Interreg Italy - Croatia DigLogs European Regional Development Fund

EUROPEAN UNION

DigLogs

Digitalising Logistics processes

DigLogs Project Portrait: Transferability and Action Plans

DigLogs

DigLogs is characterized by the implementation of seven pilots in Italy and Croatia with technological solutions, models and plans for advanced digitalised logistic processes for multimodal freight transport and passengers' services. This project addresses the Italia Croatia Cross-Border Cooperation Program of Interreg, in particular the objective 4.1 to Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the programme area.

- The pilots have contributed to three major areas of innovation, which all contribute to fostering multimodal services, in different ways:
  - Supporting Better Multi-modal delivery planning
  - Supporting Passenger Services
  - Improving Port Authority Services Supporting Clients

Diglogs has achieved valuable results towards its vision statement: "In five years time, most of the transport flows, concerning freight and passengers, of the Italy-Croatia area will be digitalised and therefore connected through innovative ICT solutions able to support a wide range of IT services for logistic operators, industrial users, private passengers and public authorities."

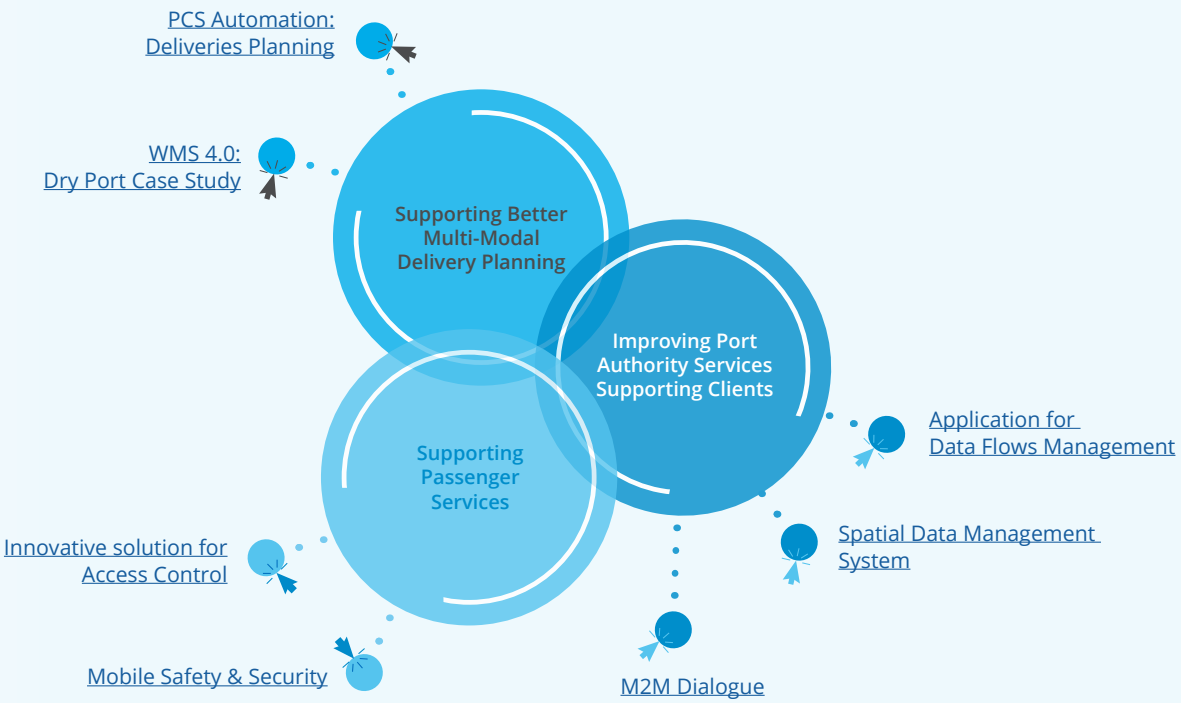
- In particular, Diglogs project has brought numerous benefits for businesses and the society, including:
  - enhanced and widespread capability to monitor, trace and safely handle moving goods and passengers flows;
  - increased efficiency of transportation networks, by improving synchronization between logistic users, operators and control authorities;
  - improved sustainability of logistic systems, by reducing their impact on local communities in terms of traffic congestion and pollution.

Transferability

The most important factors to ensure the durability and the sustainability of the Diglogs project include:

- **Maintaining a strong network** is a key element, to establish relationships with other stakeholders, considering the possibility of participating in future projects with a partnership that shares the common objectives.
- **Integrating Diglogs pilot results in a local or regional system**, in a way to ensure the durability of the model.
- **Advertising results and outcomes ready to be capitalized**, offering the methodology and the tools ready to be adapted and implemented.
- **Finding new funding**, through private or public funding sources (EU or national funding).

Pilots overviews and considerations for future



WMS 4.0: Dry Port Case Study

Supporting Better Multi-Modal Delivery Planning

WMS 4.0

Overview

Location	Intermodal rail-road terminal of Gorizia (**SDAG**), Friuli Venezia Giulia Region, Italy
Actors involved	Intermodal Terminal Management Body, Road haulers, Combined Railroad transport operators, MTOs, Shippers and Customs operators
Relevance to Whom	Carriers, Multimodal Transport Operators (MTO), dry ports and public authorities
What	Piloting of a Decision Support System (DSS), implemented in the form of an open-source platform providing optimized transport arrangements for last-mile transport segments, by making use of specific algorithms and coordinated data from multiple stakeholders
Technical Objectives	• to demonstrate how multimodal transport arrangements among a heterogeneous set of logistics operators including carriers, logistic providers, transport operators and authorities can be thoroughly and conveniently optimized by exchanging real-time information concerning planned delivery schedules • to overcome existing transport challenges affecting the very last mile of the multimodal transport chain by making the execution of road transport activities from the destination railroad terminal in Gorizia (SDAG) to the final goods delivery destinations in the most efficient, convenient, and seamless way

elevante

Problems, Benefits & Opportunities

Supporting Better Multi-Modal Delivery Planning

WMS 4.0

Problems before the pilot	Benefits/Strengths of Pilot	Improvements & Opportunities for future implementations
Difficulties in communication between terminal operators, warehouse management and carriers for real time decision-making	Real time decision-making with centralized data system	Predictive data analysis based on historical data. Using statistical algorithms and machine learning techniques to identify the likelihood of future outcomes
Difficulties in the exchange of data between MTOs, terminal operators and carriers	Data synchronization offered by TAS (Track Appointment System), by making use of specific algorithms and coordinated data of the whole intermodal transportation chain, solving also last mile transport segments	Large scale installation of WMS 4.0 would increase the efficiency of intermodal freight transport in national and international scale. The use of specific algorithms and coordinated data gathered from multiple stakeholders will provide optimized transport arrangements for last mile transport segments
Redundancy, lack of data and data dispersion (i.e. exchange of data in paper form or 1-to-1 mails)	Digitization of flow management information	The reduction of the redundancy, the lack of data and data dispersion by integrating further operators' systems

Considerations for Future | 1

No.	Mandatory requirements for successful pilot implementation
1.	Updates and maintenance activities must be done by a development team that operates continuously
2.	It is necessary to have qualified personnel for the management of WMS4.0
3.	A total (Versus partial) digitization and centralization of the data by the authors involved
4.	Optimization and upgrades with the addition of improvement tools
5.	The possibility of communication with external services already present in the intermodal system

Considerations for Future | 2

No.	Constraint / bottleneck/weakness/ threat	How to overcome it or avoid it
1.	Initial assessment for personal training by using digital information	By using user-friendly interfaces and clear and detailed user guides
2.	Providing staff with computers, tablets, smartphones or other devices connected to the Internet	Nowadays obtaining communication and internet-connected devices is very easy and not expensive
3.	Digitization should be fully completed to have a full working WMS4.0 service	Gradually making its use mandatory by all the actors involved
4.	Force majeure events (e.g., natural disasters (or other destructive events)) which are utterly outside of human control	Making periodic backups of the data to avoid their loss at any time. Backups must be periodically performed every few days so as not to block the operation of the system
5.	Initial data digitization cost (digitization is the conversion process applied to the current system into a digital information)	Providing sufficient funding for the future development services

PCS Automation: Deliveries Planning

Supporting Better Multi-Modal Delivery Planning

PCS Automation

Overview

Actors involved	Interporto di Novara, Interporto Marche, Interporto Bologna, Scalo Intermodale Saletti, Port of La Spezia, Port of Ortona, Port of Vasto, Port of Ancona, Port of Split, Port of Sibenik and Freight Terminal of Sisak
Relevance to Whom	1. Carriers 2. Shipping Companies 3. Freight Terminals 4. Ports 5. Vessels 6. Custom Agents 7. MTOs
What	Specialized Decision Support System that calculates and suggests routes by processing normalized real-time data coming from external sources and systems used by the port community • Offer a direct tool for shipment planning, with indications of prices, transit times and emissions • Follow-up on shipments during each step of the multimodal chain, adding the re-routing tool as an option for shipments' non-compliance
Technical Objectives	• A Multimodal route planner on 3 modalities, rail, sea, road; • Comparison of routes based on ITUs and ranking available on price, transit times and emissions • Rerouting option, based on the journey non-compliance, and re-route from that point onwards, with rankings on price, transit times and emissions • Mapping of key routes in rail and sea freight transport and key intermodal hubs in Italy and Croatia • Deliveries planning solution that can be easily connected to the existing Port and Maritime information systems both as sources and as targets of the Delivery Planning Solution

POLO INOLTRA INNOVAZIONE LOGISTICA & TRASPORTI

ACTUAL Simplify your day

Problems, Benefits & Opportunities

Supporting Better Multi-Modal Delivery Planning

PCS Automation

Problems before the pilot	Benefits/Strengths of Pilot	Improvements & Opportunities for future implementations
Lack of information in relation to multimodal planning	Integrated information on routes (rail-sea-road) & ITU's compatibility	Potential extension of the geographical coverage
Difficulties in prediction of transit times, costs and emissions	Automatic cost, transit times and emission calculations	Potential improvement of the algorithm in order to add also the hidden fees and external costs
Delay and complexity in shipment re-routing, based upon the operator's personal experience	Improved re-routing options, based on the current traffic and weather situation	Potential improvement of the system, in order to transform the current set of data (static) into a dynamic data-set for a real-time calculation of the service
Complexity in calculating the emissions of a multimodal shipment	Automatized emission calculator, taking into consideration the different emission classes for rail, sea and road options	Improved algorithm on the emission calculation, for potential European certification of the emission saving effort
Subjective selection of the service's ITU type	Full cost-transit time-emission comparison for different service ITUs, for an improved selection beforehand	Extension of the available ITUs, in order to add more complexity to the system

Considerations for Future | 1

Supporting Better Multi-Modal Delivery Planning

PCS Automation

No.	Mandatory requirements for successful pilot implementation
1.	Geographical extension beyond the Italy-Croatia area, towards a pan-European coverage
2.	Real-data collection of traffic and weather conditions
3.	GPS coverage of ITUs, intermodal trains and Ro-Ro services to be included in the system for better multimodal planning
4.	Certified dataset for emission calculations, in order to issue an emission' saving certificate at the end of a shipment
5.	Full participation in the system implementation of key intermodal operators, in particular MTOs operating open-access intermodal train services and Ro-Ro operators across Europe

Considerations for Future | 2

Supporting Better Multi-Modal Delivery Planning

PCS Automation

No.	Constraint / bottleneck/weakness/ threat	How to overcome it or avoid it
1.	Weak system for routing selection	Increase the number of services available in order for the system to find the best solution
2.	International services crossing Italy and Croatia are not considered by the system	Expand the geographical coverage
3.	The traffic and weather calculator may be ineffective	Link the system algorithm to reliable real-time traffic and weather portals
4.	Train and Ro-Ro delays are not reliable	Link the delay-calculation to actual tracking system mounted on intermodal open-access trains and Ro-Ro services
5.	Emissions-saving calculations may be subjective	Link the emissions saving calculation to a certified portal in order to formalize the procedure

Mobile Safety & Security

Overview

Location	Trieste, Italy Pilot Location: GNV Bridge Ro-pax ship
Actors involved	Shipping companies, Port terminal managers, Shipyards, and Ship Classification Societies
Relevance to Whom	Shipping companies • Shipyards in charge of building the testing ships • University, in order to manage and monitor the development of the innovation • Mobile security application developers • Bluetooth net specialists and beacon suppliers
What	Deliver clear guidance information to passengers, considering the current status of escape routes, by adoption of mobile technology. Pilot resulted in a demonstrated reduction of evacuation time by 16.9% when some of the escape routes were not available
Technical Objectives	• Testing mobile wearable devices (smart bands) and a backend application to configure and monitor the system from the ship bridge • To compare the standard evacuation time with real time information on available escape routes • The test environment included an area covering 2 decks connected by multiple staircases on a the GNV Bridge Ro-pax ship

Supporting Passenger Services

Mobile Safety/ Security

Problems, Benefits & Opportunities

Supporting Passenger Services

Mobile Safety/ Security

Problems before the pilot	Benefits/Strengths of Pilot	Improvements & Opportunities for future implementations
Fire or flooding could block some escape routes. Passengers would then have to find alternative escape routes wasting time	The mobile guide reduces the evacuation time when escape routes are blocked	Positive association for shipping company due to increased vessel safety. Besides, guidance could become an additional service during normal operations to navigate the ship
During the ship's evacuation, panic may occur and passengers could become lost (resulting in Crew searching for them and losing time)	The system enables the localization of passengers in real-time. It might aid the crew in handling lost passengers in a shorter time	Localization data can be used for commercial purposes, provided that all the privacy regulations are respected
The ship is a large and complex environment that requires the coverage of wide steel-made spaces, which can create technical challenges	The pilot system has been successfully tested in a small space (2 decks in one main vertical zone) of a passenger vessel	The system has been designed to be easily scaled for application to wider environments
During an emergency, main electric generators may not be available. Only a limited set of systems is connected to the emergency grid	Beacons are equipped with batteries and the system is designed to continue working even, if a connection drops between beacons and the backend	Wired connection and power source (connected to the emergency grid) may be implemented to make the system more resilient in case of WiFi failure
It is essential to assure a widespread usage of the app onboard to reap benefits during the evacuation	The pilot APP has been developed for a specific wearable hardware that can be always carried by the passenger and integrated with other services onboard (e.g.to open cabins, make payments, etc.)	A mobile APP downloadable from the main app-stores and working on passengers' own mobile devices could be developed

Considerations for Future | 1

No.	Mandatory requirements for successful pilot implementation
1.	Integration of the system with other passenger services (e.g. APP used to unlock cabins, billing, book activities, etc.)
2.	Make APP available on the the main app-stores
3.	Connect onboard WiFi to emergency grid or implement wire connection between beacons and backend
4.	Analyze the privacy issues for storing and using passenger localization data to define the consent forms for passengers
5.	Simulate/test the effect of guidance system in more complex environments (e.g. a complete cruise vessel) to raise the interests of shipping companies

Supporting Passenger Services

Mobile Safety/ Security

Considerations for Future | 2

Supporting Passenger Services

Mobile Safety/ Security

No.	Constraint / bottleneck/weakness/ threat	How to overcome it or avoid it
1.	Smart bands battery capacity is insufficient	Redesign smart bands to improve battery capacity
2.	Beacon battery capacity is insufficient	Connect the beacons to emergency grid and use battery as backup source of power
3.	Steel-made structure causes reflection problems	Uses limited signal power of sending beacons to avoid reflection issues
4.	Steel-made structure causes reflection problems	Limit as far as possible the number of active sending beacons per area
5.	A WiFi failure, before activating the system, can compromise its functionality	Include the WiFi network among the essential systems connected to the emergency grid or establish wired connection between beacons and backend

App for Data Flows Management

Improving Port Authority Services Supporting Clients

App for Data Flows Management

Overview

Location	Port control center of the Port of Rijeka Authority
Relevance to Whom	Passenger and freight terminals, Passengers, Shipping companies, Shippers, Multimodal transport operators (MTOs), Mobile security application developers
What	Provision of an additional visibility layer to the VTS system operators, increasing boat resolution and visibility, showing port basin situation to end stakeholders and passengers and enhancing safety in the area
Technical Objectives	• To develop a monitoring system using a highly modular, ready to go, compact surveillance solution, consisting of video and fixed lens thermal cameras, which is ideal for short to medium range surveillance applications, capable to exactly pinpoint every small vessel or other vehicle present or approaching the passenger terminal • Installation of the video sensing device, serving output data to a dedicated, custom made Web client application connected to existing traffic system and displays in real time showing the inflow of small and large vessels and vehicles moving at the passenger terminal • To expand existing Rijeka Traffic solution with publicly available information on moored vessels • To provide situational overview to interested stakeholders • To enhance passenger port security

Problems, Benefits & Opportunities

Improving Port Authority Services Supporting Clients

App for Data Flows Management

Problems before the pilot	Benefits/Strengths of Pilot	Improvements & Opportunities for future implementations
The passengers did not have a digital means to acquire situational data on the passenger port of Rijeka.	Opening up information towards passengers	Increase readily available information towards the public, especially traffic and passenger statistics, from PCS to-be system, in live mode
VTS resolution was lower than its potential, as all modules were not integrated	Enhanced VTS resolution	Explore technical possibilities for further VTS resolution enhancement
Addition of one more visualization layer, decreased VTS visibility and ability to identify smaller vessels	Enhanced VTS visibility	Identify technical possibilities for vessel and other objects (pontoons, unidentified objects) identification and integration
Solutions for traffic management are disjointed and not fully integrated	Integration with already existing systems increases capability of the IT solutions portfolio (VTS and Rijeka Traffic)	Transfer effects to end users (passengers), even when it is not directly visible to them (enhancement of port basin security due to better resolution and visibility of smaller area objects)

Considerations for Future | 1

No.	Mandatory requirements for successful pilot implementation
1.	Compliance with the VTS system used as a part of this pilot
2.	Skilled and trained personnel (external/internal) for unobstructed installation
3.	Ongoing maintenance contract for the VTS maintenance services
4.	Ongoing maintenance contract for the traffic visualization application
5.	External company well-versed in maritime processes and development technologies

Improving Port Authority Services Supporting Clients

App for Data Flows Management

Considerations for Future | 2

No.	Constraint / bottleneck/weakness/ threat	How to overcome it or avoid it
1.	Custom solution built by a smaller vendor and as a consequence, somewhat dependent on vendor availability	During preparatory phases, identify a reputable vendor even if smaller enterprise, that will be able to complete development and provide maintenance services
2.	Maintenance and upgrades are required for the pilot outcomes to continue functioning	For the anticipated duration of the project outcomes, reserve annual financial means and other resources for maintenance and upgrades
3.	Parts of the equipment are installed in open spaces facing the sea and, consequently, could be jeopardized by weather elements over time, despite being IP-certified, increasing possibility of equipment failure and maintenance costs	Use adequate sheltering and purchase only adequate IP-certified equipment. Use shielded cabling and shelter/ isolate the cabling and equipment appropriately
4.	Passengers need to be informed how to access information on the situation in the passenger port	Furnish Web pages and passenger spaces/areas with information, URL link and QR codes to be used to access the information. Use other means of promotion
5.	Application needs to be adjusted for usage in other ports	During subsequent development, try to standardize the mapping portion and create a standardized application to be used with other ports

Innovative solution for Access Control

Supporting Passenger Services

Innovative Solution

Overview

Location	Port of Šibenik
Relevance to Whom	Local and regional national public Authorities; Enterprises, transport and multimodal transport operators (MTO); Shippers; Passenger and freight terminals; Shipping companies; Sector associations
What	New digital access control system, which manages the access permit requests for the passenger side of Port of Šibenik
Technical Objectives	• Eliminating the use of manual procedures in permit issuing • Creating a dependable technical base for the process to be expanded in the future • Simplifying procedures for issuing of permits • Improving user experience in the request for access permits • Enhancing port security by digital data, permit transparency and searchability

Problems, Benefits & Opportunities

Supporting Passenger Services

Innovative Solution

Problems before the pilot	Benefits/Strengths of Pilot	Improvements & Opportunities for future implementations
Manual permit issuing is hindering effective cruise passengers' processing during arrivals	Increased speed of permit processing	Increase revenue
The process is manual, paper based, disjointed and not streamlined across different involved actors	Various application suites for suitable and individual needs (police, Web, mobile application)	Increase control
The funds for access control solution implementation are inadequate	Cost efficiency in comparison to "off the shelf" products	Retain the know-how and transfer of knowledge to other Port Authorities, become a competency centre for this process
Passenger processing procedure is obsolete in comparison to the competition	Greatly modernized permits issuing and checking process	Transfer effects for other stakeholders and immediate positive externalities for the Ministry of Interior
Paper-based system does not allow for easy searching and reporting	Introduction of structured reporting module and capability	Better, automated reporting

Considerations for Future | 1

No.	Mandatory requirements for successful pilot implementation
1.	Availability of the development team for the maintenance of the Web and mobile application
2.	Sufficient funding for the future development of services
3.	Sufficient funding for replacement of faulty hardware equipment, when outside of warranty
4.	Regular Inspection of the equipment for mechanical and other functional damage
5.	Proper system hardware and network patching and ongoing maintenance upgrading

Supporting Passenger Services

Innovative Solution

Considerations for Future | 2

Supporting Passenger Services

Innovative Solution

No.	Constraint / bottleneck/weakness/ threat	How to overcome it or avoid it
1.	Custom solution built by a smaller vendor and as a consequence, highly dependent on the vendor availability	Liaise with the vendor, follow-up its situation, timely plan for migration in case necessary, ensure proper documentation of the pilot project and its future upgrades
2.	The solution requires maintenance and upgrades to continue functioning	Ensure adequate funding for the maintenance of the permit issuance system mid-term
3.	Budgetary project limitations have enabled on premise solutions, while hybrid or public cloud would be more flexible albeit much more costly	Timely study of technical possibilities and identification of possibilities for migration to the cloud, as a part of the overall IT strategy
4.	New technologies might render developed solution as obsolete	Follow technological trends for similar technologies as the ones used in the pilot project development
5.	Tentative adoption of a new maritime management solution might already include similar permit issuance module, that might displace developed solution within pilot project	Research possibilities to integrate existing solution with the future PCS system, displacing the need for generic PCS access control modules to be implemented

M2M Dialogue

Improving Port Authority Services Supporting Clients

M2M Dialogue

Overview

Location	Port of Rovinj Authority
Actors involved	Rovinj Port Authority, Primary: actors delivering passenger traffic services in the port; Secondary: actors for cargo and other non-passenger traffic; Port Community System (PCS); National Single Window (CMS)
Relevance to Whom	Local, regional and national public authorities; Regional Development Agencies; Enterprises, transport and multimodal transport operators (MTO) including operators of multimodal logistics hubs, infrastructure providers; Transport Association; Education and training organisations
What	Integration of the operational and accounting system of the Port Authority's operations to enable mooring reservation system, graphic mooring occupancy management, billing via mobile application, creating daily, monthly and annual reports, generating mooring contracts, automatic invoicing, CRM-Integrated Email System, accounting, paying invoices and automated importing of bank statements
Technical Objectives	• To improve contract generating process, graphic and visual representation of berth occupancy, preparation of official notes and complaints, as well as facilitate reservation management and ship announcement entries • To upgrade existing maritime traffic control system • To integrate operational and accounting systems

Problems, Benefits & Opportunities

Problems before the pilot	Benefits/Strengths of Pilot	Improvements & Opportunities for future implementations
Use of outdated technological solutions	Currently-used solutions enables faster and more efficient business processes	Possible facilitation of future integration with NSW
Incompatibility due to multitude of programs needed for smooth business conduct/ Use of non-unified technological solutions	Elimination of need for using several non-interlinked services in order to keep track of all business-related activities	Easier future upgrades and transitions due to the fact that unified solution require less transitional work than several unrelated programs
Lack of automation/ digitalisation	Simple improvements encompassed in pilot's solution enable greater level of autonomy while reducing the possibility of error due to human factors	Full automation of simple business processes resulting in greater efficiency, increased control and revenue

Considerations for Future | 1

No.	Mandatory requirements for successful pilot implementation
1.	Availability of vendor's services regarding regular maintenance and upgrade work
2.	Sufficient funding for replacement of malfunctioned equipment
3.	Ensuring proper infrastructural and superstructural environment
4.	Timely inspection of installed HW and SW and taking the proactive approach in case of irregular/non-ordinary occurrences
5.	Employee's acceptance and adaptation to the newly installed equipment

Improving Port Authority Services Supporting Clients

M2M Dialogue

Considerations for Future | 2

Improving Port Authority Services Supporting Clients

M2M Dialogue

No.	Constraint / bottleneck/weakness/ threat	How to overcome it or avoid it
1.	Marina Master is a turn-key solution with features that must blend with the existing ones or completely replace them	Timely and often costly endeavor requiring a certain level of patience until the data is extracted from existing solutions and adapted to the new ones
2.	Complexity of not having an integrated accounting service within the existing PCS	The situation presents as fairly unique as the implementation was successful until a certain point. External accounting services are mostly maintained nonetheless until the development of the accounting service within the pilot's solution is fully capable of providing the service itself
3.	Absence of general ledger	Ensuring that the general ledger has the capability of accepting the exports of journal entries from the system
4.	Requirements for invoice issuance	The current process requires a multitude of information in order to issue an invoice, which is not always an easy task as the employees are often required to work in difficult weather situations. Facilitation will come through simplification or reduction of required data entries
5.	Difficulties regarding the connection to the national e-invoice system	Difficulties occur when the aggregate orders for the payment of invoices are set to be exported through a bank. Avoidance is unacceptable but tweaks and further development from the developers is a key to overcoming the issue

Spatial Data Management System

Overview

Location	Venice Port Authority
Relevance to Whom	Port Authority, Educational institutions, Transport associations or companies
What	• A centralized and interoperable spatial data repository aimed at giving a robust structure to the information and data used within the internal processes and to provide services to external operators and institutions • The new Spatial Data Infrastructure (SDI) performs both, data storage and processing functions, making copies no longer necessary and allowing processing to be archived, both in the form of new data archives and as algorithms that provide results in real time, allowing operators to maintain the known methods and tools thanks to the interoperability protocols • With the pilot action, the SDI has been implemented with 45 data sources (mostly spatial data sources), loaded by processing, and optimizing over 500 existing layers, images, and data tables
Technical Objectives	• The Spatial Data Infrastructure (SDI) has two main components, one for the vector maps and data table and one for the imagery data and some 3D models. Both components enable direct access from desktop application as well as web access through standard interoperability protocols • Time reduction in getting information for planning • Increase real-time data availability • New types of data analytics documents and interfaces to access data from various internal and external sources

Improving Port Authority Services Supporting Clients

Spatial Data Management System

CFLI

Problems, Benefits & Opportunities

Improving Port Authority Services Supporting Clients

Spatial Data Management System

Problems before the pilot	Benefits/Strengths of Pilot	Improvements & Opportunities for future implementations
Ease the communication and sharing of information	The new centralized data infrastructure eases collaboration between employees and stakeholders and the sharing of data processing results	Many actors will be able to directly share data through digital interoperable applications, reducing time wasted and environmental impact
Improve processes control and decision-making	With the new Spatial Data Infrastructure, data visualization is more reliable and effective, and it improves the quickness and the quality of the decision-making processes	Some recurrent outputs needed for decision-making and control processes are now easier to obtain and can also be stored as dynamic procedures
Eliminate data duplication and redundancy	The optimization process that has been carried-out to implement the infrastructure has decreased the number of datasets from hundreds to dozens. The centralized repository will help to reduce fragmentation as recommended by INSPIRE EU directive	Some in-use software platforms can dynamically share data by implementing special database connectors and increase the capability of integrated data processing
Allow the creation of new generation location-based services for companies, institutions, and citizens	The new Spatial Data Infrastructure is mainly an interoperable system that enables spatial based web services and system integration both of internal tools and with external actors' web platforms. So far, some spatial datasets already fuel a, experimental mobile APP for small ships navigation	New tools and services such as Open Data web portal, data-driven online services, Business Intelligence tools and platforms

Considerations for Future | 1

No.	Mandatory requirements for successful pilot implementation
1.	Availability of a master (or detailed) plan for implementation
2.	A hardware/software IT responsible team (or person) to ensure platform efficiency and reliability
3.	One or more internal operators with sufficient (advanced) skills in spatial data management to ease data collection and internal support between operators
4.	Identification of a responsible team (or person) for internal training activities
5.	Availability of funds for IT equipment (upgrade), external expertise for possible advanced operations, and training activities

Considerations for Future | 2

No.	Constraint / bottleneck/weakness/ threat	How to overcome it or avoid it
1.	Difficulty to collect data (get the up-to-date and most accurate data)	Create a workgroup to create a list of data, repositories, responsible persons and draft a plan for the collection activities. Involve department directors
2.	Resistance of employees to attend training activities	Carry on internal promotion events. Involve department directors, draft a training program in collaboration with the human resources responsible
3.	Hard to obtain the right IT equipment dimensioning	Use a scalable platform. Oversize the hardware as much as possible. Execute stress tests, if possible, also during training activities
4.	Resistance of employees to share data with others	Carry on internal promotion events in order to emphasize the advantages in data sharing. Use data shared from several departments in training activities. Involve department directors. Show some advanced results (data or applications) obtained integrating different data sources
5.	Some advanced data management requiring external expertise	Consider different types of data management operations in master and detailed plans. Allocate special funds for possible external expertise needs

Interreg
Italy - Croatia
DigLogs
European Regional Development Fund
EUROPEAN UNION

University of Rijeka,
Faculty of Maritime studies
RIJEKA (HR)

Intermodal Logistics
Training Center
VENICE (IT)

ELEVANTE
TRIESTE (IT)

Regional Union of the Chambers of
Commerce of Veneto Region
VENICE (IT)

University of Trieste
TRIESTE (IT)

Actual I.T.
ŽMINJ (HR)

Polo Inoltra
PESCARA (IT)

Port of Rijeka Authority
RIJEKA (HR)

Port Authority of Šibenik
ŠIBENIK (HR)

Port Authority of Rovinj
ROVINJ (HR)

CONTACT
University of Rijeka,
Faculty of Maritime Studies
Edvard Tijan: etijan@pfri.hr
Ivan Dovadžija: idova@pfri.hr
tel. +385 (0)51 338 411

For more information