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# Integrating Maritime National Single Window with Port Community System – Case Study Croatia

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# Integrating Maritime National Single Window with Port Community System – Case Study Croatia

EDVARD TIJAN, MLADEN JARDAS, SAŠA AKSENTIJEVIĆ & ANA PERIĆ HADŽIĆ

**Abstract** A single point of data entry for documentary requirements and procedures in maritime transport - Maritime National Single Window (MNSW) includes process integration of all stakeholders in the entire seaport system. The primary goal of the MNSW is to eliminate data redundancy in a way that the entered data is instantly visible in other systems, according to the set level of authorization and authentication. In many seaports, the administrative MNSW is connected to the commercial Port Community System (PCS), an information system for the exchange of cargo related commercial data. The linking of the MNSW and the PCS connects the administrative with the commercial business aspect, making seaport business processes more efficient and more effective. Both interfaces can only be developed by using process reengineering and presume significant investments in underlying information technologies. Such implementation requires in-depth analysis of all stakeholders' processes in the seaport system, in order for both systems to complement each other.

**Keywords:** • Maritime National Single Window • Port Community System • business integration • reengineering •

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## 1 Introduction

According to the Directive 2010/65/EU of the European Parliament and of the Council (Directive 2010/65EU, 2010) each Member State should implement the Maritime National Single Window (MNSW) in order to optimize and facilitate the process of announcement and registration of ships which arrive to ports and/or depart from ports of the Member States. Single Window is defined as a facility that allows parties involved in trade and transport to lodge standardized information and documents using a single entry point to fulfil all import, export, and transit-related regulatory requirements (Moïsé, E. et al., 2011). MNSW is the place where according to the Directive, all information is entered only once, and becomes available to various competent authorities and the Member States. The aim of the Directive is to simplify and harmonize the administrative procedures applicable to maritime transport by electronic data exchange prescribed by standards and rationalization of formal reporting (European Commission, 2015).

According to the new directive, which should be published mid-2018, a better cooperation is required between national authorities in the development of the MNSW and the implementation of the eManifest. The main objective of the eManifest is to demonstrate the way in which cargo-related information required by both maritime and customs authorities can be submitted together with other reporting formalities required by Directive 2010/65/EU in a harmonised manner, and using a European Maritime Single Windows environment (EMSA, 2015). The Republic of Croatia, as an EU member, is obligated to invest in the development of information technologies and thus in the development of the MNSW (EMSA, 2015). The development of MNSW should accelerate business processes, which also means increasing competitiveness in relation to neighboring ports. Croatia is currently using an integrated maritime information system (CIMIS) (Čičovački, 2013) for electronic delivery and exchange of data about ships, cargo and passengers in the official processing of announcement, arrival and departure of the ships, their stay in ports, as well as the related official procedures.

The problems occur in subsequent official procedures due to multiple entries of the same data in several diverse applications where errors often occur during repeated data input. Data is still duplicated using paper and electronic means (inputting the same data in different systems). It is therefore necessary to develop a Port Community System (PCS) which represents a neutral platform for electronic data exchange between all stakeholders of the port process (Bezić et. al., 2011). By harmonizing MNSW and PCS, the ultimate goal would have been achieved, which is the elimination of data duplication in a way that once entered data is visible to all stakeholders of the seaport system, resulting in more efficient and more effective business processes.

## 2 Maritime National Single Window and Port Community System

One of the most acute problems of seaport processes is the lack of automatic data exchange between existing systems. Processes are being slowed down due to the administrative load, which refers to the entry of data related to the announcement and

registration of the arrival of ships into the port. Processes are being slowed down even further in the commercial part of the port activities (cargo-related data) because of the similar reasons. Stakeholders involved in seaport processes are still burdened with the manual inputting of data into paper documents, documents that contain almost the same information as already electronically submitted data. Therefore, data and/or document distribution to the competent authorities creates confusion caused by data redundancy. These administrative tasks significantly increase shipping costs by utilizing excessive waiting time for cargo processing, also causing delays in the next port of call. This archaic method of doing business reduces the competitiveness of maritime transport. Therefore, the EU has adopted a Directive 2010/65/EU about reporting formal reports, whose goal is to harmonize administrative procedures applicable to maritime transport. To achieve this, it is necessary to develop the MNSW that would be connected with the SafeSeaNet, eCustoms and other regional and supranational electronic data exchange systems. Safeseanet, a system of EU for the exchange of maritime information to promote efficient maritime transport (SafeSeaNet, 2016) provides almost real-time information for about 17 thousand ships that operate on a daily basis throughout the EU (EMSA, 2018). The data that are exchanged in SafeSeaNet are identity of the ship, position and condition of the ship, time of departure and arrival, incident reports, details of dangerous cargo, waste and ship safety. eCustoms is defined as an application of IT technologies in public administration. It is connected with the organizational changes and new abilities of public services, which aim to improve quality of provided services by the government (Granqvist et al., 2012.)

MNSW are systems that combine data from all ports of a state and have B2G features (Single Window Directive for formalities in maritime traffic, 2015). Usually a smaller set of data is shared through these systems because this data is important on the national level. For the past several years, the EU has been working on the development of the European Maritime Single Window (EMSW) with the aim to fully harmonize interfaces available to operators of ships in order to provide required information all across the EU. The purpose of EMSW is to standardize information needed for port management so that the submitted data can be publicly available to all relevant stakeholders. (EMSA, 2018) To improve business processes, EMSW and MNSW should be synchronized and fully integrated with the PCS. The PCS combines and exchanges data among all the stakeholders involved in the operation of a particular port cluster (van Oosterhout et al., 2008). Many countries do not have a developed MNSW, but they have very diverse and well developed PCS systems instead. There is no global and standardized PCS model applicable to all ports as it may be the case with the MNSW. Each PCS is specific, each country has specific legal regulations and therefore each port community develops its own PCS according to its needs. Each PCS should communicate through the interface of MNSW so that the data would not be duplicated and in order to speed up business processes (Kapidani et. al., 2015).

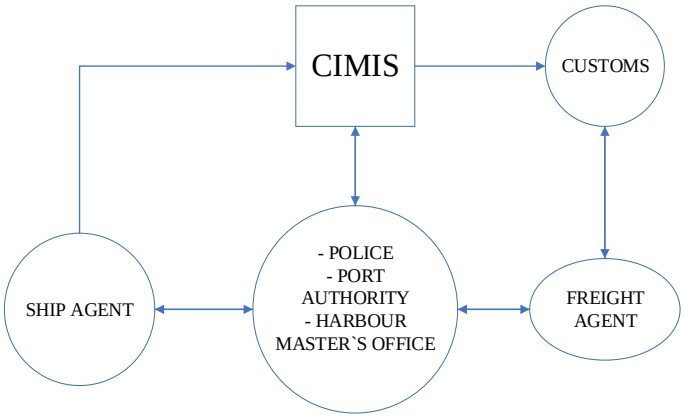
PCS helps stakeholders of the port processes to reduce logistics costs through faster information flow, deliver the cargo faster, enable the flow of goods, and finally, boost economic growth. As a secondary result it helps in reduction of externalities such as

pollution and harmful emissions (IPCSA, 2018). Therefore, conclusion can be derived that there is no unique way to define MNSW. Each Member State will have its own requirements and conditions, for example, should the MNSW be associated with other systems of the authorities or will the authorities only collect information from the MNSW's user interface; should the national maritime transport system (in Croatia - CIMIS) be part of the holistic MNSW solution or will it be a separate system; which legal regulations will be included in the development of the MNSW environment.

## 3 Current State of MNSW Development in the Republic of Croatia

Beginning with 2013, an integrated maritime information system (CIMIS) has been in development in the Republic of Croatia for electronic delivery and data exchange about ships, cargo and passengers in the official proceedings of announcement and registration of arrival and departure, as well as related official procedures except in one segment - customs supervision of ship`s cargo. Using announcement of the ship's arrival, the agent receives the documents that are entered into the CIMIS system (The regulation on forms, documents and data in maritime traffic, their collection and exchange, and the issuing of Free Pratique, 2017). In the relevant documents, some fields are redundant, but in the CIMIS system they are entered only once, and the entered data is automatically propagated into the fields of other documents, where applicable.

Documents entered into CIMIS are Notification of arrival, Ballast Water Reporting Form, Notification of Ship-Generated Waste, ISPS Code Arrival Notification, Dangerous Goods Manifest, PortPlus Announcement - PSC MEI, IMO FAL forms (Tijan et al., 2017). By entering data related to the announcement of the ship's arrival, the data becomes visible to all users of the process and they can use them for planning and implementation of their own activities. During the announcement of ship's arrival, the data about the ship, the voyage, passengers, crew, cargo and documents that are submitted during the procedure of the ship's arrival are entered into the system (Tijan et al., 2017). At the time when the foreseen operations are completed during stay of the ship in the port, be it commercial activities related to loading or unloading of cargo, the ship's agent (or ship`s captain) submits required documents through the CIMIS system that are then used by all stakeholders involved in the administrative reception of the ship such as the Harbor Master Office, Port Authority, Ministry of Health, Ministry of Internal Affairs and Customs. Data provided through the CIMIS system are the crew and passengers list, stability calculations of the ship, the permit to complete all customs procedures, ETD, actual quantity of the cargo and exact number of passengers on board. The port authority defines location of the mooring or berthing through CIMIS and confirms the ETA.




**Scheme 1: Current procedures in Croatian ports**

The problem occurs after the ship's arrival in the port at the cargo registration through Cargo Declaration - IMO FAL 2 form, (IMO, 2018) which in the current system does not have the possibility of uploading so the data must be manually entered which requires quite a lot of time. Often, multiple errors occur when entering the data.

At this point, it is important to distinguish the ship's agent (usually one) from the freight agent (possibly multiple). Several freight agents can sometimes handle the cargo formalities for different cargo aboard the same ship. The freight agent takes the cargo list from CIMIS and must enter the cargo data in detail in the IMO FAL 2 form, which is after completion sent to the Customs administration. It should be emphasized that the Customs interface is functioning independently of the CIMIS system and that is the reason why it is necessary to constantly retype the data manually (Čičovački, 2018). The Customs administration communicates directly with the freight forwarder and the freight agent during cargo processing (Tijan et al., 2017).

The same procedure is applicable when the ship leaves the port. The freight agent manually fills out the data (Export manifest) and only then the ship can leave the port. This problem occurs also because the whole procedure does not use electronic signature resulting in processes being performed both in electronic and in paper form (Port of Rijeka Authority, 2018).

The procedure is even more complicated in the case when the ship is moored outside the customs gate (Tijan et. al., 2017). Then the ship agent needs to submit the request to the Ministry of Internal Affairs and to the Customs Administration that approves the request. The Harbor Master`s Office gives the consent to such request which is previously approved by the Ministry of Internal Affairs and the Customs administration.

In terms of delivering real and accurate data of the ship, the ship's agent announces the ETA via CIMIS (Čičovački 2018). This data can be used by the Harbor Master Office,

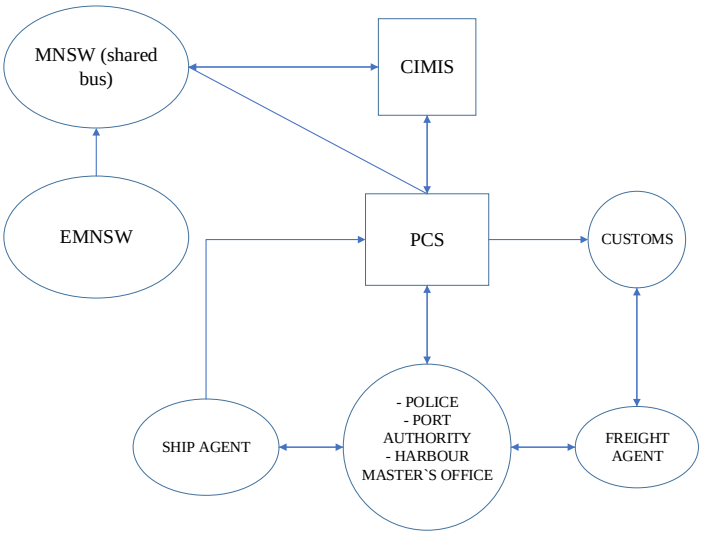
pilot service, tug service, and the number of available tugs can be checked if they are necessary for the ship's entry process. The Harbor Master's Office then issues the formal permit which enables the start of port operations that are not directly under the jurisdiction of the Port Authority. This permit may only be issued after the following services have ascertained that there are no obstacles in their domain of jurisdiction: consent must be given by the Sanitary Inspection, the Border Phytosanitary Inspection, the Ministry of the Internal Affairs - Maritime Police and the Customs Administration. The port authority shall provide (in the CIMIS system) a certificate of the quantity of the ship's really delivered (unloaded) waste to the Harbor Master`s Office for inspection so that the ships can receive the permit to navigate to the next port without the delivery of the waste and/or cargo residues (Tijan et. al., 2017).

If a ship is travelling in an international voyage from the mooring or berthing that is outside of the customs gate, the agent must submit a request. Upon receipt of the request, the Ministry of Internal Affairs can make the necessary checks and issue a decision that is available to the Customs, or to the Harbor Master Office through the CIMIS. On the basis of the received data, documents related to the international voyages departing from the last Croatian port, the port authority issues the permission to the ship to leave the port when all conditions for departure are met in accordance with special regulations.

## 4 Development of MNSW and PCS with EMSW in Croatia

At the beginning of 2017, the EU ministers agreed on a declaration that would harmonize the data between ports of the Member States (European Commission, 2018). The European Maritime Single Windows (EMSW) is a place where all information (except eManifest) is registered and accessible to all various competent authorities (EMSA, 2018). The data would be available to all providers of the ship-related data (agents, ship masters, ship owners), relevant public authorities associated with the seaport and other Member States of the SafeSeaNet. The data that is entered in the EMSW are port arrival and departure, ship particulars, cargo and dangerous goods, ship`s stores, crew and passengers, crew`s effects, security, waste and health data. The ship agent registers the described information in previously described CIMIS system, which in Croatia currently serves as the MNSW.

In the development of the single interface, MNSW would represent an information bus established between the CIMIS and the EMSW. By linking these systems, administrative procedure of the ship's arrival and departure would be significantly accelerated, which would also accelerate other administrative and commercial procedures between the stakeholders of the seaport system. Data redundancy would also be avoided. In a real life scenario, the ship agent inputs the ship identification data, crew list and other relevant data in the CIMIS system, which could be avoided because of established connection to the EMSW through the MNSW bus. For example, if the ship is leaving the port of Trieste for the port of Rijeka, all data related to the ship would be visible through the EMSW in the next phase(s) of the voyage.



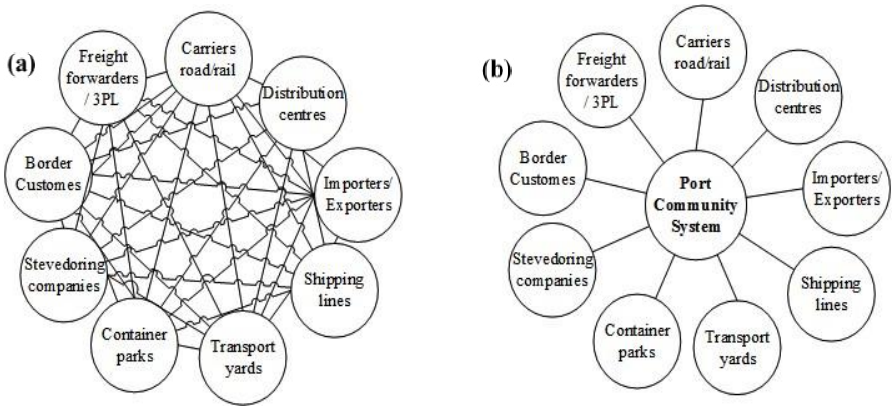

**Scheme 2: System orchestration in Croatian Maritime National Single Window**

Further problems that slow down the seaport processes are caused by an underdeveloped or non-existent PCS system (current exception is the port of Ploče, where PCS is partially introduced and still in development), thus making the customs procedures and the work of freight agents more difficult. By introducing the eManifest into the EMSW, the work of the freight agent and customs would be considerably simplified.

The eManifest project started in February 2017 and will encompass the Arrival Manifest, using the existing Maritime Single Window prototype which was developed by the European Maritime Safety Agency (EMSA) in compliance with the Directive 2010/65/EU on reporting formalities (EMSA, 2016). The eManifest, or electronic cargo list, contains information about the status of transported goods and is considered to be a practical solution by which this could be achieved. The eManifest would assume the form of a harmonized electronic cargo list and as such would represent an instrument for further facilitation of the maritime transport which is done by ships that operate in seaports of the EU and third countries. The eManifest must be available in electronic form to the customs authorities at the next port of call where the cargo will be unloaded, whereby quick transit would be enabled to cargo from the EU (European Commission, 2018). By referring to the information about the cargo that is collected in the previous port in the eManifest, an additional factor of compliance with the fiscal and safety requirements of the EU would be provided. By introducing the electronic signature within the PCS system, administration procedures would be additionally validated and secured.

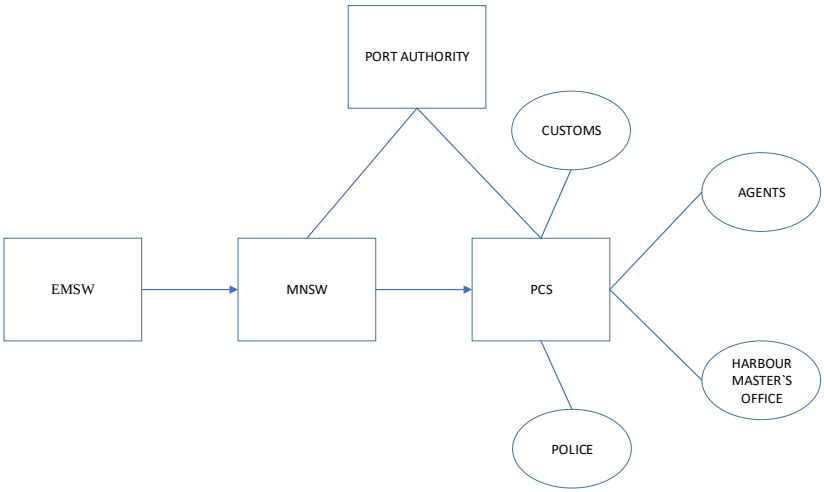
## 5 The Example of MNSW and PCS Integration

The integration of MNSW and PCS would greatly contribute to the development of seaport processes, while at the same time the cost to the ship owners or shippers would be reduced. Therefore, it is of a common interest to speed up and facilitate the procedures required for the arrival, stay and departure of the ship, throughout the business processes. For example, when a ship departs from one port, the ship's port of entry would convey the EMSW data regarding the arrival of the ship to the next port. The data entered in the EMSW would be synchronized to national platforms or the NMSW. The next step is establishing the connection of the NMSW with the PCS. The data entered in NMSW (synchronized data from EMSW) would be visible in the PCS (an integration of the entire port community is required as shown in Scheme 3.).




**Scheme 3. Communication between individual seaport stakeholders (a) without the PCS and (b) with the PCS (Irrannezhad et. al., 2017)**

Using the data related to the type and size of the ship, the port authority could plan in advance or define the place of mooring or berthing, so all stakeholders of the port process could be optimally organized such as pilots, Harbor Master Office, customs, etc. (scheme 4). The described communication would greatly accelerate and facilitate the ship's agent work through the announcement and registration procedures of the ship, as well as other operational activities during the ship's stay in the port.




**Scheme 4: Integration between MNSW and PCS**

## 6 Conclusion

According to the presented research, Croatia will have to develop the MNSW to comply with the present EU recommendations. For the development of the MNSW, it is necessary to analyze the existing systems that will participate in the exchange of data, their ability to communicate through exchange of the messages, receiving, storing and exchanging the documents and information. It is important to emphasize that there is no unified or universally applicable method of establishing the MNSW. It is necessary to establish a broader integration infrastructure of seaport stakeholders. In Croatia, the MNSW should be integrated with the CIMIS system, which proved to be successful and well accepted by stakeholders. Therefore, the MNSW should represent a "government service bus" that will be used for the exchange of data, ensure the compliance with business processes and conversion of the various data formats entered by stakeholders. This means that the MNSW system should not be used for the active entry of documents and data in the sense of a single data entry point. The relevant data exchange will be achieved through the existing or future systems (the new PCS systems of Croatian seaports). The construction of the PCS system is essential for the stakeholders of the port processes to whom business operations would considerably be facilitated through faster information flow and the reduction of errors that occur through multiple data entry. In order to achieve this, it is primarily necessary to invest in information and communication technologies that represent the basis for the described development. This should substantially accelerate business and port operations, both in the seaport itself, and among stakeholders. In addition to the acceleration of the processes, it would also simplify data entry procedures, resources would be used more efficiently, redundant data would be eliminated, cargo would be processed faster (which especially applies to the Customs part) and security, integrity and transparency of the process would be greatly increased.

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