

Baltic Sea Information Motorways



WP1

BaSIM Collaboration Architecture

Attachment 2



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1. ABSTRACT

The BaSIM Collaboration Architecture aims to create generic maritime logistics architecture with focus on information required by authorities and inter-nation port operability. The Architecture aims to facilitate information exchange between different organisations. Process areas are scoped to include activities related to cargo, vessels and passengers. Interfaces that represent exchange of information between different organisations, preferably across the Baltic Sea, are described to facilitate the Motorways of Sea.

The first part of the Collaboration Architecture, the Conceptual architecture describes the processes of goods and passenger transport and vessel traffic, actors related to the processes and information exchanges between the processes. The processes are described at high level, since all differences in details between individual Baltic Sea countries have been abstracted out. The second part of the Collaboration Architecture, the Logical Architecture describes the high level Information System Services and Information Objects needed to support the information exchange needs.

Passenger traffic process describes travel process from departure location to destination including both land and sea transport. Passenger traffic process includes passenger's entire trip and sea voyage planning through travel on board to travelling by connecting land transportation. Information relevant for Collaboration is passenger identity information, timetable & route information of both land and maritime transportation and terminal information to the passengers.

Vessel traffic corridor process describes activities related to the vessel during its passage from the point when a vessel prepares to depart from a port, its sea passage (movement in a fairway or a sea area) during which it uses different supporting services, up to the moment when it is fastened to the next port of call. The need for collaboration in vessel traffic corridor process relate to the traffic situation and the various notifications related to a port call (like general declaration (IMO FAL form 1), declaration of dangerous or polluting goods carried onboard, notification prior to port call, notification of ship-generated waste and ISPS pre-notification)

The Goods Transport Process describes the cargo related activities and actors in short sea shipping. The process is structured around the physical flow of goods being shipped. The flow of goods is controlled by various other sub-processes for the purpose of shipment management, control by authorities, tracking and tracing and operations planning and management. There are five main groups of information exchange needs in goods transport process; sharing of information on cargo security and cargo safety between authorities, relaying of consignment tracking & tracing information, customs exit and summary declarations, timetable information on regular cargo lines and submitting dangerous cargo declarations.

The Logical Architecture consists of The Information and Services Architecture that describe the high level organisation of information stores and information system services supporting the processes. The Information View describes the organisation of information and it's relation to process areas and actors. The Services View describes

the Information System Services to support and automate the processes and their relation to actors.

Other projects and organisations can make use of the BaSIM Collaboration Architecture. The purpose of BaSIM WP1 is to find pairs of organisations with opportunity to automate one or more information exchanges between them. To plan such an implementation project, the Collaboration Architecture can be used to assist the planning. The WP1 process model can be used as a reference framework for the WP2 to identify the points where security related processes should connect to the actual transport processes. The WP3 may utilise the WP1 processes as a framework. The framework could consist of the process visualisations. Such a framework could be used to relate different development needs, suggested policy changes and proposed initiatives to each other.

The task of WP4 is to depict the interfaces between the actors of WP1 processes as interface processes to the web directory service. WP1 is to provide input in form of process charts and related explanatory documentation. The WP1 process and interface descriptions are used by the WP4 to transform the interfaces between different actors into standard ebXML Business Process Specifications. The Collaboration Architecture supports the development of an organisation's general operating concept, but also provides guidelines for individual systems.

The Collaboration Architecture can be used by an organisation:

- to assess the current status of its own system by comparing it to the national target.
- as the basis for developing its own operations, an actor-specific architecture or an individual system.

2. DESCRIPTION OF WORK

2.1 Definitions

Architecture – a style and method of design and construction. The overall design or structure of a system, the way components fit together.

Actor – a logical business entity, representing a specified role, contributing to the business goals.

Process – A set of related activities that support the realisation of (a part of) the business goals and strategic objectives.

Activity – task executed within a process. In an architecture of as large scope as BaSIM Collaboration Architecture, an activity may itself be a whole sub process.

Security - measures taken as a precaution against theft or espionage or sabotage etc.

Safety - measures taken as a precaution against personal injury or danger to public health or environmental damage.

Information Object – is a subject of communication according to specified business processes.

Information View – a description of the relation between the Information Objects, Processes and Actors that is based on the primary usage of information by the processes and ownership of information.

Information Service – is a structured description of automated support required by an information service or component.

Services View – description of relation between the Information Services, Processes and Actors that is based on the support to processes.

2.2 Goal of the Collaboration Architecture

The BaSIM Collaboration Architecture aims to create a generic maritime logistics architecture with focus on information required by authorities and inter-nation port operability.

2.3 Scope of Collaboration Architecture

The Collaboration Architecture aims to facilitate information exchange between different organisations. Process areas are scoped to include activities related to cargo, vessels and passengers. Interfaces are relevant for the Collaboration Architecture when they represent exchange of information between different organisations, preferably across the Baltic Sea, to facilitate the Motorways of Sea.

2.4 Participants

The working group for Collaboration Architecture consisted of following persons during the period of 2004-2007:

| | | |
|-------------------------|----------------------------------|---------|
| Bäckström Rolf (chair), | Finnish Maritime Administration, | Finland |
| Arkima Antti, | Finnish Maritime Administration, | Finland |
| Rautiainen Pekka, | Confidea Consulting | Finland |
| Rinta-Keturi Irmeli | Confidea Consulting | Finland |
| Pasi Mäkinen | Capgemini | Finland |
| Aki Siponen | Capgemini | Finland |
| Sami Urpila | Capgemini | Finland |
| Markus Kärki | Capgemini | Finland |
| Juha Levo | SysopenDigia | Finland |
| Jukka Lähesmaa | SysopenDigia | Finland |
| Anssi Kuusela | SysopenDigia | Finland |
| Sanna Sonninen | VTT | Finland |
| Mikko Lehtonen | VTT | Finland |

The Collaboration Architecture workshops in 03-05/2005 were attended by:

| | | |
|-----------------------|---|---------|
| Aspelund Minna, | Finnlines, | Finland |
| Dowgiewiczyk Tomas, | Institute of Logistics and Warehousing, | Poland |
| Heikonen Kaisu, | Finnish Maritime Administration, | Finland |
| Lehtokangas Lasse, | Finnish Customs, | Finland |
| Linjos-Maunula Hanna, | Finnish Maritime Administration, | Finland |
| Maskulin Tapio, | Finnish Maritime Administration, | Finland |
| Mattila Tapio, | Steveco, | Finland |
| Nuotio Leena, | DHL Danzas, | Finland |
| Pahl Horst, | Technology Centre Lübeck, | Germany |
| Pönkä Heimo, | Finnish Customs, | Finland |
| Roppola Jouko, | Finnish Maritime Administration, | Finland |
| Salonen Esa, | Port of Helsinki, | Finland |
| Sarpaneva Kai, | Port of Helsinki, | Finland |
| Siht Alar, | Estonian Maritime Administration, | Estonia |
| Toivonen Reijo, | Port of Turku, | Finland |
| Tuomisto Olli, | Finnish Customs, | Finland |
| Vaarama Hannu, | Viking Line, | Finland |

The collaboration workshop in Tallinn in 13 December 2005 was attended by:

| | | |
|--------------------|-----------------------------------|---------|
| Käärman Leo, | Estonian Maritime Administration, | Estonia |
| Lehtokangas Lasse, | Southern Customs District, | Finland |
| Piel Are, | Estonian Maritime Administration, | Estonia |
| Portsmuth Raivo, | Estonian Maritime Administration, | Estonia |
| Raid Marko, | Port of Tallinn, | Estonia |
| Tikerpuu Liis, | Estonian Maritime Administration, | Estonia |

The collaboration workshop in Gdansk/Gdynia in 22-23 February 2007 was attended by:

| | | |
|-------------------|---------------------------------------|--------|
| Baranowski Artur, | SPRINT Sp z o.o., | Poland |
| Bibik Łukasz, | VTS for Gulf of Gdańsk, | Poland |
| Burka Michał, | SPRINT Sp. z o.o., | Poland |
| Dreijer Malin, | Swedish Maritime Safety Inspectorate, | Sweden |

| | | |
|------------------------|---|--------|
| Durczak Wojciech, | VTMS Świnoujście-Szczecin, | Poland |
| Gąsiorowski Krzysztof, | Chamber of Customs, | Poland |
| Kalinowski Marcin, | Maritime Institute in Gdańsk, | Poland |
| Kawecki Tomasz, | Institute of Logistics and Warehousing, | Poland |
| Kowalczyk Urszula, | Maritime Institute in Gdańsk, | Poland |
| Kubicki Tomasz, | Sea-Logistics, | Poland |
| Kurpiński Konrad, | SPRINT Sp. z o.o., | Poland |
| Langer Janusz, | Institute of Logistics and Warehousing, | Poland |
| Mackiewicz Marek, | Port of Gdansk Authorities, | Poland |
| Narolski Jacek, | Customs Office, | Poland |
| Paulauskas Vytautas, | University of Klaipeda, | Poland |
| Piotrowicz Jakub, | Maritime Institute in Gdańsk, | Poland |
| Rodziewicz Marzena, | Maritime Statistics Center, | Poland |
| Rojek Bogdan, | Office in Gdynia, | Poland |
| Sławarz Stefan, | Statistical Office in Gdańsk, | Poland |
| Sukiennik Jerzy, | Port of Gdańsk Authorities, | Poland |
| Twardowski Sławomir, | Customs Office in Gdynia, | Poland |
| Zapałka Agnieszka, | Polish Ministry of Maritime Economy, | Poland |
| Zimny Rafał, | Sea Unit of the Polish Border Guard, | Poland |

The collaboration workshop in Lübeck in 28 March 2007 was attended by:

| | | |
|--------------------|----------------------------------|---------|
| Mr. Prof. Fischer, | University of Lübeck, | Germany |
| Mrs. Havemann, | Transfennica, | Germany |
| Mr. Kuschmierz, | Port Department, City of Lübeck, | Germany |
| Kalinowski Marcin, | Maritime Institute in Gdańsk, | Poland |
| Pahl Horst, | Technology Centre Lübeck, | Germany |
| Mr. Werner, | University of Lübeck, | Germany |

The collaboration workshop in Stockholm in 23-24 May 2007 was attended by:

| | | |
|--------------------|----------------------------------|---------|
| Berggren Pär, | Swedish Coast Guard, | Sweden |
| Hellerström Björn, | Port of Stockholm, | Sweden |
| Holgersson Mats, | Swedish Coast Guard, | Sweden |
| Oscarsson Niklas, | Swedish Maritime Administration, | Sweden |
| Pekkari J. Sixten, | Swedish Customs, | Sweden |
| Ringström Lars, | Swedish Customs, | Sweden |
| Vaarama Hannu, | Viking Line, | Finland |
| Wiman Malin, | Port of Stockholm, | Sweden |

2.5 Work Procedures

The creation of Collaboration Architecture was preceded by Architecture Inventory phase that studied 15 other architectures designed all over the world.

Based on the Architecture Inventory it was recommended that the sea transport process area of Finnish MeriArkki is used as core starting point of BaSIM Interoperability Architecture. Consequently the BaSIM Collaboration Architecture process areas (Goods Transport, Vessel Traffic Corridor and Passenger Traffic) used the MeriArkki process descriptions as a baseline. Actors and activities specific to the Finnish maritime processes were abstracted out of the processes.

Other architectures noted within the Collaboration Architecture are:

1. Linkage to other transport modalities is taken into account both in Goods Transport and Passenger Traffic processes. The Finnish TARKKI (Multimodal Goods Transport Telematics Architecture) has provided the main model applied. The Norwegian ARKTRANS is similar in scope. The tracking related features are compatible, but specified at higher level than the US DoD RFID Implementation Approach. Like the DoD model, TARKKI allows for multilevel and nested tracking of individual goods, parcels, containers and transport units (vessels).
2. The roles of authorities, within the BaSIM Collaboration Architecture, are compatible with the Finnish MeriArkki and TARKKI architectures.

The Collaboration Architecture is divided into two parts. The first part, the Conceptual architecture describes the processes of the Framework as sets of sub-processes (or activities in places where detail is required), information exchanges between the processes and actors related to the processes.

The Collaboration Architecture workshops 1 and 2 were used to review and validate the aforementioned parts of the conceptual architecture and to gather a prioritised list of information exchange needs.

The second part of the Collaboration Architecture, the Logical Architecture describes the high level Information System Services and Information Objects needed to support the information exchange needs. Services View describes the functionality that supports the processes and information exchange needs. Information View describes the logical information stores and how they relate to the processes and actors.

The Collaboration Architecture workshops 3 and 4 were used to review and validate the logical architecture and to make recommendation on services most suitable as pilots.

The Collaboration Architecture was further validated with local Estonian, Polish, German and Swedish stakeholders in collaboration workshops that were organised in Tallinn, Gdansk/Gdynia, Lübeck and Stockholm. In each of these workshops the generic actors and processes of the Collaboration Architecture were mapped against the local actors and processes. Also ICT readiness, user requirements for the architecture and co-operation opportunities were gathered during the workshops.

2.6 Related programmes

2.6.1 BaSIM Work Package 2 Port and Supply Chain Security

The BaSIM Work Package 2 (WP2) aims to improve the security of transport and logistics by applying integrated ICT solutions. The most important international standards to consider are ISPS code, SOLAS convention and IMO regulations.

Specific objectives of WP2 are:

- Increase of Port Security by means of electronic identification and control of goods and their carriers in line with international regulations and standards

- Increase of Security of Goods and their flows in the transport- and logistics-chains by means of electronic identification and control in line with international regulations and standards
- Increase of the Telematics Facilities for co-operation and contribution in security of all parties along the chains
- Increase of Data Exchange, ahead of the cargo flows, for better forecasting and planning
- Increase of Intermodal Tracking & Tracing under the special aspects of exception reporting and reaction

The key outputs of WP2 are:

1. Overview level documentation of current security related processes in selected ports and transport chains
2. Best practice report identifying improvement opportunities in security practice.
3. Demonstrator implemented for a selected port and transport chain.

2.6.2 BaSIM Work Package 3 Maritime Transport Corridor Development

The concept of Maritime Transport Corridor considers the end-to-end corridor including also the connecting transport modes. The total corridor may consist of several transport modes and be several thousands of kilometres in length.

BaSIM Work Package 3 (WP3) aims to produce the following outputs:

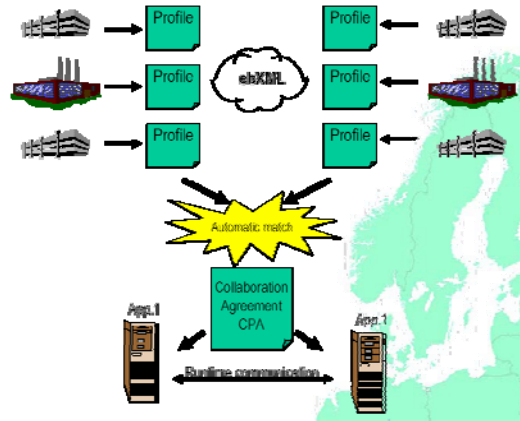
1. Report on Best Practice innovative freight transport corridor concepts
2. Report on Feasibility of Maritime Corridor Concepts incl. spatial planning impact
3. Handbook on measures and strategies for creating effective framework conditions from maritime freight corridors
4. Scenario analysis on the measures for new maritime corridors with special focus on Motorways to Sea
5. Report on political recommendations

Each output is connected to the previous one building on top of accumulating results.

2.6.3 BaSIM Work Package 4 Supporting Information Services

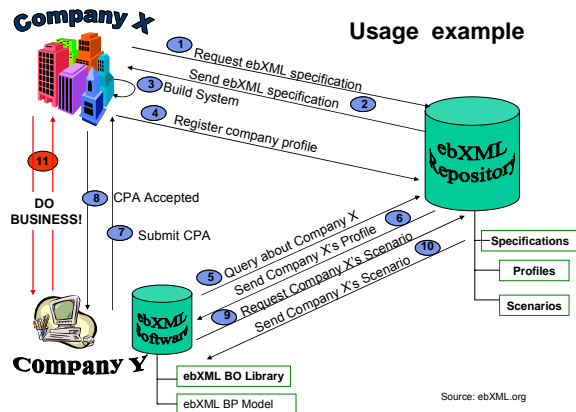
In any large community it is a challenge to keep track of all the actors, their modus operandi, maintain awareness about their abilities, track recent changes (like on message types) and their effects. A large community could consist of the "PortNet-like communities" in different countries that had agreed to start to collaborate. It would then become important that actors could make their web services known in public web directories. It would enable the prospective customer to automatically engage himself with any of those web services at any time, with a minimum technical effort.

The BaSIM Work Package 4 (WP4) aims to implement a platform demonstrator for registering and querying available information and communication interfaces of different parties (businesses and authorities) based on the ebXML standard. The platform also allows the registration of collaboration agreements between the different parties. Actual exchange of information between the parties is executed outside the demonstrator platform.



ebXML defines two architectural levels, the Product Architecture specifying the technical infrastructure and the Process Architecture specifying how to describe eBusiness processes.

ebXML is based on four architectural elements: the Messaging Service, Registry & Repository Service, Trading Partner Information and Business Process Specification Schema. The Messaging Service handles the information exchange between the ebXML platform and collaboration parties reliably and securely. It also takes care of internal routing within the ebXML platform. The Messaging Services is also neutral to the actual file transfer protocol used.



The Registry & Repository Service provide services to store and retrieve objects, query and update them, version control and classification. The Trading Partner Information is not a service, but two types of objects: Collaboration Protocol Profile (CPP) and Collaboration Protocol Agreement (CPA). The CPP is used to describe information about potential parties with capability for ebXML based information exchange. The CPA describes an information exchange agreement between two such parties. The Business Process Specification Schema allows describing the process model for collaboration between any two parties as set of interrelated Roles, Actions and Transactions.

2.6.4 InLoC project

Integrating Logistics Centre Networks in the Baltic Sea Region (InLoC) is a project, which aims at improving the competitiveness and attractiveness of the Baltic Sea region in relation to other European regions through transnational co-operation on spatial planning and improvement of transport and communication links. InLoC stimulates the business sector of the area by creating better conditions for logistics operations and will result in innovative co-operation networks of all actors in transport chains as well as networks of the logistics centre related actors.

InLoC project is divided into 4 work packages, the objectives of which are to:

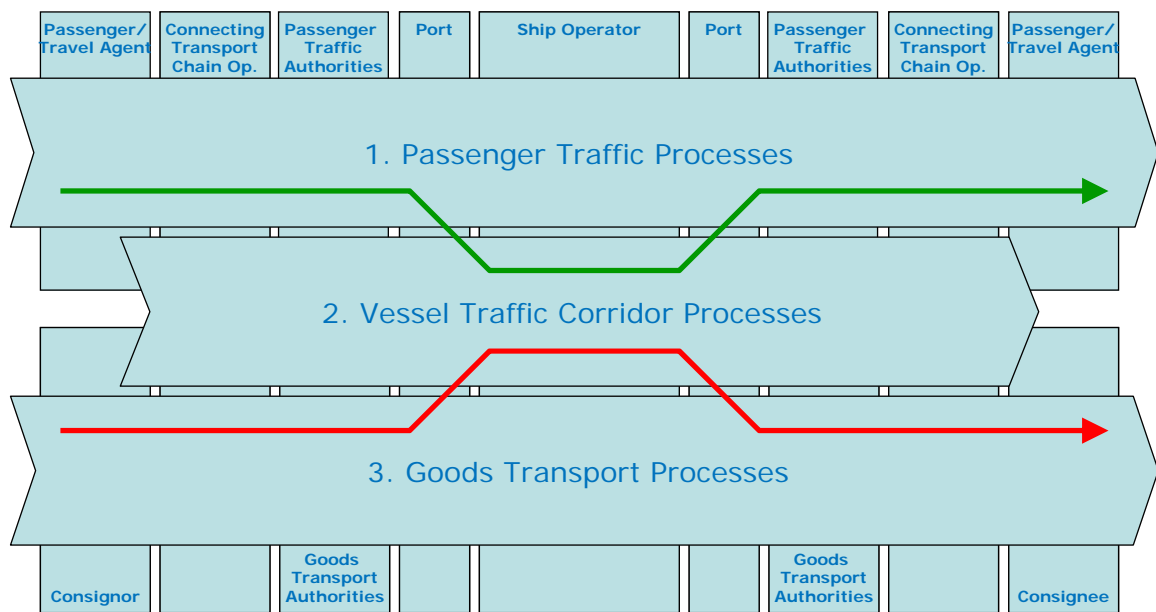
1. improve the networking and operation of ports, logistics centres and other logistics operators and to create innovative solutions and strategies for all actors in logistics chains,
2. create conditions for the spatial integration of logistics operations, to analyse spatial and environmental consequences of LC-development and to remove bottlenecks in port-hinterland-logistics centre connections,
3. improve the compatibility of different ICT-based transport & logistics networks, and
4. organise educative events related to logistics centres and disseminate knowledge and potential of logistics centres, logistics in general and the results of the InLoC project.

The InLoc project was finalised in March 2007. The InLoC project involved 35 partner organisations from nine Baltic Sea countries. The project period was from August 2004 to March 2007. The Centre for Maritime Studies of the University of Turku, Finland, acted as the lead partner of the project.

There is a requirement from the EU that BaSIM and InLoC should not duplicate any effort.

3. COLLABORATION ARCHITECTURE FRAMEWORK

The Collaboration Architecture describes a set of common business processes and related information and communication needs for Baltic Sea Region goods and passenger transport and vessel traffic. The business processes are divided into three core processes described in the picture below. The processes describe the business at high level, since all differences in details between individual Baltic Sea countries must be abstracted out.



Picture 1. Core processes of BaSIM Collaboration Architecture

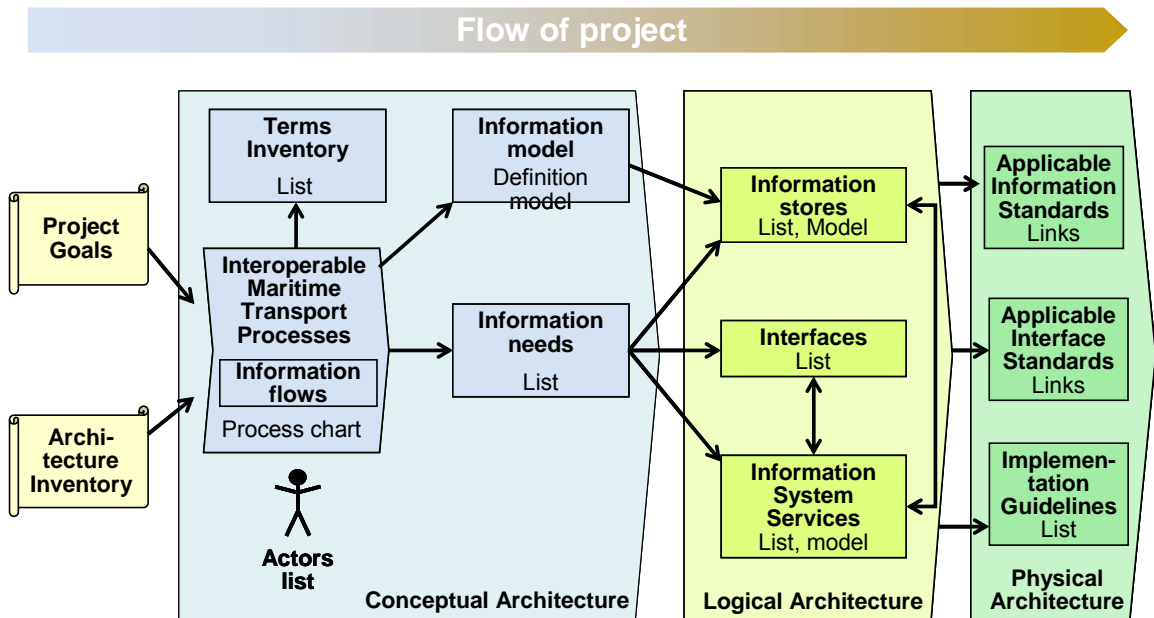
The Passenger Traffic Process covers activities concerned with passengers. The process describes the sub-processes of passenger, travel agent, ship operator, agent, support and security service providers, port organisation and relevant authorities from booking of a trip, disembarkation from the port of origin and arrival to the destination port along with the necessary connecting transports.

The Goods Transport Process describes the flow of goods from the production process of consignor to the production process of the consignee via the possible intermediate transport chains, port handling and actual sea transport. Besides the consignor and consignee, the actor groups of port organisation, ship operator, goods transport related authorities, forwarding agent, connecting transport chain operator and information service providers are involved.

The Vessel Traffic Corridor Process describes the generic handling of a vessel in the ports and the actual voyage between the ports. Actor groups related to the process are the ship operator, agent, supporting service providers (piloting, tug assistance, ice breaking), vessel traffic management, vessel traffic related authorities and the collector of statistical information.

Based on the process descriptions and the identified information and communication needs, this Collaboration Architecture defines a set of Information System Services,

their Interfaces and Information Stores to support the information and communication needs. The emphasis is on the information and communication needs between the different processes and actor groups. Services internal to a process are not in focus. Finally the applicable existing information and interface standards are identified and linked to the defined interfaces and information stores. The interdependencies of the Collaboration Architecture elements are visualised in the picture below.

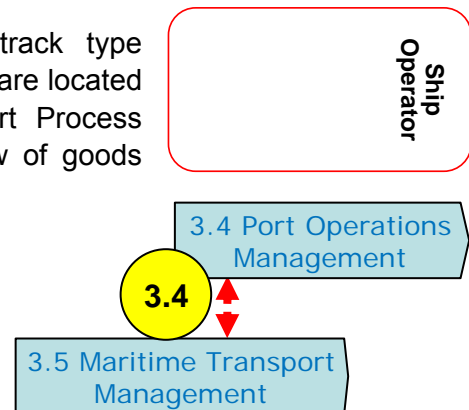


Picture 2. Interdependencies of WP1 elements

4. PROCESS DESCRIPTIONS

The process descriptions use a swimming track type notation, where all activities by a group of actors are located in one horizontal plane. The Goods Transport Process breaks this rule to emphasize the physical flow of goods from consignor production process to consignee production process.

Activities and sub-processes of each process are expressed as either rectangles or pentagons stating the number and name of the process. Some sub-processes omit the process number for the sake of saving space.

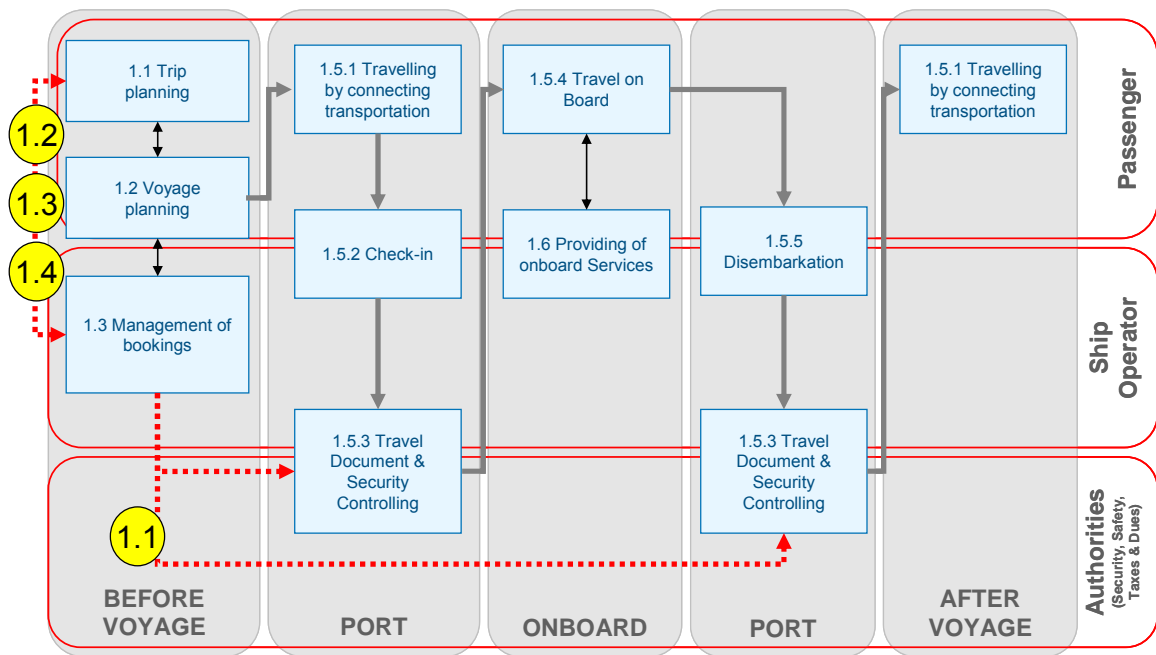


Communication needs between different sub-processes are expressed as arrows going between the sub-processes. The communication needs that are described in more detail have an assigned numeric identifier displayed next to the arrow in a yellow circle.

In addition to the elements described above, some of the processes also divide the process in vertical blocks illustrating distinct phases within the process.

4.1 Passenger Traffic

The Baltic Sea passenger traffic consists of more than 60 million passengers in 50 major ports annually. Passenger traffic process describes travel process from departure location to destination including both land and sea transport. Passenger traffic process includes passenger's entire trip and sea voyage planning through travel on board to travelling by connecting land transportation. The actors of process are passenger, ship operator and related authorities. Authorities include taxes & dues authorities and security and safety organisations. Since the roles of each authority vary nationally, none of the included functions are aligned to single authority.



Picture 3. Passenger Traffic Process

Passenger process begins with trip planning, which includes the entire trip planning. The passenger or passenger’s representative (e.g. travel agent) plans the entire trip including all needed transportation modes and transfers. Voyage planning begins when sea transportation is needed. This activity includes planning of voyage, booking of voyage and needed services (e.g. cabin, car space, restaurant services) and buying of the ticket. The ship operator manages ship’s booking situation and transmits the reservation situation to travel agents. Ship operator issues the tickets for its’ shipping lines and collects port’s passenger fees.

Passenger’s travel process begins with land transportation to port. Passenger checks in at ship operator’s service desk or car check-in by representing the needed travel documentation (e.g. passport, ID) and ticket. Ticket is exchanged to boarding pass. Embarkation begins with border and customs control when needed (international traffic) and continues with security control if required.

Passenger travels and uses the possible services on board. Ship operator may provide hotel, restaurant and recreation services on board depending on duration of the voyage. Disembarkation includes customs and border control when needed. Passenger continues the trip by other modes of transport.

The next table describes the actors of Passenger Traffic process:

Table 1. Passenger Traffic Actor Definitions

| Name | Description of role |
|----------------------|--|
| Ship operator | A company which operates the vessel. Provides passenger transportation, accommodation and restaurant services. |
| Agent | Arrangement of supporting operations, sales, ticketing, etc, |
| Authorities | |
| Security authorities | |

| Name | | | Description of role |
|---|------------------------------|-------------------------|---|
| | | Border Guard | The Border Guard is an authority that supervises the arrival or departure of passengers. |
| | | Customs | The Customs is an authority responsible for supervision over the passenger traffic across state borders. |
| | | Police | The police is an authority that is responsible of general order and security. |
| | | Maritime Administration | Official ISPS authority. |
| | | Port Authority | Port authority is responsible for security in port. |
| Safety Authorities | | | |
| | | Maritime Administration | Controlling the implementation of passenger safety regulations. For example: rescue equipment, manning. |
| Taxes & Dues Authorities | | | |
| | | | The authority responsible for collection of fees related to passengers and goods, imported and exported by passengers. |
| Support service provider | | | A party providing support services (hotel services, catering, cleaning, communication services, environmental information, security services) |
| Security service provider | | | An organisation authorised by the respective authority and providing guarding, inspection, and other security management-related services which concern persons, goods, or areas. |
| Passenger | | | Passenger travelling on board the vessel |
| Travel agent | | | The travel agent responsible in relation to the passenger |
| Connecting Transportation Operator | | | Provides transportation to / from the port. |
| Port | | | Represents all the actors related to port (port authority, port operator, etc.) |
| | Port authority | | The port authority is the supervising authority of the port functions and security. |
| | Port infrastructure operator | | The port infrastructure operator is the party responsible for port infrastructure, functions of the port, and security. |
| | Terminal Operator | | Terminal Operator is one several parties responsible for vessel loading and discharging, as well as warehousing of cargo. |

The next table defines the processes of Passenger Traffic:

Table 2. Passenger Traffic Process Activities

| ID | Name | | Description of activities |
|-------|--------------------------|---------------------|--|
| 1 | Passenger Traffic | | |
| 1.1 | | Trip planning | Planning of trip as a whole. Multimodal trip planning including all parts of a trip. |
| 1.2 | | Voyage planning | |
| 1.2.1 | | Voyage ordering | Activities performed by the passenger: collection of voyage alternatives, selection of voyage, ordering from travel agent, receipt of voyage confirmation, payment, receipt of ticket. |
| 1.2.2 | | Voyage reservation | Assistance to passengers in voyage selection. Booking of a voyage complying with the order from a freighter (carrier-shipping company). |
| 1.2.3 | | Voyage confirmation | Confirmation on booking of a voyage complying with the order for the passenger. Delivery of travel ticket or corresponding information to the passenger. |

| ID | Name | | Description of activities |
|---------|------|--|--|
| 1.3 | | Management of bookings | |
| 1.3.1 | | Management of voyage bookings | Reservation of the space capacity complying with the voyage bookings on the vessel. Management of passenger list. |
| 1.3.2 | | Management of space bookings | Management of space capacity and conditions-related information. Indication of space provided according to voyage bookings. Accommodation of passengers. |
| 1.4 | | Authority processes | |
| 1.4.1 | | Collection of passenger charges | Collection of passenger charges in accordance with the port organisation's price list. Collection of passenger tax. Shipping line collects these charges. |
| 1.4.2 | | Charging | Collection of taxes included under the taxation obligations of the Customs, collection of tax-like receipts. |
| 1.5 | | On Travel | |
| 1.5.1 | | Travelling by connecting transport modes | Travelling to port by other transport modes. |
| 1.5.2 | | Check-in | Submission of the travel ticket or respective information and of the ID document to the check-in counter at the passenger terminal. Receipt of the boarding card. |
| 1.5.3 | | Travel Document & Security Controlling | |
| 1.5.3.1 | | Ticket control | Inspection of the travel ticket or respective information, verification of the matching of the passenger and the ID document, issue of boarding card, entry of arrived passengers to the passenger list. |
| 1.5.3.3 | | Security control | Inspection of passengers, baggage, and baggage/vehicles transported separately from the passengers in the vessel's hold. |
| 1.5.3.4 | | Boarding the vessel | Boarding of passengers from the passenger terminal to the vessel. |
| 1.5.4 | | Travel on board | Use of travel services on board the vessel between boarding the vessel and disembarkation. |
| 1.5.5 | | Disembarkation | Transfer of passengers from the vessel to the passenger terminal. |
| 1.6 | | Travel services onboard | Providing of travel services onboard. Hotel, restaurant, spa, entertainment & shopping etc. services. |

4.1.1 Identified interfaces relevant for Collaboration

Interface 1.1: Passenger information

Passenger information includes ship's and its' passengers information on specific voyage. The ship operator sends the information to departure and destination countries' border and customs authorities and ports at both ends. Required ship information includes name, nationality, route, date of departure / arrival. Passenger information includes family and given names, nationality, date and place of birth, embarkation and disembarkation ports.

Recognized information standards are:

- IMO FAL Form 6 (vessel with maximum 12 passengers)
- SOLAS regulation for passenger list.

Interface 1.2: Timetable & Route Information of land transportation

Port provides passengers timetable and route information of public transportation in the port and its surroundings. Data include form of transport, route, departure times, services in transport vehicle (Train restaurant etc.), and ticket price. Passenger may use this information when travelling to port by connecting transportation.

Recognized information standards are:

- Trident (<http://www.ertico.com/en/activities/activities/trident.htm>)
- Datex
- CEN TC278 Standard WG4
(<http://www.cenorm.be/CENORM/BusinessDomains/TechnicalCommitteesWorkshops/CENTechnicalCommittees/TCStruc.asp?param=6259&title=CEN%2FTC+278>)
- TPEG (UK)

Interface 1.3: Timetable & Route Information of Maritime Transport

The Ship Operator provides passengers timetable and route information of its ships. Data include information such as Route, Direction, Port of departure, Departure time, Via port, Arrival time, Port of destination, Arrival time, Capacity for carrying cars on board the ferry (not real-time). The information may also include links to tariff information and booking systems.

A recognized information standard is:

- Data Specification: System architecture for the Baltic Sea ferry data pool (Ministry of Transport and communications Finland, Helsinki 2004).

Interface 1.4: Terminal Information

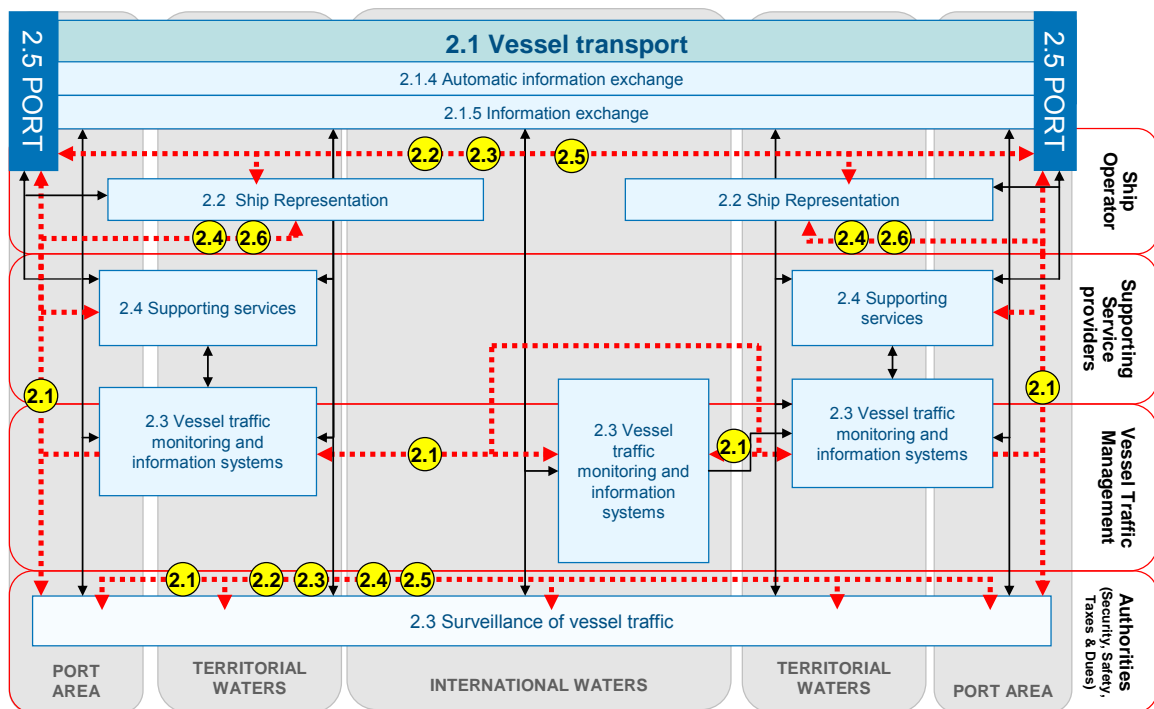
Ship Operator or port provides terminal information to the passengers. Terminal infrastructure description include information such as: name of the port, pier (name, ferry company, coordinates), check-in-terminals (name, ferry company, coordinates), luggage storage facilities (coordinates), parking facilities check-in-times for cars and passengers, maps, coordinates.

Recognized information standard is:

- Data Specification: System architecture for the Baltic Sea ferry data pool (Ministry of Transport and Communications Finland, Helsinki 2004).

4.2 Vessel Traffic Corridor

The process describes actors, information objects, interface candidates for information exchange and connections between components associated with vessel traffic corridor. A central party in the process is the vessel and its passage of which monitoring, information and surveillance as well as the supporting services are described in the process. The need for this process is created either by the need to transport good or passengers or both.



Picture 4. Vessel Transport Corridor Process

Vessel traffic corridor can be seen as a process describing activities related to the vessel during its passage from the point when a vessel prepares to depart from a port, its sea passage (movement in a fairway or a sea area) during which it uses different supporting services, up to the moment when it is fastened to the next port of call. The vessel and the ship operator representative communicates with traffic monitoring and information and surveillance systems as well as other authorities to fulfil the requirements set for reporting and submitting notifications prior to entry to a certain monitoring area or to a port or when departing from those. Information about vessels, their passages and the cargoes they carry, is exchanged in the process both automatically and manually. Especially information concerning the type and amount of the hazardous cargo onboard is often required. In addition to information exchange between the above mentioned stakeholders, notifications prior to entry are also delivered to other parties such as port organisations, maritime safety and security authorities and to the commercial actors in the maritime field for the basis of their operation.

When a vessel enters a traffic management, monitoring and information system (traffic control) area, the monitoring of its passage starts by confirming the vessel's identity. This can be accomplished either by receiving identification information automatically when the vessel is equipped with AIS (Automatic Identification System) or by communicating manually with the vessel, in most cases by VHF-radio. For the purpose of monitoring the traffic controller e.g. a VTS (Vessel Traffic Service) operator has information about sea areas, fairways and their locations as well as aids to navigation and their attributes and current status. The traffic controllers receive real time information about the traffic situation based on vessel monitoring systems (radar and AIS), camera monitoring (CCTV) and by communicating directly with vessels. Based on basic information and real time vessel monitoring information the traffic monitoring centre has complete picture about the traffic situation in the area. This comprehensive understanding of the traffic situation is required in order to be able to conduct traffic management.

Traffic is managed by transmitting general and traffic information. The operator may also transmit navigational recommendations concerning their passage to vessels. For this purpose the traffic control requires a large amount of versatile information which is received and actively collected from different sources. Information concerning vessel movements, their compliance with rules and restrictions, environmental conditions e.g. weather or ice situation, piloting or assistance of winter traffic, port operators, authorities as well as parties in the logistics chain is needed. The traffic control transmits the information as general information announcements to vessels or gives direct recommendations on navigation to a specific vessel. Based on general and traffic information and the recommendations the vessel is manoeuvred by its crew making the final decisions on the manoeuvring actions.

In addition to transmitting information to vessels, the traffic control acts as a hub, providing the information it obtains to many of the other parties of the vessel traffic system. For example through the traffic monitoring and information centre the actors in ports receive needed information about vessels positions and real timetables. If necessary the traffic control also serves the information needs of passengers or multimodal transport chain parties either giving spontaneously information or giving information when needed.

All data associated with traffic monitoring and surveillance is recorded for later use. These recordings may be used both for analysing the incidents that have occurred and for the planning of forthcoming activities and development measures to be implemented to enhance safety and/or efficiency.

The central actors in the process are the vessels used as a means of transport and the traffic monitoring and information systems. The tasks of these systems are carried out by traffic centres i.e. VTS, VTMIS (Vessel Traffic Monitoring and Information Service or System) or SRS (Ship Reporting System) centres. The traffic monitoring, surveillance and information activities are often executed by various authorities but the activities may also be carried out by a commercial actor. In this connection the term 'monitoring' refers principally to the activities carried out by maritime safety authorities or commercial actors such as ports providing the VTS services. The term 'surveillance' describes the activities of security and military authorities. In some nations these actors may of course be one and the same. In addition to the above mentioned actors the vessel traffic corridor process includes actors providing supporting services for the vessel traffic as well the port operations enabling the vessel's entry to and departure from a port and collecting statistic information. The supporting service providers include piloting, icebreaking, environmental information, radio services (Coastal Radio Stations) and towage services. The services are provided to the vessels and are focused on making the vessel transport process safer and more effective. The traffic information received from monitoring and surveillance actors is also used for planning and realising the own activities of the service providers and port actors. On a reciprocal basis, they also provide significant information to the monitoring and supervision actors for their operation.

The next table defines the actors of Vessel Transport Corridor process:

Table 3. Vessel Transport Corridor Process Actor Definitions

| Name | | Description of role |
|---|--|--|
| Vessel | | A vessel is a waterborne transport vehicle used for commercial transportation of cargo or passengers or both. |
| Ship operator | | Ship operator performing the role of "owner", "carrier" or "ship master". Bears responsibility for the obligations of the vessel and accepts the transportation task. Represents the parties managing and selling the transport capacity and takes care of the cargo-related information exchange tasks. |
| Agent | | Third party conducting part of the activities belonging to the Vessel or Ship operator |
| Vessel traffic monitoring and information system | | |
| | Vessel Traffic Service (VTS) | VTS manages the vessel traffic on a specific territorial water area by monitoring vessel movements in real time and providing vessels with relevant information, advice and instructions concerning their passage. |
| | Ship Reporting System (SRS) | SRS monitors the vessel traffic on a specific water area by collecting information from vessel traffic and providing ships with relevant information concerning their passage. SRS may also monitor vessel movements' online and dangerous cargo. In order to implement SRS an IMO decision is needed. |
| | Automatic Identification Systems (AIS) | AIS provides data to enable display systems a visual display of a ship position by a symbol or "mark" which can be scalable to indicate ship size. The position, course and speed data is derived from the global navigational satellite positioning system (GNSS) or from the differential global navigational satellite positioning system (DGNS). The basic "who are you", "where are you", and "where are you going" questions are clearly and accurately answered by the visually displayed data. |
| Support service providers | | A party providing navigation support services (ice-breaking, piloting, communication services, environmental information, security services). |
| | Pilotage | Pilotage organisation that provides pilotage and other related services. |
| | Pilot agency | Party co-ordinating and offering pilot services within a certain geographic area |
| | Icebreaking | Icebreaking organisation providing icebreaking services such as assisting vessels to or from a harbour through ice both territorial and international waters. |
| | Environmental information provider | Environmental information provider provides weather-related and ice-related services, as well as other related services. Water level (ports) |
| | Coastal Radio Station | A Coastal Radio Station maintains distress and safety radio communications, including transmission of navigational warnings and weather forecasts. |
| | Towage company | Towage service company provides tugs that assist vessels in their manoeuvring both within harbour areas and on the high seas. |
| Authorities | | |
| | Authority Security Roles | Authorities that are responsible for maritime surveillance, performing of rescue operations at sea, guarding territorial waters and repelling territorial violations and safeguarding vital sea lines of communication. |
| | Naval surveillance | Maritime surveillance and repelling territorial violations and safeguarding vital lines of communication and traffic |
| | Maritime rescue (SAR) | Maritime Search and Rescue (SAR) operations and readiness |

| Name | | Description of role |
|--------------------------------|--|---|
| | ISPS / Anti-terrorism operations | Under international acts and treatments the actions taken to prevent and against terrorism and organized criminals |
| | Traffic Control of pleasure boats etc. | Monitoring and controlling leisure boat traffic, onboard equipment based on legislation and regulation, usage of alcohol and narcotics etc. |
| | Crime prevention | Actions taken against criminal acts or to prevent criminal activity at sea or in the coastal area |
| | Fire and Rescue Services | Actions taken to prevent accidents or consequences of accidents (fire, hazardous material, accidents etc. Or operative / disaster relief actions taken by the acting authorities |
| | Border control | Passport control and control of crossing border |
| | Customs | The Customs is the authority responsible for supervision of freight traffic across state borders. |
| Authority Safety Roles | | Authorities responsible for ensuring the safety of vessel traffic |
| | VTS Authority | VTS Authority is the authority made responsible for the management, operation and co-ordination of the VTS, the interaction with participating vessels, and efficiency of vessel traffic and the protection of the environment. The VTS Authority is based on IALA (= International Association of Marine Aids to Navigation and Lighthouse Authorities) recommendations. |
| | Winter navigation authority | Winter navigation authority is responsible for the assistance of winter traffic, its coordination, development and management. It decides on the length of the assistance period, exemptions from ice class requirements and traffic restrictions because of ice. |
| | Pilotage authority | The pilotage authority supervises the activities of the pilotage service provider and the enforcement of related laws. |
| | Environmental authorities | Environmental authorities produce and compile environmental data and develop ways to protect water, to improve waste management, and to improve the supervision of chemicals. They co-ordinate and participate in the monitoring of pollution at sea. |
| Authority Taxes & Dues Roles | | Authorities responsible for collecting taxes and dues related to vessels. |
| | Collect the fairway charges. | Customs |
| Port | | Represents all the actors related to port (port authority, port operator, etc.) |
| | Port authority | The port authority is the supervising authority of the port functions and security. |
| | Port infrastructure operator | The port infrastructure operator is the party responsible for port infrastructure, functions of the port, and security. |
| | Terminal Operator | A terminal Operator is one of several parties responsible for vessel loading and unloading, as well as cargo warehousing. |
| Statistical information | | |
| | Information collector | Collecting statistic information on port calls, port specific imports and exports, passengers etc. |

The next table defines the processes of Vessel Traffic Corridor:

Table 4. Vessel Traffic Corridor Process Activity Definitions

| ID | Name | Description of activities |
|-----|--|---------------------------|
| 2. | Vessel Traffic Corridor Processes | |
| 2.1 | Vessel transport process | |

| ID | Name | | | Description of activities |
|---------|------|---|--|--|
| 2.1.1 | | | Vessel steering | Planning of vessel's route at sea and steering the vessel on the basis of all relevant information (including the traffic monitoring and information system recommendations). |
| 2.1.2 | | | Vessel management | Activities required for the management of the vessel, its safety and documentation. |
| 2.1.3 | | | Cargo management | Supervision over cargo and transport-related safety. Supervision over compliance with safety instructions and regulations. |
| 2.1.4 | | | Automatic information exchange | Continuous transmission of identification, destination etc. information by the means of AIS system to vessel traffic monitoring and information system, surveillance and other vessels. |
| 2.1.5 | | | Information exchange | Information exchange between the vessel and vessel traffic monitoring and information system, supporting service provider or authority including the transmission of preliminary information required by different organisations. |
| 2.2 | | Ship Representation | | Preparation of declarations and other necessary documents required for obtaining a permit for a vessel to leave or enter a port. Submission of these declarations and documents to the parties involved. |
| 2.3 | | Vessel traffic monitoring and information system and surveillance | | |
| 2.3.1 | | | Management of basic monitoring information | Management of basic information necessary for monitoring of vessel traffic, such as charts, restrictions and vessel characteristics information, and the storage of this information. |
| 2.3.2 | | | Monitoring of vessel traffic | Monitoring vessels movements and related data by various means available. Obtained information may be used for the planning of vessel traffic monitoring and information system measures. |
| 2.3.3 | | | Management and distribution of information | Receipt and management of information from other traffic monitoring and information systems, authorities and support service providers for the purpose of vessel traffic monitoring, information and surveillance, and distribution of this information to authorised users. |
| 2.3.4 | | | Transmission of safety related information | Transmission of traffic monitoring and information system recommendations or advice and environmental or other safety related information for the monitored vessels. |
| 2.4 | | Supporting Services | | |
| 2.4.1 | | Winter traffic processes | | |
| 2.4.1.1 | | | Management of winter navigation related information | Management and storage of vessel characteristics data, waiting place and winter route data, ice conditions data, ice-breaker location data, and assistance event data. |
| 2.4.1.2 | | | Notification on traffic restrictions and assistance | The responsible organisation establishes traffic restrictions and notifies about the restrictions and which vessels are to be assisted. |
| 2.4.1.3 | | | Co-ordination and conduction of ice-breaking | Planning and co-ordination of ice-braking operations on sea areas or ports. Conduction of the icebreaking operations e.g. assisting vessels or convoys. |
| 2.4.1.4 | | | Information exchange with vessel traffic monitoring and information system | Ice-breaker informs the traffic monitoring and information system of waiting places and winter routes in ice and traffic monitoring and information system notifies the icebreaker of vessels expected to enter its area of responsibility. |

| ID | Name | | | Description of activities |
|---------|------|-----------------|--|---|
| 2.4.2 | | | Pilotage | |
| 2.4.2.1 | | | Piloting of a vessel | Piloting of a vessel (pilotage) means vessel manoeuvring activities in which the pilot acts as both adviser to the captain of the vessel and as an expert on the territorial waters and their navigation. |
| 2.4.2.2 | | | Pilotage data exchange | Data exchange between pilot and vessel traffic monitoring and information system or support service provider before and during piloting. |
| 2.4.3 | | | Tug assistance | Assisting of vessels in their manoeuvring with a tug both within harbour areas and on the high seas. |
| 2.5 | | Port operations | | |
| 2.5.1 | | | Management of information for port operations | Management of information for use as the basis for planning and realisation of port operations, as well as transmission of data for vessel traffic monitoring and information system, authorities or support service providers. |
| 2.5.2 | | | Organising port activities related to vessel traffic | Receipt of declarations associated with vessel arrival and departure. Indication of berths or waiting areas. Fastening. Provision of the port services required by vessels such as stevedoring work. |

There are several important information groups and individual information objects in the vessel traffic corridor process. All of the information objects can be classified as information related to the vessel characteristics and the cargo it carries, dynamic information (movement, position and times of entry or departure), environmental information (weather, ice conditions, etc.), information on the traffic infrastructure (fairways and sea mark, port structures, etc.) and security and safety information. Information concerning the vessel's passage and its cargo is the most frequently required information in the process and can thus also be deemed as the most important information group in the process. Based on the observation of all of the above mentioned information, the traffic monitoring and information system actor makes decisions on information, guidance and recommendations it provides to the vessel traffic.

The actual monitoring and surveillance information concerning the traffic image is to some extent exchanged between the authorities as well as the information on the sea area, fairways, seamarks and navigational aids and their attributes. Information about different reports, notifications, restrictions, recommendations etc. should also be automatically exchanged by taking into account related standards, existing message descriptions and volume parameters as described in the next paragraph.

4.2.1 Identified interfaces relevant for Collaboration

Interface 2.1: Traffic Situation

Traffic situation is a complete overview of the movements and positions of vessels berthed or navigating in the fairways or at open sea and consist of:

- AIS information (static information related to vessel, dynamic information related to vessels movement and voyage related information);
- Traffic report information;
- Track data produced from radar information.

Various vessel traffic monitoring and information systems possess the above listed information of which the traffic situation can be composed of and distribute the situation to different authorities, other vessel traffic monitoring and information systems, ship operators, port organisations or support service providers.

Related Standards

- SOLAS, IMO Resolution MSC.97(73)
- IMO Resolution MSC.74(69)
- IMO Resolution A.694(17)
- IMO Resolution A.851(20)
- MSC.43(64) as amended by Res. MSC.111(73)–IMO Resolution
- IMO Assembly Res. A.857(20)
- National VTS/SRS reporting requirements

Existing Message Descriptions

- IEC Standard 61993 Part 2: Universal Ship borne Automatic Identification System (AIS)
- ITU Recommendation ITU-R M.1371-1 AIS
- HELCOM AIS standard on information exchange

Volume Parameters

- Number of port calls
- Number of transits through monitoring area
- Number and coverage area of monitoring systems
- Number of sensors

Interface 2.2: General Declaration

General declaration (IMO FAL form 1) is the basic document required by the authorities on ships arrival and departure providing information relating to the ship. This information includes:

- name and description of ship;
- port and date of arrival/departure;
- nationality of ship, name of master;
- port arrived from/port of destination,
- certificate of registry;
- name and address of ship's agent;
- position of the ship in the port;
- brief particulars of the voyage;
- brief description of the cargo;
- number of crew and number of passengers.

Documents FAL form 3, 4, 5 and 6 are always attached to the General Declaration. This declaration is submitted by a vessel, its ship operator or the authority to whom it was originally forwarded by either of the first mentioned. Information is provided to an authority, a ship operator or a port organisation.

Related Standards

- IMO Convention on Facilitation of International Maritime Traffic, FAL
- Directive 2002/6/EC

- Directive 2002/59/EC

Existing Message Descriptions

- IEC Standard 61993 Part 2: Universal Ship borne Automatic Identification System (AIS)
- ITU Recommendation ITU-R M.1371-1 AIS
- HELCOM AIS standard on information exchange
- PortNet message Port_Call_input (in Finland)

Volume Parameters

- Port calls
- Transits through monitoring area

Interface 2.3: Dangerous Cargo Declaration

Dangerous Cargo Declaration is a notification of dangerous or polluting goods carried onboard. It is given to the national competent authority of the departure port at the latest at the moment of departure, if the departure port is in EU member state. If the port is outside EU, but the destination of the vessel is inside, the notification is made to the destination. This information is required for permission to port entry and includes:

- vessel identification information
- port of destination
- ETD from port or pilot station (leaving a port of EU member state)
- ETA to the port of destination (leaving a port of EU member state)
- ETA at the port of destination or pilot station (leaving a port outside EU but bound for port in EU member state)
- total number of persons on board
- correct technical names of dangerous or polluting goods
- UN numbers (if exists)
- IMO hazard class
- quantity and location on board
- ID No of transport unit (excl. tanks)
- cargo details and location info on board
- address for detailed cargo information

Information is reported by a vessel or its ship operator. Information should also be forwarded from one authority to another as well as to port organisations.

Related Standards

- Directive 2002/6/EC
- Directive 2002/59/EC
- (IMO Convention on Facilitation of International Maritime Traffic, FAL)

Existing Message Descriptions

- PortNet message DG_Cargo_Doc (in Finland)

Volume Parameters

- Port calls
- Cargo handled in a port

- Amount of traffic from EU member states or outside EU
- Transits through monitoring area

Interface 2.4: Ship/voyage notification

Notification prior to port call based on AIS and IMO FAL forms information can be provided by an authority possessing this information to ship operator or another authority. The information contains following entities:

IMO FALS forms

- IMO FAL form 3, ship's stores declaration
- IMO FAL form 4, crew's effects declaration
- IMO FAL form 5, crew list

AIS information

- vessel identification information (IMO number, call sign, name and MMSI)
- length and beam
- location of positioning antenna on the vessel
- Ship's position
- Speed and course
- navigational status
- present draught
- hazardous cargo
- destination and ETA
- vessel type
- number of persons onboard

Related Standards

- IMO Convention on Facilitation of International Maritime Traffic, FAL
- Directive 2002/6/EC
- Directive 2002/59/EC

Volume Parameters

- Number of port calls
- existence and coverage of monitoring systems

Interface 2.5: Waste Notification

Waste notification is information concerning the ship-generated waste and its delivery to port reception facilities given to an authority or a designated body prior to entry into port. It is provided by the vessel or its ship operator to authorities, other relevant ship operators or port organisations. It could also be provided as second hand information from authorities to other authorities and port organisations. This information includes data of:

- vessel identification information
- registered Flag State
- ETA and ETD
- previous and next port of call
- is the vessel delivering waste and if, what part of the waste on board

- type and amount of waste and residues to be delivered and/or remained on board

Related Standards

- Directive 2000/59/EC of the European Parliament and the Council on port reception facilities for ship-generated waste and cargo residues

Volume Parameters

- Number of port calls
- Number of port calls by vessels with an exemption on submitting waste notification and delivering waste

Interface 2.6: ISPS pre-notification

ISPS pre-notification is given to nationally designated authority by a vessel intending to enter a port and the notification contains information about:

- Vessel identification information
- Registered Flag State
- Validity of International Ship security Certificate
- Present Security Level onboard
- Following information concerning the last 10 ports of call:
 - names of the ports of call
 - vessel's Security Level
 - special or additional security measures taken
 - verification that appropriate procedures have been followed during any ship-to-ship operation
- Other practical security-related information
- Reason for the possible changes in vessel's security level during last 10 ports of call

Related Standards

- IMO ISPS Code (SOLAS Convention)
- Regulation (EC) No 725/2004 of the European Parliament and the Council on enhancing ship and port facility security

Existing Message Descriptions

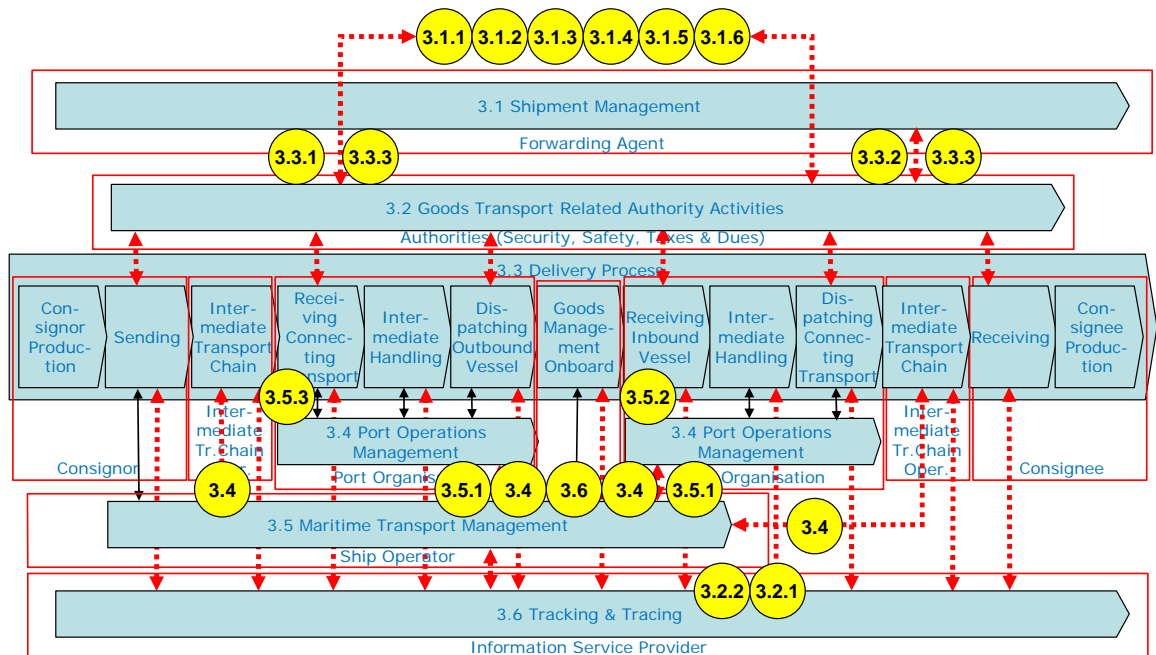
- PortNet message (in Finland)

Volume Parameters

- Number of port calls
- Number of vessel that have an exemption from giving ISPS pre-notification

4.3 Goods Transport

The Goods Transport Process describes the cargo related activities and actors in short sea shipping. The process is structured around the physical flow of goods being shipped. The flow of goods is controlled by various other sub-processes for the purpose of shipment management, control by authorities, tracking and tracing and operations planning and management.



Picture 5. Goods Transport Process

The need for shipping goods arises outside this process description. The Consignor and Consignee may agree on trading transaction concerning certain goods. The processes needed to conduct such a trading transaction are not described in this process. Based on the reached agreement, either the Consignor or Consignee orders the required transport services from a Forwarding Agent. If the transport need is from door to door (as is the case most of the time) instead of port to port, the Forwarding Agent forms a transport chain consisting of necessary transport legs. The Forwarding Agent Shipment Management process (3.1) takes care of ordering the individual transport operations, managing the transport documentation, applying for necessary permits and subjecting the shipment to customs clearance.

The authority decisions required for permits and customs clearance of shipments are handled within the Goods Transport Related Authority Activities process (3.2). Main decision categories include export and import clearance and control for environmental hazards and animal and plant safety. The authority processes also include a security process that monitors and supervises cargo and transport security.

After the trade transaction has proceeded to the point that actual delivery of goods needs to be done, the physical flow of goods (3.3 Delivery Process) starts from the production process of the Consignor. In sending sub-process the Consignor prepares the goods to be shipped and necessary documentation. The shipment is next handed over to the possible Intermediate Transport Chain Operator that has been contracted to transport the shipment to the port of origin. The intermediate transport chain may consist of several transport legs and different transport modalities.

The intermediate transport chain ends to the port, where the connecting transport is received and responsibility for the shipment is passed to the Port Organisation. The cargo may require temporary storage or other cargo related services like stripping or stuffing. This is also the point where the export declaration is given for goods exiting the Community. The process includes the planning and control of cargo related activities like yard, vessel loading and machine operation planning. When the vessel that

the cargo is scheduled for is available, the cargo is loaded to the vessel and responsibility for the cargo is passed from the Port Organisation to the Ship Operator.

Management of different actors forming the Port Organisation is described in the Port Operations Management process (3.4). The activities include management of port safety and security, management of port resources and collections of cargo related fees and dues.

The Ship Operator is responsible for any management of goods on board the ship. Activities on-board the ships, during its voyage, are described within the Vessel Transport Corridor process area. The cargo transport related activities like managing transport capacity, managing transports along with accepting and releasing cargo from transport are included in the Maritime Transport Management process (3.5).

When the vessel arrives in a port where the cargo or part of it is destined, the cargo is discharged from the vessel and responsibility for the shipping is passed to the Port Organisation. This is also the point where the import declaration is given for goods entering the Community. The cargo may require temporary storage or other cargo related services like stripping or stuffing. The shipments are then handed over to the Intermediate Transport Chain Operator that has been contracted to transport the shipment to the final destination. As in the beginning of the process, also the second intermediate transport chain may consist of several transport legs and modalities including a possible overseas transport.

The physical flow of goods ends to the Consignee receiving process where the shipment is checked and the responsibility for it is transferred to the Consignee. The goods are then unloaded and prepared for the Consignee Production Process.

During the physical flow of goods, one or more Information Service Providers may collect, process and distribute tracking data on parcels, transport units and vessels.

The next table describes the actors of Goods Transport process:

Table 5. Goods Transport Process Actor Definitions

| Name | | Description of role |
|-------------------------|--------------------------|--|
| Customer | | Consignor, consignee or other party whose logistics chain the delivery is part of. A customer can issue an order for 'a transport'. A transport can also be ordered by another party, but the transport demand depends on the customer production planning and management process and the transport order can be seen on basis of the customer's logistics planning process. |
| | Consignor | The parties contracted by a customer to carry out goods transport service with the carrier-shipping company |
| | Consignee | The parties contracted by a customer to receive the goods transport service with the carrier-shipping company |
| Forwarding Agent | | A representative authorised by the charterer (e.g. forwarder) who, on its principal's account, takes care of the cargo-related information exchange tasks. |
| Ship Operator | | Represents the parties managing and selling transport capacity |
| | Carrier-shipping company | Represents the parties managing and selling transport capacity |

| Name | | Description of role |
|--|---|---|
| | Owner-shipping company | A shipping company performing the role "owner" or "ship master". An owner-shipping company bears responsibility for the obligations of the vessel. The shipping company that owns the vessel or some other party approved by the shipping company may serve as the owner-shipping company. |
| Connecting Transport Chain Operator | | The parties involved in providing the connecting transport chain between the consignor and the port or the port and the consignee. The intermediate transport chain operators may include one or several parties handling e.g. road transport, rail and combined rail transport, barge traffic etc. |
| Goods Transport Authorities | | Represents all authorities in regards with goods transport (customs, environmental authority, animal and plant disease control, etc.) |
| | Goods Transport Security Authorities | Authorities responsible for ensuring the security of goods transport processes. The security issues may relate to crime, terrorism, fraud, etc. |
| | Goods Transport Safety Authorities | Authorities responsible for ensuring the safety of goods transport processes. The safety issues may relate to sea worthiness of vessels, hazardous goods, environmental damage, risks to public health, animal and plant diseases etc. |
| | Taxation and Dues Collection on Goods Transport | Authorities responsible for collecting goods transport related taxes and dues. Depending on the country, the taxes and dues may include customs tariffs, fairway dues, etc. |
| Port | | Represents all the actors related to port (port authority, port operator, etc.) |
| | Port authority | The port authority is the supervising authority of the port functions and security. |
| | Port infrastructure operator | The port infrastructure operator is the party responsible for port infrastructure, functions of the port, and security. |
| | Terminal Operator | Terminal Operator is one of several similar parties responsible for vessel loading and discharging, as well as cargo warehousing. |
| Information Service Provider | | The Information Service Provider is responsible for providing information services like collecting, storing and managing tracking data throughout the supply chain. |

The next table describes the Goods Transport processes:

Table 6. Goods Transport Process Activity Definitions

| ID | Name | Description of activities |
|-----------|--|--|
| 3. | Goods Transport Processes | |
| 3.1 | Shipment Management | |
| 3.1.1 | Management of transport documentation | Prepare declarations and necessary documents for sea or overland transport as shipper's representative and deliver the documents to the parties involved. |
| 3.1.2 | Application for permits | Apply for necessary cargo-related permits for sea or overland transport as shipper's representative. |
| 3.1.3 | Subjection to customs clearance | Subjection of cargo to customs clearance procedures required by customs inspection (release into free circulation, transit, customs warehousing, export, etc.) |
| 3.1.4 | Ordering of transport operations | Order sea or overland transport operations and the related additional services as shipper's representative. |
| 3.2 | Goods Transport Related Authority Activities | |
| 3.2.1 | Goods Transport information management | Receive and collect security and safety related information and distribute to the relevant parties |

| ID | Name | | | Description of activities |
|----------|------|--|---------------------------------------|--|
| 3.2.2 | | | Customs Activities | |
| 3.2.2.1 | | | Goods Transport Security management | Monitor security and supervise cargo & transport security. Collect investigation information, exchange international investigation information. Do profiling of the transports. Analyse security risks. Make decisions on security management covering national, regional, and local levels. |
| 3.2.2.2 | | | Export Clearance | Inspect persons, cargo, transport units, and transport means required for export clearance. Manage and grant export licences for goods. |
| 3.2.2.3 | | | Import Clearance | Inspect persons, cargo, transport units, and transport means required for import clearance. Collect taxes included under the taxation obligations of the Customs, collect tax-like receipts. Cover customs duties, import duties, the value added tax, as well as excise taxes, vehicle taxes, navigation tax, oil protection tax, waste tax, traffic insurance taxes collected at the border, if necessary, etc. |
| 3.2.3 | | | Animal and Plant Safety Control | Authority activities for controlling the transportation of animals and plants across state border for controlling the spread of animal or plant diseases. |
| 3.2.4 | | | Environmental Hazards Management | Authority activities for controlling the transportation and use of substances harmful for the environment or people. |
| 3.3 | | | Delivery Process | |
| 3.3.01 | | | Consignor Production | The production process(es) of the Consignor |
| 3.3.02 | | | Sending | Preparing goods for transport and releasing them to the transport operator. |
| 3.3.03 | | | Intermediate Transport Chain | Intermediate transport chain between the consignor and the port. The intermediate chain may consist of any transport modes including overseas shipping. |
| 3.3.04 | | | Receiving Connecting Transport | |
| 3.3.04.1 | | | Delivery of transported cargo (1.2.3) | Unload vehicles, for which the freighter bears responsibility (hinterland transport). Hand over cargo's or transport unit's responsibility to the next actor, i.e. the port operator. Acquire transfer receipt from the next actor. |
| 3.3.05 | | | Intermediate Handling | |
| 3.3.05.1 | | | Storage and warehousing | Temporary storage of cargo unloaded from a vessel or cargo to be loaded to a vessel in the terminal. Load cargo to sea transport units or containers (stuffing) and remove from transport units or containers (stripping) on account of the principal (carrier-shiping company, shipper's representative). Additional services associated with storage. Export declaration to customs by declarant when leaving Community. |
| 3.3.05.2 | | | Vessel loading control | Plan and control in-port placement of cargo for which the port operator is responsible (yard planning). Plan and control vessel loading operations (terminal vessel planning). Plan machine operation. Manage loading alteration. Transmit event information (bay plan) to the vessel representative. |
| 3.3.06 | | | Dispatching Outbound Vessel | |

| ID | Name | | | Description of activities |
|----------|------|--|--|---|
| 3.3.06.1 | | | Loading and transfer (1.3.3) | The port operator is responsible for : a) performing vessel loading related operations (stevedoring) on account of the principal (freighter); b) transferring cargo and responsibility to the next actor in the transport chain, i.e. the freighter (carrier-shippping company); and c) acquiring transfer receipt from the next actor in transport chain. |
| 3.3.07 | | | Goods Management Onboard | Managing goods onboard during the transport. Includes monitoring of cargo requiring special environmental conditions. |
| 3.3.08 | | | Receiving Inbound Vessel | |
| 3.3.08.1 | | | Vessel unloading management | Plan and control vessel discharge operations by the port operator (vessel planning). Plan machine operation. Plan and control cargo placement in the port (yard planning). Manage unloading alterations. |
| 3.3.08.2 | | | Delivery of transported cargo (1.2.3) | Discharge vehicles, for which the freighter bears responsibility (overland transport). Hand over cargo's or transport unit's responsibility to the next actor, i.e. the port operator. Acquire transfer receipt from the next actor. |
| 3.3.08.3 | | | Discharging and receipt (1.3.1) | Customs declaration before arriving. Perform vessel discharge related operations (stevedoring) on account of the principal (freighter), for which the port operator is responsible. Inspect and receive unloaded cargo, report to the freighter. Take storage responsibilities. |
| 3.3.09 | | | Intermediate Handling | |
| 3.3.09.1 | | | Intermediate handling procedures (1.3.2) | Temporary storage of cargo unloaded from a vessel or cargo to be loaded to a vessel in the terminal. Load cargo to sea transport units or containers (stuffing) and remove from transport units or containers (stripping) on account of the principal (carrier-shippping company, shipper's representative). Additional services associated with storage. |
| 3.3.10 | | | Dispatching Connecting Transport | |
| 3.3.10.1 | | | Acceptance for transport (1.3.1) | Inspect the cargo to be loaded onto vehicle, for which the freighter (overland transport) is responsible, accept responsibilities for transport of the cargo, approve loading operations, and issue transfer receipt. Prepare waybill. |
| 3.3.11 | | | Intermediate Transport Chain | Intermediate transport chain between the consignor and the port. The intermediate chain may consist of any transport modes including overseas shipping. |
| 3.3.12 | | | Receiving | Receiving a shipment, checking and unloading the parcels, checking the goods and their condition, and preparing the goods for the consignee and the next stage of the production process. |
| 3.3.13 | | | Consignee Production | The production process(es) of Consignee |
| 3.4 | | | Port Operations Management | |
| 3.4.1 | | | Port Safety management | Supervise cargo and transport-related safety. Examine the permits and declarations required for transport of dangerous goods. Supervise compliance with safety instructions and regulations |
| 3.4.2 | | | Port Resources Management | Receive declarations of vessel arrival and departure. Indicate berths or waiting areas. Fasten. Provide port services required by vessels. |

| ID | Name | | | Description of activities |
|-------|-------------------------------|--|-------------------------------|---|
| 3.4.3 | | | Port Security management | Monitor security and supervise cargo & transport security. Collect inquiry information, exchange international inquiry information. Profile. Analyse security risks. Make decisions on security management covering national, regional, and local levels. |
| 3.4.4 | | | Port Fees & Dues Collection | Collect cargo fees according to the port authority's price list. |
| 3.5 | Maritime Transport Management | | | |
| 3.5.1 | | | Transport Capacity Management | The vessel representative plans the use of cargo spaces and make decisions on routes, stages and specific ports. Manage cargo placement for vessel stability assurance. Manage dangerous substances placement for safety assurance. Provide vessel unloading and loading instructions, provide "master" bay plan. Update unloading and loading events information for the purpose of stability calculation. |
| 3.5.2 | | | Transport management | Transport operation-related tasks to be performed by the freighter. Conclude transport contracts, handle transport orders, book necessary cargo space, make decisions on loading of cargo to vessel or unloading of cargo from it, prepare shipping documents (such as manifest, B/L, etc.), and transmit data regarding cargo transported by sea to various parties. |
| 3.5.3 | | | Acceptance for transport | Operations under the ship operator's responsibility: inspect cargo to be loaded onto vessel, take the related responsibilities, approve loading operations and issue transfer receipt. Prepare cargo-related documentation, i.e. manifest. |
| 3.5.4 | | | Release from transport | Operations under the ship operator's responsibility: inspect cargo to be loaded onto vessel, take the related responsibilities, approve discharge operations and issue transfer receipt. Prepare cargo-related documentation, i.e. manifest. |
| 3.6 | Tracking & Tracing | | | Collect and record track & trace data, and distribute it to users. Carry out tracking and tracing on request through logistics service providers within the supply chain. The users of track & trace data provided by logistics service providers include at least the supply chain service provider, who is provided with track & trace data per tracking request. |

4.3.1 Identified interfaces relevant for Collaboration

3.1: Sharing of Information on Cargo Security and Cargo Safety between Authorities

Sharing of information (on transported cargo and authority activities concerning the cargo) between different authorities provides potential benefits as better cargo security and cargo safety. Also the authority activities can be targeted to provide better impact with the available resources. Key attribute of this information exchange is accurate and detailed description of the shipment content. As the new EU Customs Code will introduce the concept of Authorised Economic Operator, it would be useful for the authorities to exchange information on who has been granted that status in each member state. Also the tightening security requirements for container traffic to US territory requires growing information exchange between EU Customs.

Interface 3.1.1: Information on Inspected Consignments

Exchange of information between Customs on inspected consignments would provide benefits by avoiding unnecessary overlapping inspections and enabling focusing of activities. One practical need is exchange of information on changed customs seals in order to maintain a chain of seals when Customs officials inspect the transportation unit. The information includes consignment identifying information and description of inspection activity and results.

Recognized information standards are:

- EU Customs Code

Interface 3.1.2: Request for Inspection of Consignment

Information could be exchanged electronically when sending a request from an Authority to another Authority to inspect a given consignment. This information includes consignment identifying information, consignment content information and documented reason for request.

Recognized information standards are:

- EU Customs Code

Interface 3.1.3: Request for More Information on Consignment for Risk Analysis

Additional information that is not included in the standard Customs Declaration may be requested on a specific consignment. Exchange of information is done in order to perform better risk analysis. This information exchange is often necessary between the Customs at the Port receiving an overseas transport and the Customs receiving the transit. The exchange of information would speed up the flow of goods in the transit destination. This information includes:

1. Consignment identifying information
2. Description requested information
3. Additional information on decisions taken on a consignment
4. Additional documentation on a consignment

Recognized information standards are:

- EU Customs Code

Interface 3.1.4: Information on Export / Import Manifests for Control of Taxes, Excise, Export Refunds and Dues

Information is exchanged between Customs on export and import declarations to control taxes, excise, export refunds and dues. This information includes consignment identifying information, consignment content information and the decision made (import/export declaration).

Recognized information standards are:

- EU Customs Code

Interface 3.1.5: Information on Safety Related Inspections Done in the Country of Origin

Safety related inspections done to consignments in country of origin require exchange of information between Authorities. This information is used for cargo safety monitoring. Information includes consignment identifying information and description of inspection activities.

Recognized information standards are:

- EU Customs Code

Interface 3.1.6: Annotated Manifest Information

Information about processed customs manifests with additional information could be exchanged electronically between Customs. Information includes:

1. Consignment identifying information
2. Consignment content information
3. Description of decisions taken
4. Additional annotation related to the consignment and decision taken

Recognized information standards are:

- EU Customs Code

3.2: Relaying of Tracking & Tracing Information

Interface 3.2.1: Relaying of Raw Tracking Data

Raw tracking & tracing information on vessels, transport units (containers, trailers, etc.), pallets and individually identified goods may be relayed. Information may consist of location, conditions (temperature) or logical locations/events (loaded, discharged, containerised, etc.)

Recognized information standards are:

- Bar-Code standards
- RFID standards specify radio frequency identification
- EAN European Goods Coding System
- Geographical coordinate standards GWS -84 coordinate standard
- EDIFACT D95B – CODECO
- ISO Standard 18185 on Electronic Seals for Freight Containers (target publication date 31.10.2005)
- NATO STANAG 2233 on RFID for NATO Asset Tracking

Interface 3.2.2: Relaying of Information on Exceptions to the Transport Plan

Exception information based on the transport plan and actual tracked transport may be relayed. The information includes consignment identification information, consignment exception type / reason and new ETA (Estimated Time of Arrival) information.

For recognized information standards, see interface 3.2.1.

3.3: Customs Manifest

Interface 3.3.1: Exit Declarations

Electronic exchange of Exit Declaration information (EDI/ITU) will be required 2008 onwards. Exit Declarations are done for Community goods exported to a non-EC country or to one of the “non-fiscal” territories.

Recognized information standards are:

- EU Customs Code (new version under development)
- WCO standards

Interface 3.3.2: Summary Declarations

Information on goods for import declaration may be submitted electronically. Possible situations are:

- a) Community goods are transported within the EC by a service provider that does not have the status of authorised regular shipping service.
- b) Non-Community goods are brought into the EC, cleared by Customs and released into free circulation as community goods.
- c) Goods are brought into the EC from a third country, and placed in a free zone type II prior to being cleared and released into free circulation

Local Finnish development need: Currently Summary Declaration information is not transmitted electronically from Finnish PortNet to Finnish Customs. Of total customs import transactions in Finland, 80% are reported as manifest level information and 20% as statistical level information (by Authorised Regular Shipping Services). Transmission of Summary Declaration information should take place after the assignment of port call notification number. Authorised Economic Operators give transit information at manifest level.

Recognized information standards are:

- EU Customs Code (new version under development)
- WCO standards

Interface 3.4: Sharing Timetable Information on Regular Cargo Lines

Timetable and route information of regular cargo lines could be exchanged electronically. This information includes: Route, Direction, Port of departure, Pier of departure, Departure time, Via port, Arrival time, Departure time, Via pier, Port of destination, Pier of destination, Arrival time, Capacity for carrying cars on board the ferry (not real-

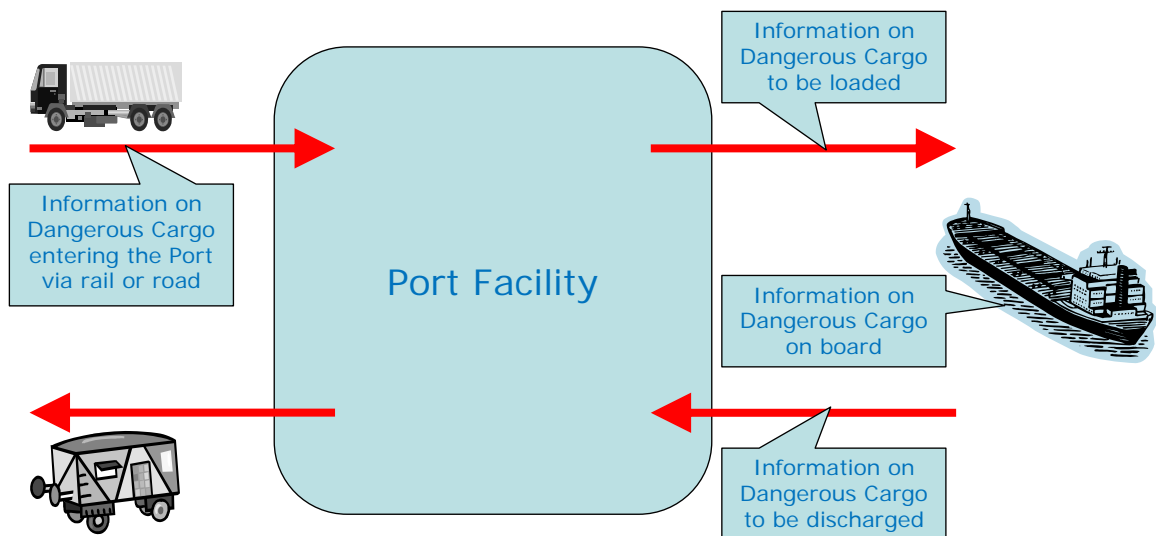
time), Validity of timetable, calendar, Days of traffic. The information could be linked to tariff information and to booking systems.

Recognized information standards are:

Data specification: System architecture for the Baltic Sea ferry data pool. (Ministry of Transport and Communications, Finland, Helsinki 2004. (Report not printed)).

3.5: Submitting Dangerous Cargo Declarations

The main need for Dangerous Cargo Declarations arises from the Port Organisations desire to ensure the safety of Port Facility in relation to dangerous cargo onboard vessels, being loaded or discharged from vessels and being brought to port facility via other transport modes (e.g. road, rail).



The generic procedure for getting permission to bring dangerous cargo to port facility:

1. The Consignor or their representative requests a permit from Port Organisation to transport dangerous goods via the port.
2. The port specifies the terms for the transport.
3. The Consignor issues a Terminal Notice to inform the Port Organisation of the transportation details and timetable.
4. The transportation is registered at the Port perimeter.
5. The information of dangerous cargo is attached to the transport unit (e.g. container).

Local Finnish development need: The current practice of notifying the Ports of dangerous goods arriving via land transport is inconsistent. The PortNet Terminal Notification message (TERMIS) should be utilised consistently. The Terminal Notification could also serve the security related information needs of the Port.

Despite the above process, transportations containing dangerous goods often arrive at the Port perimeter without prior notice. For fast cargo liner traffic the content of trailers to be loaded is often known just 20 minutes before the departure of the ship.

Interface 3.5.1: Submitting Information on Dangerous Cargo on Board.

Information on dangerous cargo on board could be submitted electronically to port.

This information includes:

A. General information:

- (a) ship identification (name, call sign, IMO identification number or MMSI number);
- (b) port of destination;
- (c) for a ship leaving a port in a Member State: estimated time of departure from the port of departure or pilot station, as required by the competent authority, and estimated time of arrival at the port of destination;
- (d) for a ship coming from a port located outside the Community and bound for a port in a Member State: estimated time of arrival at the port of destination or pilot station, as required by the competent authority;
- (e) total number of persons on board.

B. Cargo information:

- (a) the correct technical names of the dangerous or polluting goods, the United Nations (UN) numbers where they exist, the IMO hazard classes in accordance with the IMDG, IBC and IGC Codes and, where appropriate, the class of the ship as defined by the INF Code, the quantities of such goods and their location on board and, if they are being carried in cargo transport units other than tanks, the identification number thereof;
- (b) confirmation that a list or manifest or appropriate loading plan giving details of the dangerous or polluting goods carried and of their location on the ship is on board;
- (c) address from which detailed information on the cargo may be obtained.

Recognized information standards are:

- International Maritime Dangerous Goods (IMDG) Code
- IBC, IGC and INF codes
- IMO FAL Dangerous Goods notification
- Directive 2002/59/EC (HAZMAT)

ADR Code – European Agreement Concerning the International Carriage of Dangerous Goods by Road (applicable on certain Baltic Sea transportation routes on basis of MoU agreement).

Interface 3.5.2: Submitting Information on Dangerous Cargo to be Discharged.

Information on dangerous cargo to be discharged could be submitted to port electronically. For information content and recognized information standards, see interface 3.5.1.

Interface 3.5.3: Submitting Information on Dangerous Cargo Entering the Harbour via Rail or Road.

Electronic information exchange could be utilised in submitting information on dangerous cargo entering the harbour via rail or road. The Ship Operator notifies the Port Organisation of dangerous cargo entering the port area. The Ship Operator receives the information from the Forwarding Agent via a Dangerous Goods Declaration. For information content and recognized information standards, see interface 3.5.1.

Interface 3.6: Location of Dangerous Cargo on Board

The Ship Operator gives information on location of dangerous cargo on board for the Port Organisation to maintain safety of the port facility.

For information content and recognized information standards, see interface 3.5.1.

5. INFORMATION AND SERVICES ARCHITECTURE

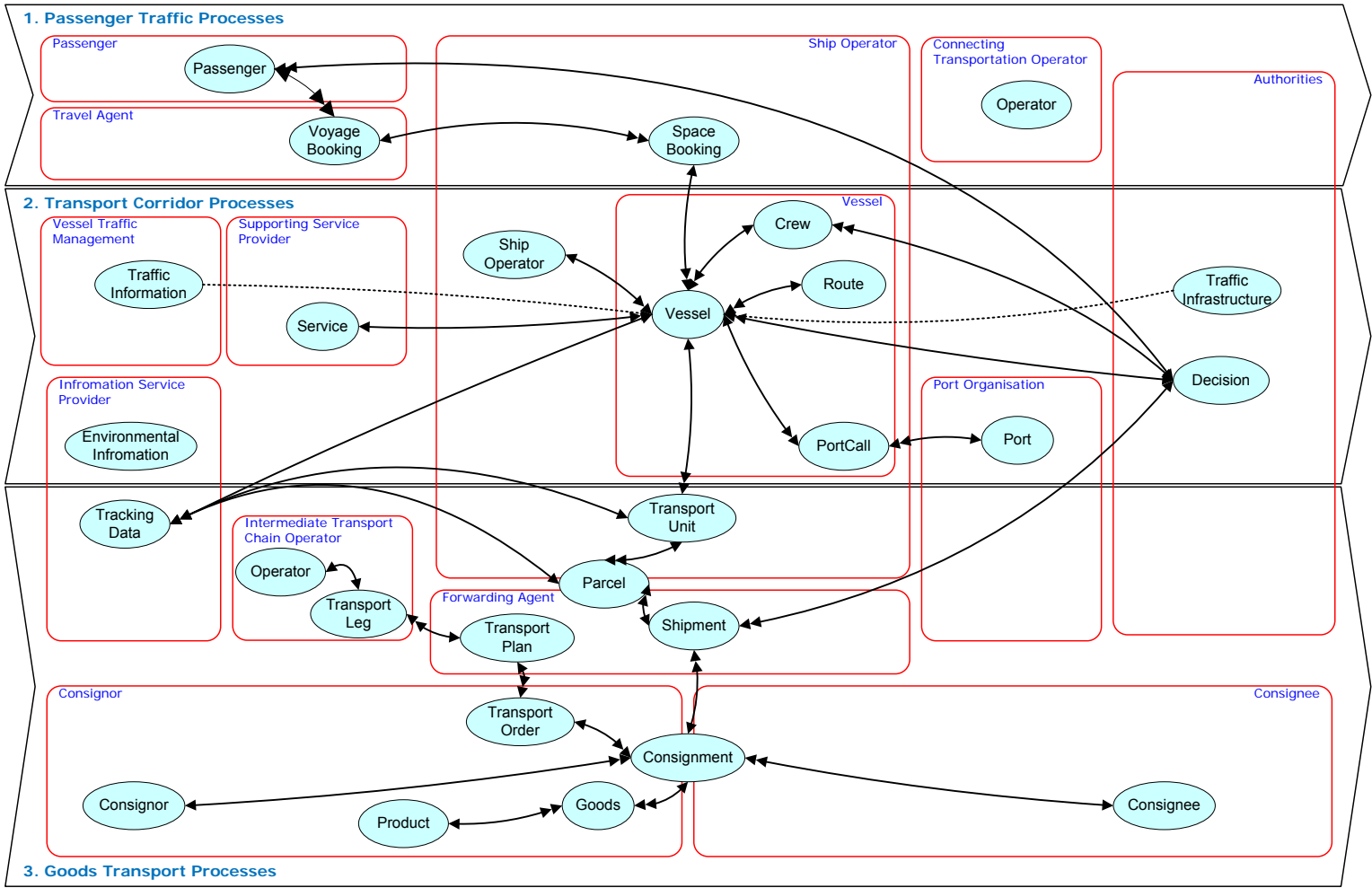
The Information and Services Architecture describe the high level organisation of information stores and information system services supporting the Passenger Traffic, Vessel Transport Corridor and Goods Transport process areas.

5.1 Information View

The Information View describes the organisation of information and its relation to process areas and actors. Process areas are described as chevrons. The Information Objects are described as ovals and their relationships with arrows. Single arrowhead denotes that the cardinality of the Information Object within the relation is zero or one. Two arrowheads denote a cardinality of zero to multiple. When the arrowhead is missing, the cardinality is unspecified. An example of the cardinality is that in the relation between a Vessel and Port Call, there is always one Vessel involved, but the Vessel may relate to multiple consecutive Port Calls.

A red rounded square encloses the Information Objects that a certain Actor within the Collaboration Architecture owns. Ownership is defined as having control over the creation and content of an Information Object. Ownership does not imply that the owning Actor maintains an information store containing said Information Objects.

The Information View can be used as basis for Information Architecture design for individual organisations.



Picture 6. Information View of Collaboration Architecture

Table 7 contains the definitions for the Information Objects. In a high level architecture like the Collaboration Architecture, each Information Object represents several detailed items. The type of each Information Object is indicated as original information, document or message. Documents and messages are collections of the original information for the purpose of information exchange. As such, they could be excluded from the list of Information Objects. They are still valuable as source of information definitions and formats when doing a design based on this architecture. Also the process area that the Information Object is relevant for is documented in the three process columns labelled as GT (Goods Transport), PT (Passenger Transport) and VTC (Vessel Traffic Corridor).

Table 7. Definitions of Information Objects

| Name | | Description of content | Type | | | Process | | |
|----------------------------------|---|--|------|-----|-----|---------|----|-----|
| | | | Inf | Doc | Msg | GT | PT | VTC |
| Consignee | | The one to whom something, such as goods or merchandise, is consigned. | X | | | X | | |
| Consignor | | The one who delivers over or commits merchandise | X | | | X | | |
| Consignment | | The delivery of goods for sale or disposal | X | | | X | | |
| Crew | | | X | | | | | X |
| | Crew member | A crew member is a person included in a vessel's crew. | X | | | | | X |
| | Crew list | Crew list is a document including the information required by the authorities about the number of crew and the crew's composition on arrival and departure of the ship. (FAL Convention/Directive 2002/6/EC) | | X | | | | X |
| | Crew's effects declaration | Crew's effects declaration is the document for arrival to provide the information required by the authorities.(FAL Convention/Directive 2002/6/EC) | | X | | | | X |
| Decision | | | X | | | X | | X |
| | Declaration of Security | Declaration of Security in accordance with IMO'S ISPS regulations, which has to be prepared if the vessel's chief of security or the port facility's chief of security demands so. | | X | | | | X |
| | Discharge permit | A permit issued by the Customs, allowing commencement of vessel Discharge. | | | X | X | | |
| | Loading permit from the Customs | A permit issued by the Customs, allowing the loading of cargo or transport unit to the vessel. | | | X | X | | |
| | Permit for entry to port with dangerous cargo | Permit for entry to port with dangerous cargo is a permit granted to the cargo holder's representative for entry to port with cargo classified as dangerous and/or storage of such cargo in the port. | | | X | X | | |
| Environmental Information | | | X | | | | | X |

| Name | | Description of content | Type | | | Process | | |
|------------------|---|--|------|-----|-----|---------|----|-----|
| | | | Inf | Doc | Msg | GT | PT | VTC |
| | Environmental conditions | Environmental conditions information is either measurement data concerning weather conditions at a certain moment of time or forecast information. | X | | | | | X |
| | Ice conditions data | Data concerning the occurrence, thickness and type of ice and the temperature of surface water produced on the basis of information acquired from an environmental information provider or an icebreaker. | X | | | | | X |
| | Sea level data | The sea level is stated as the difference between the current sea level and the mean sea level height. | X | | | | | X |
| Goods | | The commodities being consigned. Identified set of goods that are of some product type. | X | | | X | | |
| Operator | | The party operating the connecting transportation service or the intermediate transport chain service. | X | | | X | X | |
| Parcel | | A packaged set of goods belonging to a shipment | X | | | X | | |
| Passenger | | | X | | | | X | |
| | Passenger | A passenger is a person who is present on board of a vessel in the status of a passenger. | X | | | | X | |
| | Vehicle | Vehicle accompanied with passenger. Car, van or bus. | X | | | | X | |
| | ID document | A passport or identity card proving the identity of the passenger | | X | | | X | |
| | Passenger list | A list of persons present on board the vessel as passengers | | X | | | X | |
| Port | | | X | | | X | X | X |
| | Port | A port is a place near a waterway arranged for loading or unloading of cargo or passengers from a vessel. May include facilities for the temporary storage of cargo. | X | | | X | X | X |
| Port Call | | | X | | | X | X | X |
| | Port call | A port call is the visit of a certain vessel to a certain port i.e. the arrival to a port and departure from that port. | X | | | X | X | X |
| | Statistical cargo declaration | Statistical information is given by shipping line's agent to port organisation, customs and maritime administration. | | X | | | X | |
| | Notification of dangerous or polluting goods carried on board | Notification of carried dangerous or polluting goods at the latest at the moment of departure to competent authority if the port is in EU member state. If the port is outside EU, but the destination of the vessel is inside the EU, the notification is made to the destination. (Directive 2002/59/EC) | | X | | | | X |

| Name | | Description of content | Type | | | Process | | |
|----------------------|-----------------------------------|--|------|-----|-----|---------|----|-----|
| | | | Inf | Doc | Msg | GT | PT | VTC |
| | Notification prior to entry | Notification made prior to the vessels entry into ports of the EU member states. (2002/59/EC) | | X | | | | X |
| | Ship's stores declaration | Ship's stores declaration is a document for arrival and departure to provide the information required by the authorities about the ship's stores. (FAL Convention) | | X | | | | X |
| | Manifest | A list of the cargo transported by a vessel submitted by the freighter (the shipping company performing the role "carrier"). | | X | | X | | |
| | Shipper's manifests | Shipper's manifests are submitted to port authority immediately after vessel arrival or departure, unless agreed otherwise. | | X | | X | | |
| | Shipping company's loading permit | A permit allowing the loading of a consignment or transport unit onto a vessel, issued by the shipping company (carrier). Often included in the loading list. | | X | | X | | |
| | discharge instructions | Instructions concerning the correct order for vessel discharge. Special instructions. | | | X | X | | |
| | Loading instruction | Instructions concerning the placement of cargo in vessel hold. | | | X | X | | |
| | Loading report | Report concerning loading operations performed. | | | X | X | | |
| Product | | Abstract entity identifying the physical properties of certain goods | X | | | X | | |
| Route | | A scheduled course fixed to a vessel or group of vessels | X | | | X | | |
| Service | | | X | | | | | X |
| | Piloting information | Information on a realised or planned piloting event. | X | | | | | X |
| | Pilot ordering | Ordering of pilots in advance by telephone, fax, or e-mail. | | | X | | | X |
| Ship Operator | | The party operating the ship. | X | | | X | X | X |
| Shipment | | | X | | | X | | |
| | Terminal notice | A notice submitted to a terminal concerning a transport unit arriving or leaving by overland transport. | | X | | X | | |
| | Terminal report | A report issued by the terminal to the submitter of a terminal notice after receipt or transfer of the transport unit. | | X | | X | | |
| | Booking | Transport reservation from shipping company (freighter) | | | X | X | | |
| | Booking confirmation | Confirmation on approval of transport reservation. | | | X | X | | |
| | General declarations | General declarations are submitted to the Customs concerning other than EU-goods, which have been turned over to the Customs, but did not pass | | | X | X | | |

| Name | | Description of content | Type | | | Process | | |
|-------------------------------|---|---|------|-----|-----|---------|----|-----|
| | | | Inf | Doc | Msg | GT | PT | VTC |
| | | customs clearance procedures straight away. | | | | | | |
| Space Booking | | | X | | | | X | |
| | Space booking | Booking of capacity | X | | X | | X | |
| | Voyage booking | Booking of a voyage from a shipping company (freighter) | X | | X | | X | |
| | Space booking confirmation | Confirmation that the booked capacity of cabin's / seats is available | | | X | | X | |
| Tracking Data | | Location, event and environmental information on tracked Parcel, Transport Unit or Vessel | X | | | X | | |
| Traffic Information | | | X | | | | | X |
| | Traffic recommendation | Traffic recommendation is a recommendation or advice concerning the navigation of a vessel at a certain part of the route or fairway given by the vessel traffic monitoring and information system operator to a ship's master. | X | | | | | X |
| | Traffic restriction | A traffic restriction is imposed due to ice conditions by authorised organisation. Icebreaker assistance is only given to vessels that fulfil the requirements (ice class, DWT) set in the traffic restriction. | X | | | | | X |
| | Traffic situation | Traffic situation is a complete overview of the movements and positions of vessels berthed or navigating in the fairways or at open sea. | X | | | | | X |
| | Vessel movement | Vessel movement includes information about the vessel, its movement and location at a certain point of time. | X | | | | | X |
| | Preliminary information | Information transmitted in advance e.g. before entering a certain area or a port. Reported to vessel traffic monitoring and information system or support service provider. | | | X | | | X |
| | Vessel traffic monitoring and information system report | Report made by a vessel to a vessel traffic monitoring and information system including the required information. | | | X | | | X |
| Traffic Infrastructure | | | X | | | | | X |
| | Fairway | A fairway or a waterway is a shipping lane established for vessel traffic at sea or inland waters. | X | | | | | X |
| | Restrictions | Restrictions in the use of waterways and sea areas. | X | | | | | X |
| | Sea area | Description of sea areas geographical information, its fairways and sites, and their characteristics. | X | | | | | X |
| | Special fairway area | A special fairway area is an area indicated for a special purpose (e.g. passing area, meeting area, anchoring area). | X | | | | | X |

| Name | | Description of content | Type | | | Process | | |
|------------------------|-----------------------------|---|------|-----|-----|---------|----|-----|
| | | | Inf | Doc | Msg | GT | PT | VTC |
| | Winter route | A winter route is a fairway channel in ice opened for navigation by an ice-breaker. | X | | | | | X |
| | Winter route recommendation | A winter route recommendation describes the route through ice under the prevailing ice conditions. Recommendation is given by an icebreaker to vessels which fulfil the national ice class regulations and are fit for winter navigation. | X | | | | | X |
| Transport Leg | | Individual stage of a transportation chain | X | | | X | | |
| Transport Order | | The request and reply for obtaining services to transport a consignment | | | X | X | | |
| Transport Plan | | The plan to deliver transportation services | | X | | X | | |
| Transport Unit | | | X | | | X | | |
| | Hazardous cargo manifest | Hazardous cargo manifest contains information about the hazardous cargo to be loaded on the vessel. | | | X | | | X |
| | Cargo list | A specification submitted by the terminal to the shipper's agent concerning the way cargo is loaded into the transport units (containers). | | | X | X | | |
| | Cargo status data | Information transmitted by the terminal to the shipping company concerning the cargo received. Vessel loading list is prepared based on this data. | | | X | X | | |
| | Dangerous cargo declaration | Specifications of dangerous cargo present in the transport vehicle or transport unit, prepared by the shipper's agent. | | | X | X | | |
| | Dangerous cargo manifest | A list of dangerous cargo present on the vessel, submitted by the freighter (the shipping company performing the role "carrier"). | | | X | X | | |
| | Discharge list | A list of consignments or transport units to be unloaded from vessel, prepared by the shipping company (freighter). | | | X | X | | |
| | discharge report | Report concerning discharge operations performed. | | | X | X | | |
| | Identification instructions | Instructions submitted by the shipper's agent to the terminal concerning the loading of cargo to transport unit (container). | | | X | X | | |
| | Loading list | A list of consignments or transport units to be loaded on vessel, prepared by the shipping company (freighter). | | | X | X | | |
| | Hazardous cargo | Vessel cargo includes substances that the transport of such goods might cause harm, risk, peril, or other evil to people, environment, equipment or any property whatsoever. | X | | | X | | X |

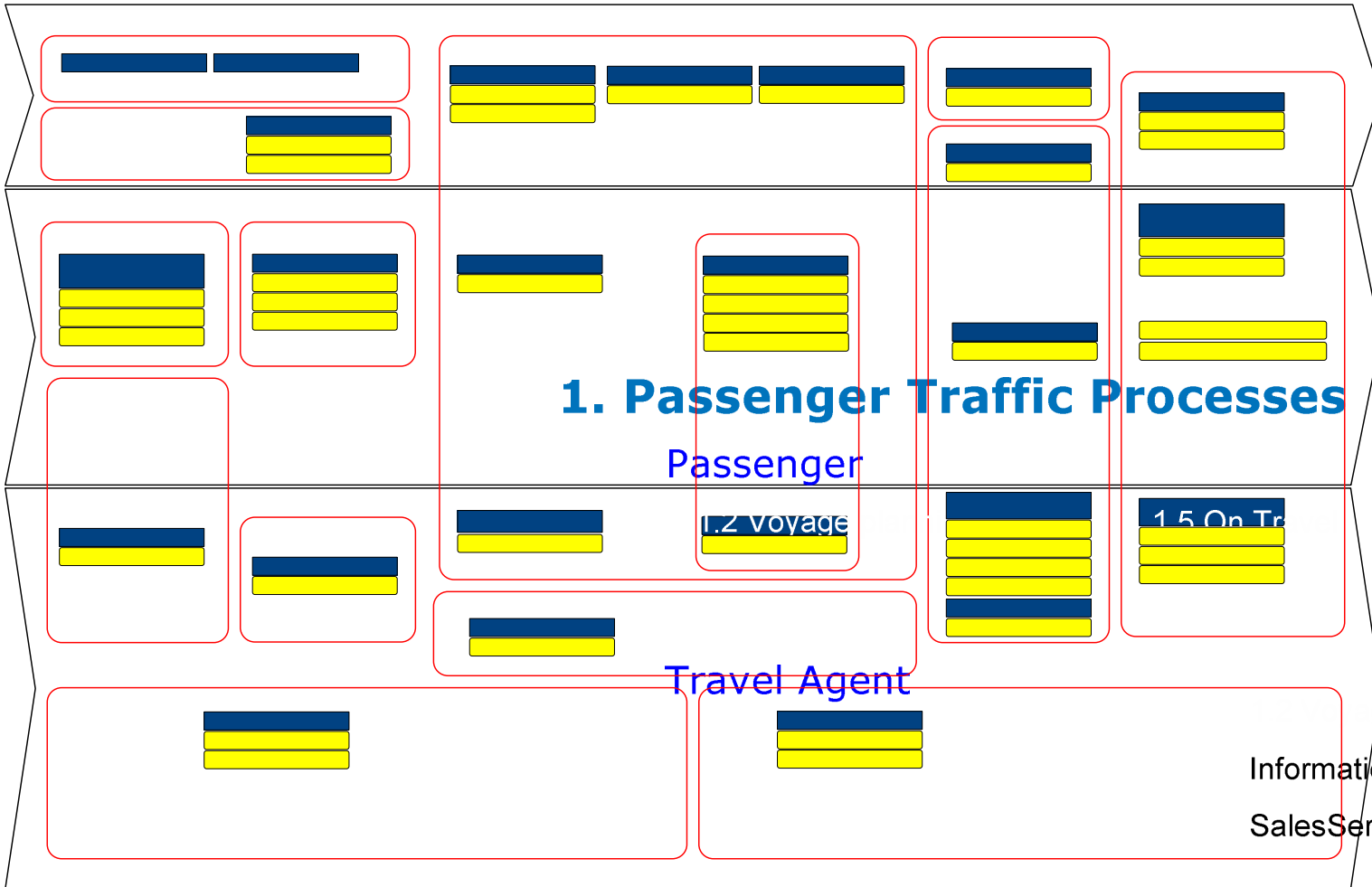
| Name | | Description of content | Type | | | Process | | |
|-----------------------|-----------------------------|--|------|-----|-----|---------|----|-----|
| | | | Inf | Doc | Msg | GT | PT | VTC |
| | Freight | Freight is cargo loaded to a vessel for the purpose of transportation. | X | | | X | | |
| Vessel | | | X | | | X | X | X |
| | Port rotation | A port rotation is a series of port calls made by a certain vessel. ISPS requires information on the 10 last port calls of a vessel. | X | | | X | X | X |
| | Timetable | A timetable is preliminary or factual information on arrival or departure of a vessel or passing of a fixed point. Timetable may include data on accuracy of the information. | X | | | X | X | X |
| | Vessel | A vessel is a waterborne transport vehicle used for commercial transportation of cargo or passengers or both. | X | | | X | X | X |
| | Fairway depth exemption | A fairway depth exemption is a permit granted to a vessel allowing it to deviate from the established navigable depth of the fairway. | X | | | | | X |
| | Ice class | Vessel's ice class to which the vessel has been classified by the competent authority. For the meantime there are several ice class classification systems in use in the Baltic Sea. | X | | | | | X |
| | Ice class exception | Ice class exception is a permit granted to a vessel allowing it to deviate from the ice class requirements. | X | | | | | X |
| | Stability information | Statistics associated with vessel stability calculations. | X | | | | | X |
| | Vessel waiting time | Time spent by a vessel on waiting for icebreaker assistance. | X | | | | | X |
| | Bay plan | A diagram or respective file describing the location of transport units in a LoLo-vessel hold. | | X | | X | | |
| | Cargo plan | A diagram or respective file describing the location of cargo in a RoRo-vessel hold. | | X | | X | | |
| Voyage Booking | | | X | | | | X | |
| | Boarding card | A card issued at the check-in counter in exchange for the travel ticket, by which the passenger confirms his/her right to board the vessel. | | X | | | X | |
| | Travel ticket | A document by which a passenger proves his/her right to make the voyage | | X | | | X | |
| | Voyage booking confirmation | Confirmation on acceptance of voyage booking | | | X | | X | |
| | Voyage order | Ordering of a voyage by the arranger of the voyage | | | X | | X | |
| | Voyage order confirmation | Confirmation on acceptance of voyage order | | | X | | X | |

5.2 Services View

The Services View describes the Information System Services to support and automate the processes. The Services are grouped according to the process they are supporting and the actor owning the Service. Process areas are described as chevrons. The Services are described as rectangles and the process supported by the Service(s) is described as a rectangle above one or more Services.

A red rounded square encloses the Services that a certain Actor within the Collaboration Architecture owns. Ownership of a Service is defined by the process that it supports.

The Services View can be used as basis for Service Architecture design for individual organisations



Picture 7. Services View of Collaboration Architecture

2. Transport Corridor Processes

Vessel Traffic Management

Supporting Service Provider



The next table defines each of the services. For each service, the actor owning the service is also specified.

Table 8. Definitions of Information System Services

| ID | IS Service | Actor | Description |
|----|----------------------------------|-----------|---|
| 1 | GoodsSafety Mgmt | Authority | Collection and analysis of information related to safety of goods transport. Information may concern transportation and use of substances harmful for the environment or people or the transportation of animals and plants across state border for controlling the spread of animal or plant deceases. Planning and control of authority activities taken on basis of the analysis. Preparation, dissemination and archiving of authority decisions related to safety of goods transport. |
| 2 | GoodsSecurity Mgmt | Authority | Collection of information related to security of goods transport. Analysis and profiling of information in order to uncover security risks, threats and crime. Support the international exchange of investigation information. Support planning and coordination of security related activities (like inspections). Supporting the preparation, dissemination and archiving of authority decisions related to security of goods transport at national, regional, and local levels. |
| 3 | GoodsTaxes& DuesMgmt | Authority | Maintain information on cargo taxation and dues rules. Support planning and management of necessary inspection activities. Support preparation, dissemination and archiving of authority decision (import clearance, export clearance, export licences, etc.) related to cargo taxes and dues. Maintain the financial records and audit trail of taxes and dues (e.g. customs duties, import duties, value added tax, excise taxes, vehicle taxes, navigation tax, oil protection tax, waste tax, traffic insurance taxes). |
| 4 | Passenger SecurityMgmt | Authority | Collection of information related to security of passenger transport. Analysis and profiling of information in order to uncover security risks, threats and crime. Support the international exchange of investigation information. Support planning and coordination of security related activities (like Inspection of passengers, baggage, and baggage/vehicles transported separately from the passengers in the vessel's hold). Supporting the preparation, dissemination and archiving of authority decisions related to security of passenger transport at national, regional, and local levels. |
| 5 | PassengerTaxes &DuesMgmt | Authority | Maintain information on passenger taxation and dues rules. Support planning and management of necessary inspection activities. Support preparation, dissemination and archiving of authority decisions related to passenger taxes and dues. Maintain the financial records and audit trail of taxes and dues. |
| 6 | VesselTaxes& DuesMgmt | Authority | Maintain information on vessel taxation and dues rules (e.g. fairway fees). Support planning and management of necessary inspection activities. Support preparation, dissemination and archiving of authority decisions related to vessel taxes and dues. Maintain the financial records and audit trail of taxes and dues. |
| 7 | Traffic Infrastructure InfoMgmt | Authority | Support the collection, maintenance and dissemination of information on vessel traffic infrastructure (e.g. maritime maps with fairways, safety equipment, restrictions, etc. depicted on them) |
| 8 | BSRMaritime Information Exchange | Authority | Receiving, transmitting and archiving information on vessel port calls, notices and manifests related to port calls, cargo and passengers. Providing reports based on archived information. Keeping a directory of available interfaces and services and parties that are transmitting information via the service. Handling message transformations to support different versions of messages (in order to detach the upgrades of various messages and systems from each other). Information is transmitted between NationalMaritimeInformationExchange services and possibly between individual actors in countries where no national service |

| ID | IS Service | Actor | Description |
|----|--|---------------------------------------|--|
| | | | exists. |
| 9 | National Maritime Information Exchange | Authority | Receiving, transmitting and archiving information on vessel port calls, notices and manifests related to port calls, cargo and passengers. Providing reports based on archived information. Keeping a directory of available interfaces and services and parties that are transmitting information via the service. Handling message transformations to support different versions of messages (in order to detach the upgrades of various messages and systems from each other). Information is transmitted between national actors and the possible BSRMaritimeInformationExchange service |
| 10 | Transport Operations Mgmt | Connecting Transportation Operator | Management of connecting passenger transport operations. Maintaining and disseminating information on routes, timetables and services. Maintaining information on available capacity and bookings. |
| 11 | ERP | Consignee | The enterprise resource planning functions. Production planning, financial reporting, accounts payable, etc. |
| 12 | SCM | Consignee | The supply chain planning services. Managing information on received shipments and the status of their handling. Managing storage of goods. Submitting the information on received goods for production planning. |
| 13 | ERP | Consignor | The enterprise resource planning functions. Production planning, financial reporting, accounts receivable, accounts payable, etc. |
| 14 | SCM | Consignor | The supply chain planning services. Managing storage of goods. Receiving information on shipments from ShipmentMgmt. Managing information on shipments to prepare and the status of their handling. Submitting the information on prepared shipments to ShipmentMgmt and Intermediate Transport Chain Operator. |
| 15 | ShipmentMgmt | Forwarding Agent | Receiving information on trade transactions. Ordering of transportation and interim handling services based on the trade transactions. Supporting the preparation of declarations and necessary documents for transport and delivery of said documents to the parties involved. Subjection of shipment to customs clearance (release into free circulation, transit, customs warehousing, export, etc.) |
| 16 | Tracking & Tracing | Information Service Provider | Collection and recording of tracking data and distributing raw data or exception information to necessary parties (consignee, consignor, ship operator, authorities, port). Carrying out tracing on request. |
| 17 | TransportMgmt | Intermediate Transport Chain Operator | Management of intermediate transport chain operations. Maintaining and disseminating information on routes, timetables and services. Maintaining information on available capacity and bookings. Receiving, archiving and disseminating documentation and receipts related to shipments. |
| 18 | PortPassengerServiceMgmt | Port | Management of port passenger handling services. Receiving information on ships arriving. Planning and management of passenger services. Information exchange on passengers with authorities, ship operators and Connecting Transportation Operators. Maintain information on passenger fees and dues rules and price lists. Support calculation and collection of fees and dues. Maintain the financial records and audit trail of fees and dues. |
| 19 | PortCargoServicesMgmt | Port | Management of port cargo handling services. Receiving information on shipments arriving by land transport or vessels. Planning and management of cargo handling (e.g. stuffing, stripping). Planning and management of cargo warehousing services. Information exchange on shipments with authorities, ship operators and consignors, consignees and intermediate transport chain operators. Submitting shipments for customs declaration on behalf of consignor or consignee. |

| ID | IS Service | Actor | Description |
|----|-------------------------|------------------|---|
| | | | <p>Planning and control of in-port placement of cargo for which the port operator is responsible (yard planning). Planning and control of vessel loading operations (terminal vessel planning). Planning of machine operation. Managing loading alteration. Transmit event information (bay plan) to the vessel representative. Transmitting waybill for the Intermediate Transport Chain Operator.</p> <p>Maintain information on cargo fees and dues rules and price lists. Support calculation and collection of fees and dues. Maintain the financial records and audit trail of fees and dues.</p> |
| 20 | PortVessel ServicesMgmt | Port | <p>Receipt of declarations associated with vessel arrival and departure. Indication of berths or waiting areas. Fastening. Provision of the port services required by vessels such as stevedoring work. Monitoring vessel traffic within the port area. Exchanging traffic information with the vessel traffic monitoring and information system, authorities or support service providers.</p> |
| 21 | PortResources Mgmt | Port | <p>Management of the port structural and services information. Supporting budgeting and planning of the Port operations.</p> |
| 22 | SafetyMgmt | Port | <p>Collection and analysis of information concerning transportation and use of substances harmful for the environment or people. Support activities to supervise compliance with safety instructions and regulations. Planning and control of activities to maintain safety of cargo at Port. Preparation, dissemination and archiving of decisions and permits related to transport of dangerous goods in and out of the port area.</p> |
| 23 | SecurityMgmt | Port | <p>Collection of information related to security of the port area. Analysis and profiling of information in order to uncover security risks, threats and crime. Exchange of security related information with authorities and other parties. Support planning and coordination of security related activities.</p> |
| 24 | PilotingMgmt | Service Provider | <p>Maintaining and disseminating information on piloting services. Receiving piloting requests. Planning and control of piloting services.</p> |
| 25 | TugAssistance Mgmt | Service Provider | <p>Maintaining and disseminating information on tug assistance services. Receiving tug assistance requests. Planning and control of tug assistance services. Billing for the service.</p> |
| 26 | Winter Assistance Mgmt | Service Provider | <p>Maintaining and disseminating information on winter traffic assistance services, routes available and traffic restrictions. Receiving winter traffic assistance requests. Planning and control of ice breaking and vessel or convoy assistance. Billing for the service.</p> |
| 27 | Passenger CheckIn | ShipOperator | <p>Verification of passenger travel ticket and identity against the stored information on reservations. Printing a boarding card. Registration of the passenger as arrived for the passenger list.</p> |
| 28 | Passenger ServicesMgmt | ShipOperator | <p>Receiving and processing bookings for passengers. Maintaining information on available accommodation and hospitality services capacity and bookings. Planning and control of service production. Charging for services.</p> |
| 29 | PortCallMgmt | ShipOperator | <p>Managing the ship port call. Ordering and paying all the necessary services. Preparing, submitting and archiving the documentation needed for the ship to enter or leave the port.</p> |
| 30 | SalesService | ShipOperator | <p>Ship passenger ticket and services sales. Charging for the sold tickets and services. Maintaining the financial records and audit trail of sales. Possibly a web based service for travel agents and passengers. Reservations are maintained in the PassengerServicesMgmt service.</p> |
| 31 | TransportMgmt | ShipOperator | <p>Planning and control of cargo transport services. Maintaining information on vessel cargo capacity, transport orders and bookings. Planning and control of cargo related activities on ship. Planning and control of loading and discharging of cargo. Planning and control of routes, stages and port call from cargo point of view. Planning and control of vessel stability. Support for pre-</p> |

| ID | IS Service | Actor | Description |
|----|--------------------------------|--------------------------|---|
| | | | paring, submitting and archiving of cargo related documents, notices and manifests. |
| 32 | Information Service | TravelAgent | Travel sales and reservation services for passengers (via web and other automated channels). Support for browsing the available travel services, ordering the services, service confirmation, payment and ticketing. |
| 33 | SalesService | TravelAgent | Travel sales and reservation services form the travel agent personnel. Support for browsing the available travel services, ordering the services, service confirmation, payment and ticketing. Processing the travel reservations into bookings to the ship operator. Managing the financial records and audit trail of passenger and ship operator reservations. |
| 34 | CargoMgmt | Vessel | Planning and control of cargo management onboard the vessel. Monitoring of the cargo conditions for compliance with safety instructions, regulations and terms specific to the shipment. |
| 35 | Information Exchange | Vessel | Continuous transmission of identification, destination etc. information by the means of AIS system to vessel traffic monitoring and information system, surveillance and other vessels. |
| 36 | Navigation System | Vessel | Support for planning of vessel's route at sea and steering the vessel on the basis of all relevant information (including radar images, maps, satellite positioning information, the traffic monitoring and information system recommendations). |
| 37 | Operations Mgmt | Vessel | Support for planning and controlling of activities onboard the vessel. Maintaining the required set of documentation concerning the vessel, crew, passengers, cargo, safety and security. |
| 38 | Vessel SecurityMgmt | Vessel | Controlling access to vessel based on personnel identification tokens or passenger boarding cards. |
| 39 | Traffic Information Exchange | VesselTraffic Management | Receipt and management of information from other traffic monitoring and information systems, authorities and support service providers for the purpose of vessel traffic monitoring, information and surveillance, and distribution of this information to authorised users. |
| 40 | Traffic Information Publishing | VesselTraffic Management | Transmission of traffic monitoring and information system recommendations or advice and environmental or other safety related information for the monitored vessels. |
| 41 | Traffic Monitoring | VesselTraffic Management | Monitoring vessels movements and related data by various data available. Supporting the planning of vessel traffic monitoring and information system measures. |

6. USING BASIM COLLABORATION ARCHITECTURE

The following chapters describe how various other projects and organisations can make use of the BaSIM Collaboration Architecture.

6.1 Use by BaSIM WP1 Implementation Projects

The purpose of BaSIM WP1 is to find pairs of organisations with opportunity to automate one or more information exchanges between them. To plan such an implementation project, the Collaboration Architecture can be used to assist the planning via the following steps:

1. Identify the role of both organisations within the Collaboration Architecture. Decide the relevant process area(s) (Passenger Transport, Goods Transport, Vessel traffic Corridor) and match the actor definitions to the organisations.
2. Identify the scope of the project in relation to the processes. Check which process steps are included totally and which are included partially. Check if any relevant processes belonging to another logical actor are included. Visualise the scope to the process chart(s) by outlining the relevant processes.
3. Identify the collaboration interfaces relevant for the activities within the scope defined in previous step. Take note of the information content and standards listed. Check for additional material on the interfaces.
4. Based on the previous steps, document the business scope and requirements for the project.
5. Use the Information View and Information Objects list to identify the information required by the collaboration. Identify existing information stores corresponding to the Information Objects. Plan necessary steps to create information store for missing information or acquire the information from external source.
6. Use Service View and Information System Service list to identify the relevant services for information exchange.
7. Based on steps 5 and 6, document the functional and information scope for the project. Based on the documentation, the solution can be designed in detail.

6.2 Use by BaSIM WP2

The WP1 process model can be used as a reference framework for the WP2 to identify the points where security related processes should connect to the actual transport processes. The required security measures controlling the transport security can be located in relevant points in the WP1 process descriptions.

One objective of WP2 is also the increase of Intermodal Tracking & Tracing services for security related exception reporting and reaction. The WP1 describes a process called *3.6 Tracking & Tracing*, which is a clear connection point for combining the needs of security with those of transport chain management.

WP2 aims to describe the data exchange and interfaces for security related messages. These interfaces should ideally be described on top of the WP1 process and architecture framework.

6.3 Use by BaSIM WP3

The WP1 describes three processes; goods transport, passenger transport and transport corridor. The transport corridor process of WP1 describes the activities related to vessels and thus covers only the maritime leg of a WP3 transport corridor. The goods and passenger transport processes of WP1 describe the end-to-end transport chains and are thus compatible with the concept of WP3 transport corridor.

The WP3 may utilise the WP1 processes as a framework. The framework could consist of the process visualisations. Such a framework could be used to relate different development needs, suggested policy changes and proposed initiatives to each other.

6.4 Use by BaSIM WP4

The objective of the work of WP4 is the establishment of a service, i.e. a directory that is at the disposal of a computer, which contains information on:

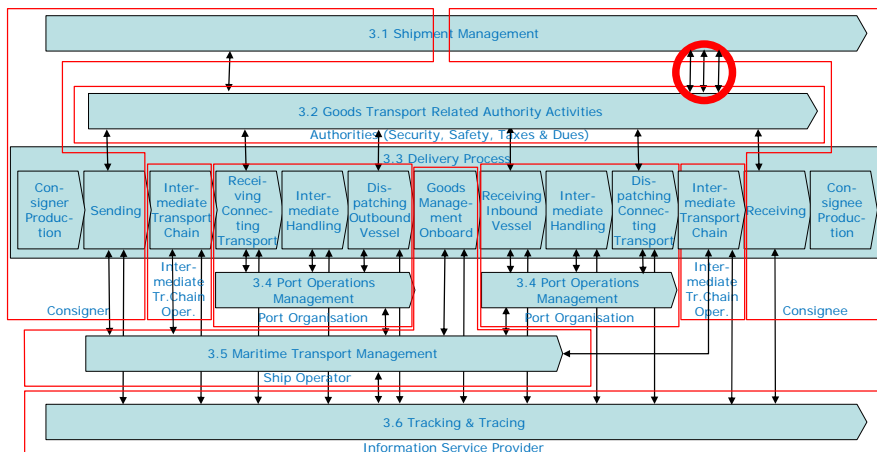
1. Community actors (aka “the yellow pages”)
2. Community actor roles and their ability to take part in common processes
3. How the process works technically in different phases of the process (e.g. the different message options).
4. Descriptions on the process flow between actors etc.

The information is formally stored as XML-documents, which can be read and executed automatically.

The task of WP1 is to provide input in form of process charts and related explanatory documentation to points 1 and 4 above and to describe the overall information system services, interfaces and information stores needed to support a Collaboration Architecture as a generic framework for logistics systems development.

The task of WP4 is to depict the interfaces between the actors of WP1 processes as interface processes to the web directory service. The solution may be designed to be completely open, hence there is no need to distinguish whether the structures are utilised for communication between businesses or authorities.

In addition WP4 creates a demonstrator platform that implements services to enable collaboration according to the ebXML model. The WP1 includes these services within its architecture (BSR Maritime Information Exchange and National Maritime Information Exchange) and specifies other services describing the externally relevant characteristics of the information systems of the collaborating parties.



Picture 8. Example of WP1 interface described as WP4 Business Process Specification

The WP1 process and interface descriptions are used by the WP4 to transform the interfaces between different actors into standard ebXML Business Process Specifications (see the above example). The Business Process Specifications form the Core Library for Baltic Sea Region Short Sea Shipping collaboration.

Since the WP1 and WP4 processes are on different level, there is hardly any danger of duplicated efforts. The WP1 processes are end-to-end processes describing the whole goods transport chain. The WP4 processes are more detailed descriptions of interactions between two actors within the WP1 higher level process. For example, the activity of getting customs clearance for a consignment involves a single interface between the WP1 sub-processes of *3.1 Shipment Management* and *3.2 Goods Transport Related Authority Activities*. In WP4 this single interface is described in more detail as a sequence of several interactions.

6.5 Use by Organisations developing their processes and information systems

The Collaboration Architecture supports the development of an organisation's general operating concept, but also provides guidelines for individual systems.

The Collaboration Architecture can be used:

- to assess the current status of its own system by comparing it to the national target.
- as the basis for developing its own operations, an actor-specific architecture or an individual system.

The assessment of the current status goes as follows:

1. The organisation has an overview or documentation of a part of business it wants to compare with the BaSIM Collaboration Architecture.
2. Select a Collaboration Architecture process description or group of processes associated with this function.
3. Reduce the business to its basic components to match the Collaboration Architecture processes.

4. Assess which process components or connections the business covers, and whether the business is missing any process components or whether the process components include everything the business does.
5. Assess what information exchange with other organisations (actors) is needed according to the process description. Assess which connections already exist and which do not, and whether the current connections need development.
6. Assess the current status of the process components of other organisations. Find out whether these process components are sufficient for a connection between the organisations to be successful.

The Collaboration Architecture can be used as the basis for the organisation's development operations as follows:

1. Select a Collaboration Architecture process description or descriptions that deal with the planned operating concept or an individual business function.
2. If the development plan involves an existing function, the function's current status is assessed as outlined above.
3. Start off the development process by selecting those process components from the Collaboration Architecture process description that the organisation will want to implement to create the function.
4. Find out which inter-organisational information exchanges listed in the architecture are needed.
5. Assess the current status of the process components of other organisations. Find out whether the processes of these organisations are sufficient for maintaining successful connections.
6. Check the Collaboration Architecture for international or national standards in the processes or connections.
7. Select information system services and their definitions that support the process components under examination from Collaboration Architecture logical architecture descriptions. Highlight these functions on the Services View. This will give a general idea of the system being developed.
8. Select data sets associated with the Information System Services by using the Information View and Information Object definitions. The data sets can be used as the basis for conceptual data modelling during system development.

7. RECOMMENDATIONS

This chapter collects the recommendations regarding the use and further development of the BaSIM Collaboration Architecture.

7.1 Architecture Dissemination

The BaSIM Collaboration Architecture should be marketed within the Baltic Sea Region to all organisations related to Short Sea Shipping. The marketing should take place via national activities supported with common presentation material and when required with a presenter from the core architecture team.

The BaSIM Collaboration Architecture should also be marketed as a baseline for development of European Community level short sea shipping collaboration architecture.

Possible dissemination channels at European level are:

- European Shortsea Network (www.shortsea.info/).
- ESPO - European Sea Ports Organisation (www.espo.be).
- BPO - Baltic Ports Organization (www.bpoports.com)
- CLECAT - European Liaison Committee Of Freight Forwarders (clecat@infoboard.be).
- ESC - European Shippers Council (www.europeanshippers.com).
- ECSA - European community association of ship owners (www.ecsa.be).

7.2 Architecture Governance and Development

The governance and development of BaSIM Collaboration Architecture needs a responsible party that acts as the architecture custodian. The role of architecture custodian involves:

- Directing the development of the architecture,
- Maintaining and developing the architecture,
- Marketing the architecture and
- Assessing compliance of solutions against the architecture.

The task of directing the development needs to be performed by the architecture custodian. Other activities can be contracted to a competent organisation possessing suitable experience on enterprise and inter-enterprise level business and information architecture.