



Internet of things, blockchain and digitalization among
international logistic chain:

Industry 4.0 projects and fast trade lane experiences



Leghorn, April 18th
6th MED PORTS 2018

Agenda

- From Industrial to a Digital Smart Port
- How the digitalization is the key of *Logistics 4.0*
- International ongoing projects
- “B2MOS project” in collaboration with Leghorn Port Authority
- Solutions and framework

From Industrial to a Digital Port 4.0



Port of the Future

The **digitalization era** promises to **revolutionize worldwide supply chain system**, according studies effected by *Mckinsey* and the *Boston Consulting Group* we are entered in the **Fourth Industrial Revolution**.

The main actors will be **smart devices IoT** able to dialogue with safe **digital platform**, while **data** will be the stars.

The **Logistics field** is fully involved in the digitalization. According to the main shipping lines as Maersk we are entered in a disruption point, where data and contracts will pass from a *physical flow* to a *smart digital flow*. The ports must follow the trend to be named **Smart Ports**.

Smart Ports Features

- *Digitalization using IoT device;*
- *Intelligent Information Infrastructure;*
- *Integration of different Management areas;*
- *Optimal and maximal utilization of the existing capacities.*

The Results

- *Increased customer satisfaction;*
- *Increased competitiveness;*
- *Developing agility in port in response to the changeful business environment;*
- *Template changes in port services.*

Circle is project coordinator of **EU Project “Dock the Future”**. The research has the purpose to find and implement new port management models innovative design, and innovative technologies solutions to increase the **ports’ performance and the customer satisfaction**



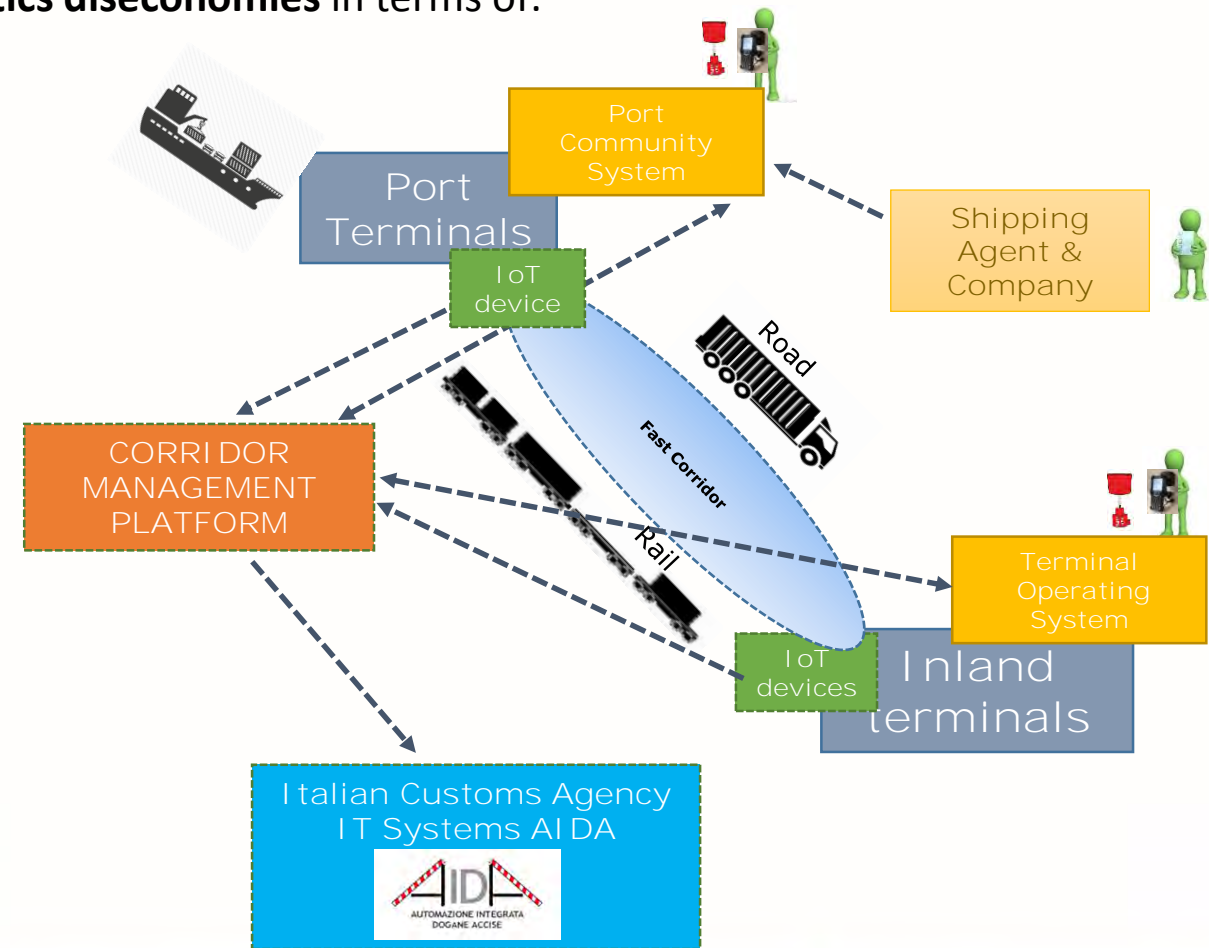
The Connection of the Future

One of the main issues related to the **ports and logistics management** is about **the lack of dialogues between the different Inland Terminal or Logistics Hubs**. This aspect represents **one of bigger logistics diseconomies** in terms of:

- *Transit-time*
- *Costs linked to the permanence of goods inside the different storages area*
- *Difficult to optimize the yard and storage area management*
- *Urban impact*

Digital Solutions:

- **Digital platform** able to share the data and documents
- **IoT devices** able to catch the information, increase the security level and digitalize and automate the gate in and gate out operations
- **Blockchain** platform able to increase the level trust regarding finance operations among the stakeholders



Why the digitalization is the key of Logistics 4.0



Main topics:

- *Internet of Things in logistics field*
- *Blockchain and IoT*
- *Blockchain and smart contract.*

The impact of “Internet of Things” in the logistic chain

The **IoT** promises far-reaching payoffs for **logistics operators, public authorities** and their **stakeholders**. These benefits go across the entire logistics chain including: yard, gate-in, gate-out operations and last-mile delivery.

A report by IDC and SAP predicts that **IoT will lead to a 15% productivity increase in delivery and supply chain performance**, many logistics experts are using these new resources to improve systems and supply networks, **reduce costs** and the **transit-time**.

The Benefits

- An **increased Security and Safety** level of logistics operations;
- **Optimization of operations**, thanks to data obtained by IoT devices, it is possible to analyze the overall performance improving the level of safety, security and productivity
- **Track and Tracing**, RFID tags can connect to the cloud and share data regarding the location and the status of goods shipped . According to Auburn University 96% of retailers are planning on adopting RFID technology.



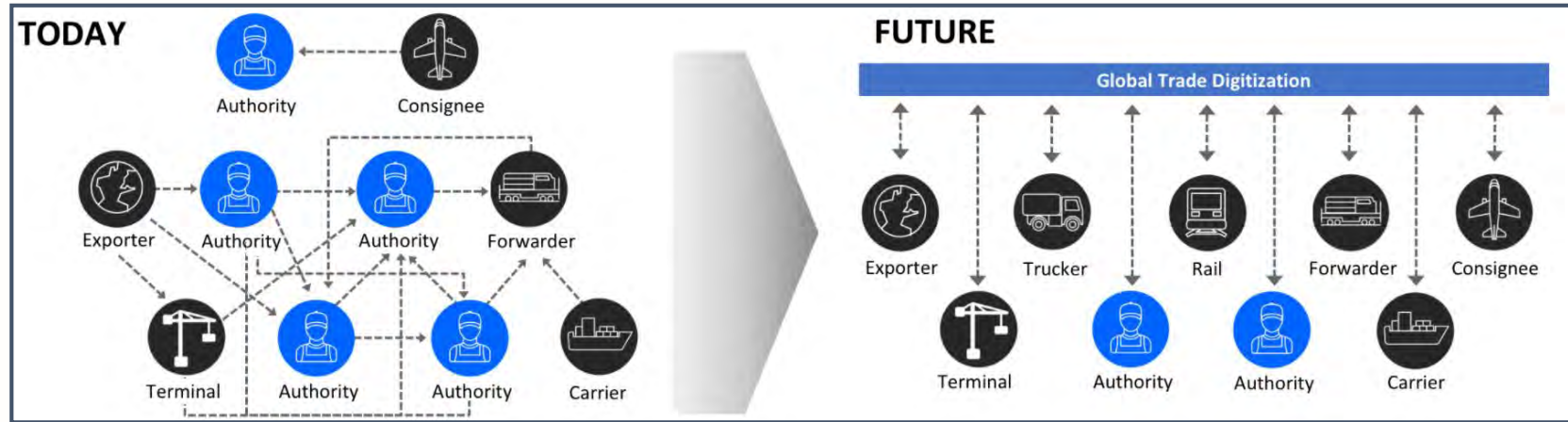
MILOS for Internet of Things

MILOS IoT allows the authorized companies to receive **safe information regarding the containers transported in a suitable dashboard**



IoT devices are important tools used in international trading with the aim to **share the information, speed up the operations and reduce the risk of misplaced container.**

Blockchain and the dream of “International Single Window”

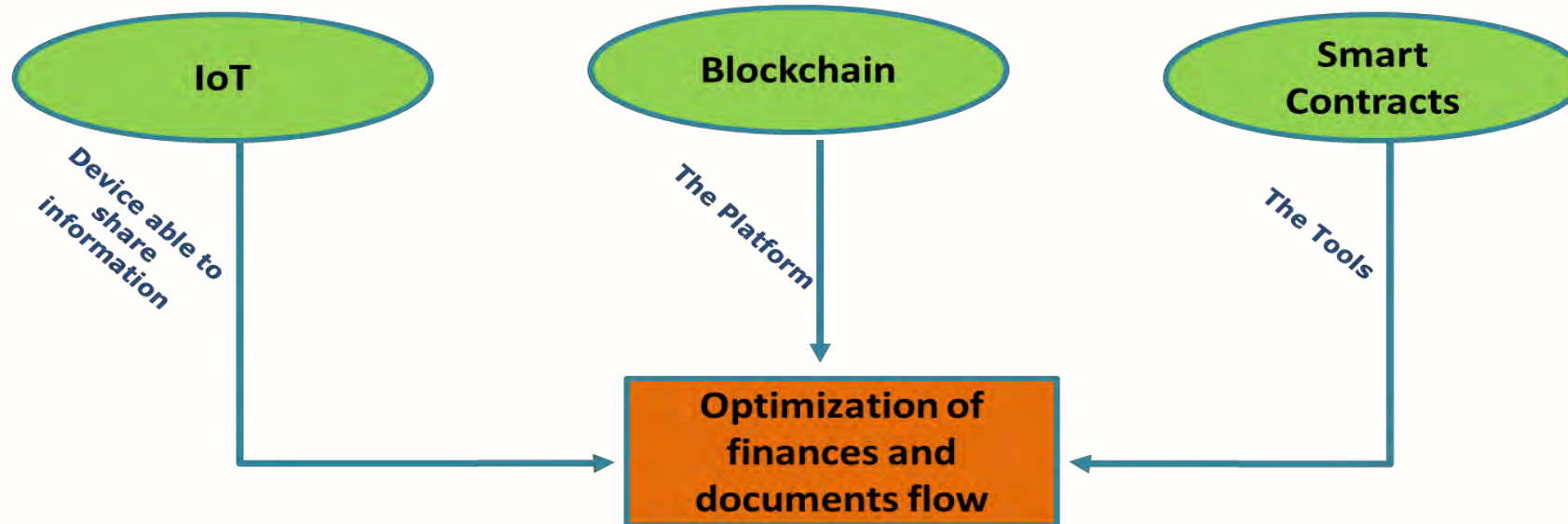


According to Maersk and PSA studies the creation of a Blockchain Platform optimized for the logistics field will be able to reach the dream of worldwide operators related to an “**International Single Window**” with the follow goals:

- A shipping information pipeline, to provide an end-to-end visibility enabling to all actors involved in the supply chain a securely and seamlessly exchange information about shipment events in real time creating de facto an international “**International Single Window**”
- Paperless Trade, to automate paperwork filings by enabling end-users to securely submit, validate and approve documents helping to reduce time and costs for clearance and cargo movement. Blockchain based smart contracts ensure all required approvals are in place, helping speed up approvals and reducing mistakes.

Blockchain Solutions - Main goals

The combined use of smart devices **IoT** and digital tools such as **Blockchain Platforms** and **Smart Contracts** has the purpose to dematerialize the transport procedures and relative contracts leaving traces of all operations and events occurring within the Logistics Chain.



MILOS Blockchain Connector is a solution designed to integrate these innovative solutions.

Blockchain and IoT integration

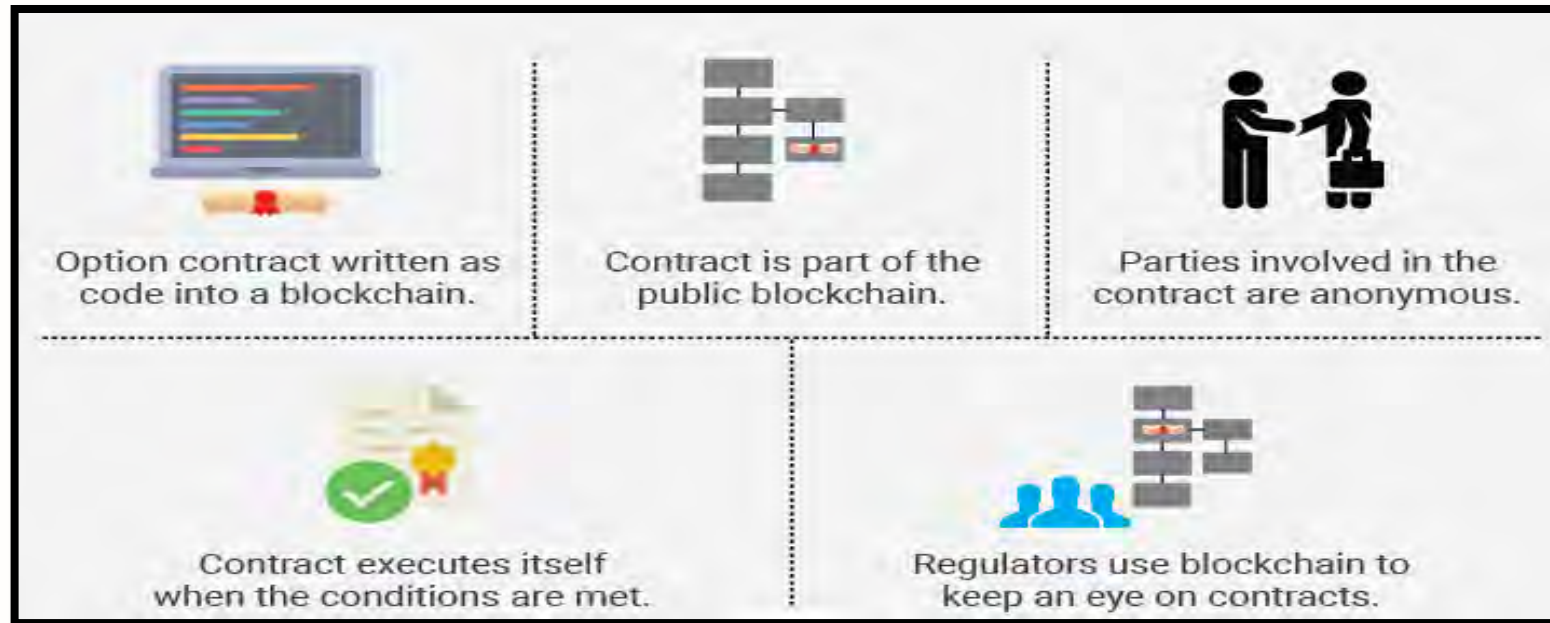
Thanks to the use of **smart devices IoT** installed on containers it is possible to share information automatically to the different actors involved in the logistics chain and recorded it by the blockchain without any user input.



The Benefits

- **Insurance Companies**, the information provided in real-time can be used by the insurance companies, which in case of excessive vibrations or change of container's temperature will change the insurance payments automatically thanks to specific Smart Contracts
- **The Bank**, once the container is unloaded, smart device IoT can communicate automatically to the bank to start the procedure of commercial viability
- **Customs**, thanks to the use of smart devices IoT it is possible to evaluate whether the container's internal condition has changed as a result of legitimate container's opening. This information can be communicated to the customs increasing the level of security and quality of controls.

Blockchain and Smart contract integration



The smart contracts are computer codes embodied in the **Blockchain**, which are formulated in “**if this then do that**” structures. Their application is important in **the logistic field** because the *Smart contracts enable the automation of transactions, reducing the human error or cases of fraud, but they also increasing the privacy, the cost and time efficiency as well as the trustworthiness.*

In the business environment, there are already companies selling smart contract solutions, such as **Ethereum** and **SmartContract**.

The Benefits for Logistics actors

- **Ports and Terminals:** pre-built connections to the shipping lines and other actors, an end-to-end visibility across shipping corridors
- **Ocean Carriers:** pre-built connections to customers and ports/terminals around the world
- **Customs Authorities:** more informed risk assessments, better information about the export and import clearance and information shared
- **Intermodal Transport:** improved planning and utilization of assets and information the shipments carried on trucks rail, barges etc
- **Shipper:** an increased transparency to validate fees and surcharges and an increase of paperless process.

International ongoing Projects



Main topics:

- *Introduction about the “Fast Trade Lanes” Concept*
- *IoT2IoG Project: Mersin-Trieste corridor*
- *International Fast Trade Lane: Morocco – EU corridors*
- *Fresh Food Corridors (FFC): Israel - Central Europe.*

B2MOS Project in collaboration with Leghorn Port Authority.

The pilot involved an international **RoRo transport** of trailers between the ports of **Rades** and **Leghorn**. A **preclearing procedure** using passive **eSeals** and a **Corridor Management Platform** were tested for the first time, integrating logistics and Customs aspects.

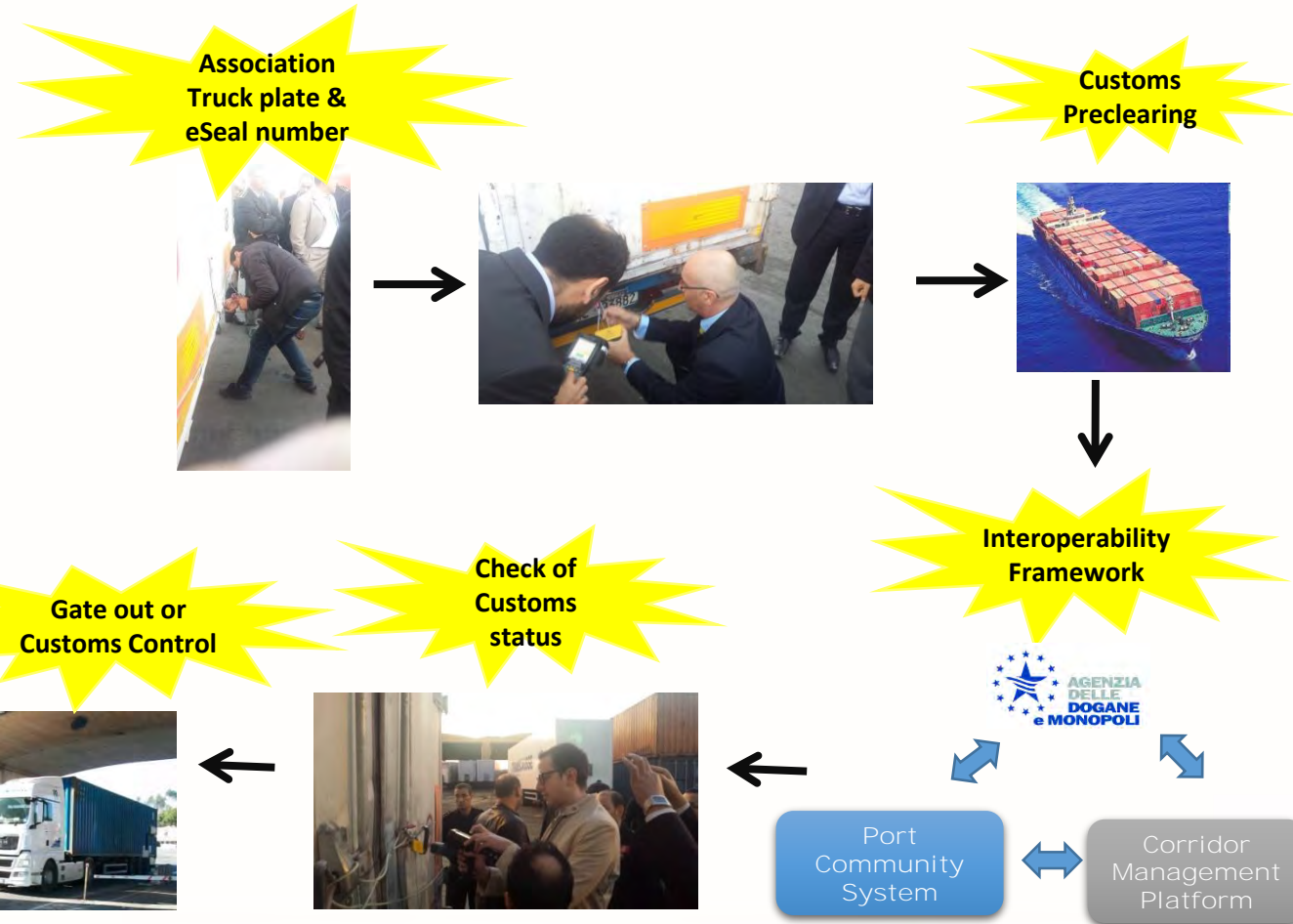
Private actors involved

Port Terminals of Leghorn and Rades;

- Importers;
- Exporters;
- Shipping Company;
- Shipping Agency;
- Freight Forwarders.

Public Institution involved

- Leghorn and Rades Port Authorities;
- Italian Port Captaincy;
- Italian Customs Agency.



International Fast Trade Lane Perspective

The Digitalization of main logistics nodes, **Ports** and **Inland Terminals** allows to create **digital management platform** able to provide **international end to end vision** sharing data and documents from the different stakeholders.

The Main Goals:

- The **management of data** provided by public and private actors
- Aligning multi-actor performance along complete port-centric corridors regarding **both inland and maritime side**
- Improving **efficiency, automation** and **optimization** performance in order to meet customer requirements and satisfy **security standards**.

Following these aspects the concept of **International Fast Trade Lane** has been designed an **End to End solutions** able to **share, manage and anticipate** the documents and information flow provided by the different stakeholders.

IoT2IoG Project



The project regards an international **RoRo transport** of trailers between the **Mersin port and Trieste** and the related **Dry Ports**.

Private actors involved:

- *Mersin International Port;*
- *Samer Seaport & Terminal;*
- *Fernetti Inland Terminal;*
- *UN.RO.RO;*
- *Catoni.*

Public Institution involved:

- *Trieste Port Authority;*
- *Italian Port Captaincy;*
- *Italian Customs Agency;*
- *Turkish Customs Agency.*



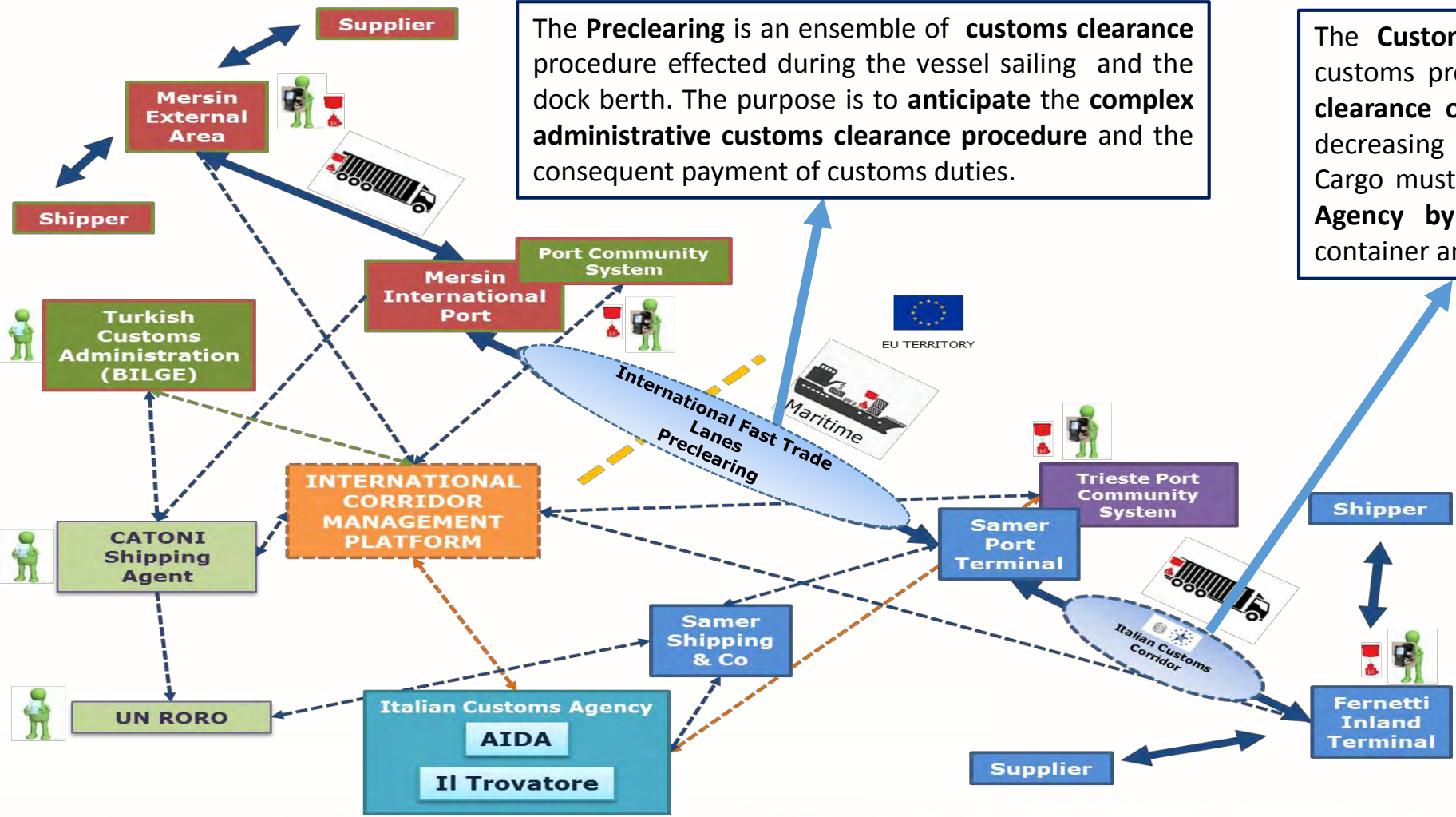
*Trailers Shipped
IoT Tags*

IoT2IoG Project

Project description: the IoT2IoG project regards a RoRo traffic from Turkey to Italy and from Italy to Turkey. In order to *reduce the transit time* and the *dwell time* inside ports and dry ports, advanced IoT devices (eSeals RFID) have been applied to trailers and IoT readers (RFID antennas) have been installed at the gates of ports and dry ports in order to automate the entire flow. The use of a **Corridor Management Platform** allows sharing information among actors involved in the international logistics corridor (dry and port terminals, port authorities, customs agencies, carriers, shipping agencies, etc.).

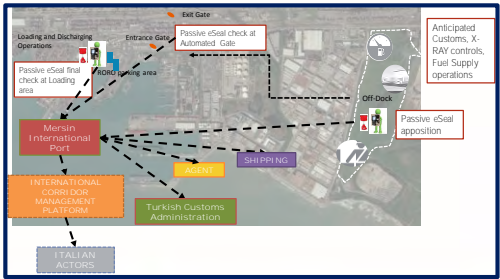
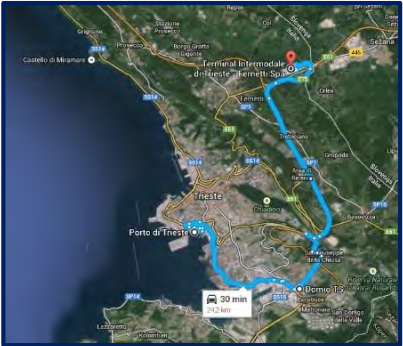
Main Goals: the project has the purpose to create a **Corridor Management Platform** with the aim to make easier the dialogue and the share of information among the different stakeholders involved. The use of **IoT devices and the digitalization** of the entire information flow has the result to allow **simplifications of operative and customs procedures, decreasing the overall transit-time** respecting the IMO standard of security and creating a **paperless international flow, thus saving the relating costs.**

International Fast Trade Lane: Trieste - Mersin Corridor

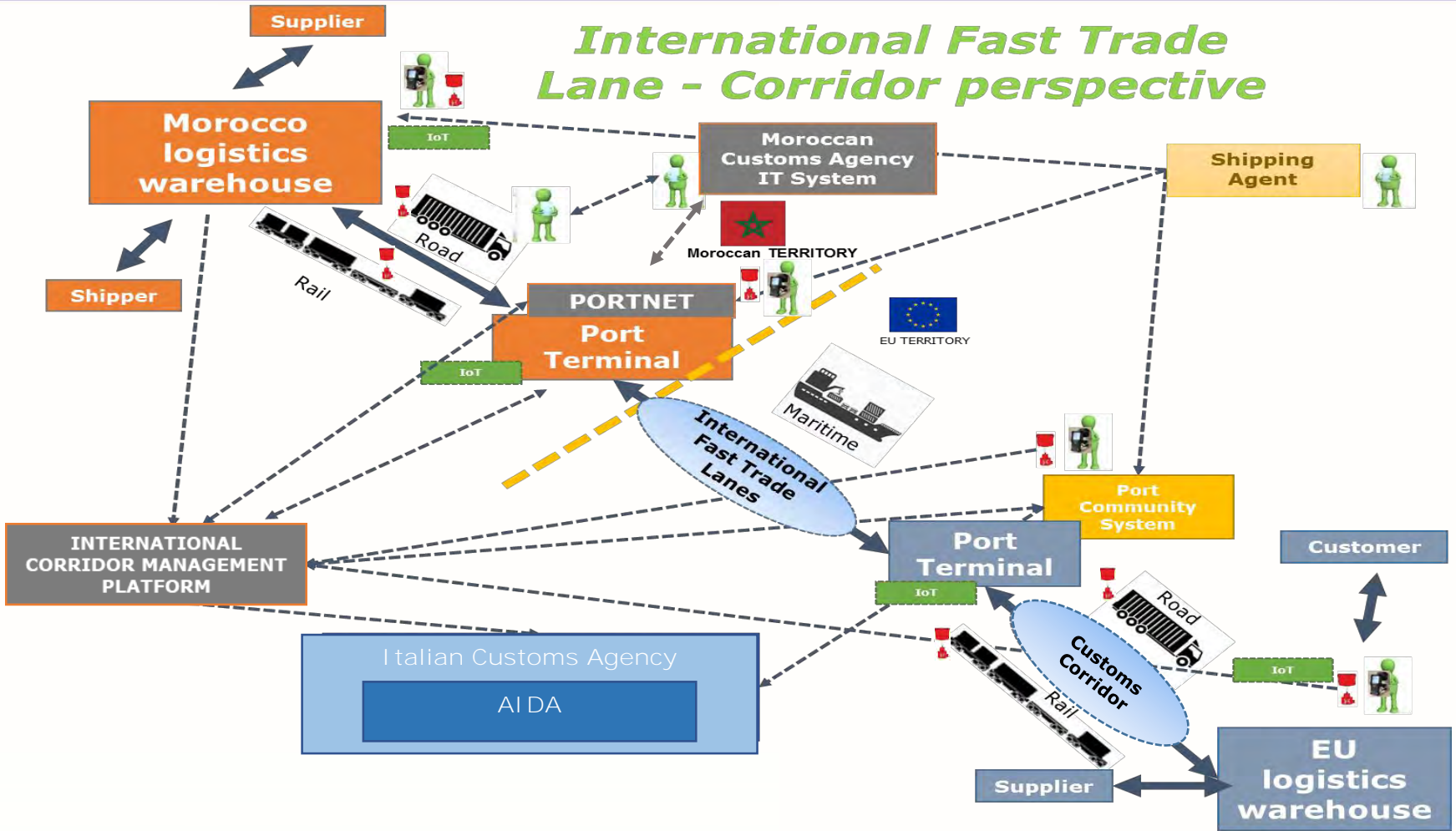


The **Preclearing** is an ensemble of **customs clearance** procedure effected during the vessel sailing and the dock berth. The purpose is to **anticipate the complex administrative customs clearance procedure** and the consequent payment of customs duties.

The **Customs Corridors** is an innovative Italian customs procedure. The **purpose is allowing the clearance operation outside the port area**, thus decreasing the dwell-time and port congestion. Cargo must be monitored by the **Italian Customs Agency by using RFID eSeals tag** applied to container and trailers.



International Fast Trade Lane: Morocco - EU projects Pilot



Fresh Food Corridors: Israel - Central Europe

The project has the aim to create an efficient **fresh food transport system** thanks the use of **container reefer** connecting **Israel market** to the **Central Europe** through the port of:

- Koper;
- Venice;
- Marseille.

This Logistics flows is managed using a **Digital Corridors Management Platform (CMP)** able to share in real-time information and data.



Fresh Food Corridor: The Framework

EU Port of arrival
Koper, Marseille, Venice



Integration with the system in order to retrieve ship's geographical position, ETA and ATA



Loading of full reefers onto the ship

Exporter



Israel



Sending to the CMP info relating container (gross weight, VGM, cntr type, cntr code, goods type, etc.);

EU operators (Freight Forwarders, Rail Operators and Port Authorities) send information relating the shipment:

- Container discharged;
- Customs and phytosanitary infos;
- Train Loading list;
- Info relating train voyage,...



Customs and Phytosanitary controls



Final Destination



MILOS Dashboard

- information acquisition;
- visibility along every step during the shipping;
- possibility of prompt decision making in base of situation

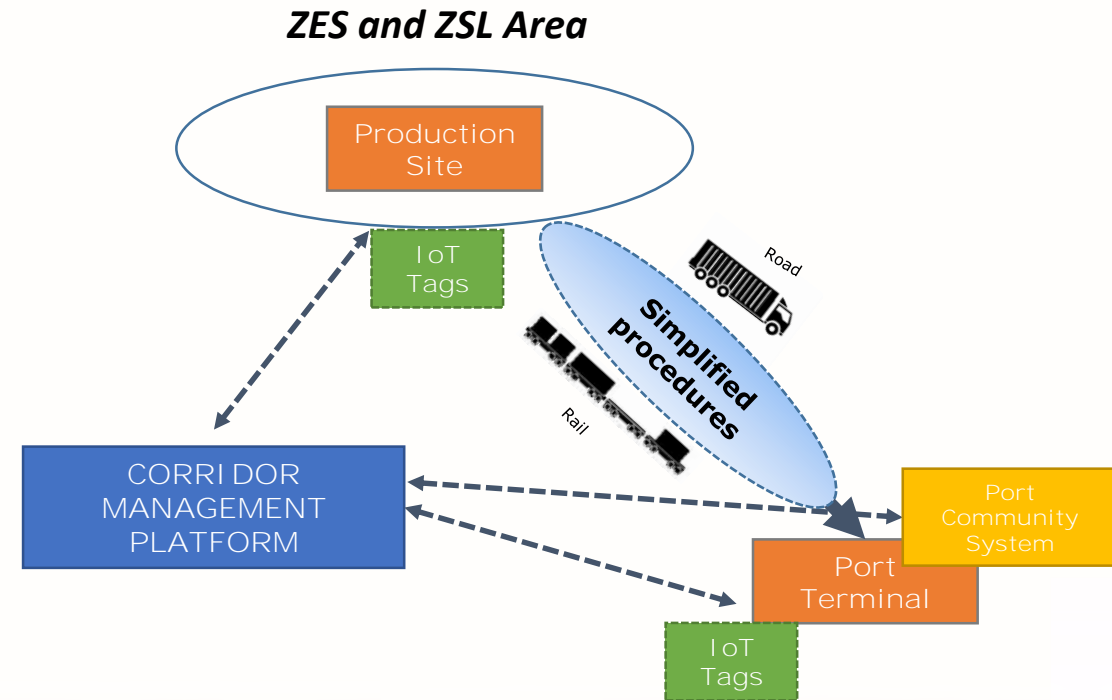
The ZES and ZLS Opportunity

During the past years the Ministry of Economic Development has established the **ZES (Zona Economica Speciale)** and **ZSL (Zona Economica Speciale)** to increase the competitiveness of Italian port system attracting **new economic operators**. The main features of both special areas is the need to be in proximity to the ports involved inside the **European TEN-T Corridors** and the benefits are related to tax and administrative field.

The Main Benefits:

- **ZES**, tax credit 50% of investments, administrative and permission simplifications
- **ZLS**, administrative and permission simplifications

>> Digitalization and automation about operations among the ZES and ZSL area and port terminals.

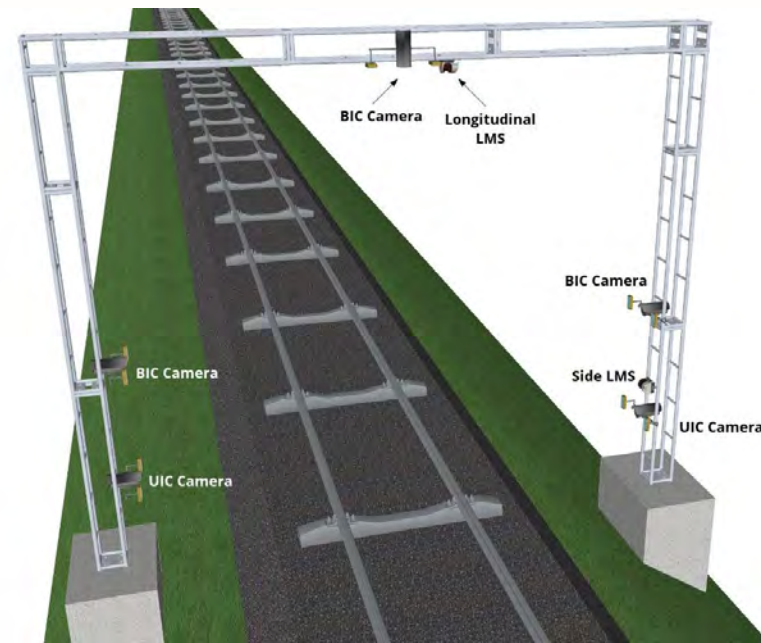
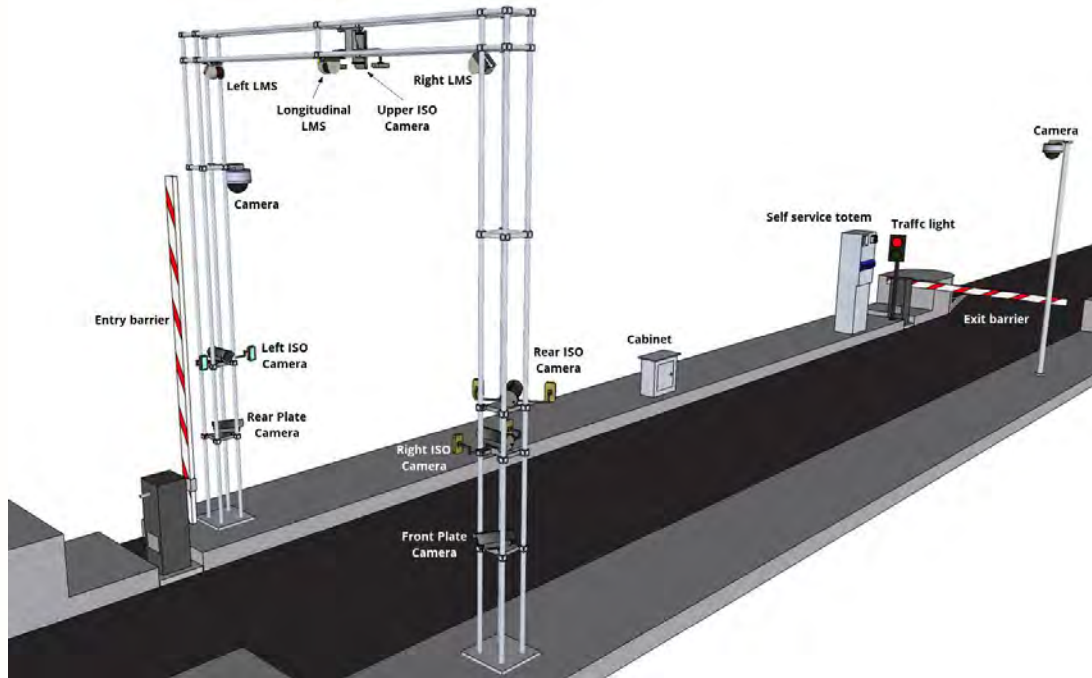


Gate Automation solutions in Ports and Dry Ports

- ✓ Remote/unmanned control of transit procedures
- ✓ Improved reliability of vehicle/load inspections
- ✓ Improving security and accuracy of acquired data
- ✓ Reducing the duration of check/inspection procedures
- ✓ Blockchain compliant

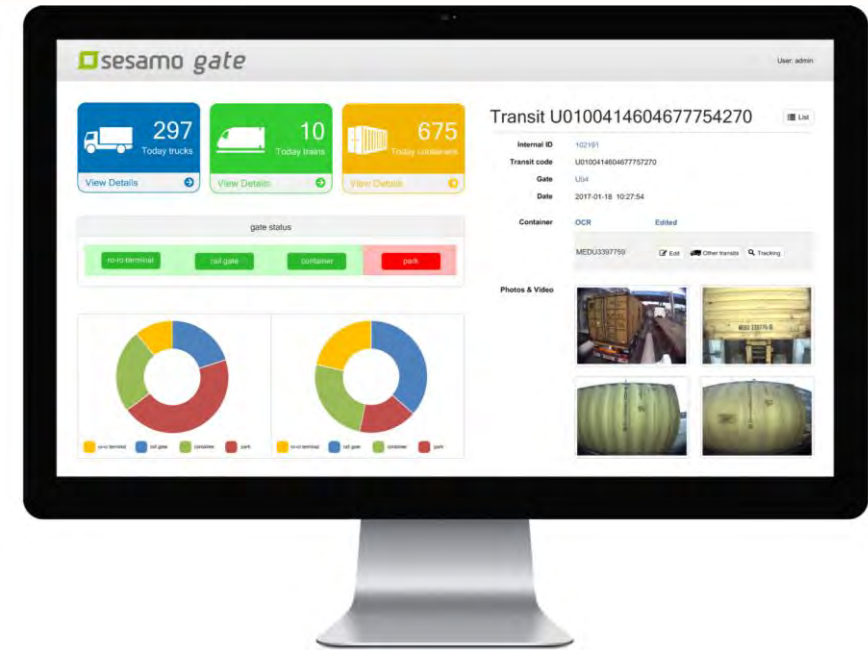
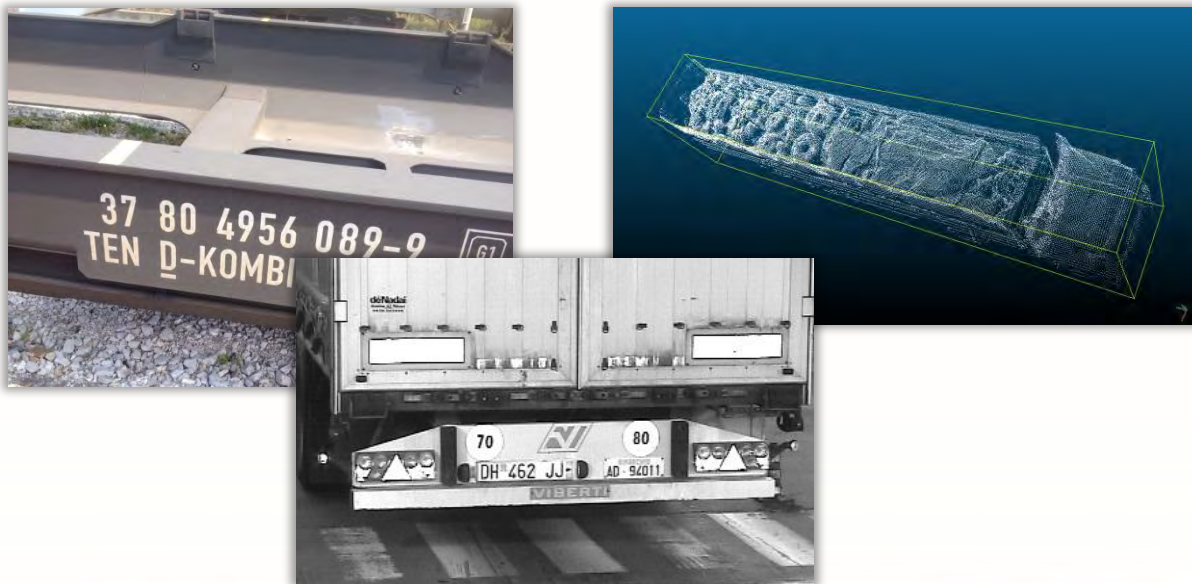


Digital video technology allows customized solutions for the automation and remote management of the transit procedure of vehicles, containers and goods at roadway or railway access gate

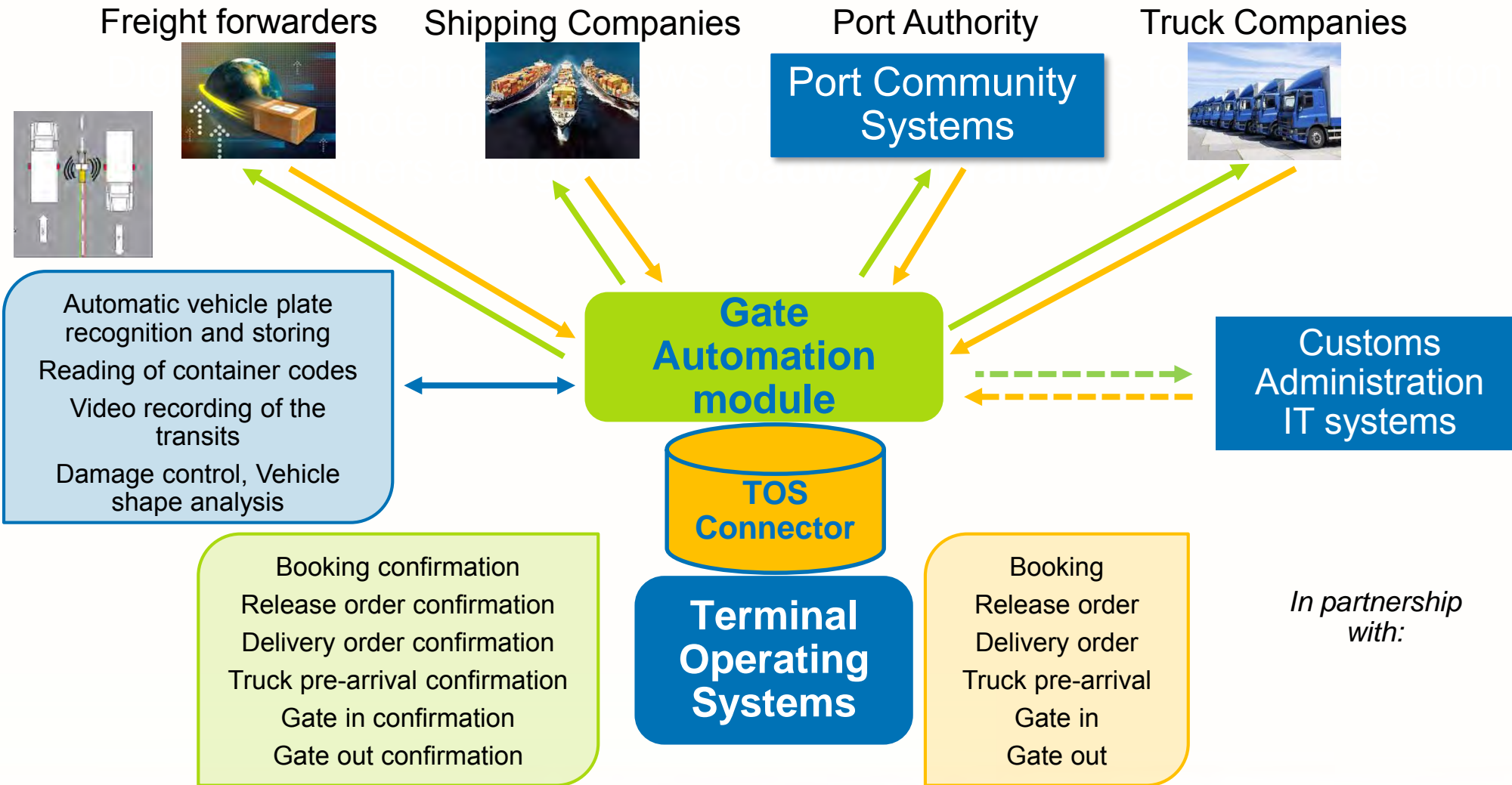


Real time acquisition of:

- ✓ license plates of vehicles and trailers
- ✓ ISO 6346, ILU, UIC and ADR codes
- ✓ shape and dimensions of vehicles in transit
- ✓ HD images for container integrity



Example of supply chain integration



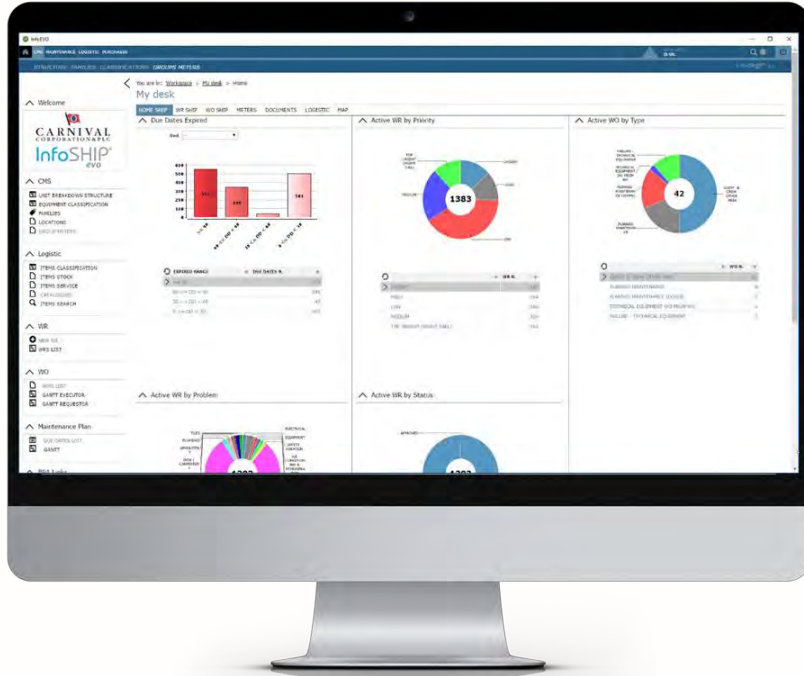
In partnership with:



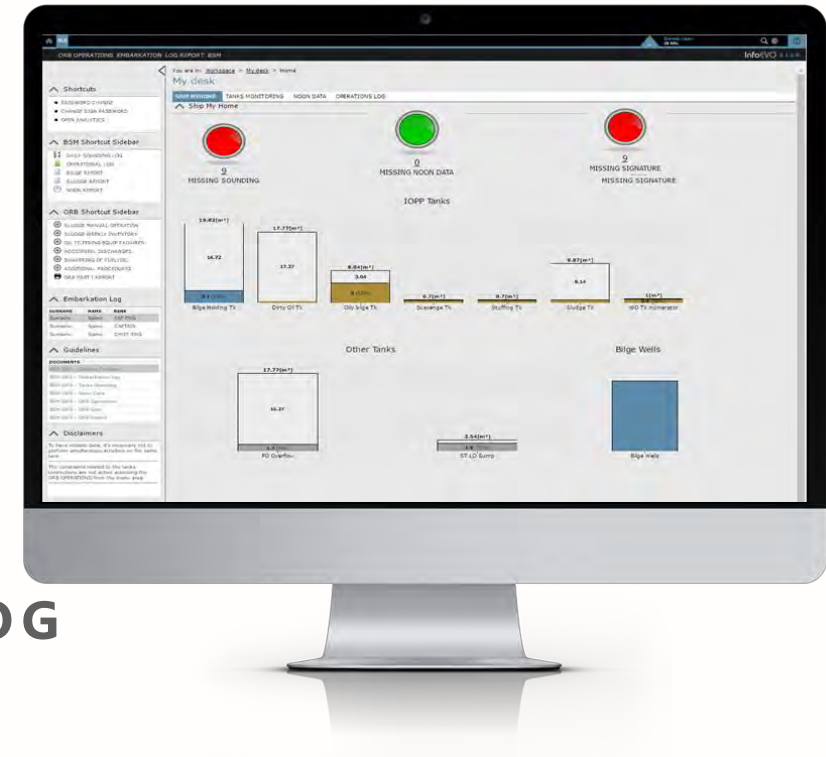
From the ship side perspective: some services and solutions

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PLANNED MAINTENANCE SYSTEM



ELECTRONIC LOG BOOKS



InfoSHIP EGO: Fleet Performance Management

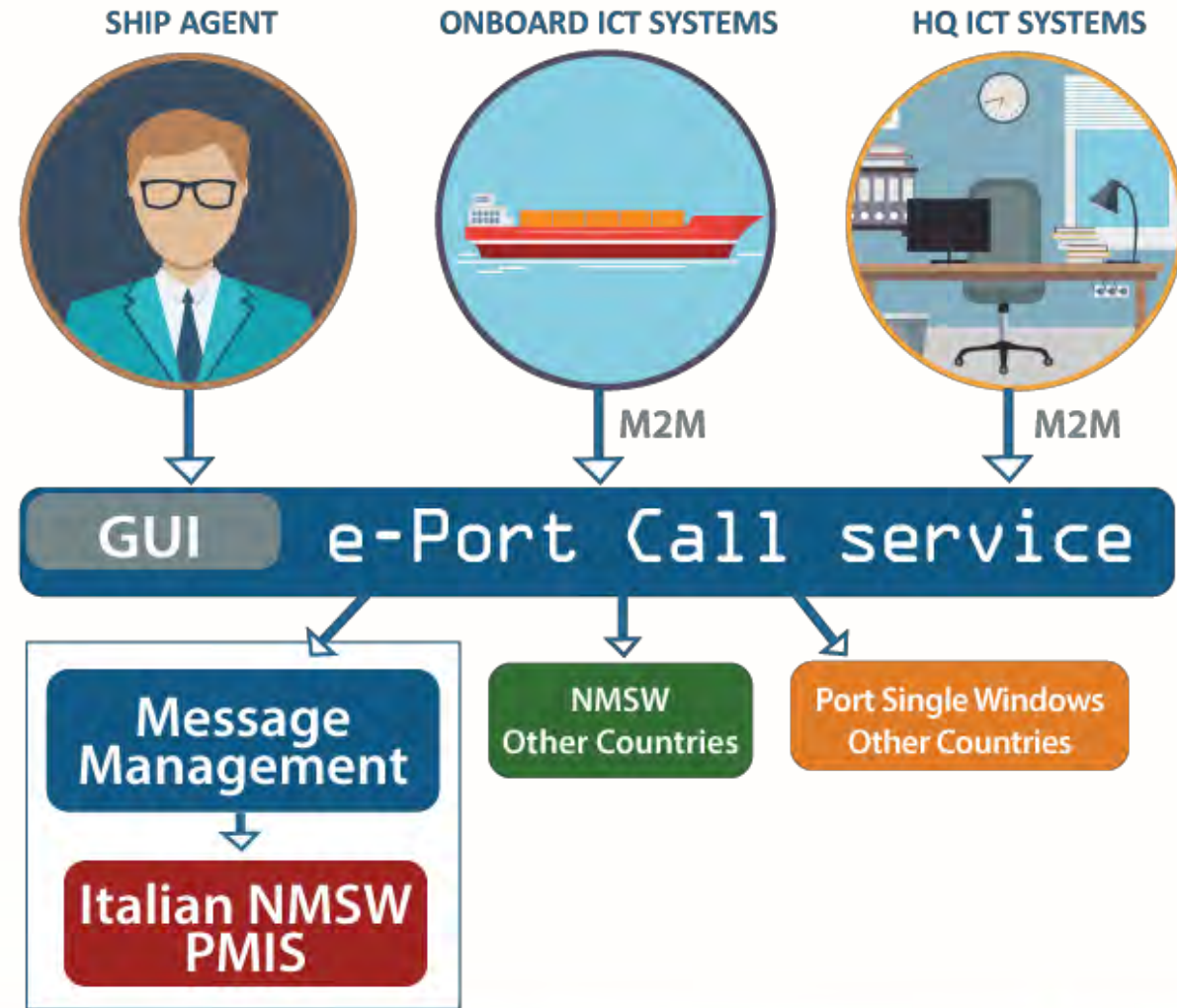
KPI indicators

Analysis and Reporting



NATIONAL MARITIME SINGLE WINDOW Connector

- ✓ Reporting Formalities simplification
- ✓ ICT tools to support shipowner during the Port Call procedures
- ✓ Allowing digitalization processes





Thanks for your
attention!

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