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ELECTRONIC MEANS FOR THE CLEARANCE OF SHIPS

The use of the Single Window concept

Submitted by Brazil

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Background

1   The Committee established the Correspondence Group on the Development of guidelines for setting up a Single Window system in maritime transport under the direction of Mr. Luis Fernando Resano (Brazil) at FAL 35 in January 2009.

2   The work of the Correspondence Group was guided by the terms of reference established in section 5.28 of document FAL 35/17.

3   Representatives from the following Member States participated in the work of the Correspondence Group:

BRAZIL   NORWAY
NETHERLANDS   SWEDEN

Terms of Reference for the Correspondence Group

4   As mentioned in paragraph 1, the Correspondence Group received the following terms of reference:

.1   prepare a first draft of Guidelines for setting up the Single Window system in maritime transport, taking into account and building upon existing standards, guidelines and recommendations adopted, for example, by UN/CEFACT, WCO and ISO on the understanding that the guidelines are intended for use

primarily by those who will embark on the establishment of a Single Window system henceforth and ensure compatibility and harmonization with other modes of transport;

.2   prepare an index listing the related standards, guidelines and recommendations on the Single Window concept adopted by UN/CEFACT, WCO and ISO, as well as other international bodies and regional organizations and current developments which are in hand in this respect;

.3   prepare a summary of the lessons learned from Member States who have established or are intending to establish Single Window; and

.4   submit a report for consideration by FAL 36.

Work done by the Correspondence Group

5   The coordinator waited for the final report from FAL 35 which was published in March 2009. After that still waiting for participants, until June 2009 and the Group had only four participants.

6   Starting the task the coordinator circulated the following questions:

.1   Suggestion in relevant aspect for the Guidelines for setting up the Single Window system in maritime transport taking into account and building upon existing standards, guidelines and recommendations adopted by UN/CEFACT, WCO and ISO to be in the Guidelines under development;

.2   Relevant related standards, guidelines and recommendation on Single Window:

a)   UN/CEFACT
b)   WCO
c)   ISO
d)   IMO
e)   others; and

.3   Lessons learned by your country in establishing Single Window.

7   Instead due to the reduced numbers of participants the Group has prepared a draft for a future guideline. There are a few points where the Group could improve with more participation from Contracting Governments to the FAL Convention who have implemented the Single Window concept.

Action requested of the Committee

8   The Committee is invited to:

.1   take note of the work of the Correspondence Group above;

.2   note the first draft of the guidelines as a first step from the Correspondence Group shown in the annex; and

.3   invite more participation from Contracting Governments.

***

ANNEX

**DRAFT RECOMMENDATIONS AND GUIDELINES FOR SETTING UP A
SINGLE WINDOW SYSTEM IN MARITIME TRANSPORT**

1. Introduction

There is a strong international consensus that there is a need for setting up the Single Window (SW) system in maritime transport, taking into account and building upon existing standards.

There is a substantial amount of literature available on "single window", but this is mostly concerned with trade and cargo-related issues. The issue of clearance of the ship as a transport means is less extensively covered. Thus, these guidelines will attempt to provide more specific guidance on maritime transport clearance, *including* the clearance of the ship. This does not necessarily mean that one needs to define different single windows for transport and trade. Ideally, one single window should cater for both.

Definitions of specific terms can be found in section 3. An important background to these guidelines is the discussion on the different types of single windows and how these relate to trade and transport. This leads up to the actual guidelines in section 5. This section will make references to other sections and general background material. Some references to documented and practical experiences are discussed in section 9 and an overview of applicable standards can be found in section 10. The guideline will make extensive use of external references in the form of an abbreviation enclosed in square brackets. The corresponding reference can be found in section 10. A list of other external resources can be found in section 12.

2. Scope

This guideline is primarily intended for countries and ports that are considering establishing a Single Window system for maritime transport. The intention is to provide some background to the design process and references to external sources that can help in the process of establishing the single window.

2.1 Maritime transport

These guidelines will focus on the development of single window solutions for maritime transport. One should keep in mind that transport is only one component of trade (see section 4.1) and also that maritime transport is only one of several other transport modes.

2.2 Electronic messaging

Electronic exchange of information is obviously the most efficient way to perform the necessary clearance of ships before loading or discharging cargo. Thus, this guideline covers the implementation of an electronic facility for clearance of ship and/or cargo. However, the definition of single window does not preclude the use of paper documents. One should keep in mind, though, that the FAL conventions still requires the authorities to accept paper forms.

2.3 No standards defined

This guideline does not define any particular standard for implementing a Single Window. It will point to different international recognized standards that are available and can be utilized as appropriate.

3. Definitions

The definitions in this section are for use in these guidelines and will not necessarily be fully accurate in a more general trade or transport setting. They are based on commonly used terms, but do not necessarily cover all details of the terms in all circumstances.

3.1 Bill of lading

A bill of lading is similar to a waybill (see below) and the two terms are sometimes used for the same document. However a bill of lading is normally more formal and is often negotiable, which gives the person with ownership of the bill of lading the right of ownership of the goods and the right to re-route the shipment.

3.2 Carrier

The party undertaking the physical transport of a consignment, possibly as part of a larger supply chain.

3.3 Clearance

Clearance is defined as getting the permits (written, electronically, informally) to allow a certain process to be performed. In the scope of these guidelines, the following clearances are relevant:

- Clearance for ship to enter national waters.

- Clearance for ship to berth. This will normally include clearance for cargo or passenger to proceed to import/immigration control.

- Clearance for ship to leave berth.

- Clearance for cargo to be imported or exported.

Other forms of clearance may also be relevant, e.g., clearance to enter ship reporting areas, port fairways, channels, locks or other restricted traffic areas. However, this is normally part of traffic management.

3.4 Consignee

The party defined in the transport document as whom the consignment is to be received and accepted. The consignee is normally responsible for import procedures such as paying customs duties as well as a party in the discharging procedures subject to terms and conditions. (Free out).

3.5 Consignor/Freight Shipper

The party that is the sender of and formal owner of the consignment. The consignor is generally liable for the freight or the hire for the carriage of consignment.

3.6 Consignment

A collection of goods or merchandise that has a consignor and consignee. Ownership of the merchandise shipped on consignment rests with the consignor or freight shipper until the goods are disposed of according to agreement.

3.7 EDIFACT

EDIFACT, or more correctly UN/EDIFACT, is an abbreviation for United Nations / Electronic Data Interchange for Administration, Commerce and Transport. It is a special format defined by UN/CEFACT and later standardized by ISO as the ISO 9735 standards.

3.8 Electronic Data Interchange – EDI

The abbreviation EDI is used to refer to any type of electronic data interchange. The interchange can take place with XML formatted data, EDIFACT formatted data or even comma separated fields.

3.9 Electronic Port Clearance – EPC

The term EPC will be used as an abbreviation for a single window solution for the electronic clearance of ships arriving to or departing from a port. EPC will not normally include cargo clearance for import or export.

3.10 Freight Forwarder

The party arranging the carriage of goods including related services and/or associated formalities on behalf of a freight shipper or consignee; the forwarder is often contracted by the principal, the consignor or the consignee, depending on which terms of contract apply in the business relation between them.

3.11 Manifest

A specification of all cargo transported on a transport means (ship). This can be looked at as an aggregate of all waybills. However, the purpose is for management of the transport operation.

3.12 National Single Window – NSW

The term National Single Window is used in two different contexts:

- As the "only" single window solution nationally. This implies that all single window operations are performed through the one NSW. The alternative is regional SW solutions, e.g., for each port.

- As a portal between international data exchange systems and national trade data management systems. This is the case in Europe, where the NSW is the gateway between the European SafeSeaNet and the national authorities. It is implied that the NSW also undertakes a SW function.

These guidelines will only use the term Single Window (SW), except when discussing a single window solutions that mix local clearance functions (e.g., for one or a few ports) and national clearance functions through one common national single window.

3.13 Port Community System – PCS

Port Community System (PCS) can be defined as a computerized system that simplifies information exchanges between non-governmental parties in a port. This typically includes functionality also found in single windows, such as data bases, message exchanges, etc. The definitions used in other literature vary somewhat between authors and contexts, but the above definition will be used in these guidelines. The exchange of information with public authorities could also be part of the scope of a PCS. In this case a PCS can function as a SW in a public private partnership or as a gateway to a governmental SW.

3.14 Port Single Window – PSW

This term is sometimes used for a SW system that is deployed per port, i.e., different PSW exists for each port. This may be useful in situations where the port is very large and where the PSW is integrated with the Port Community System (PCS).

The term PSW will be used in these guidelines to denote an authorities' SW for one single port. The PSW may or may not be connected to a PCS.

3.15 Principal

An individual or organization that entrusts the execution of a carriage order to a contracting party in return for appropriate remuneration, (it is a generic term for the entity that requests carriage, for example the consignor, consignee, freight forwarder or any third party).

3.16 Ship's agent

The party representing the ship's owner or charterer in port. The agent is arranging together with the port a proper berth, pilots, clear the vessel with the port and other authorities along with releasing or receiving cargo on behalf of the ship's owner or charterer.

3.17 Single Window – SW

The below text is taken from the UN/ECE Recommendation 33.

A Single Window (SW) is defined as a facility that allows parties involved in trade and transport to provide standardized information and documents in a single entry point to fulfil all import, export, and transit-related regulatory requirements. If information is electronic, then individual data elements should only be submitted once.

The three basic models for the Single Window are:

- *A Single Authority* that receives information, either on paper or electronically, disseminates this information to all relevant governmental authorities, and co-ordinates controls to prevent undue hindrance in the logistical chain.

- *A Single Automated System* for the collection and dissemination of information (either public or private) that integrates the electronic collection, use, and dissemination (and storage) of data related to trade that crosses the border. There are various possibilities:

    i.   Integrated System: Data is processed through the system
    ii. Interfaced System (decentralized): Data is sent to the agency for processing
    iii. A combination of i and ii.

- *Automated Information Transaction System* through which a trader can submit electronic trade declarations to the various authorities for processing and approval in a single application.

Note: This definition mainly cover import, export or transit operations. Thus, it does focus more on the transported goods that the transport means (e.g., the ship).

3.18 Waybill

An agreement between consignor, carrier and consignee covering the transport of a consignment. This agreement covers the ownership and liability issues of the parties related to the consignment.

4. A high level overview of international trade

This chapter discusses the concepts behind the single window for maritime transport and looks at its relationship to the general trade requirements which in many cases operate their own single windows.

One of the major obstacles to the successful deployment of any technical system, single window or not, is how well it satisfies the requirements to the intended users. This implies that the designers of the single window need to know who the users are and what requirements they have.

Thus, the main message in this chapter is that trade has different dimensions, each with different parties and different responsibilities. A single window solution must define what dimensions, what parties and what responsibilities it is intended to serve and then implement technical solutions that satisfy these requirements.

4.1 Different business process groups

Trade involves a number of different business processes which interact to solve the higher level objective of movement of goods. Figure 1 attempts to illustrate some of the main business processes and parties in trade and transport. The top level, driving the whole process, is the international trade. This creates the need for transportation which in many cases is supplied by transport service providers, e.g., the forwarders. The actual transport may be performed over several legs, of which some typically are with ships. During the ship transport, there are also operational issues that need to be taken care of between the parties involved in the transport operation.
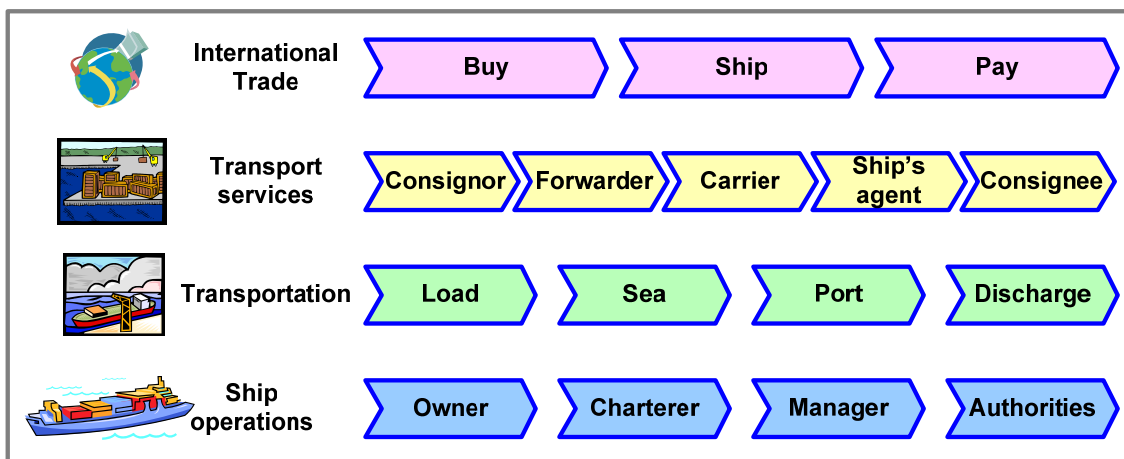
Figure 1 – Main business processes in trade and transport

Note that the figure is much simplified and that the real processes are significantly more complex. Also, these four levels may be repeated several times over the freight operations and the roles and actions on each level will often be intertwined with other levels' roles and action. This is only a high level view of the processes.

The users' requirements on each level are driven by the business process on that level and have relatively different focus. On the highest level it is driven by the sale and purchase of transported goods, while on the lowest level it is driven by the need for return on investments in ship and infrastructure. Thus, single window solutions may not be able to cater for all requirements and one will in many cases use a combination of different single windows and more conventional party to party interaction.

4.2 Different roles in each process

In general, one will also find that each process has different groups of parties that have very different roles in the process. This is illustrated in Figure 2.
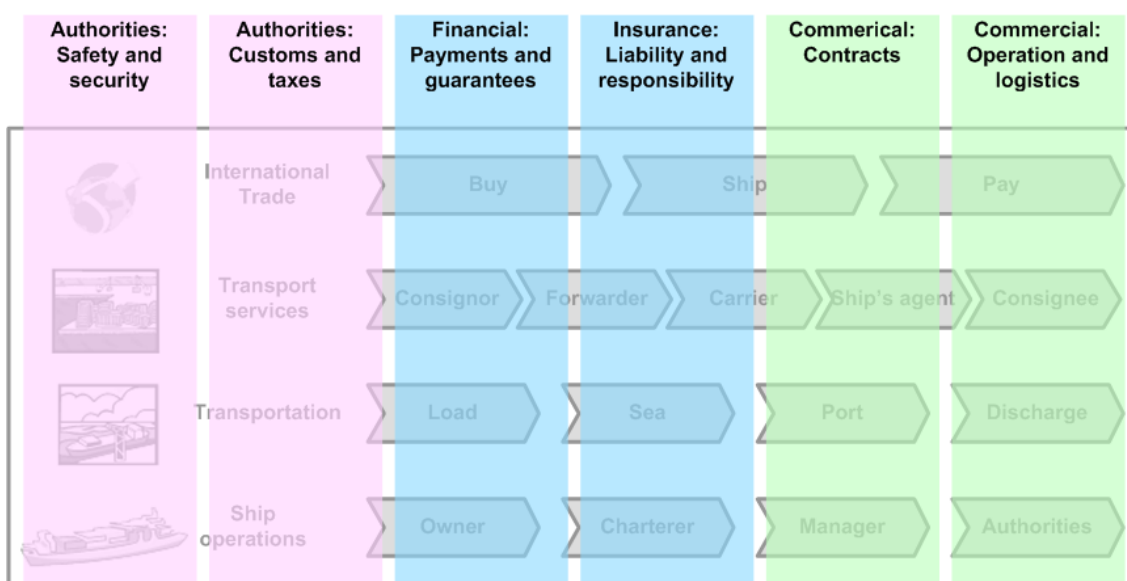

Figure 2 – Different roles in each process

The vertical boxes indicate the different party groups and their roles. From left to right, these are:

- *Authorities – Safety and security:* Various authorities are in charge of safety and security in the different operations. This may include import of prohibited goods or carriage of legal, but dangerous materials.

- *Authorities – Customs and taxes*: Other authorities are charged with levying taxes on import and export as well as on some forms of general transport. The most common is export and import customs duties.

- *Financial – Payments and guarantees*: This covers interactions with banks and other financial institutions and in general payment for commercial and authorities services.

- *Insurance – Liability and responsibility*: This covers all aspects of responsibilities for safe delivery of cargo at scheduled times and under contractual obligations. It also covers liability insurance from accidents or spills.

- *Commercial – Contracts*: This covers interactions related to contracts, e.g., exchange of ownership proofs, status messages, etc.

- *Commercial – Operation and logistics*: This covers operations and exchanges related to planning and execution of the operations, ordering resources, sending arrival and departure notifications, etc.

The important message here is that the different groups of actors with individual responsibilities also have a significant impact on what information that needs to be exchanged, when and in what format.

4.3 Transport timeline

Reporting requirements and, hence, the use of the SW, will depend on where a ship or the cargo is on its voyage. The below diagram shows some of the phases that can be used as reference for reporting.
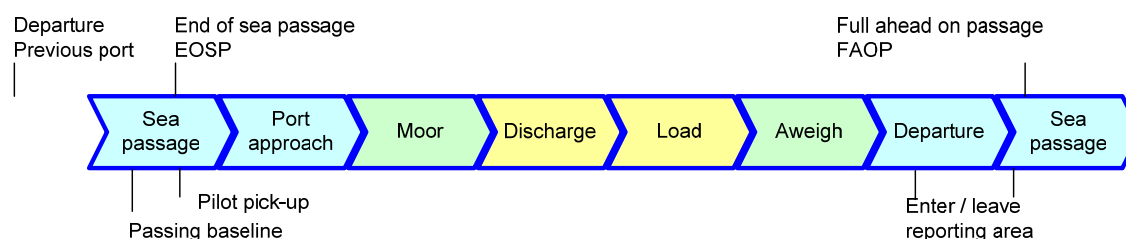
Dependent on applicable rules or commercial processes, a number of other sub-divisions are in use. Some are included in the figure:

- Passing baseline: Where ship enters national waters, normally with some reporting requirements to coast guard, navy or police.

- End of sea passage (EOSP): Normally used in transport contracts, where ship reduces from transit speed.

- Pilot pick-up: Often at EOSP.

- Enter and leave ship reporting area/VTS area.

- Full ahead on passage (FAOP): Where transit to next port starts.

Note also that the sea passage may contain channel or strait passages and that the port approach likewise may be subdivided into more phases.

5. Guidelines for implementing a Single Window

This section is written as a short step by step guideline to the implementation of a single window solution for maritime transport. Each step is relatively briefly described, but will give references to other parts of the guideline with more information when required.

Note that each new step may invalidate some assumptions on earlier steps that may require that the user of this list does some backtracking.

5.1 Determine scope and stakeholders

One needs to determine what functions the single window shall have and who the main stakeholders are. More details are given in section 6, but the main issues one needs to cover are:

1.   The domains covered, e.g., cargo import/export or transit, ship entry into national waters and ports, national transit legs, ship reporting issues.

2.   The clearance functions implemented. This may include FAL referenced clearance, additional national ship related clearance, regional or international legislation, private/commercial functions, etc.

3.   The type of shipping one needs to support. There is a significant difference, e.g., between bulk shipping requirements and container ship requirements.

4.   The geographic scope and types of ports covered. Is it a NSW or a PSW and what types of ports need to be covered?

For each group of functions, the list of stakeholders may change. The issue of stakeholder identification is part of the formal design process as discussed in section 5.6.

5.2 Analyze relevant legislation

Legislation is perhaps the most complex factor in the establishment of a single window. Section 7 discusses this in some detail, but one should in particular look at some of the experiences gained in other projects, see e.g., the UN/ECE SW Repository discussed in section 12.1.

5.3 Requirements for information security

As the single window will be used for transactions that can have commercial as well legal importance, it needs to address the issue of information security. Security normally involves some or all of the following concepts:

- *Confidentiality:* Assurance that information is not disclosed to unauthorized individuals or systems.

- *Integrity:* Assurance that the received (or sent) information is correct and logically consistent.

- *Authentication:* Assurance that the identity of the sender (or receiver) is the one specified.

- *Authorization:* Assurance that the sender or receiver has the authority to provide or receive the information.

- *Availability*: Assurance that the system is available when needed.

- *Non‐repudiation*: Assurance that the sender or receiver of information cannot deny that the information was sent or received.

Necessary emphasis needs to be put on implementing technical features that address the relevant security issues.

5.4 Determine business model

The success of the single window will also depend on to what degree the business model matches the users' expectations. Thus, the selection of a suitable business model is important. There is a long range of variants one may chose, but some typical models are:

- Fully operated and funded by public authorities. No payment for using the system.

- Funded by commercial port companies with no direct pay for usage. This may make sense as a single window can significantly simplify many port processes.

- Pay for by users as a fee per transaction. This assigns costs directly to the users of the system. This is mostly the case with Port Community Systems operated by private companies.

The benefit of waiving usage fees is that the uptake among users may be quicker. This will in turn give faster return on investments for the shore authorities and other users. However, this model also requires that the long term funding is in place before the system is implemented.

5.5 Selection of methodology and tools

Modern ICT tools may significantly help to organize and improve the efficiency in a SW design process. This report will not suggest any specific tools or methods, but encourage using whatever is most convenient. Today, this will most likely be based on the Unified Modelling Language (UML) which is the most popular baseline specification. However, there are a few issues related to tool selection that may be of interest:

- Enterprise Architect (Sparx Systems) is used to produce some of the development frameworks that are available on the Internet. The native format of the files is called EAP. As an example, the MarNIS architecture and the ISCRM model (section 12.2) are available as EAP files.

- UN/CEFACT has developed a modelling methodology called UMM (umm-dev.org/). This methodology is also available as EAP files.

- ARKTRANS is also partly a modelling methodology as well as a framework for ICT systems in co-modal transport (www.arktrans.no).

5.6 The design process

The design process should follow the selected methodology selected as discussed in section 5.5. Various documents, among them those mentioned, are available to give guidance to the process. Typically, the process will consist of the following steps:

- Requirements capture, including as-is situation and desired to-be system.

- Analysis phase, where requirements are synthesised into specification that can be used for design.

- Design phase where overall specifications are converted into technical solutions.

- Implementation and test phases where specifications are converted into real systems.

- Maintenance phase where the implemented system is regularly updated and maintained, following an organized plan.

Sources for more details on design processes that have been used in the transport domain can be found in section 12.

5.7 Implementation issues

During the implementation phase, one has to consider various "non-functional" requirements that limit the implementation selections quite substantially. The typical problem is to what degree one can expect the prospective users to actually make use of the new technological solutions provided. This is obviously a critical issue regarding the final adoption of the proposed technical solutions. Section 8 discusses this in some detail.

6. Scope and stakeholders for a Single Window

6.1 Inter-modal transport and supply-chain actors model

The below figure shows a more detailed view of the actor groups involved in clearance of a ship. The top level boxes define the actor groups responsible for the clearance process and the rectangles at the bottom the actor groups involved in the transport operation.
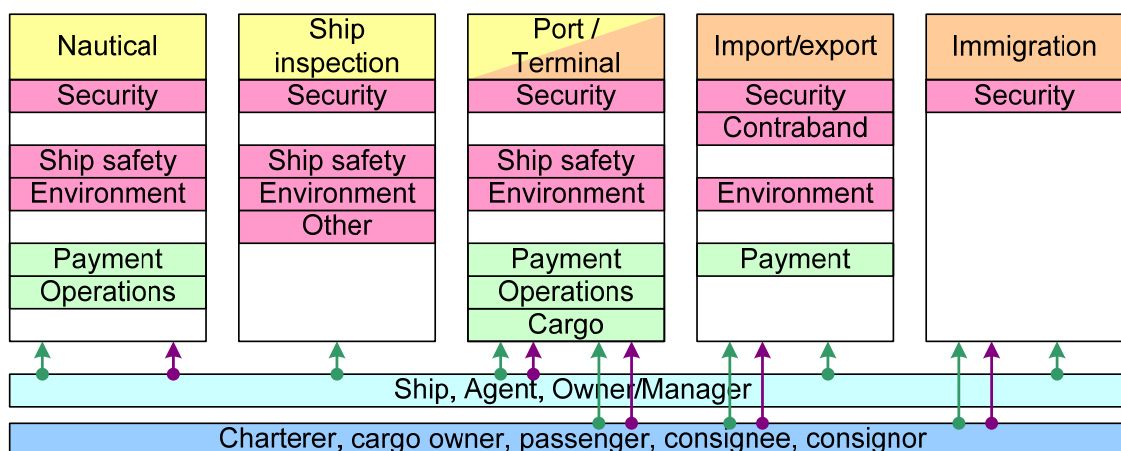
The colour of the top level boxes indicates if this is purely for maritime transport (yellow) or if the group of actors processes clearance for several transport modes (orange). The port and terminal actors have been shown to belong to both areas. This is because the terminal (or in some cases the port) also have to relate to hinterland transport, e.g., by road, rail or inland waterways.

To indicate the reason for the information exchanges, the top level boxes have got some internal operational labels showing some of the operations performed.

The arrows indicate reporting requirements. Green arrows show data flows that normally have to take place well before arrival while mauve arrows show flows that take place closer to, or even after arrival.

The below tables show some examples of concrete parties that can be assigned to the actor groups. The actual parties may have different names and functions in different countries and even ports, but the list presented here is relatively general.

Group	Function	Example party (documents)
Nautical	Security	Navy (ISPS reports, arrival notifications)
	Safety	Coast Guard (arrival notifications, passing base line)
		VTS, Pilot, ship reporting area (arrival notifications)
	Environment	Coast Guard (DG manifest, ballast water reports)
	Payments	Fairway fees, pilot fees
	Operations	VTS, Pilot (Arrival notification)
Inspection	Security	Port State control: ISPS documents
	Safety	Port State control: Certificates
	Environment	Port State control: Waste and oil records
	Other	ILO: Contracts
Port/terminal	Security	Port security officer: ISPS reports
	Safety	Safety officer: DG manifest, Arrival notification
	Environment	Safety officer: Waste reports, ballast water reports
	Payment	Port/terminal fees
	Operations	Arrival/Departure notifications
	Cargo	Clearance status for cargo, cargo manifest
Import/export	Security	Cargo manifest
	Contraband	Arrival notification (previous ports), cargo manifest
	Environment	Cargo manifest, veterinary, health, other certificates
	Payment	Customs dues
Immigration	Security	Crew list, passenger list

These are only examples of some of the requirements and some of the parties.

6.2 Scope definition

6.2.1 Cargo and/or ship Single Window

In the context of shipping, one can generally distinguish between two main types of Single Window although many real implementations will be a mix of the two.

Ship single window: The FAL convention [FAL] and the FAL compendium [FALC] define the maximum required clearance information required before a ship can go to berth. However, getting cleared according to the FAL requirements does not automatically imply that the

passengers or crew can enter the country or that the cargo can be imported. Normally, ship clearance could mean that cargo can be offloaded to the quay side and that passenger may disembark for immigration control.

Cargo and Trade Single Window: Most existing Single Window implementations deal with the import or export clearance of cargo and can be normally operated by customs authorities and in some cases veterinary or agricultural authorities. This is related to protection of national interests in terms of taxation and protection of the nation from various forms of dangerous imports.

Passenger clearance beyond what is done in ship clearance is normally not done through a single window, although some countries enforce various forms of pre-registration before passenger are allowed to disembark.

Note also that the UN/ECE definition of Single Window is mostly related to the cargo and trade type. Thus, not all concepts discussed in the UN/ECE documents are applicable to ship clearance.

6.2.2 Clearance functions implemented

One may also want to consider that different types of clearance that can be given. One may want to distinguish between the following categories:

1. *Clearance of ship to enter territorial waters.* This allows the ship to proceed from international to national waters and will usually require some kind of permit from military or similar entities.

2. *Clearance of ship to berth.* This includes clearance of ship from various safety and security issues, possibly including sanitary, phytosanitary and security related clearance of cargo and passengers.

3. *Clearance of passengers and crew.* This includes necessary measures to allow crew and passengers to leave the ship.

4. *Clearance of cargo for discharge, load or transhipment.*

5. *Clearance for bunker or other port operations.*

Similar clearance levels may be defined for departure. Note also that this list does not include customs' and other authorities' clearance of goods for import and export. The distinction between a ship single window and a cargo related single window was discussed above.

6.2.3 Types of shipping supported

There are wide variations between types of shipping, some examples are:

-   ROPAX: No knowledge of cargo in passengers' cars makes it necessary to consider how clearance of cars and passengers in cars should be undertaken. A special problem is very short international ferry rides that may need special legislation to avoid excessive delays for embarkation and disembarkation.

-   Passenger/Cruise: Special requirements in terms of large groups of passengers, both moving between national ports and also as "day immigrants".

- RORO/Container: This is characterized by large amounts of cargo information, typically in EDIFACT format. However, the manifest and bills of lading are usually readily available as electronic documents.

- Bulk: Bulk shipping has normally simple manifests and bills of lading with normally easy procedures in customs.

- General Cargo: More complex related to manifests and customs procedures, normally with several receives and shippers. Within this sector we will also find vessels with regular calls to a given port and usually more frequent compared to Bulk Shipping.

Thus, the proposed Single Window should consider what types of ships are most likely to be handled through the system and what can be handled as exceptions.

One should, however, keep in mind that most of the clearance may be done by the ship's agent so that problems with bulk and spot shipping may be less acute than described above.

6.2.4 Geographic scope

A Single Window can provide clearance for different geographic areas. From largest to smaller areas, some examples are:

1. *National clearance.* Clearance for entry into a nation.

2. *Port clearance.* Clearance for entering a specific port.

Dependent on national legislation and regional agreements, one or more of these levels of clearance may be required.

6.3 Relevant authorities

This issue is mostly related to what authorities that are accepting input from the Single Window for clearance of ship, passengers or cargo. The MarNIS architecture report [MNHA3F] identifies a number of "roles" in the national and local authority groups. The use of roles and associated responsibilities is a method to make the identified roles independent of local variations in what party undertakes the role. As an example, the "Immigration Authority" role may be undertaken by police, military or special organizations, dependent on what country one looks at.

Role	Description	Comment
Agricultural Authority	Competent authority for agriculture	Admittance of agricultural products
Clearance Authority	Competent authority for vessel clearance	The entry/exit clearances of vessels before entry/exit to/from territorial areas, ports, etc. The clearance process may also involve coordination with other authorities.
Customs Authority	Competent authority for the cross border movement of goods.	The levying of duties and taxes on imported goods. The control over the export and import of goods such as control over prohibited goods and security purposes.
Defence Authority	Competent authority for defence.	Protection of the territorial waters against foreign armed forces

Role	Description	Comment
Health Authority	Competent authority for public health.	Entrance of people or objects that may cause a health risk.
Immigration Authority	Competent authority for immigration	Enforcement of regulations and laws applicable to persons requesting to enter a country or territory.
Policing Authority	Competent authority for policing.	Enforcement of civil law applicable to vessels and their presence in territorial waters.
Port State Inspection Authority	Competent authority for the inspections of ships visiting ports.	Port State inspection (of coastal state). Inspection of certificates, adherence to safety regulations and the testing of safety and other equipment
Registry Authority	Competent authority for ship registry (flag State).	Establishment and maintenance of ship registry. Issues certificate of registry.
SAR Authority	Competent authority for search and rescue	Responsible for the SAR policy for an area and for bilateral agreements on SAR regions.
Safe Working Inspection Authority	Competent authority for use of equipment.	Responsible for rules and regulations on how equipment is used related to transport, loading, unloading and transhipment.
Safe Working Procedures Authority	Competent authority for healthy and safety work procedures.	Responsible for rules and regulations on how work related to transport, loading, unloading and transhipment is executed.
Safety Authority	Competent authority for safety at sea.	Responsible for emergency response and the final decisions on how to handle emergencies or incidents, e.g. decisions on place of refuge to be used.
Security Authority	Competent authority for security.	
Ship Inspection Authority	Competent authority for the ship inspections and the implementation of IMO and national rules on flag state ships.	Flag state inspection (of flag state). Inspection of certificates, adherence to safety regulations and the testing of safety and other equipment
Statistics Authority	Competent authority for statistics systematic collection of data and facts.	
Veterinary Authority	Competent authority for animals (dead or alive).	Entrance/exit of animals and animal products.
Environmental Authority	Competent authority for environmental protection.	Protection and preservation of the marine environment and the marine species.
Waste Authority	Competent authority for the fulfilment of the waste directive.	Monitoring and reporting of waste disposals from ships (according to the waste directive). Fulfilment of the waste directive.
Pollution Response Authority	Competent authority with respect to pollution	The establishment of rules and regulations with respect to pollution control.
Local Security Authority	Responsible for the security in ports.	Enforce ISPS Code.
Local Safety Authority	Responsible for nautical safety in local areas	Need information about dangerous goods, use of port facilities, etc.

Role	Description	Comment
VTM Authority	Competent authority for the definitions of vessel traffic management areas and for the regulations concerning these areas. Also responsible for the enforcement of laws and regulations for transport and maritime traffic.	Knowledge of the position of vessels in the territorial waters. Establishment of regulations for transport and maritime traffic. Enforcement of laws and regulations for transport and maritime traffic.

Some of these authorities are not relevant for a given port and the list is supplied for information only.

7. Legislation issues

7.1 General issues

The following text is taken from a draft version of the UN/ECE Recommendation 35 [UNR35D] on the legal aspect of a single window. It is repeated here for convenience. The publication is primarily targeted at cargo clearance and trade, but the list presented here is of general interest.

When a national or regional single window is established, legal issues mentioned in this checklist may arise.[1] It is important to note that this list is not exhaustive. Depending on the actual implementation of the single window facility, legal issues not mentioned in this Guideline may arise. For many governments, this beginning list of legal issues will provide the basis for discovering other issues related not only to B2G and G2B transactions but also to the broader B2B environment nationally and internationally.

- Has the legal basis for the implementation of the single window facility been examined/established?

- Has an appropriate organizational structure for the establishment and operation of a single window facility been chosen?

- Are proper identification, authentication and authorization procedures in place?

- Who has the authority to demand data from the single window?

- When and how data may be shared and under what circumstances and with what organizations within the government or with government agencies in other countries?

- Have proper data protection mechanisms been implemented?

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[1] It is important to distinguish between national and regional (or transnational) Single Windows. Where a national single window is established, attention is primarily paid to the legal regime of the state concerned, including the international agreements binding the State. A regional single window, however, must in principle observe the requirements of all States it is serving but being mindful as well of the broader trade opportunities for members of such regional group beyond the member-countries themselves.

- Are measures in place to ensure the accuracy and integrity of data? Who are the responsible actors?

- Are liability issues that may arise as a result of the single window operation addressed?

- Are there mechanisms in place for dispute resolution?

- Are procedures in place for electronic archiving and the creation of audit trails?

- Have issues of intellectual property and database ownership been addressed?

- Are there any situations where competition issues may arise?

7.2 Specific types of shipping

In addition to the general issues discussed above, there are also more specific legal issues related to different types of shipping that needs to be considered. The following paragraphs point to some of the types of legislation that need to be considered.

7.2.1 International shipping

Normally, requirements to international shipping are covered in national legislation. However, national legislation will often reflect the FAL Convention or other regional directives as, e.g., in the EU [2002/6/EC]. There may also be other national or international legislation to consider, e.g., related to security clearance and special requirements for early arrival notification.

7.2.2 Regional shipping

Some regions have special legislation covering ship traffic between nations in the region. This typically involves stricter controls at entry to region than when moving between regional ports.

7.2.3 National shipping, cabotage

National shipping and cabotage operations will normally be covered in national legislation. Cabotage agreements may again refer to international legislation.

7.3 Trade and import/export issues

Trade issues and import and export of cargo is normally covered by different legislation than ship calls to port. Cargo and trade legislation and contracts will in part cover financial liabilities of cargo buyers/consignee and sellers/consignors towards each other or to the state they export from or import to. The legislation will also cover various issues related to the safety of imported goods, e.g., from veterinary or agricultural authorities.

These issues are much more extensively covered in the various UN/ECE documents listed in the reference section. See also [UNR35D].

8. Implementation issues

Technology develops rapidly and these guidelines will not give any recommendation to the use of specific technical solutions. However, there are some general issues that should be considered before a system solution is selected. This section will discuss some of these issues.

8.1 Physical realization

There are various ways to implement physical networked systems interconnecting ports, NSW and commercial operators.
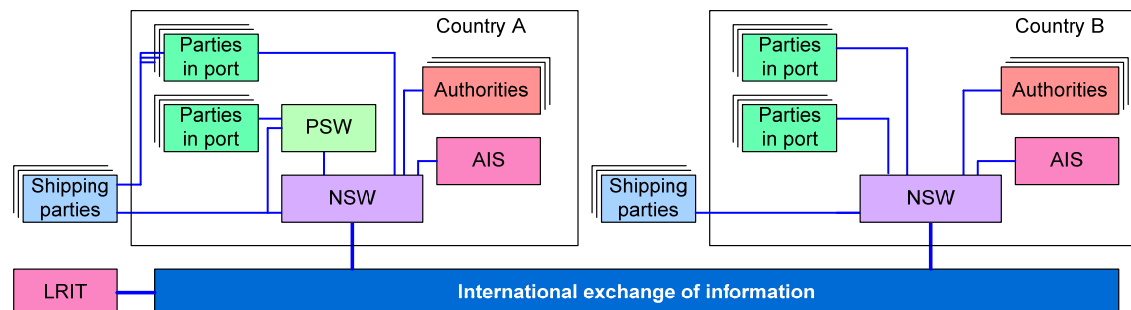
This figure illustrates a country B that has a common national single window both for authorities and port clearance. This is an interesting approach, particularly for countries with several relatively small ports and where legislation allows this form of information exchange. Country A has one port with a port single window handling commercial clearance and another port where clearance must be made with the involved parties. A national single window will handle authorities' clearance independent of port.

An international information exchange mechanisms is also shown. One example of this is the SafeSeaNet that is being used in Europe (see section 12.3).

8.2 Data entry into SW

Normally, one will need to consider different ways for data to be entered into the system. These methods should cater for different users' requirements and possibilities for entering data. Some common methods are:

- *Via manual web interface*: This is typically a web page where users can manually enter data into specific fields. This is useful for casual users that use the system rarely and which do not want to invest in automatic systems.

- *Low bandwidth web interface*: The same mechanism as above can be designed to be used over low bandwidth (typically ship to shore) data links. This may be necessary if the ship is expected to enter some data.

- *EDI via e-mail*: Electronic documents can be sent as e-mail attachments to a central server. This is a useful method for users that are not always on-line (e.g., ships) or for single window that cannot guarantee continuous availability.

- *EDI as direct Internet entry*: Electronic documents can also be deposited directly via an online protocol such as FTP, HTTP or other. This is the most automated way to do data entry and is increasingly more popular, typically in the form of "web services".

8.3 Tools to aid users' data entry

For EDI interfaces, one also needs to consider how the users format their EDI file. In more automated systems, the EDI formatting is done by the local administrative systems and sent more or less automatic to the single window. However, it is also possible to provide data

entry tools that allow the user to enter data manually and generate an EDI file for deposit through e-mail or direct Internet.

Data entry tools can be stand alone applications or can be implemented with the help of, e.g., HTML forms, Adobe PDF or Excel workbooks. The benefit of the latter variants is that they do not require installation of any special software onboard the ship or on the user's premises.

8.4 Electronic Data Interchange formats

As section 10 will point out, there is no lack of "standards" for EDI and that section only scratches at the surface of the area. There are numerous other formats in use, also for ship clearance.

In most cases one should use the EDIFACT and the FAL compendium as basis for implementing a new single window. This is briefly discussed in the first sub-section below. However, the use of XML is increasing and this may be an alternative in special cases, but a problem with XML is that de facto standards are missing. The issue is discussed in the second sub-section below.

8.4.1 EDIFACT and FAL Compendium

At time of writing, it is only one electronic message set that can be said to have the status of de facto standard, and that is the EDIFACT messages (see section 10.1 and 10.8.2). However, even in the area of EDIFACT, there is a plethora of different message types in use and even different ways to use each message. The main reference for use of EDIFACT should be the FAL Compendium [FALC]. This document contains a comprehensive discussion of the relevant EDIFAC message types and how they should be used in ship clearance.

One may also in some cases consider the use of the PROTECT group of EDIFACT messages (see section 10.10). These standards cover some issues that are not covered in the FAL Compendium, e.g., waste related reporting and berth management.

The reader is referred to the FAL Compendium for a more extensive discussion of the use of EDIFACT for ship clearance.

8.4.2 Extensible Markup Language – XML

Most new developments within the area of electronic messaging are being based on the use of XML. XML is a relatively simple system for electronic data interchange with extensive support in common office automation tools and off the shelf or public domain computer software. Thus, the threshold for implementing XML support in an organization can be perceived to be lower than for EDIFACT, which normally requires more specialized competence and more expensive tools.

However, the relative ease with which new variants of XML can be created has led to a large number of different and partly competing "standards". This also applies to ship clearance, although the use of XML for this purpose is not widely implemented. Some relatively well known examples of implementations are listed below:

- PortNet in Finland use XML for ship clearance, but does also support FAL forms and EDIFACT. Information about the system can be found at the Single Window repository (see section 12.1).

- eNOA/D (electronic notice of arrival and departure) was implemented by the US Coast Guard for early arrival and departure notification. It is a mandatory XML based messaging system (see http://www.nvmc.uscg.gov).

- SafeSeaNet in Europe is intended for data interchange between port State and not for direct user submission. However, it is based on XML and a message guideline structure has been developed (see http://www.emsa.europa.eu/).

Various research projects have also looked as XML message formats for ship clearance and information on several of these are available from Internet resources. At time of writing, one cannot point to one of these as a likely emerging standard for ship clearance. This is a significant problem as ships travel between many ports and developing and incompatible XML implementations will require that the ship has to support many different message formats.

ISO TC8 (see section 10.9.1) is developing a new XML-based standard (ISO 28005-2) that contains definitions of the data elements currently in use for ship clearance. The intension is that this standard can be used as basis for new implementations of ship clearance systems. However, at time of writing, the standard is not finally approved.

XML is also gaining ground for more trade oriented applications. UN/CEFACT is cooperating with OASIS (see section 10.12) to develop ebXML (electronic business XML) for trade documents. ebXML has also been published as ISO standard. Also, OASIS is also involved in the development of UBL (Universal Business Language – see section 10.13). One may also expect some developments here that may support ship clearance.

8.5 Information repository

Centralized system versus distributed. Parties get messages or have direct access to database.

8.6 How are users going to access the system

There are several issues in this area that needs to be addressed. Some are outlined in the following paragraphs:

- Simple entry mechanisms for ships or agents that rarely use the system: Excel, web entry, etc.

- Backward compatibility. EDIFACT for container. XML for bulk cargo.

- Paper formats accepted to provide FAL compliance? Use of simple Excel sheets to do this is encouraged.

9. Lessons learned

This clause contains some lessons learned from other implementations of Single Windows with references to additional documentation where available. Propose to make a suitable selection of cases, representative for various ways to implement SW.

9.1 Authorities exclusively SW

An authority based NSW without port services. Several examples can be found on the website of the WCO (www.wcoomd.org/sw)

9.2 Private-public partnership SW

Example may be Finish port net or proposed Norwegian MIS system.

9.3 National Public SW

The system has been implemented by Brazilian Government "Paperless Port" – Porto sem Papel which integrate all the information required by Port, Maritime, Immigration, Custom, Sanitary, Animal and Fito-sanitary Authorities. The system allows the authorities to inform the clearance direct by the website.

9.4 Regional port

Perhaps something from Sweden/Gothenburg. Could also use something from Portel.

9.5 Large port

PortBase is the port community system for the ports of Rotterdam and Amsterdam and some smaller ports in the Netherlands. Although this is a private system, several public authorities have been involved in the development of this system and receive information through this community system or directly from private parties.

10. List of applicable standards

This section discusses some of the standards that is or may be applicable to single window implementations for ship clearance. This is not an exhaustive list, but we have tried to include the most relevant.

However, one should note that at time of writing, it is mainly EDIFACT standards as listed in the FAL Compendium that are used to any great extent.

10.1 IMO – Facilitation Committee

The FAL Convention was adopted in 1965 and has been amended a number of times since then. This Convention defines a maximum number of documents that contracting governments can require from a ship as well as standard formats for these documents (on paper).

The EDI messages which can be used to implement the FAL reporting requirements are indicated in the below table which has been taken from the FAL Compendium.

Table 1 – FAL Forms and EDI

Data	FAL form	Suggested EDI
General declaration	1	CUSREP
Cargo declaration	2	CUSCAR
Ship's store	3	INVRPT
Crew's effects	4	
Crew list	5	PAXLST
Passenger list	6	PAXLST
Dangerous goods	7	IFTDGN

10.2 World Health Organization (WHO)

WHO issues the International Health Regulation [IHR]. This regulation requires ship on international voyages to provide the following documents:

- *Maritime Declaration of Health*. The content and basic format is defined in [IHR].

- *Deratting certificate or exemption certificate*. If not carried, officials may require the ship to undergo deratting at arrival.

The first document is usually a mandatory report to be sent from the ship before crew is allowed on or off the ship.

10.3 World Customs Organization (WCO)

The Convention establishing a Customs Co-operation Council, now known as the "World Customs Organization", entered into force in 1952 with 17 participating countries. Today the WCO has 173 Members, spread throughout the world. WCO publishes recommendation to its members on various issues among them electronic customs declaration and clearance (see www.wcoomd.org).

In the International Convention on the simplification and harmonization of customs procedures (Kyoto Convention) and its protocol of amendment of 1999, principles and standards have been given for customs procedure and other customs formalities, the collection and payment of duties and taxes, security, customs control and the application of information technology.

In the Chapter 7 of General Annex of the Convention and the accompanying guidelines on information technology has been mentioned that the development and rapid expansion of the internet has opened up new possibilities for information exchange. Consequently new standards such as XML (possibly ebXML) will become international standards through global usage. The Kyoto Convention indicates that the harmonized use of codes at application level will be of great benefit to the facilitation of international trade.

The WCO has developed the WCO Data Model based on the G7 Customs Data Harmonization Initiative and the WCO Data Mapping Guide for UN/EDIFACT Messages, which includes their definition of customs data requirements and message implementation guidelines on the basis of the UN/EDIFACT Customs messages.

The result from the above work is the recommendation to use UN/EDIFACT messages and Codes to facilitate standard message exchanges. The relevant messages are:

- CUSCAR: Customs cargo report message

- CUSREP: Customs Conveyance Report message

- CUSDEC: Customs declaration message

- CUSRES : Customs Response Message

These messages will soon be replaced by one UN/Edifact message, GOVCBR, which will cover the information requirements from several cross border authorities.

The WCO has produced in December 2009 version 3 of the WCO Data Model which not only customs related data but also includes the data requirements from other public authorities, such as data elements for agriculture, food safety, maritime safety, immigration (crew) and dangerous goods. The WCO Date Model version 3 is a base for the developments for a single window and contains also detailed guidelines on the data sets and on how to use the messages in trade and transport. While Electronic Data Interchange using the international standard UN/EDIFACT is presently implemented by a large number of WCO member-states as one of the preferred interchange options, the WCO has made the recommendation to offer more than one solution for the electronic exchange of information. Customs now are also looking at other options such as ebXML. The WCO Data Model recommends the use of international codes such as the ISO, UN transport codes, UNLOCODE, WCO Convention on the Harmonized Commodity Description and Coding System (HS). The WCO Data Model is aligned to the UN/TDED B2B data model. The draft UN/ECE Recommendation 34 on Data harmonization and single window is based on WCO guidelines related to this subject.

The WCO Data Model is also used as a base for the development of the FAL Compendium.

The WCO developed for the recent security requirements the SAFE Framework of Standards which consists of four core elements. *First*, it harmonizes the advance electronic cargo information requirements on inbound, outbound and transit shipments. *Second*, each country that joins the SAFE Framework commits to employing a consistent risk management approach to address security threats. *Third*, it requires that at the reasonable request of the receiving nation, based upon a comparable risk targeting methodology, the sending nation's Customs administration will perform an outbound inspection of high-risk containers and cargo, preferably using non-intrusive detection equipment such as large-scale X-ray machines and radiation detectors. *Fourth*, the SAFE Framework defines benefits that Customs will provide to businesses that meet minimal supply chain security standards and best practices.

The harmonization of advance cargo information resulted in a list of security data elements to perform risk analysis. The security data element from that list is also part of the WCO Data Model version 3.

Part of the business and customs cooperation the SAFE Framework provides the concept of the Authorized Economic Operator. This is a party involved in the international cross border movement of goods in whatever function that has been approved by or on behalf of a national Customs administration as complying with WCO or equivalent supply chain security

standards. Authorized Economic Operators include inter alia manufacturers, importers, exporters, brokers, carriers, consolidators, intermediaries, ports, airports, terminal operators, integrated operators, warehouses, distributors.

10.4 World Trade Organization (WTO)

10.4.1 International standards

The Agreement on Technical Barriers to Trade (TBT) – sometimes referred to as the Standards Code – is one of the legal texts of the WTO Agreement which obliges WTO Members to ensure that technical regulations, voluntary standards and conformity assessment procedures do not create unnecessary obstacles to trade.

Basically, this requires members to use international standards whenever these exist or are imminently forthcoming, unless special interests of security and safety prohibit the use of international standards.

The agreement also requires members to participate in international standardization work where the work is important for the member's trade. Further more, the agreement lays down rules for how international (and national) standardization work shall be done. Basically, it requires that work is transparent and open to comments from other members that may have an interest in the work.

10.4.2 Trade facilitation

In the decision adopted in 2004 by the WTO General Council on the Doha Work Programme contained in document WT/L/579, WTO members decided by explicit consensus to commence negotiations on Trade Facilitation. The modalities stipulate that negotiations shall aim to clarify and improve relevant aspects of Articles V, VIII and X of the GATT 1994 with a view to further expediting the movement, release and clearance of goods, including goods in transit. Furthermore the modalities lay down that "the work of relevant international organizations in the area of trades facilitation shall be taken into account". In this context, the United Nations work deliverables and expertise through the Inland Transport Committee and UN/CEFACT both administered by the UNECE is considered highly relevant by the WTO members as evidenced by various submissions of the European Communities G/C/W/394 and G/C/W/422, Japan, Australia and many others.

GATT (General Agreement on Tariffs and Trade) prescribes measures to reduce difficulties for international trade, also with respect to transit. Article V sets out the basic principles for freedom of transit through the territory of each member, but provides no guidelines on how these principles should be applied. Proposed are simplifying and standardizing customs procedures and documentary requirements – including risk management and limitation of physical inspection. Import and export, article VIII, recognizes the need for simplifying import and export formalities and documentation. It does not, however, provide any mandatory requirements. Several WTO members have suggested that international standards should be used to simplify border related documentation and procedures.

Although no particular provisions for electronic data exchange is mentioned, it is clear that this is an important element. Through UN/CEFACT, UN/ECE develops instruments to reduce, simplify, harmonize and automate procedures, information flow and paperwork in international trade. The instruments include international standards, recommendations, guidelines, best practices and other tools for standardization of trade documents, simplification and harmonization of Trade Procedures, automation and use of information technology. Moreover it maintains and publishes standardized codes for international trade. Several of these instruments are specifically referred to, such as the WCO Revised Kyoto Convention.

The objective of Article X of the GATT (Publication and Administration of Trade Regulations) is to ensure transparency by making available all regulations, laws and other information affecting international trade including cross border procedures and customs administration.

10.5 UNECE

The Economic and Social Council, Economic Commission for Europe, the Committee for Trade, Industry and Enterprise development (UN/ECE) administers among others the Inland Transport Committee which is responsible for among other the Customs Convention on the International Transport of Goods under Cover of TIR Carnets ("TIR Convention") and the International Convention on the harmonization of Frontier Controls of Goods and the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) which are maintaining and publishing recommendations and standards reflecting best practices in trade and transport procedures, related data and documentary requirements. Whilst UN/CEFACT does not directly have a legislative role for international shipping, it has over 40 years developed and maintained specifications that are referenced by legislation and other standards. The applicable standards will be discussed in the next chapter. This section will briefly look at the respective UN Recommendations pertaining to transport and trade facilitation in the form of improved processes.

10.5.1 A trade reference model: Buy-Ship-Pay

On the highest level, transport is generally driven by trade. Facilitation of maritime transport is therefore a subset of the more general drive to facilitate international trade.

The scope of the UN/CEFACT International Supply Chain Reference Model (ISCRM) covers the quotation, ordering and transportation of goods through to invoicing. The ISCRM covers processes in the four main business areas – Commercial, Logistics, Regulatory and Financial as illustrated below.
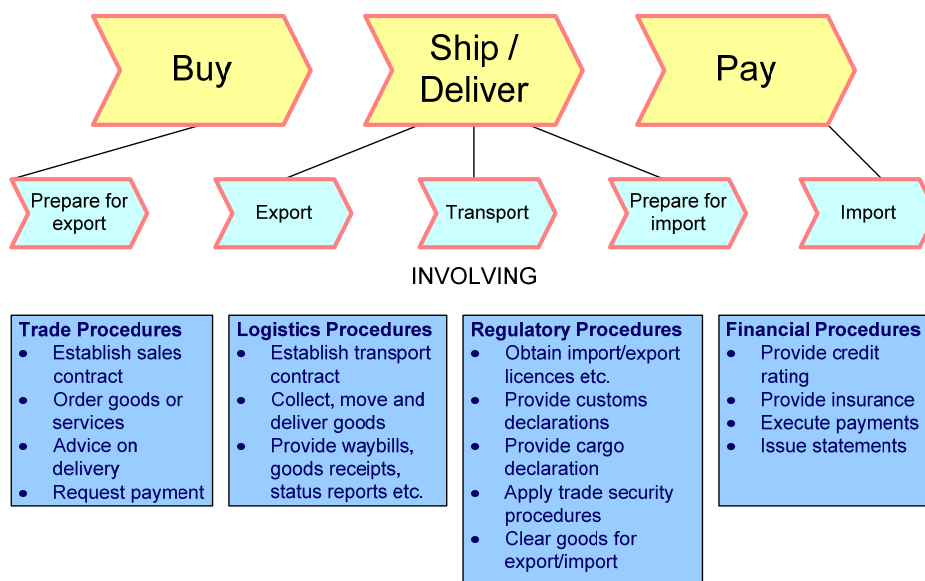
Figure 3 – The UNeDoc Supply Chain reference model

This is an extensive model that is the basis for the development of new electronic standards for invoicing, transport documents, authorities' clearance and many other aspects of trade facilitation. The model is available in electronic format and may also be used as starting point for development of national single window solutions for trade (see section 12.1).

However, the model does not include enough details of the transport or logistics area to use directly in the definition of a single window solution for maritime transport. Thus, the model will be developed further in the following sections.

10.6 UNCTAD

Established in 1964, the United Nations Conference on Trade and Development (UNCTAD) aims at the development-friendly integration of developing countries into the world economy.

UNCTAD is the focal point within the United Nations for the integrated treatment of trade and development and the interrelated issues in the areas of finance, technology, investment and sustainable development.

The United Nations Conference on Trade and Development has developed a number of instruments such as the "Asycuda systems" to deal with customs requirements in developing countries.

More information can be found on http://www.unctad.org.

10.7 UNCITRAL

United Nations Commission on International Trade Law (UNCITRAL) is the core legal body within the United Nations system in the field of international trade law. UNCITRAL was tasked by the General Assembly to further the progressive harmonization and unification of the law of international trade by:

- Co-ordinating the work of organizations active in this field and encouraging co-operation among them;

- Promoting wider participation in existing international conventions and wider acceptance of existing model and uniform laws;

- Preparing or promoting the adoption of new international conventions, model laws and uniform laws and promoting the codification and wider acceptance of international trade terms, provisions, customs and practices, in collaboration, where appropriate, with the organizations operating in this field;

- Promoting ways and means of ensuring a uniform interpretation and application of international conventions and uniform laws in the field of the law of international trade;

- Collecting and disseminating information on national legislation and modern legal developments, including case law, in the field of the law of international trade;

- Establishing and maintaining a close collaboration with the United Nations Conference on Trade and Development; and

- Maintaining liaison with other United Nations organs and specialized agencies concerned with international trade;

Examples are the model law on electronic communication, electronic signatures, and the use of electronic negotiable documents.

UNCITRAL and the WCO are cooperating in a joint legal task force to identify the legal aspects of a single window with the aim to develop international legal instruments for single window.

More information can be found at http://www.uncitral.org/.

10.8 UN/CEFACT

Centre for Trade Facilitation and Electronic Business (UN/CEFACT) does not have a legislative role for international shipping, but it develops and maintains specifications that are referenced by legislation and other standards. The most relevant work for shipping is the work on EDIFACT and related standards.

10.8.1 ITU, IEC, ISO and UN/CEFACT Memorandum of understanding

According to the ISO, ITU, IEC and UN/CEFACT memorandum of understanding, it is the responsibility of UN/CEFACT to maintain EDIFACT standards and application guidelines. The syntax for EDIFACT is maintained by ISO as ISO 9735. The United Nations Trade Data Element Directory latest publication 2005 (TDED, published, in part, as ISO 7372) is jointly maintained by ISO and UN/CEFACT. Work on the ebXML specifications is being continued under the respective OASIS and UN/CEFACT processes. OASIS and UN/CEFACT have their own agreement for the joint coordination and management of the ebXML work.

This is the principle as defined in the memorandum, but realities may not quite live up to this standard. Some discussions on this can be found in the respective sections on ISO and OASIS.

10.8.2 Electronic data interchange (EDI)

The following definition of UN/EDIFACT has been published by the UNTDID:

- United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT) comprise a set of internationally agreed standards, directories and guidelines for the electronic interchange of structured data, and in particular that related to trade in goods and services between independent, computerized information systems.

- Recommended within the framework of the United Nations, the rules are approved and published by UN/ECE in the United Nations Trade Data Interchange Directory (UNTDID) and are maintained under agreed procedures.

    The same document goes on to summarize the principles for the establishment of any trade data interchanges method or system as follows:

- The basis for any trade data interchange (B2B) is the United Nations Trade Data Elements Directory (UNTDED), where data elements are uniquely named, tagged and defined, and where the representation of data entries is specified both as regards expression and syntax. From this directory, data elements required to fulfil specific documentary functions are selected both for UNLK based forms and to form messages for transmission. Data elements from UNTDED used in UN Standard Message types are also part of a separate directory (EDED) in UNTDID.

- Data elements can be grouped in various sets, systematically arranged according to agreed rules. These groups (or "segments"), which are designated by a common denominator (a segment tag), can be arranged as specified in United Nations Standard Message types (UNSM's) or by agreement between interchange partners. Each data elements are implicitly identified by its position in the segment.

- Data elements in the United Nations Trade Data Elements Directory (UNTDED) are used in the segments specified in the present United Nations Trade Data Interchange Directory (UNTDID) and are also, in a condensed form for this purpose, included in a special directory (UNTDED).

10.9 International Standards Organization (ISO)

The International Organization for Standardization (ISO) is a non-governmental organization established in 1947. The mission of ISO is to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing co-operation in the spheres of intellectual, scientific, technological and economic activity. ISO's work results in international agreements, which are published as International Standards. More information is available from http://www.iso.org.

10.9.1 TC8 - Ships and marine technology

ISO TC8 (Ships and marine technology) published some standards in the area of EDI. Most important is ISO 28005-2 that defines information elements for ship clearance.

10.9.2 ISO TC 154 – Processes, data elements and documents

ISO TC154 is named "Processes, data elements and documents in commerce, industry and administration". In the scope of EDI, they are responsible for formal standardization of UN/CEFACT documents, like TDED and EDIFACT syntax. They also work with ebXML and conversion of EDI to XML. A list of some of the standards is given below.

Table 2 – EDIFACT ISO Standards

Number	Content/Title
ISO 9735	Application level syntax rules
ISO 9735-1	Syntax rules common to all parts.
ISO 9735-2	Syntax rules specific to batch EDI.
ISO 9735-3	Syntax rules specific to interactive EDI.
ISO 9735-4	Syntax and service report message for batch EDI, message CONTRL
ISO 9735-5	Security rules for batch EDI (authenticity, integrity and non-repudiation of origin).
ISO 9735-6	Secure authentication and acknowledgement message, message AUTACK
ISO 9735-7	Security rules for batch EDI (confidentiality).
ISO 9735-8	Associated data in EDI.
ISO 9735-9	Security key and certificate management message, message KEYMAN
ISO 9735-10	Syntax service directories

TC154 has also converted some of the ebXML specifications into ISO documents. The below table lists the relevant documents.

Table 3 – ebXML ISO Documents

Number	Content/Title
ISO/TS 15000-1	Collaboration-protocol profile and agreement specification (ebCPP)
ISO/TS 15000-2	Message service specification (ebMS)
ISO/TS 15000-3	Registry information model specification (ebRIM)
ISO/TS 15000-4	Registry services specification (ebRS)
ISO/TS 15000-5	ebXML Core Components Technical Specification, Version 2.01(ebCCTS) – In work

10.10 PROTECT

The PROTECT Group has been established by the Port Authorities of several major ports in North-West Europe. The group aims to harmonize the implementation of the UN/EDIFACT standard messages for vessel reporting in the different ports (see www.smdg.org for more information about PROTECT).

The PROTECT Group has developed the UN/EDIFACT standard messages for the electronic notification of Dangerous Goods (IFTDGN) and of waste (WASDIS) to Port Authorities.

The PROTECT Group has further developed MIGs – Message Implementation Guides – for these messages and also for the acknowledgement message from the Port Authority and for the berth (request) management message (BERMAN) to Port Authorities.

10.11 TDCC and ANSI X.12

The Transportation Data Coordinating Committee (TDCC) devised an electronic railroad bill of lading in 1975 and went on to establish a whole suite of electronic documents for rail, motor, ocean, and air freight. Individual companies and industries began developing their own means of exchanging data, which raised the prospect of splintering and conflicting documents that created more work for the users rather than less. The result, in 1979, was the United States Electronic Data Interchange standard, which became accredited under the American National Standards Institute as the X12 committee. X12 incorporated the work of TDCC into its standard in the early 1980s.

These standards together with the TDI standards used in Europe were the building blocks for UNEDIFACT when work was started in 1985 on the Invoice, Purchase order and ships manifest. UNEDIFACT has been recognized by ANSI X12 as the uniform world wide standard to replace whenever possible, the older standards

ANSI (American National Standards Institute) is the US membership organization in ISO. It does also develop own standards. One of these is the ANSI X.12 standard which is functionally more or less identical to EDIFACT although other coding schemes and keywords are used. It is being used extensively in US electronic business, but is probably not relevant for EPC use X12. The standard is used in the USA, Canada and to some degree in Australia. The X12 transaction sets cover a wide range of industry sectors, including administration, education, finance and government.

The X12 EDI had a large impact on the business-to-business electronic commerce in the 1970s and 1980s and consists of more than 315 transaction sets.

The development of the X12 standard is now on the ASC X12's new XML architecture, called Context Inspired Component Architecture (CICA). This architecture aims to enable individuals to build XML business documents in a cross-industry setting.

10.12 OASIS – ebXML

The Organization for the Advancement of Structured Information Standards is a not for profit international consortium that drives the development, convergence, and adoption of e-business standards. The consortium produces more Web services standards than any other organization along with standards for security, e-business, and standardization efforts in the public sector and for application-specific markets. Founded in 1993, OASIS has more than 4,000 participants representing over 600 organizations and individual members in 100 countries (from www.oasis-open.org).

OASIS develops XML based standards for a long range of applications. The most relevant is ebXML – Electronic Business using eXtensible Markup Language. ebXML was started in 1999 as an initiative of OASIS and the United Nations/ECE agency CEFACT (see www.ebxml.org).

ebXML has also been published as ISO Technical Specifications, see section 10.9.2.

10.13 OASIS – UBL Universal Business Language

OASIS has also published UBL, Universal Business Language. This was created by UBL localization subcommittees (LSCs) to aid in global UBL deployment, the UBL 1.0 IDD consists of over 600 normative business data definitions from the UBL 1.0 Standard together with translations of the definitions into Chinese (Traditional and Simplified), Japanese, Korean, and Spanish. With the original English, these definitions make the XML business documents specified in UBL 1.0 understandable to more than two-thirds of the world's current online population (http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=ubl).

11. Bibliography and references

[2002/6/EC] Directive 2002/6/EC of the European Parliament and of the Council of 18 February 2002 on reporting formalities for ships arriving in and/or departing from ports of the Member States of the Community (Text with EEA relevance)

[FAL] IMO Convention on Facilitation of International Maritime Traffic, Adoption: 9 April 1965, Entry into force: 5 March 1967.

[FALC] Ref. T3/2.02 FAL.5/Circ.15, 19 February 2001, Electronic Data Interchange (EDI) For The Clearance Of Ships, IMO Compendium on facilitation and electronic business.

[KYOTO] The revised Kyoto Convention on the harmonization and simplification of customs procedures, WCO, 2006.

[MN13H] EU Project MarNIS, Contract N°: TREN/04/FP6TR/S07.36353/506408, Deliverable D1.3H, Commercial information needs in a Port Environment, November 2004 (see also other resources).

[MNHA3] EU Project MarNIS, Contract N°: TREN/04/FP6TR/S07.36353/506408, Deliverable HA3F, Final report on the MarNIS e-Maritime architecture, December 2008 (see also other resources).

[RTISA] International Shipping, Carrier of World Trade. Round Table of International Shipping Association, 2005.

[SAFE] The SAFE Framework of Standards, WCO June 2007.

[UNR18] UN/CEFACT Recommendation No.18 on "Facilitation Measures Related to International Trade Procedures", 3rd Edition 2002.

[UNR33] UN/CEFACT Recommendation No.33 on "Recommendation and Guidelines on Establishing a Single Window".

[UNR34] UN/CEFACT Recommendation No.34,on Data Simplification and Standardization for International Trade. Draft Version.

[UNR35D] UN/CEFACT Recommendation 35 , Establishing a Legal Framework for International Trade Single Window, DRAFT Version 9.0.

[UNISCR] Business Requirements Specification, TBG2, Cross-Border Supply Chain (UNeDocs). DocNo: TBG2-2007-33-1-UNeDocs BRS Mar2007.doc, March 2007.

12. Other resources

12.1 UN/ECE SW repository

The UN/ECE single window repository currently has 12 case study reports available as well as links to other SW resources.

http://www.unece.org/cefact/single_window/welcome.htm

12.2 ISCRM model

Various information about the ISCRM model, including electronic modelling files in EAP format are available from the UN/ECE web pages.

http://www1.unece.org/cefact/platform/display/TBG/TBG14.

12.3 SafeSeaNet

SafeSeaNet has been established in Europe to exchange safety and security information between port States. More information on:

https://extranet.emsa.europa.eu/index.php?option=com_content&view=article&id=70:ssn-main&catid=103&Itemid=114

12.4 MarNIS

The MarNIS project was partly funded by the EU Commission to, among other things, improve efficiency and reliability of maritime information management systems. The project has done extensive studies into these areas and many of the reports are publicly available from the below link.

http://www.marnis.org

Some of the documents that may be of most interest are tabulated below (all from WP1.3, on the link for public documents).

Document code	Description
D1.3D1	State of the art (from 2004) on EPC initiatives, standards and standardization organizations. Most of the information in Chapter 10 is taken from this document.
D1.3G	Description of a possible implementation of an EPC system. May be used as stating point for new designs.
D1.3H	Analysis of ship reporting requirements in a number European ports (Arrival and departure). May be used to do a similar mapping in own ports.

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