



## Activity 1

# SUMMARY OF FINAL REPORT



Co-financed by the European Union  
Trans-European Transport Network (TEN-T)

## **ABSTRACT**

This document summarizes the final report of Activity 1. Interoperability of Door-To-Door MoS Supply Chains of the B2MOS Action.

## **DISCLAIMER**

*"The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein."*

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## **Activity 1 – Sub-Activity 1.1. ELECTRONIC SEA WAYBILL INTEROPERABILITY**

Bills of lading and sea waybills are two basic documents that verify the carriage of goods by maritime transport, the latter is used predominantly in short sea trade while the former is mainly used for deep sea transportation. They are closely related to the underlying contract of sale and where applicable, to the documentary credit transaction of the banks concerned. The sea waybill is a non-negotiable receipt for the goods loaded aboard the carrying ship at the port of loading, which also evidences the terms and conditions of the contract of carriage.

Within the report on this document, an analysis of interoperability and harmonisation issues regarding electronic sea waybills is carried out aiming at the simplification, rationalisation and harmonisation of procedures and documents used to evidence the contract of carriage in maritime transport.

### AIMS AND OBJECTIVES

There are three objectives behind the promotion of the development of the electronic sea waybill. The first stems from the European level, as a white paper on European transport competitiveness and efficiency counted among its 40 initiatives, the developments of an e-sea waybill. This white paper entitled “Roadmap to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System” was commissioned in 2011, it not only sets a precedence but also an objective; the improvement of efficiency within the European transport system in order to make it more competitive.

Secondly the report attempts to highlight a few of the inefficiencies regarding the sea waybill, there are time consuming procedures such as emails, paper documents, phone calls and draft validations that are still active today. The costs associated with these types of actions are borne by shippers, freight forwarders and sea carriers.

This introduces the third aim of the initiative; exploring how to negate such time and cost consuming actions by prototyping electronic means to execute them whilst studying the effect and savings of such an action.

### POTENTIAL BENEFITS AND INVESTMENTS NEEDED

Through the analysis of the surveys it was found that many companies are still sending and receiving input regarding the sea waybill via email attachments. This differs between countries however this is a process that could benefit highly from an automated solution as the procedure of physically checking each individual mail is both time consuming and prone to human error.

Some of the benefits of automating a manual task include time saving for staff, reduced errors and automated auditing (as the time and date of every document being submitted can be recorded). The reduced errors comes from two different processes, one from the reduction in human error by replacing the validation process with a computational based audit performed as the documents are received but also once the file is received the data can be cross referenced with other sources which can identify any further errors.

The automated validation process also is a benefit to those sending the documentation as they receive immediate feedback about the submission with details as to what information is missing or incorrect.

#### SOLUTIONS FOR THE USE OF E-SEA WAYBILL

Using the following methods of data exchange, the advantages and disadvantages will be identified to select the most useful implementation approach.

- Peer to Peer or P2P
- Delivery platform
- Interactive platform

#### **Peer to Peer:**

Generally, a peer-to-peer data exchange is a direct conversation between two parties. On one end we can find the sender of the information and the receiver in the other. A connection is made and is maintained until all the information is complete and accepted by both parties.

#### PROS

- Fast implementation between the two parties for a specific project.

#### CONS

- When a third or more parties are included in the process it becomes more complicated.
- No data can be accessed if the party is not part of the conversation.
- No tracking history.
- Implementation for multiple participants is slow.
- If problems are raised, no one can ensure which information was sent.

#### **Delivery Platform:**

A transport platform is an intermediary system that would act only as a repository of information. In this scenario, every participant would send the information through the platform, thus would make the information available to the different participants involved.

#### PROS

- This repository would act as a contract of information being sent, to referee if problems are raised.
- More than one party can be involved in the same procedure.
- Easy implementation and cheap maintenance for the platform.

### CONS

- No validations on the information are sent.

The workflow of the information has to be implemented on each part increasing cost on the development phase.

### **Interactive Platform:**

An interactive platform is a system that keeps track of any information exchanged and provides interaction with all parties at a given process level. The interaction could be given to each party in many different ways; as the logic and data validations remain on the platform, the technological means to interact with it are not relevant.

Normally, these types of platforms offer a web interface to interact with the user and another web service so that any party can integrate it into their own system and make use of the services offered by this platform following the method they most prefer or can financially afford.

### PROS

- The information resides on the platform, thus the reliability is greater and this information could be used to benefit the generation of other processes.
- Workflows and validations reside on the platform, thus is only one implementation on the program logic.
- As the information resides on the platform and a web gateway could be created, not all parties should be necessarily integrated by EDI. In fact, a party could be working with EDI and the other with the web gateway, interacting with the same information.
- Opens the door to step into new developments and improvements.
- Any party involved in a process can access the same information in real time.
- Different roles could be implemented to give access only to the information they need, excluding irrelevant parts.
- Notifications could be programmed to inform the availability of the information on the system so that they would only have to retrieve it.

### CONS

- Maintaining the system and developing it has a greater cost than other methods.
- Breakdowns and unusual problems make the system collapse.

### ROADMAP FOR THE ESTABLISHMENT OF AN ELECTRONIC SEA WAYBILL

Within the report a design was developed that specific prototypes and pilots could be based on. Partners would be invited to use these specifications in order to develop future web services or PCS enhancements. Having provided a schema with the data variables gathered from the input received from the questionnaires, this can be used as the foundations of the communications for such developments.

From the data received it has become clear that not all ports in Europe will be able to offer the same level of service, added value and functionalities derived from the introduction of an electronic sea waybill as every port PCS varies greatly in its services and also in its functionality.

Attachments to the report are samples of the schema which is being made available for all those who would choose to develop the services. The schema provides a defining map for all variables required in the document. This map will assist end users (logistics operators, freight forwarders, neutral NVOCCs, shippers and consignees) in configuring their supply and distribution logistics networks including MoS according to the facilitation and simplifications that the origin and destination ports are offering for intra-EU movements.

This report also provides relevant outputs for the training and dissemination activities that will promote the adoption of these new tools with the aim of attracting new intra-EU trade flows to be transported by sea, instead of using long road haulage routes within the EU.

#### CONCLUDING REMARKS

The outline for a web services has been completed and it has a lot of potential for benefiting all parties who choose to pilot the activity. Generally the move to electronic messaging is an inevitability and by choosing our methods of implementation wisely it can be a reality sooner rather than later.

## **Activity 1 – Sub-Activity 1.2 - INTEROPERABILITY ANALYSIS OF THE ELECTRONIC COMMERCIAL AND TRANSPORT INVOICE**

Shippers and freight forwarders are increasingly demanding dematerialisation of documents as they seek to remove inefficiencies from business processes. The possibility to transmit commercial invoices electronically (further in the document e-invoicing) could provide significant benefits for intra-EU trade and transport. Interoperability in e-invoices could also be used to simplify the billing and payment of transport services to different carriers, as well as to pay port dues and THC (Terminal Handling Costs) in MoS routes.

This research was undertaken with the collaboration of Fundació Valenciaport, Port Authority of Valencia, Boluda Lines, GRM, TIBA, PORTIC, 2E3S, Contenosa, Port Authority of Bilbao, Luka Koper, d.d., Intereuropa d.d., dbh Logistics IT AG, Neptune Shipping Lines, Global Maritime Agency, and Port Authority of Piraeus

### AIMS AND OBJECTIVES

The fundamental aim of this report was to assess the practicality of introducing e-invoicing into the European shipping and freight markets. To achieve such a goal, in particular the following aspects were analysed:

1. Legislative and institutional framework at the European level as well as at the level of Member States (with a look at Spain, Greece, Germany and Slovenia);
2. Potential savings deriving from the introduction of electronic invoices as well as investments needed;
3. Current use of electronic invoices in Spain, Greece, Germany and Slovenia and barriers that are preventing from using electronic invoices with a special attention to the transport and maritime sector.

The methodology adopted to carry out the work consisted of a preliminary desk research of the legislation, a consultation of studies and publications on savings generated by the use of e-invoices and a consultation of official statistical data bases on the use of electronic invoices. The second part of the activity instead included field work with contacts to the members of the National Multi-Stakeholder Forums and to members of port communities as well as other transport and logistics operators.

Considering a relatively low degree of use of electronic invoices in particular in the transport sector, a very important objective of the study was to promote the use of e-invoicing to provide an alternative, efficient method of dealing with transactions throughout the European shipping and logistics industry.

Finally, this report states a list of suggested actions that should be taken to overcome the problems identified.

### LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

Over the last few years several initiatives took place to promote the use of e-Invoices and to tackle technical issues that appeared during the development phase. Beside work carried out by various organisations and projects it is worth emphasizing the efforts carried out by the European Commission to address e-invoicing matters. On the European level the cornerstones are:

- Commission Decision of the 31 October 2007 setting up an Expert Group on electronic invoicing (e-invoicing);
- Communication of the European Commission with the title Reaping the Benefits of Electronic Invoicing for Europe of the 2<sup>nd</sup> December 2010 containing the Commission's vision for making e-invoicing the dominant form of invoicing in Europe by 2020 and with the proposal of creating a European Multi-Stakeholder Forum (EMSF);
- Commission Decision of the 3 December 2010 entitled Setting up the European Multi-Stakeholder Forum on Electronic Invoicing (e-invoicing), where the mission of the EMSF is to assist the Commission in the monitoring of the development of the e-invoicing market and the e-invoicing adoption level in industry and services across the Member States;
- Council Directive 2010/45/EU, referred to also as e-invoicing directive, on the common system of value added tax which revises and simplifies the rules for the submission of electronic invoices, setting the electronic and the paper invoice on an equal footing giving a great freedom to the electronic-invoicing technology;
- Directive on electronic invoicing in public procurement (2014/ 55/ EU) of the 16<sup>th</sup> of April 2014, which is introducing mandatory e-procurement.

Partners ascertained that developments of the Greek, German, Slovenian and Spanish legislations follow the European Directives. The legal frameworks and the governmental entities appeared to be very supportive toward the needs of operators in relation to e-invoicing. Members of the national forums or / and representatives of different industries were in close discussions with governmental entities to define minimum standards for data exchange, including formats and contents of electronic invoices.

### POTENTIAL BENEFITS AND INVESTMENTS NEEDED

Since the term e-invoicing is used in very different situations, for the purposes of the current study we consider (full) e-invoicing the act of receiving and or sending e-Invoices in a structured format that is suitable for automated processing. In fact this type of e-invoicing permits the major benefit both for the invoice issuer and for the recipient.

Businesses that are shifting to a paperless (Electronic) invoice strategy require some convincing from the benefits that have been obtained from other companies that currently use e-invoicing. The potential benefits are numerous when switching to a paperless environment. Based on the two key metrics that are considered to evaluate the efficiency of accounting in relation to invoices (time to process an invoice and cost to process an invoice) savings for organizations can be identified considering in particular financial terms (ex. skipping printing, enveloping, no stamps needed) and terms of time management (ex. savings on operational costs due to shorter processing with less human errors, increased transparency and higher auditability of data, reduced administrative burden with the possibility to shift human resources from the physical execution of tasks to control operation, etc.). By considering wider benefits for the community there are savings also in terms of the environment (a decrease in CO2 due to the elimination of physical transportation and reduction in the use of paper).

Various studies have been conducted on that topic, but for the European dimension work done by B. Koch appears to be of a major relevance. He indicates that electronic and automated invoice processes can result in savings of 60 – 80% compared to traditional paper-based processing, and payback period of investments in e-invoicing should be 0.5 – 1.5 years. He further states that savings between 1% and 2% of the turnover are realistic objectives.

Although the most visible savings appear to be on the side of the sender (issuer), receivers are the ones that can benefit mostly from the use of electronic invoices. It is enough to think of a faster processing of invoices at their receipt, of faster resolution of disputes, of faster research for invoices in electronic archives or of faster supervision of payments. However the level of savings depends on the level of automatization of procedures, where the more automated the procedures, the greater the savings.

It must be noted that in case of the persistence of both the systems – a paper based and an electronic invoicing system, the cost may even double. Various factors influence the extent of potential savings, where they are dependent also on the size of the business i.e. volume of invoices sent and received.

During our interviews very different estimations were given about the investments needed to start working with electronic invoices. There are various price models and most of them consist of a one-time license fee plus a maintenance and support fee on a monthly or annual basis.

#### SOLUTIONS FOR THE USE OF E-INVOICES IN MOS TRANSPORT SERVICES, PORT OPERATIONS AND PORT DUES

Through contacts with members of national Multi-Stakeholder Forums, members of port communities and information gathered from the existing literature it appeared that operators are approaching electronic formats by exchanging pdf files through e-mail,

(and even maintaining paper invoices in parallel), which means that they are sending invoices in a non-structured way, without taking advantage of all the potential savings. Moreover during our interviews only a relatively small number of subjects were acquainted with the difference between a structured and a non-structured e-Invoice.

For those who are acquainted with potential benefits of e-invoicing or are using them, the existence of more than 450 technical syntax standards in Europe (among them common global and regional standards, industry specific standards and national standards) represents a problem in particular in case of transnational businesses. It is true however that for the future some developments are expected to take place in particular since the European Commission decided that (although the selection of a single standard does not appear feasible or desirable) semantics rules for the core of the e-Invoices must be created.

The percentage of penetration of e-invoicing (in a structured and non-structured way) in Greece, Germany, Slovenia and Spain is estimated to vary between 5 to 40%, although nearly all companies are sending also paper. The major penetration appears to be in large business enterprises, banks and insurance industry as well as automotive industry, where SME are more reluctant to use e-invoices.

In all the countries considered, the public sector has an excellent position to initialize the use of e-invoices, so it is no surprise that especially in the recent past, e-invoicing projects were started by governmental entities:

- **Germany:** At present, large-sized companies have used the EDI/EDIFACT data format for e-Invoices for a long period of time with great success, while later the solutions are XML based. Small and medium-sized companies are able to use E-Mail with an attached pdf document for e-invoicing. The ZUGFeRD data format offers a new solution for small and medium-sized companies as they offer both pdf (small companies) and XML formats (medium companies) for e-invoicing, so it could meet the demands and requirements of the majority of companies, boosting the use of e-invoicing in Germany.

The percentage of penetration of e-invoicing in the transport sector and in particular in the surveyed maritime logistics industry is currently estimated with an average of approximately 5% or less. It can be stated that analogous to other industries, there are differences between small, medium and large sized companies that is directly related to the amount of invoices and corresponding data volumes but also to the existing IT systems and implemented software applications. Comparing the maritime industry with the big trade enterprises or the automobile industry it must be admitted that electronic invoicing is only partly spread and not really accepted by all of the business partners yet.

- **Greece:** It appears that the limited use of e-invoicing should be connected with a high share of SMEs, particularly micro enterprises in Greece, while e-invoicing is traditionally present in large businesses. The government is currently

engaged in the development of a Greek Core Invoice, minimum structure requirements in record keeping for tax purposes only.

During the interviews to members of port community, it was ascertained that in particular an untrue e-invoice type is being exchanged, but that is in particular because the customers cannot receive an invoice sent in a structured way or they do not request them. The operators reported also that there has been major reformation in Greece, so operators are waiting for the new VAT regulation.

- **Slovenia:** The Slovenian standard e-Slog was developed in year 2000 based on needs of big retail companies, but is currently under revision. The penetration of the use of the electronic invoice has not grown according to expectation, so the compulsory use of e-invoicing to supply the public sector as from the 1st of January 2015 is going to increase the volume of electronic invoices.

The use of e-invoicing in transportation is still poor, although operators are interested in optimizing business also with the employment of e-invoicing (example Slovenian railways). Some of the operators do use xml, some are sending invoices in pdf through e-mail, but the only real successful story is DHL.

- **Spain:** The national standard “facture-e” was created in year 2007 and is largely promoted by the public sector, being the widespread use of the e-Invoice one of the objectives of the Spanish government for the development of the information society (strategy 2011-2015).

The survey conducted in Spain among members of the port communities showed that 66.67% of the surveyed companies are currently using electronic invoices. Within those companies, 48.15% of them state that electronic invoices have legal validity. Most of the companies that are using electronic invoices are sending and receiving the paper printed invoices too, so they are duplicating work (even if companies know that electronic invoices have legal validity).

Spanish regulations also support for digitisation of documents, including invoices received on paper to be recognised as valid, thus enabling the substitution of the original paper documents by the corresponding files containing their graphic images and, thereby, allowing the destruction of large quantities of paper that comprise the original documents. To this end the digitisation software needs to be approved by the Spanish Tax Agency.

To summarize obstacles identified in using e-invoicing, the following appears to be of the greatest importance:

- Hardly any cost savings expected;
- Clients have no interest in receiving;
- Lack of legal knowledge;
- Time limits/ capacity shortages;
- Substantial adjustments of business needed;

- Lack of standardized document that can be used for transactions;
- Lack of specifics in the standards in use related to the maritime sector etc.

### ROADMAP FOR THE ESTABLISHMENT OF AN ELECTRONIC INVOICE ENVIRONMENT FOR INTRA-EU FREIGHT FLOWS

Analysis of the current situation in Germany, Greece, Slovenia and Spain shows that there is a relatively small volume of electronic invoices in use, which statistically appears to cover 15 to 20% of economic operators. However, there is an indication that slowly but surely more companies are moving towards using a structured or non-structured electronic invoice. The difference between a structured and non-structured e-Invoice format is that only structured e-Invoices can automate and optimise business processes within the company and between partners.

In the transport and maritime sector the use of paper invoices largely prevail, and this presents yet another problem for the aims and objectives of B2MoS as companies do not see the benefit of switching to an electronic invoice.

Based on the information collected in literature and during our interviews, the following recommendations can be applied to increase the use of e-invoicing to any intra EU trade:

- Member states have adjusted their legislations for a simplified integration of the use of e-invoicing within businesses, but there appeared to be some uncertainties as well as need to further simplify the legal requirements when possible.
- Communication about the benefits of e-invoicing toward operators must be efficiently increased, since it appears that there is no sufficient knowledge about the possibilities to switch to e-invoicing.
- Training programmes for dealing with capacity shortage and for preparation of the workplace to use electronic invoicing.
- Financial incentives to be given to micro and small businesses by Member States to support investment for the integration of e-invoicing.
- Spread the use of e-invoicing between different businesses i.e. by exchanging experience and practice with other companies who are still using paper invoices.
- Further technical developments are needed to simplify intra EU operations.
- To find a technical solution to attachments needed in the transport and maritime sector that for now are required/ needed in paper (originals).

### CONCLUDING REMARKS

It is apparent that e-invoicing could be a game changer for many businesses in the EU. The benefits are numerous e.g. cost savings, potential to increase productivity and overall increased efficiency and transparency just to name a few. However, the

implementation of e-invoicing is dependent on the individual business needs and size, there the transport and the maritime sector are no exception.

The legal framework was conceived in a way to support the development of e-invoicing, but the knowledge about the opportunities is still low. Even when companies wish to switch to paperless operations, their clients often appear to be unable to receive only e-invoices. So, a collateral problem is that some businesses use both paper and paperless invoices, yet costs are still high.

Beside some technical issues related to the presence of a great number of standards which needs to be sold in particular to promote e-invoicing in intra EU operations, efforts should be made to educate and communicate about the advantages of this system.

## **Activity 1 – Sub-Activity 1.3 - INTEROPERABILITY ANALYSIS OF THE ELECTRONIC T2L OR EQUIVALENT SOLUTIONS**

### **Introduction**

The Proof of Union Status (PoUS) is an important document in the Motorways of the Sea environment as it is required for the transport of goods that are either leaving or re-entering the European Union. Although there is freedom for trade intra-EU, ports are needed for goods that have arrived from outside the EU. Customs controls are required to check the status of goods, with the PoUS system using the paper T2L document as confirmation of where the goods originated.

In order to establish a true internal market for goods carried by ships, the Commission launched the "Blue Belt" package with legislative and non-legislative initiatives. This is to help reduce the administrative burden and costs for intra-EU maritime transport to a level that is comparable to that of other transport modes. The package contains two measures; (1) the enhancement of the Regular Shipping Service scheme and (2) a facilitation method for vessels to be able to call into third-country ports. This report focuses on the second measure of the Blue Belt package, which is closely related to the PoUS system included in the e-Customs multi-Annual Strategic Plan, due to become operational in the fourth quarter of 2017.

According to the Union Customs Code (UCC), electronic communication will be mandatory between customs, operators and customs authorities. The system of PoUS is aiming towards a paperless environment, where the paper T2L document will now be presented electronically. The latest version of PoUS functional requirements [4] was issued in August 2012 and these are now subject of extensive discussions and decisions on how to implement the e-Manifest. The PoUS process was initially based on the assumption that a national system would be developed, which would interface to a Central Repository for the registration of the proof. However, after the publication of the Business Case for Proof of Union Status this situation has changed.

This document is aimed at providing valuable information for the implementation of the PoUS system and to potentially contribute to the Vision Document of the PoUS system being issued by DG TAXUD during second quarter of 2014. The analysis of the use of the PoUS system joint with the e-Manifest in section three (see the full report) provides valuable information regarding the identification of benefits that may be achieved by the combined use of both systems.

The implementation timeframe for the PoUS system is very well aligned with the activities of B2MoS and the Action can assist and contribute positively to tests and

pilots, especially on the trader specifications, as well as in the readiness of the industry for its eventual implementation.

#### THE PROOF OF UNION STATUS SYSTEM AND THE E-MANIFEST

##### **The Electronic Proof of Union Status in Motorways of the Sea**

A new PoUS system is being developed, with the aim of integrating it into existing shipping businesses IT departments to replace the existing paper T2L document with an electronic form. It is expected that the new PoUS system will become mandatory for businesses that operate in Member States (MS) so that it is homogenized. However, concerns have been raised regarding the increased complexity with management of the new system and whether MS will be able to integrate the PoUS application into their national customs IT infrastructure.

##### **Towards the implementation of the e-Manifest**

The implementation of the e-Manifest is to be delivered in a number of phases. Firstly, the development of an electronically harmonised manifest for the maritime sector, which will allow the PoUS of goods to be checked faster whilst being more secure. Simplified, the e-Manifest will deliver PoUS and the status of the goods will be indicated and made available to the authorities upon arrival in the port.

The use of the e-Manifest is not new in ports. In fact they have been used for a long period of time and there are already several formats (e.g. CUSCAR, IFCSUM and EDIFACT). The work of B2MoS (Activity 3) will be preparing port management, community systems and business stakeholders to comply with the requirements of Directive 2010/65/EU, as well as dealing with the requirements for the creation of an interoperable environment within MS for use of the e-Manifest.

##### **The synergy of the PoUS system and e-Manifest**

The combination of the PoUS system and e-Manifest will provide an electronic environment for port customs in MoS. When the shipping company is an authorised consignor, the PoUS procedure is greatly simplified, as only the e-Manifest containing the goods of Union Status is required by Customs authorities as proof at the port of re-entry. Those companies who are not an authorised consignor still need to have a T2L or the document that was used as a PoUS. Usually the commercial document to be archived for a period of at least two years will be the commercial invoice. Thus, an efficient archiving system will be needed for consignors, and the transition to an electronic archive seems to be the most efficient solution. Solutions and tools towards the achievement of electronic archives for MoS business stakeholders are planning to be analysed in initiative I10 of activity 2 for trade and transport facilitation initiatives in MoS.

#### IDENTIFICATION OF CURRENT PRACTICES IN POU S OF GOODS AND THE SUBMISSION OF THE MANIFEST

## Methodological approach

B2MoS has carried out a consultation process with key participants to obtain their views, stated preferences, main obstacles and existing situation regarding the current practices of PoUS in the following countries: Belgium, Germany, Greece, Latvia, Slovenia, Spain and United Kingdom. The survey considered many different types of organisations such as port community system operators, shipping agencies, freight forwarders and consolidators.

The results of the survey concluded that there were manifest data systems in all countries. Many of them are port community systems connected to the national customs system (UK, Spain and Belgium), while others supported directly through the national customs system (Greece, Slovenia) and one reported that manifest data was sent directly to SafeSeaNet (Latvia). The EDIFACT format is still used for manifest reporting, using CUSCAR, IFCSUM and IFTMCS but XML is another format that is emerging, which is used by Greece.

The diversity of existing systems and business processes involved makes it very difficult to agree on a uniform and homogeneous format for the manifest data for all Member States. However, introducing small variations of existing systems seems to be the more realistic option at present.

### BENCHMARKING OF THE SPANISH T2L SYSTEM ALONG WITH THE FUNCTIONAL REQUIREMENTS OF THE POUS SYSTEM

After the publication of the Business Case for Proof of Union Status, and the recommendation by DG TAXUD, it is clear that the decision of the Directorate General is to build and operate a centralised system for the PoUS and not base this system upon the existence of a national system to endorse the PoUS. Based on this, the benchmarking of the Spanish electronic T2L system with the functional requirements of the PoUS system published, should be viewed and a set of additional ideas on elements should be taken into consideration when designing this new system.

The following successful key elements in the Spanish electronic system to present the T2L should be taken into consideration:

1. The creation of a simple and efficient centralised system for use by economic operators to enter data into forms and to automatically submit these forms without having to re-enter data.
2. The central system should have the capability to automate the endorsement of the Proof of Union Status through a risk analysis system. Part of the risk analysis could be directly implemented into the central system and national customs system. This could be achieved by using a harmonised web service to start the risk analysis and to return results.
3. The capability of the central system to attach digitised documents in the PoUS system when required by national customs officers.

4. The capability of the central system to use digital signatures (or equivalent) in the PoUS system.
5. The capability of the central system to notify national customs along with the endorsement of a PoUS to provide all the required data for the authorisation and control of goods in a vessel.
6. To include the Vehicle Identification Number (VIN, similar to a container number), in the PoUS request to control Union goods for vehicles.
7. The ability of the central system to connect with other systems such as port community systems, to exchange validated PoUS. This includes data such as the MRNs, container numbers, VINs to simplify the process of controlling the departure of goods from the EU.
8. The capability of the central system to check the Union status nature of goods by using the MRN number through system-to-system communications.

In the B2MoS Action, a possible roadmap for a paperless and simpler PoUS environment has been defined. The e-Manifest is expected to be introduced in June 2015, while the expected introduction of the Proof of Union Status system is to be in 2017. This means that any simplifications for the use of the e-Manifest for PoUS at the port of re-entry and the facilitation of the authorised consignor concept will be decided in 2014. The B2MoS Action therefore has an excellent opportunity to introduce a pilot for these two elements complementing this process and preparing partners and stakeholders for its implementation. This could also be aligned with implementation of National Single Windows as defined in Directive 2010/65/EU. In the case of Spain, such a pilot will be able to be combined with the use of the e-T2L system as a demonstration of the future combination of the PoUS system with the e-Manifest that will be come on stream in 2017.

#### CONCLUSIONS FROM THE SURVEY

Switching to an electronic PoUS system has the potential to create a truly paperless environment. Procedures are simplified for the transport of goods at sea. In the future, we will see the combination of using both the e-manifest and e-T2L systems in Spain in 2017. However, trials are set to begin in 2015 in other Member States.

At present, shippers are unaware of the impact that these new systems may have on the operations and personnel in their businesses. B2MoS will prepare companies so that their staff have the knowledge, expertise and technological ability to correctly integrate the new PoUS system.

The principle aim here is for B2MoS collaborators to simplify shipping procedures with the hope of reducing operating/logistics costs for companies operating in member states within the EU.

## **Activity 1 – Sub-Activity 1.4 - SEA-RAIL COMBINED TRANSPORT INTEROPERABILITY ANALYSIS**

### AIMS AND OBJECTIVES

The main objective of sub-activity A1.4 is to propose recommendations for the creation of an interoperable electronic environment for commercial, shunting and transit operations in sea-rail combined transport.

Sub-activity A1.4 has consisted of the following tasks:

- Specification of opportunities for the interoperability of electronic rail consignment solutions for MoS as well as the use of standards designed for international rail transport in national rail transport.
- Analysis and evaluation of the requirements for achieving interoperability of simplified rail transit procedures in cross-border sections and mutual recognition of this simplified procedure between Customs in different Member States.
- Roadmap for the establishment of an electronic environment for commercial, shunting and transit operations in sea-rail combined transport.

### SCOPE

Firstly, the deployment of TAF-TSI (Telematic Applications for Freight-Technical Specification for Interoperability) is about halting and reversing the loss in rail freight market share in Europe. The rail system in Europe has become excessively complex in recent years and this has become difficult for setting common priorities and targets. Politicians have increasingly stepped in to oblige stakeholders to operate with transparent rules and the intention of the Telematics Application for Freight is to create open conditions for companies to operate in the market. This report presents several solutions developed, which supports the implementation of TAF-TSI providing consignment note information as well as recommended actions to be implemented for the interoperability of electronic rail consignment solutions for MoS.

Secondly, bottlenecks due to lack of synchronisation between the terminal and ship's closing time and train schedules are a major issue to be overcome in order to simplify export procedures in some EU Member States. On the import side, the main issue to be addressed is the implementation of IT tools for supporting simplified procedures for transit and carrying on Customs clearance at destination dry-ports.

Finally, a key for increasing the competitiveness of intermodal container transport by rail is to achieve more frequent operations of heavy haul container trains between port and inland railway terminals. One important factor will be carrying out fast and flexible

transshipment, shunting and coupling of container wagons. Several recommendations are proposed to be implemented for the interoperability of simplified rail transit procedures in cross-border operations.

#### INTEROPERABILITY OF ELECTRONIC RAIL CONSIGNMENT SOLUTIONS FOR MOS

The analysis is made of the current consignment note and all of the variables associated within, all of these variables and the data they regularly contain are described and the stakeholders interested in reading, writing and amending the values are also identified.

Regulation of the electronic consignment note was published as Commission Regulation (EC) 62/2006 based on the technical specifications for interoperability relating to applications for freight subsystem of the trans-European conventional rail system was adopted on 23 December 2005 and published in the Official Journal of the European Union on 18 January 2006. It was amended by Commission Regulation (EU) No 328/2012 of 17 April 2012, published in the Official Journal of the European Union on 18 April 2012.

This legislation specifies how to exchange information about:

- Freight Transport Information Systems (Online track and trace of goods and trains).
- Selection and assignment systems (assignment of train composition systems).
- Reserve systems (railway slot reservation systems).
- Intermodal exchange and documentation management (rail consignment note).

Currently there are many small and medium-sized rail undertakings in various EU countries who are not producing specific rail consignment notes for every shipment they transport. In some cases, loading lists for the whole train are adapted including information on the price paid by the customer and insurance conditions for the freight transported. This extended loading list is considered the rail consignment note for the train. This practice may entail certain legal problems as a rail consignment note should exist for every shipment transported by a train.

There are a number of existing solutions that have developed, three of which are listed and provide a range of different functionality and solutions:

- ORFEUS (Open Railways Freight EDI User System).
- CroBIT (Cross Border Information Technology).
- RailTrace.

After taking into account the study of the document, the legislation and the current situations and solutions there are a number of recommendations that have been concluded.

- Clear European-wide regulation covering standardisation would help the sector moving in a harmonised direction.

- Action Proposed: Discussion of a regulation proposal in sectorial meetings representing both large and small and medium-sized railway undertakings. This draft of regulation would then be proposed and discussed with the European Railway Agency (ERA).
- Action to be carried out by: Railway undertakings.
- Time Plan: 2015-2016.
- Railway undertakings need to be developed in their Rail Transport Management System (RTMS).
  - Action Proposed: Promotion of the opportunities that the Connecting Europe Facility of the EU provides for small and medium-sized railway undertakings to develop their RTMS including advanced options for the creation of shipment-related electronic rail consignment notes.
  - Action to be carried out by: INEA, European Commission, ERA, Ministries of Transport, innovation centres.
  - Time Plan: 2014-2020.
- Small and medium-sized railway undertakings and local infrastructure managers should be included in the working groups discussing the TAF-TSI.
  - Action Proposed: Evaluation of possible methods for small and medium-sized railway undertakings and infrastructure managers to be represented at TAF CCG or for them to be consulted prior to the adoption of sectorial regulation.
  - Action to be carried out by: TAF CCG.
  - Time Plan: 2015-2020.
- Off-the-shelf programmes including electronic invoicing tools and electronic rail consignment notes tools among other essential tools for any railway undertaking should be developed and made available in the market.
  - Action Proposed: Promotion of the opportunities to develop projects of common interest including pilots that the Connecting European Facility of the EU provides for IT companies specialised in the rail transport sector. Also, developing for railway undertakings to prototype IT tools that could become off-the-shelf programmes for small and medium-sized railway undertakings in the future.
  - Action to be carried out by: IT companies specialised in the rail transport sector and railway undertakings.
  - Time Plan: 2015-2020.
- Benefit from the use of existing communication platforms such as port community systems (PCSs) need to be exploited.
  - Action Proposed: Encouraging the inclusion of rail and port stakeholders need to support the development of railway specific tools in PCSs.
  - Action to be carried out by: PCS managers.
  - Time Plan: 2015-2020.

- Developing specific electronic messages concerning the rail consignment note for small and medium-sized rail undertakings as well as different types of traffic.
  - Action Proposed: Proposal of adaptation of rail consignment note message to the specific case of containerised rail transport to be presented at TAF CCG for discussion.
  - Action to be carried out by: Railway undertakings.
  - Time Plan: 2015-2016.

### Interoperability of Simplified Rail Transit Procedures in Cross-Border Operations

This section analyses the requirements for achieving interoperability of simplified rail transit procedures in cross-border sections and mutual recognition of these simplified procedures between Customs in different Member States.

The European Commission amended, on 20 August 2012, Regulation (EEC) No. 2454/93 – CCIP (Customs Code Implementing Provisions) laying down provisions for the implementation of Council Regulation (EEC) No. 2913/92 establishing the Community Customs Code (CCC). The CCC compiles the rules, arrangements and procedures applicable to goods traded between the European Community (EC) and non-member countries.

Although the simplified procedure for the goods in transit transported by rail is already approved (which gives a sound legal basis), there are still many aspects to be solved for this solution to be fully adopted by the involved operators. At present, the described simplified procedure is applicable only for domestic traffic and a global solution is needed because the hinterland of the ports involved in this initiative is transnational.

The following are recommendations that were proposed after the analysis.

- It is worth considering that information is submitted by shipping agents that are located at the intermediate port.
  - Action Proposed: Establish at EU level a common model of Simplified Transit Document for goods travelling via maritime transport first and then continuing their travel inland by rail.
  - This possibility could be limited to authorised economic operators (AEOs) only.
  - Action to be carried out by: The DG TAXUD.
  - Time Plan: 2015-2017.
- Customs arrangements between the different member states should be established to allow for physical inspections to be postponed in most cases to the point of destination. This possibility could be limited to AEOs.
  - Action Proposed: Develop the necessary legal instruments for Member States where transit documents are issued to accept the postponement of physical controls until the goods reach the destination.

- Action to be carried out by: DG TAXUD and Member States Customs Authorities.
  - Time Plan: 2015-2016.
- It is recommended that appropriate communication channels to exchange information on the results of the risk analysis processes are formalised.
  - Action Proposed: Develop the necessary lines of communication between customs of Member States in order to exchange information on the risk analysis carried out on a particular shipment.
  - Action to be carried out by: DG TAXUD and Member States Customs Authorities.
  - Time Plan: 2015-2017.
- It is recommended that the European Customs enable mechanisms to facilitate traceability of documentary procedures associated with rail transit.
  - Action Proposed: Develop information systems with Customs integration so that they can offer real-time information on the status of customs formalities.
  - Action to be carried out by: DG TAXUD and Member States Customs Authorities.
  - Time Plan: 2016-2017.
  - Recommendation 5.
- Goods coming from international shipping, during their subsequent rail travel retain the advantage of having 45 days to be given for customs approval instead of the 20 days available to goods of the inland customs approval.
  - Action Proposed: Develop the necessary legal instruments to ensure that goods entering the EU by sea and moved from the port to an interior point by rail have 45 days assigned for customs-approved.
  - Action to be carried out by: DG TAXUD and Member States Customs Authorities.
  - Time Plan: 2015-2017.
- In transit operations, a guarantee must be submitted, covering the total amount of customs duties and other taxes applicable to the transaction.
  - Action Proposed: Extending the exemption to submit a guarantee covering the total amount of customs duties and other taxes applicable to the transit operation to all rail transit operators can stimulate international rail transport.
  - Action to be carried out by: DG TAXUD.
  - Time Plan: 2015-2017.
- In export operations, it is recommended that the presentation of the export SAD can be sent as early as possible so that the necessary checks on the documents can be carried out in advance.

- Action Proposed: Allow for the sending of the SAD export document to Customs at the departure port when the goods are loaded at the inland dry port of origin.
- Action to be carried out by: DG TAXUD and Member States Customs Authorities.
- Time Plan: 2015-2017.

#### ACTIONS TO BE IMPLEMENTED FOR THE INTEROPERABILITY OF SHUNTING OPERATIONS BETWEEN SHUNTING YARDS AND RAIL PORT TERMINALS

This section provides an interoperable environment for the efficient exchange of information required for ordering and communicating shunting operations among the involved railway undertakings, railway infrastructure managers and railway (port/inland) terminals for coordinating shunting, coupling and transshipment operations executed in shunting yards and railway terminals.

After analysing the current situation in both Valencia port and the port of Livorno the following recommendations were developed.

- Developing standard messages for the communication between the railway undertaking and the shunting operator where trains are divided, united or transformed prior to their entry in the port terminal.
  - Action Proposed: Developing standard messages for the communication between the railway undertaking and the infrastructure manager of railway shunting yards.
  - Action to be carried out by: Railway undertakings and infrastructure managers.
  - Time Plan: 2015-2016.
- Developing standard messages for the communication between the railway undertaking and the port infrastructure manager would increase safety within the port premises and decrease train turnaround time at ports.
  - Action Proposed: Developing standard messages for the communication between the railway undertaking and the port infrastructure manager.
  - Action to be carried out by: Railway undertakings and port infrastructure managers.
  - Time Plan: 2015-2016.
- Ports with remaining available space, with investment capacity and where there is enough critical mass of traffic to justify the investment, should assess the possibility to develop a rail shunting yard within the port domain.
  - Action Proposed: Developing rail shunting yards within the port domain.
  - Action to be carried out by: Port infrastructure managers.
  - Time Plan: 2015-2020.

- The best practices recommended would be the integration of IT systems of the managers of inland rail terminals, shunting terminals and port terminals into the PCS so that all parties share the same documents and communicate electronically.
  - Action Proposed: Developing rail specific modules within PCSs and integrating railway undertakings, shunting terminal managers and port rail terminal managers in the PCS.
  - Action to be carried out by: Railway undertakings, shunting terminal managers, PCS managers and port rail terminal managers.
  - Time Plan: 2015-2020.
- Prototyping and piloting in B2MOS would constitute a good recommendation to fix existing problems when trains are operated at shunting terminals between origin and destination at port.
  - Action Proposed: Developing a specific module for RTMS to make possible the electronic communication of “container – platform related document” and “train circulation data” between railway undertaking, rail infrastructure manager, shunting terminal manager, port authority and port terminal manager.
  - Action to be carried out by: Railway undertaking, rail infrastructure manager, shunting terminal manager, port authority and port terminal manager.
  - Time Plan: 2014-2015.
- It is recommended to promote the entrance of private companies for handling and shunting operations at port areas.
  - Action to be carried out by: Rail transport and infrastructure policy-makers.
  - Time Plan: 2015-2020.

## **Activity 1 – Sub-Activity 1.5 - SEAPORTS – RIVER PORTS SYSTEMS INTEROPERABILITY ANALYSIS**

### AIMS AND OBJECTIVES

The aim of this sub-activity is to identify interoperability issues that are experienced by seaports and river ports systems. With this information, an improvement of communication, decrease in errors and increased handling operations should be foreseeable at these ports with a focus on prototyping the solutions.

The partners involved in this sub-activity are:

- dbh Logistics IT AG (leader).
- HHM (Hafen Hamburg Marketing).
- DAKOSY.

It has been suggested that the relationship between waterway ports and seaports should be improved in order to support river transport integration into the multimodal logistic chain and to help to consolidate freight volumes. Seaport dues, terminal related transshipment costs and pre/post haulage notably contribute to the total costs of the inland waterway-based multimodal chains and the role of seaports in the success of river transport is significant. Studies on potential solutions to improve the communications between the ports of Bremerhaven and Hamburg and inland waterways ports will be carried out and interoperability issues of their systems will be analyzed.

There are many constraints when dealing with interoperability issues at the EU level. Many of these constraints have already been identified and are being dealt with by the European Commission (EC). The interoperability work carried out in this activity will use the results of the initiatives driven by the EC. The most relevant aspects are:

- The EORI number has proved its usefulness for recognizing economic operators in the entire EU. However, the VAT number is also required in many declarations and transactions. Unfortunately, this number is not recognized, nor equal in the entire EU.
- The use of Digital User IDs and Public Certificates in Member States has become a problem, as the certificates are not recognized by all Member States. At present, there is no universal recognition of Certification Authorities among the EU Member States that are accepted by Customs and Tax Authorities. This is a particularly important obstacle to overcome for achieving interoperability in Europe.

## INLAND WATERWAY NAVIGATION

Germany (brief overview): Germany has a very complex inland waterway network, which is crucial to its economic success. Waterways, such as the Rivers Rhine, Donau, Elbe and Weser are owned by the federal government and are used for the transport of goods via barges. The inland waterway network is divided into nine areas, which differ from the seven sub-divisions of the WSV. Within the inland waterways, the Rhine is the most developed (complete) with the Weser, Kiel Channel and Elbe being partly developed. As well as being the most developed, it also the most important in terms of volume of goods that are transported through a waterway. Additionally, seven of the ten largest inland ports are located along the Rhine.

When compared with other inland modes of transport, shipping via the river is the most environmentally friendly option. The energy used per ton-kilometer was the lowest for shipping for the transport of both bulk and container cargo. Shipping costs are also on average 78% lower than road transport and 68% cheaper than by railway.

- **Hamburg:** The federal state of Hamburg is situated at the river Elbe in the north of Germany. The Port of Hamburg is located in the heart of the city and represents Germany's biggest seaport. In 2012, a total of 8.9 million TEU was handled in the Port of Hamburg, strengthening its position as Europe's 2<sup>rd</sup> and World's 14<sup>th</sup> largest container port. Nautical access through the traffic zones in the German bight is controlled by a modern management system. The port infrastructure is managed by the Hamburg Port Authority (HPA), which was established in 2005. It develops and enhances the strategic competitiveness of the port by offering attractive customer services.

Hamburg is the third largest inland port in Germany, with Duisburg and Cologne being larger. In 2012, a total of 9.94 million tonnes of cargo shipped through the Port of Hamburg by barge. The port is linked to the German inland highway waterway network via the Middle Elbe, which in turn links to the Elbe, Rhine and Ruhr ports.

The port of Hamburg is of particular importance to its economy; millions of consumers living in the hinterland and Baltic region depend on the activities of the port. It is in an ideal location to act as a hub for container transport to and from the Baltic region as it accounts for more than 16% of world export volume, making it one of the most dynamic and important ports in Europe. The HPA is the central contact partner for all matters regarding infrastructure, navigational and operational safety and port security.

Barges play a limited role in inland transportation as the waterways can only be used to a certain extent due to shallow channel depths, low bridge heights and small lock chambers. For example, the shipping route between Hamburg and Magdeburg is restricted by the movement of sandbars in the channels as well as

rocky areas in shallower waters at Magdeburg. A possible consequence could be that freight is shifted from barges to trucks for onward transport to their final destination due to restrictions in mobility.

- **Bremen:** There are two cities in the federal state of Bremen: Bremen and Bremerhaven. The City of Bremen, an enclave in Lower Saxony in northwest Germany, is situated on the banks of the River Weser about 70 km inland from the North Sea. The terminals of the city ports of Bremen concentrate mainly on general and heavy-lift cargo and on handling bulk commodities.

Bremerhaven seaport has a water depth of 14.50m and thus has no nautical restrictions for vessels. The port infrastructure is managed by Bremenports GmbH & Co. KG since taking over from the City of Bremen in 2002.

There are three container terminals; MSC GATE, EUROGATE Container Terminal Bremerhaven (CTB) and North Sea Terminal Bremerhaven (NTB) in Bremerhaven, with a total quay length of approximately 5km. All three operate via a straddle carrier system and can handle all modes of transport.

The locks and bridges along the River Weser determine the dimension of the barge used for the transportation of goods. Present conditions only allow the usage of 85m long Europa-class barges with a maximum stacking height of two containers; a maximum capacity of 54 TEU per barge. The volume of traffic handled by the barges has ranged from five and six million tonnes since 1990, making Bremen/Bremerhaven one of the most important German barge ports. In 2012, the most important modes of transport in terms of share are road and rail, followed by barge. This statistic indicates an opportunity for increasing the volume of traffic via barge if possible.

Again, the inland waterway network within the hinterland transport chain of German seaports is limited. This is due to fluvial restrictions as well as the heights of bridges along the Mittelweser and Mittellandkanal. This affects the length, width and height of barges and thus overall capacity is restricted. As a result, the capacity of the barges here are less than vessels deployed in the Rhine area. Additionally, and most importantly is that barge transportation has a very low share (3%) of the modal split of the other hinterland transportation modes in Bremerhaven with roads and rail accounting for 52% and 45% respectively.

## METHODOLOGY

- **Interviews:** Different types of stakeholders within sea and river port systems were interviewed. They mainly included shipping companies who transport goods between sea and river port terminals. These operators are in direct exchange with the goods and are a critical point in the information chain as they supply all the information. The participants (DAKOSY, dbh and HHM) divided responsibilities within the northern region of Germany: dbh identified

stakeholders along the River Weser and Mittellandkanal; whereas HHM and DAKOSY identified stakeholders along the River Elbe and, Mittellandkanal.

- Process analyses: Several process diagrams were theorized to gain a clearer understanding of the processes and challenges with interfaces in the hinterland transport chain. Existing information was used together with experts' statements for the detailed process overviews. The dbh project team resorted to process analysis on existing analyses and results that have been created within the framework of the TEN-T project MIELE.

## REALISATION

- Process diagram Port of Bremen and Hamburg: The process description for the container business in the seaports of Bremen and Bremerhaven can be found in the attached document (Attachment\_12\_Graphic port Process Analysis). The description is transferable to the business processes in the port of Hamburg. It differs only in IT system names and handling of Customs processes, which will not have any impact on the objectives of the B2MoS project.
- Process diagrams hinterland transport chain with focus on inland navigation: For the hinterland transport chain, two diagrams were developed with focus on inland navigation. These diagrams describe the communication and information flow between the stakeholders involved, as well as the freight flow. In addition, used communication media and file formats are demonstrated. The first diagram shows the detailed import process from seaport terminal to importer (Attachment\_10\_Process diagram inland ports\_Import). In a second diagram, the export process from consignor to seaport terminal is illustrated (Attachment\_11\_Process diagram inland ports\_Export).

## DERIVED PROPOSALS FOR PILOTS

Interview results (dbh): The level of communication between seaports and liners/carriers is high, with the majority of terminal operators using automated messages (EDI). Communication between river ports and barge operators is based on email, telephone or fax. At present, seaports and river ports are not interlinked due to there being no legal or contractual agreements. The seaports at Bremen/Bremerhaven and Hamburg use fully automated data exchange with an integrated PCS.

Interview results (HHM and DAKOSY): There is evidence that there is no direct communication between sea and river port terminals. Data and information exchange is carried out via email, telephone and fax. Electronic files used are mostly PDF, Word and Excel formats. PDFs can be problematic, as sometimes they cannot be read in non-machine format.

Inland waterway vessels do not have the status as ocean-going vessels as they do not provide sufficient information regarding the loading and unloading of goods, ETA, ETD and stowage plans. All stakeholders would like this to be rectified so that inland waterway vessels can be integrated easier at seaport terminals. In general, all stakeholders are willing to improve processes and participate in the B2MoS project.

From both interviews, the project teams received demands from the interviewed stakeholders:

1. Sailing lists for barges (information on barge routes for customers).
2. Integration of barge IT systems into current PCS systems.
3. Ability of the barge operator to have loading lists, stowage plans etc.
4. A terminal operating system, run by an ASP-platform.
5. Use of AIS to obtain positioning information on inland waterway vessels, resulting in precise ETAs at seaport terminals.