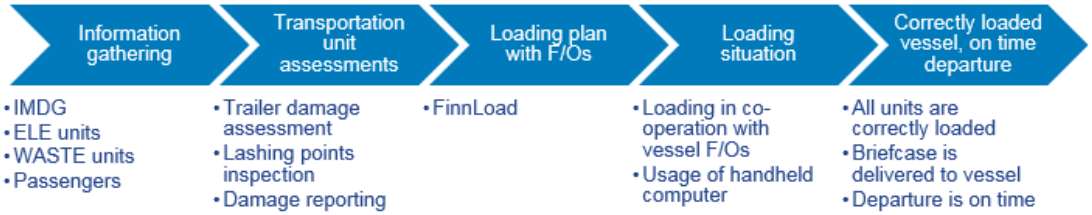
Loading

Vessel loading

- Loading assistant performs vessels loading according to vessels first officers instructions and makes sure that vessel is loaded correctly

- Ships mail and deliveries to/from vessel
- Trailer damage assessment
- Lashing points inspections
- Damage reporting



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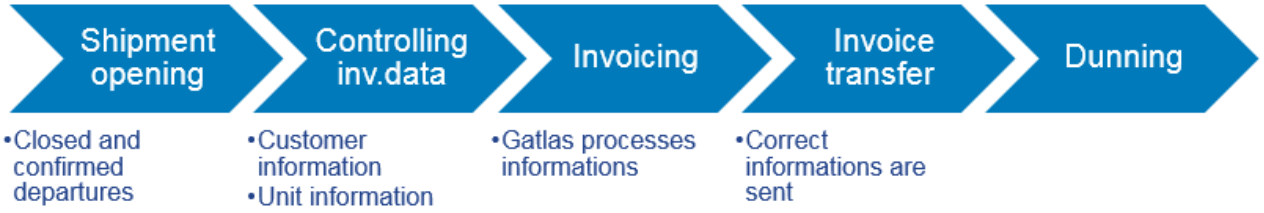
Invoicing

Invoicing

- Invoicing personnel opens new customers in Gatlas
- Invoicing and creating special price agreement for customers
- Invoicing process begins when departure is closed and confirmed
- Confirmed departures are opened and checked for if there are any corrections to be made, invoicing personnel contacts booking/check-in, if needed
- Controlling of payments and dunning activity
- Calculating volume based bonus to customers and making credit invoices in Fina
- Credit terms
- Corrections and unclear payment resolution



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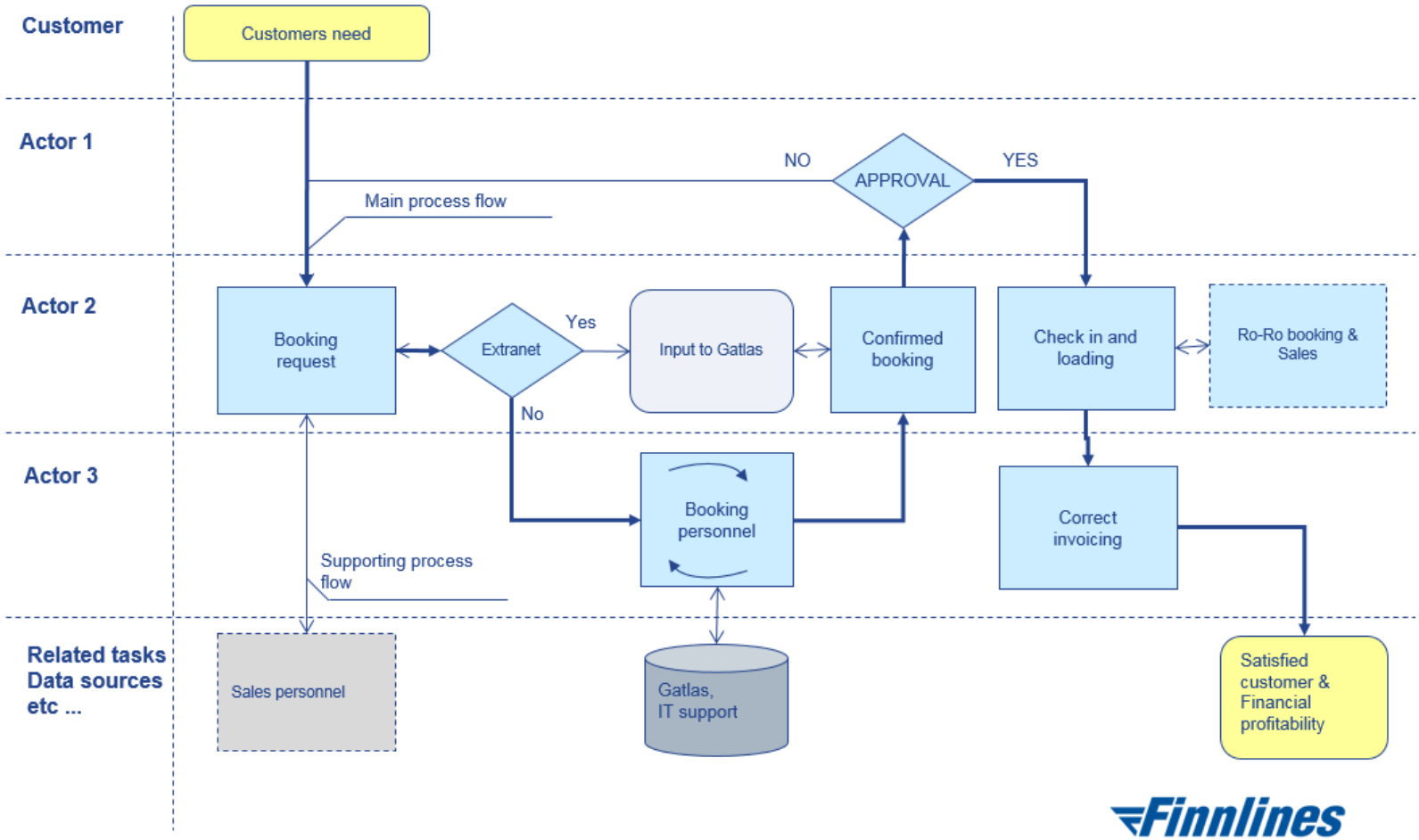
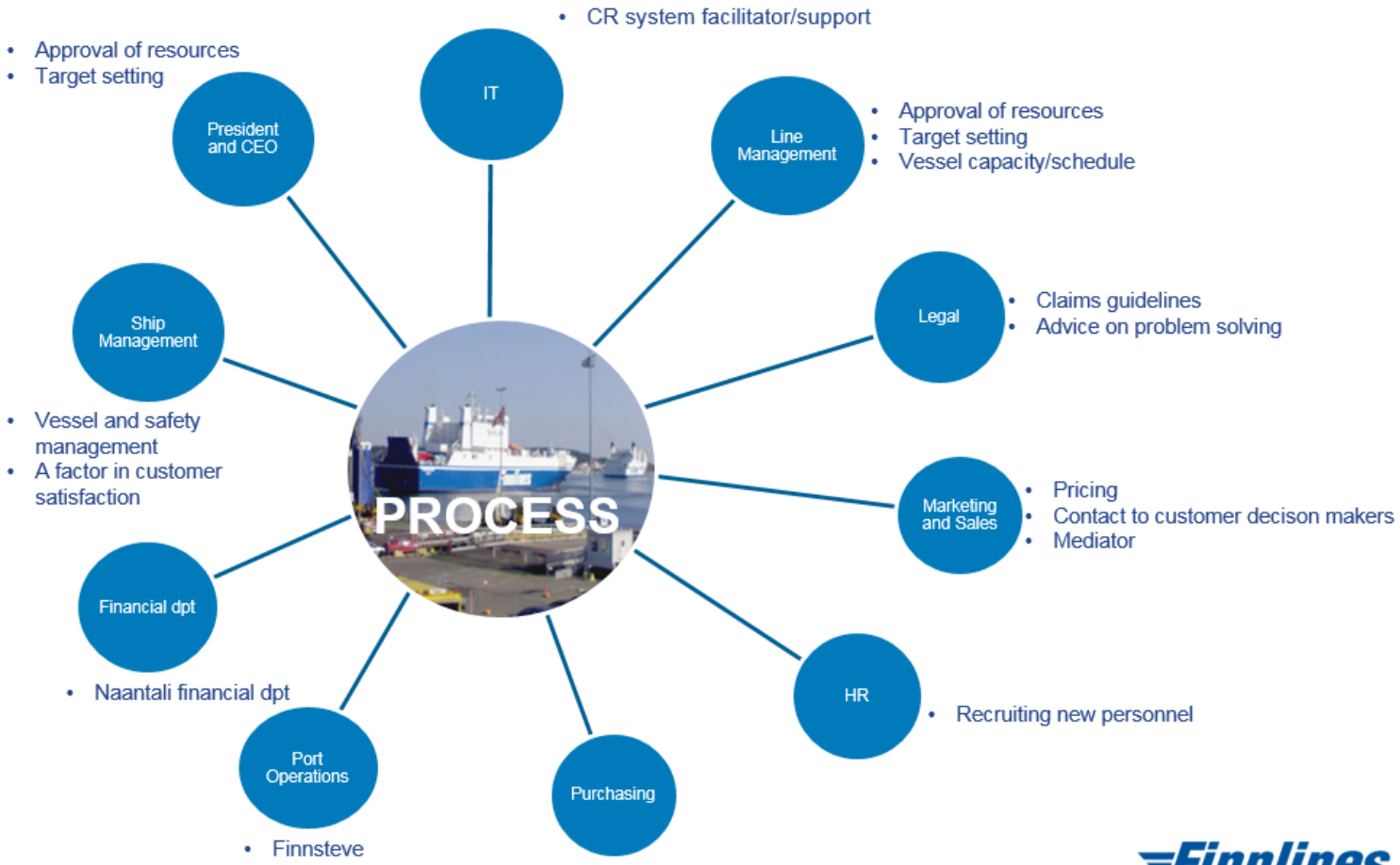
Customer Service to Invoicing, process flow



Customer Service / Invoicing Process, supporting processes



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Process responsibilities

Booking
- Handling of bookings
- Customer support: Extranet, Dangerous Goods related questions
- Problem solving
- Sales support
- Special transports

Check-In
- Check-in functionalities
- Voyage closing
- Reports to the authorities and vessels

Traffic guidance (Loading)
- Loading/discharge related port operations
- Deliveries
- Damage assessment
- Damage reports

Invoicing
- Invoicing
- Dunning
- Credit decisions
- Opening new customers in Gatlas
- Account receivables

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Process follow-up / KPIs

Customer perspective

- Customer feedback statistics
- Customer service process efficiency
- Freight invoice error rate
- Non-comformity reports and statistics

Process (efficiency or conformity) perspective

- Booking volume
- Non-comformities

Financial perspective

- Revenue

Development perspective

- Customer feedback and error situations in the operations are handled efficiently, systematically and transparently

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Multimodal Dangerous Goods Form

MULTIMODAL DANGEROUS GOODS FORM

This form may be used as a dangerous goods declaration as it meets the requirements of SOLAS 74, chapter regulation 4; MARPOL 73/78, Annex III, regulation 4.

1. Shipper/Consignor/ Sender Shippers information	2. Transport document number	
	3. Page 1 of 1 peges	4. Shipper's reference
		5 Freight forwarder's reference
6. Consignee Consignees information	7.Carrier (to be completed by the carrier) **SHIPPER'S DECLARATION** I hearby declare that the contents of this consignment are fully and accurately described below by the Proper Shipping Name, and are classified, packaged, marked and labelled/placarded and are in all respects in proper condition for transport according to the applicable International and national governmental regulations	
8. This shipment is within the limiations prescribed for: (delete non-applicable) ~~PASSENGER AND CARGO AIRCRAFT~~ ~~CARGO AIRCRAFT ONLY~~	9. Additional handling information	
10 Vessel/flight No. and date m/s Example	11. Port/place or loading Naantali	
12. Port/Place of discharge Kapellskär	13. Destination Stockholm	

14. Shipping marks	*Number and kind of package; description of goods	Gross mass(kg)	Net mass(kg)	Cube(m³)
IMDG/ADR General Requirements				
	UN 1992, FLAMMABLE LIQUID, TOXIC, N.O.S (toluene, methanol), CLASS 3(6.1), PG II, (12°C c.c), MARINE POLLUTANT, EmS: F-E, S-D 1 Plastic Drum	230 kg	200 L	
	UN 1830, SULPHURIC ACID, CLASS 8, PG II, EmS: F-A, S-B 5 Plastic jerricans	276 kg	150 L	

15. Container identification No/ vehicle registration No.	16. Seal number(s)	17. Container/ vehicle size & type	18. Tare mass (kg)	tss mass (including tare) (kg)
ABC-123				

20. CONTAINER/ VEHICLE PACKAGING CERTIFICATE I hearby declare that the goods described above have been packaged/ loaded into the container/ vehicle identified above in accordance with the applicable provisions **MUST BE COMPLETED AND SIGNED FOR ALL CONTAINER/VEHICLE LOADS BY PERSON RESPONSIBLE FOR PACKING/LOADING**	21. RECEIVING ORGANIZATION RECEIPT Received the above number of packages/ container/ trailers in apparent good order and condition, unless stated hereon: RECEIVING ORGANIZATION REMARDS.	
Name of company Senders company	Hauler's name Vechicle reg. No.	22. Name of company (of SHIPPER PREPARING THIS NOTE
Name/status of declarant Senders name	Signature and date	Name/status of declarant
Place and date Sender town, 01.01.2015		Place and date
Signature of declarant	Driver's Signature	Signature of declarant

DANGEROUS GOODS

* You must specify: Proper Shipping Name, hazard class, UN No. packing group, (where assigned) marine pollutant and observe the mandatory requirements under applicable national and international governmental regulation. For the purpose of the IMDG Code see, 5.4.1.4

*For the purpose of the IMDG Code. See 5.4.2

FinnLink IMDG stowage rules for m/s Finnclipper

Finnlines
a Grimaldi Group company

FinnLink Naantali-Långnäs-Kapellskär

FINNCLIPPER PASSENGER SHIP, **more than 188 passengers**

according Memorandum of Understanding for the Transport of Packaged Dangerous Goods on Ro-Ro Ships in the Baltic Sea **in effect 16.5.2015**

Class	Deck 1, 3 och 5	Deck 7 ON DECK
1.1 – 1.6	X	X*
1.4S	P	P
2.1	X	X*
2.2	P 3)	P 3)
2.3	X	X
3 PG I +II	X	P
3 PG III	P	P
4.1 **UN 1944 1945,2254,2663**	P	P
4.1 **Other**	X	P
4.2	X	P
4.3	X*	P 1)
5.1	X*	P
5.2	X	X
6.1 PG I+II	X	P
6.1 PG III	P	P
6.2	X*	X*
7	X*	X*
8 corrosive PG I+II	X	X*
8 liquids PG III	X*	P
8 **solids** PG III	P	P
9	P	P

P = PERMITTED
X = NOT ALLOWED
X* = if permitted under IMDG Code, those requirements may be applied (stowage categories A, B or C are acceptable. For class 1 neq max 10kg when compatibility group B, C, D, E or G. Class 6.2 and class 7 UN numbers 2908, 2909, 2910, 2911 and 3507 are acceptable by the Line's management approval)

1) The carriage of Aluminium ferrosilicon UN 1395, Aluminium silicon powder, uncoated UN 1398, Calcium silicide UN 1405 and Ferrosilicon UN 1408 when transported in bulk packagings,in containers, road vehicles or rail wagons, tank containers or demountable tanks is allowed only when accompanied by a certificate stating that the material was stored under cover, but in the open air, and that the particle size is representative of the material stored.
3) Refrigerated gases according ADR or according IMDG stowage category D are prohibited.

Finnlines Plc, FinnLink traffic, Satamatie 11, FIN21100 Naantali, Finland.

Finnlines
a Grimaldi Group company

FinnLink Naantali-Långnäs-Kapellskär

FINNCLIPPER

PASSENGER SHIP, **maximum 188 passengers**

according Memorandum of Understanding for the Transport of Packaged Dangerous Goods on Ro-Ro Ships in the Baltic Sea

Finnclipper departures
Naantali at 21:45 and Kapellskär at 09:15

Class	Deck 1, 3 och 5	Deck 7 ON DECK
1.1 – 1.6	X	X*
1.4S	P	P
2.1	X	P
2.2	P	P
2.3	X	P
3 PG I +II	X	P
3 PG III	P	P
4.1 UN 1944 1945,2254,2663	P	P
4.1 Other	X	P
4.2	X	P
4.3	X*	P 1)
5.1	P	P
5.2	X	P
6.1 PG I+II	X	P
6.1 PG III	P	P
6.2	X*	X*
7	X*	X*
8 corrosive PG I+II	X	P
8 liquids PG III	P	P
8 solids PG III	P	P
9	P	P

P = PERMITTED

X = NOT ALLOWED

X* = if permitted under IMDG Code, those requirements may be applied (For class 1 neq max 10kg when compatibility group B, C, D, E or G. Class 6.2 and class 7 UN numbers 2908, 2909, 2910, 2911 and 3507 are acceptable by the Line's management approval).

1) The carriage of Aluminium ferrosilicon UN 1395, Aluminium silicon powder, uncoated UN 1398, Calcium silicide UN 1405 and Ferrosilicon UN 1408 when transported in bulk packagings,in containers, road vehicles or rail wagons, tank containers or demountable tanks is allowed only when accompanied by a certificate stating that the material was stored under cover, but in the open air, and that the particle size is representative of the material stored.

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