D 4.2.7 –

Final Position Paper

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1. Introduction

CHARGE test pilots have been conceived in the view of eliminating or reducing the main physical and non-physical bottlenecks in the Adriatic area. They were conducted by experienced partners in dealing with bottlenecks problems, which are mainly based on continuing the work done in the experienced past projects carried out in the Adriatic. Among realized test pilots here below we focus on:

➢ the "Improvement of seaside data exchange dedicated to every navigation channels in the port area– developed by AdSPMAS and the Ports of Venice and Chioggia;

➢ the "automatic data exchange between Jadrolinija datawarehouse and TINS (Trasferimento delle merci IN Sicurezza) system" developed by the Port of Ancona;

➢ the "Upgrading of the Croatian National Single Window - MSTI" developed by the Croatian Ministry of the Sea, Transport and Infrastructure (MSTI);

➢ the "Connection of local database with CIMIS in Port of Split – SPA" developed by the Port of Split;

➢ the "Development and upgrade of PCS system modules used between port agencies and security authorities for the automatize secured exchange of gate in/on data regarding vehicles entering port terminals" developed by the Port of Ploče.

Such realized pilot activities represent best practices for the upgrading of Port Community Systems (PCS) in the Adriatic basin and are compliant to be further developed and adapted for the Italian and Croatian ports not involved in CHARGE, as well as for Greek, Albanian and Montenegro ports, to contribute to smooth the EUSAIR freight traffic flows thus increasing the competitiveness of related territories.

Test pilots are characterized by a massive use of web services and mobile technologies including those for data geocoding.

The test pilots here described are deeply connected and are here presented as reference examples, dividing them between those providing services through free mobile apps and those providing integration of existing port IT systems via web services.

2.   Description of the Pilot Actions

Concerning the sharing of port information by free mobile applications, **AdSPMAS** realized a mobile application with the scope of providing all users in the ports of Venice and Chioggia the possibility to have easy and free access to real time data to make navigation safer and to improve efficiency of port operations in order to attract more traffic and business opportunity for the territory. It is based on a scalable IT platform to consider beforehand the future increase of app sharing and thus consider that the entire infrastructure has to be able to manage a fast escalation of number of users and connections. Such IT platform (see Figure 1) uses a Geoserver technology based on PostGIS and the app has been developed on a cross-platform target aiming to provide a real-time experience through the geo-localization. In fact, the mobile application allows to access data related to entities (ships, sensors, …) georeferenced positions, weather condition, port accessibility (port entry/exit conditions), maritime traffic data (presence of other vessels), special notice to navigators.

In particular, the GUI (Graphic User Interface) of the application (see Figure 1) shows the instant position of the user's device/boat, the position of other ships, the data coming from the meteo sensors. By clicking on the ship icon, the user can see the ship name and type, its destination and other data. By clicking on the sensor icon, the user can visualize the weather condition in that point of the lagoon on real time basis. It is possible to select the position of the user, the current status of the port (open/close) for any of the three port in-lets (Chioggia, Malamocco, Lido). It is also possible to select the page showing in a table the updated weather condition data, tide data

(current and forecast) and notice to skippers, as well as it is also possible to share the user's position on the same map with AIS data coming from Coast Guard information system.

The output of this test pilot (mobile app) can be considered a new way to share maritime data among all port users. It can easily be replicated using more standardized information from the ports, making certain services more accessible for goods handling and traffic flows.
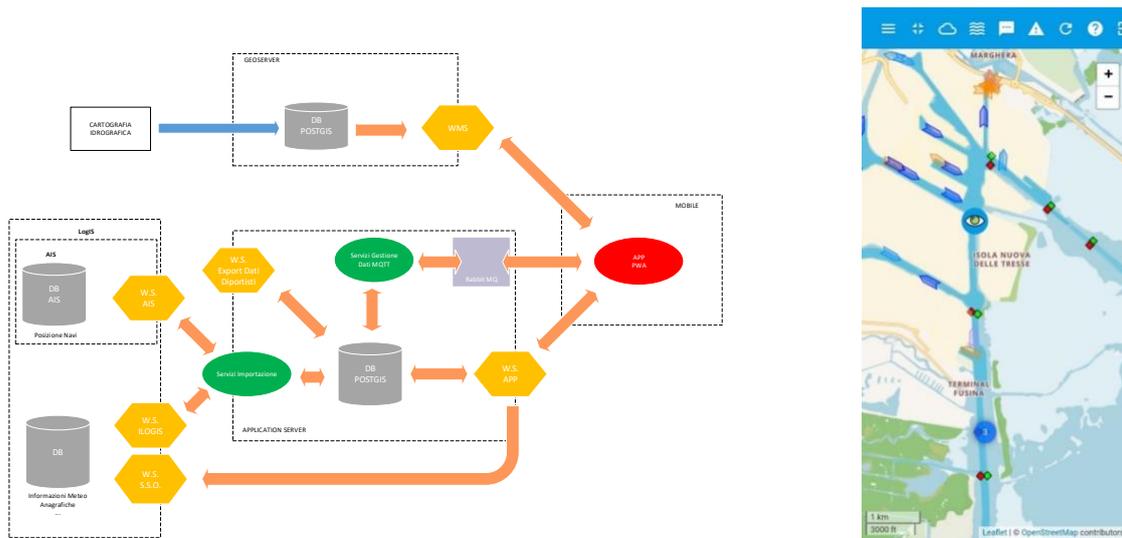

Figure 1 – IT logic architecture and App interface example.

In the field of data exchange between stakeholders and Port Authorities, **the Port of Ancona** developed a test pilot for the automated control of all commercial vehicles arriving/departing by ferries in the port areas, and specifically for a safe transfer of vehicles (for customs formalities) from the customs areas located near the embarking/disembarking docks at Scalo Marotti and vice-versa.

It aims at automatically feeding the port authority datawarehouse to speed-up security checks and controls, and it is conceived to implement a machine-to-machine data exchange between Jadrolinija (the croatian state-owned sea shipping company) and the Port of Ancona. In particular, this test pilot focuses on the automatic data exchange of Jadrolinija ships approaching the harbor in terms of vessel information and route, as well on-board vehicles and passengers lists. This

data sharing among the stakeholders (shipping company, port authority, custom and homeland security agents) allows to speed up check-in/check-out and security controls and to provide real-time reports and statistics.

Regarding test pilots in the view of PCS integration involving different stakeholders, the Croatian pilot activities mainly consist in the actions carried out by MSTI, Port of Split and Port of Ploče.

In order to improve the safety and logistics processes of ports, **MSTI** delivered an update of the NSW-port IT systems exchange functionalities aiming at interconnecting with the port IT systems via web services exchanging data on ships, cargo, passengers and all other official administrative formalities regarding the ship calls at Croatian maritime ports. Such a connection is bidirectional and an advanced "AIS trigger" functionality was developed on the basis of the IVEF (Inter-VTS Exchange) format enabling automated ship's movement monitoring on arrival at (or departure from) the area of the port authority, based on Automatic Identification System (AIS) information. This information is further extended by the regular ship electronic reporting based on inputs from shipping industry.

NSW-port IT systems exchange functionalities apply to Port of Split and Ploče, whose test pilots were developed better focusing on administrative (Split) and/or on safety (Ploče).

The pilot activity in the **Port of Split** was conducted to connect its PCS, called Framework for Business (F4B), with the Croatian Integrated Maritime Information System (CIMIS) handled by the Ministry. F4B monitors and records all vessel movements in the port area of the port of Split and the integration aims at speeding up the vessel acceptance, which is a process involving several entities, operators of different activities and functions, and the process holder (i.e. the Port Authority). The process involves: timely evidence and documentation of all inputs related to the reception of vessels at the port, in accordance with legal, regulatory and organizational requirements; coordination of all entities involved in the process selected through the flow of

information and documents; realization of outputs (statistical data and invoicing); document management and strategic management.

Aiming at obtaining as accurate as possible operational and statistical data, and ultimately the harmonization of the systems, there is an increasing need for gathering data from the state-operated information system CIMIS directly in the F4B and vice-versa. It allows to gain insight into reliable documents without the use of paper, rationalize the process and remove unnecessary documentation, simplify the collection of relevant data for statistical purposes, increase the productivity of the port and speed up the process of tracking vessels, as well as increase the throughput of the port. Synchronization of data between CIMIS and F4B would enable Port Authority of Split to use the gathered information in both systems for managing statistics and port fees, passengers and vehicles, cargo according to different features/criteria, port operational center, environment safety and protection. This is maintained until the vessel departs and all the relevant data must be available to Port Authority of Split.

The IT infrastructure is based on a client-server architecture. Web service for data communication was implemented on CIMIS side of the system (server), while F4B Port system implement the client side and initialize the communication stream. If necessary, additional services could be implemented on the F4B side of the system. The common points of the two systems regard: the unique definition of ship movement, the types of movement, the vessel identification, the port identification as well as the timestamp of the operation.

This synchronization requires changes in business procedures and further automatization, as summarized in figure 2.
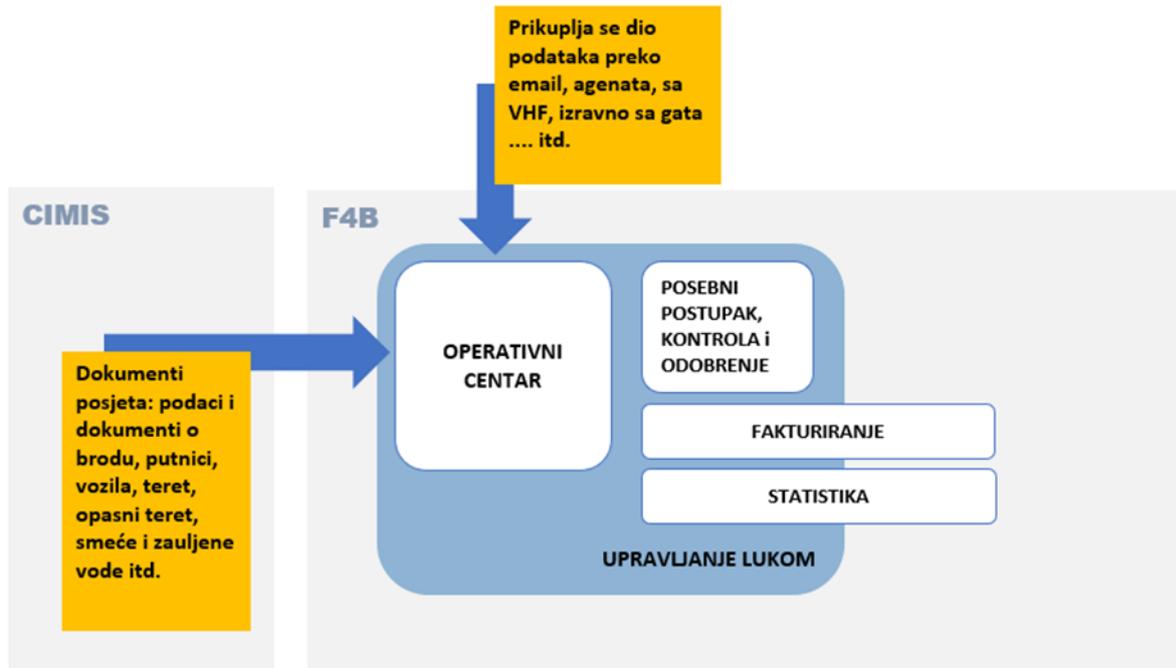
Figure 2 – CIMIS and F4B architecture integration in the Port of Split.

The availability of data provided by the Port Authority speeds up the process flow and reduces the time consumption of searching for paper invoices. Since this is the same data that serves as official documentation, there is no need for other mediators to perform services for the port's clients. The operational center is the distributor of documents for further processing, both within and outside the port's managing service. Data collected in F4B form can also be used for business processes, authorization, invoices and statistical calculations.

The pilot action carried out in the **Port of Ploče** concerns data integration within PCS to remove bottlenecks in integrated information systems and low exchange data with other systems existing in port areas. In particular, the development of this IT-system has positive impacts on safety in port areas and aims to improve and speed up port procedures within logistic chain. Port procedures are focused on ship arrival/departure procedures, cargo handling within port area,

custom and logistic procedures, gate in/out procedures and safety procedures within port areas, including the integration with AIS Base Stations and Traffic Image Application for the VTS Center and SAR MRSC operations of Port Authority of Ploče. The system is able to monitor and track ships in real-time based on the visualization of the maritime 'Common Operational Picture' (COP) based on S57 standard maritime charts and AIS data. Main features the Port of Ploče test pilot regard the incident, analytics and ship database components of the port IT system, which allow to implement incident management solutions, that is: adding incident handling (incident form, checklist, action log) to the AIS visualization, loading historic events and incidents from the database and saving them to external files, creating an automatically updated repository of ships, useful for supporting incident management by providing operators with reference information during routine and disruptive events, allowing the operator access to important contact information during an incident. Of course, the system integrates all the e-document facilities above described for the exchange within Port Community System of all relevant data regarding maritime and land side on the logistics chain, which are used to faster and automatize procedures for gate in/out.

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3. Conclusions

In conclusion, ***the pilot activities aimed to upgrade the existing Port Community Systems of the involved ports to reduce time and cost of the implementation measures to improve vessel traffic control, reporting formalities and safety and security***. Pilot activities focused on the improvement of the e-dialogue between Port Authorities, maritime agencies, security authorities, as well as the enhancement of intermodality connections through the application of ITS services accessible to all stakeholders. ***The effectiveness of the pilot activities is demonstrated by the improvement in efficiency of all relevant processes involving maritime and land side of the logistics chain***. All pilot actions have one major factor in common: all of them involve a vast range of different actors, which need to be aware of the importance of the results of the pilot action, with particular reference to the direct and indirect benefits they can obtain, and must have a clear idea of their role in the overall process.

Thus, the advantages of carrying out a series of well connected pilot actions are the involvement of all operators along the supply chain, including the competent authorities and the private operators. This can be seen as part of a bigger process for the modernization and upgrading of the entire logistic chain.