Pilot action final report

Interporto di Trieste

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1. Ex-ante situation – Background of the pilot action

As underlined in the TNA, the main feature of the Port of Trieste is represented by its legal status of Free Port, in application of the rules of the Paris Peace Treaty (Annex VIII). According to it, the Free Zones of the Port of Trieste have the legal status of customs clearance exception and do not belong to the customs territory of the European Union. The Free Port of Trieste currently includes five distinct Free Zones, three of which reserved for commercial activities (Old Free Zone, New Free Zone, Timber Terminal) and two used for industrial activities (Mineral Oils Free Zone, Zaule Channel Free Zone). Moreover, the Free Zone status is also applied to the inland terminal FREEeste located in Bagnoli, 10 kilometres far from the Trieste Port. The terminal is owned by Interporto di Trieste S.p.A, the inland terminal of the Trieste Port.

Figure 1: FREEeste position respect the Trieste Port

This dry port area has been created in 2019 in order to avoid congestion in the Trieste Port and, even more important, with the aim to enable industrial production in Free Zone area. The trade flows insisting on FREEeste are currently operated via road and refers mostly on maritime traffics operated in the major Trieste Port terminals. Considering that the Trieste Port is the first Italian port for railway traffics and that the Trieste Port Authority (AdSP MAO) has the target to increase rail traffic to and from the port of Trieste up to 25,000 trains in 2025, to achieve this goal, it is starting the executive part of the design of the extension of the railway capacity of the station of Trieste Campo Marzio and Adriafer park. In addition, it

intends to proceed with an integration increasingly distributed throughout the territory in order to connect the intermodal hubs (eg. Monfalcone, Cervignano, Villa Opicina, FREEeste, Aquilinia) with the main maritime port of reference.

The dry port of FREEeste has to be integrated in the railway network as from the physical infrastructural perspective as from the immaterial infrastructural one, following the AdSP MAO roadmap. In this scenario, the sharing of information referred to the railway customs and logistics cycles is fundamental and the main reference platform, in terms of local technological and information standards, is the "Sinfomar" Port Community System (PCS). Based on the aforementioned considerations, the adoption of automated railway portals is becoming essential in order to detect and transfer the necessary information assets to PCS Sinfomar.

1 Pilot action description

In such a context, the aim of the Trieste Port and the FREEeste management is to enrich the Trieste railway opportunities to offer on the global market more train operations from/to FREEeste, also exploiting the strengths of the Free Zone Regime.
The aim of the pilot action consists in the realisation of a gate automation-based infrastructure for railway traffic management in the FREEeste area. The new gate has been located at the entrance of the FREEeste dry port area, in correspondence with the rail network already in place.

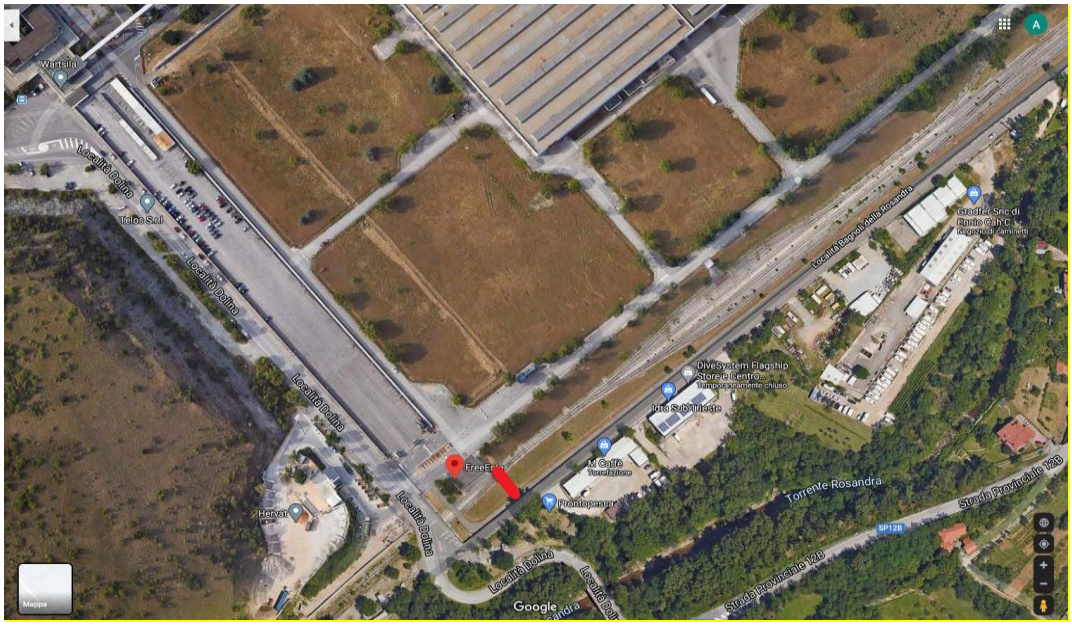

Figure 2: Automated gate position in FREEeste area

Technically speaking, the railway gate automation is a combination of innovative technological components such as:

- *Automated railway gate management:* 2 laser scanners, 1 context camera, Nr. 1 IP54 wired cabinet with power supplies, network switches and lane controllers;
- *Automatic UIC code recognition system:* 2 High resolution colour cameras complete with a pair of white light illuminators and power supplies + dedicated software license;
- *Automatic ISO 6343 container code recognition system:* 3 High resolution colour cameras complete with a pair of white light illuminators and power supplies + dedicated software;
- *Damage control system:* dedicated software;
- *Automatic ILU automatic code recognition system:* 1 lane controller.

Figure 3: Gate automation in FREEeste.

Functionally speaking, the main railway gate automation goals are:

1) Data collection

The hardware components installed on the gate are able to collect on-filed data concerning inbound / outbound trains. The main data types refer to the following groups:

a) *Railcars gate in /out:* the system is able to detect on-field data concerning wagons sequence and wagons id. Moreover, images can also be captured in order to monitor the status of the railcars, for example evidencing if a damage is present;
b) *Intermodal Transport Units (ITUs) gate in / out:* the system is able to detect on-field data concerning ITUs id and type. Moreover, images can also be captured in order to monitor the status of the railcars, for example evidencing if a damage is present;
c) Train composition: the system is able to detect the assignment wagon / ITUs, thus detecting data about the train composition for inbound and outbound flows;
d) Train direction: the system is able to detect the train direction (inbound / outbound) data;
e) Damages monitoring: the system is able to detect damages images concerning wagons and /or ITUs.

2) Data processing

Once the data have been collected they are shared with a virtual machine on a remote server in which appropriate software procedures elaborate them in order to refine data quality and produce relevant outputs for final users.

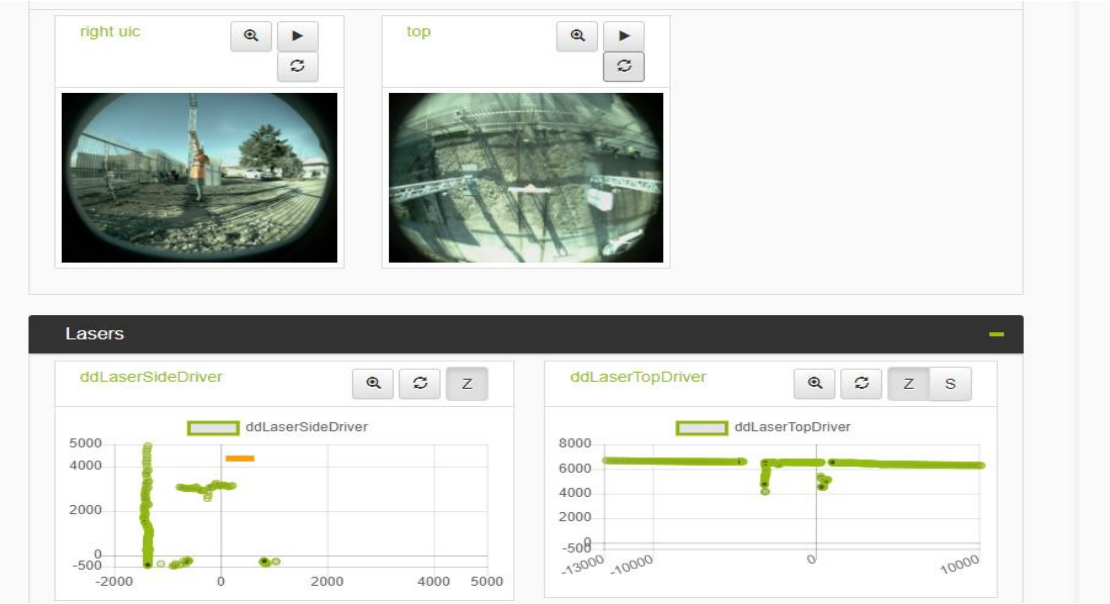

Figure 4: User interface example – technology status monitoring.

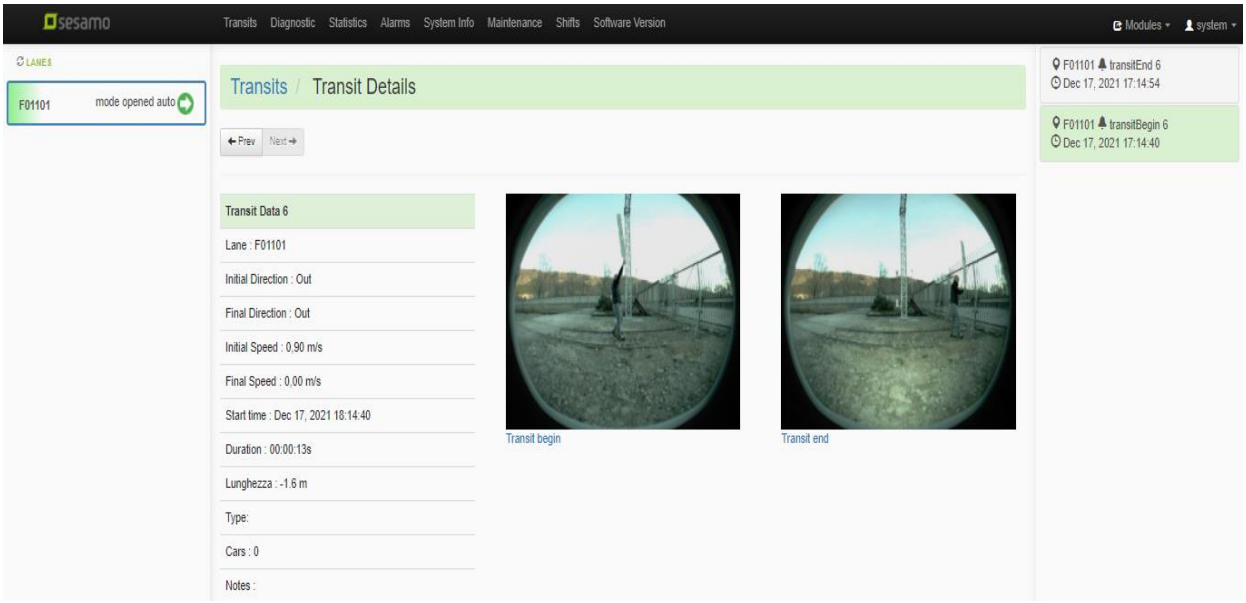

Figure 5: User interface example - transit details example

3) Data sharing

The solution also provides the possibility to share via interoperability services the elaborated data with:

- Sinfosec IT platform: the operating system used by Interporto di Trieste for the terminal management;
- Sinfomar IT platform: the Port Community System of the Trieste Port Authority (AdSP MAO).

Concerning the interoperability with Sinfomar, the PCS has specific information requirements in order to enable the software procedures embedded in the train management modules. Hereafter, the Sinfomar information requirements are listed:

Nome	Descrizione	Formato	Note
	DATI GENERALI		
Codice Varco	Identificazione varco di rilevazione	Es. 01123548	id Varco / Apparato
Nome convenzionale Varco	Campo descrittivo per identificazione varco di rilevazione	Es. Varco PF	
Luogo di rilevazione	Identificazione binari di rilevazione varco ferroviario	Es. TSCMR 25 (A), TSCMR 34 (P)	id Binari da allineare a nomenclatura ufficiale RFI
Coordinate Luogo di Rilevazione	Posizione Lat e Long GPS del varco	Es. 45.63903, 13. 77400	Coordinate GPS varco
Gestore Infrastruttura Ferroviaria	Identificazione del gestore infrastruttura ferroviaria monitorata dal varco	Es. RFI	Rete Ferroviaria Italiana
Zona monitorata 1	Indicazione dell'area di origine e destinazione del treno	Es. PFN - linea	Direzione varco flussi ingresso
Zona monitorata 2	Indicazione dell'area di origine e destinazione del treno	Es. Linea - PFN	Direzione varco flussi uscita

DATI TRANSITI			
Codice Transito	Identificativo univoco del transito	Es: 45321_A20210201	Ipotesi da concordare con il fornitore dei varchi: Traccia + A/P (direzione) + data
Data e ora inizio rilevazione	Actual Transit Time (ATT) inizio transito treno	Es. gg/mm/aaaa + hh:mm:ss	In corrispondenza del passaggio del primo vagone del treno
Data e ora fine rilevazione	Actual Transit Time (ATT) fine transito treno	Es. gg/mm/aaaa + hh:mm:ss	In corrispondenza del passaggio dell'ultimo vagone del treno
Direzione	Rilevazione direzione flusso arrivi / partenze	TBD	Da definire assieme al fornitore dei portali
Tipologia Carri	Indicazione della tipologia vagoni in composizione del treno	ES. SGNSS60	Dato riportato su ciascun carro
Identificativo Carri	Identificativo del singolo vagone	Es. Codice UIC	Es. 318449558457
Ordinamento Carri	Sequenza di rilevazione vagoni	Es. condivisione ordine di rilevazione vagoni	Es. 1 - 318449558457
Tipologia Unità Logistica trasportata	Individuazione della tipologia di unità logistica trasportata (es. container/semirimorchio/altre unità logistiche) o merce rinfusa o spazi vuoti	Es. container	
Identificativo Unità Logistica trasportata o merce rinfusa	Individuazione della specifica unità logistica trasportata (es. container/semirimorchio/altre unità logistiche) o merce rinfusa	Es. BICU 123456 5 Compliance normativa ISO 6346 ABCA 001234 2 Compliance normativa EN 13044 BL 123456A	Es. BIC Code, ILU Code (se presente), Riferimento polizza
ADR / RID	Etichettatura Merci Pericolose	Es. presenza tabella + codice pericolo + n. ONU	Compliance capitolo 5.3 Regolamenti ADR/RID 2019
Merce radioattiva	Presenza o meno di merce radioattiva	Es. SI/NO	Monitoraggio via contatore Gaiger
Guasti carri	Presenza o meno di carri guasti	Es. SI/NO	Monitoraggio via sistema RailWatch
Nome convenzionale area di effettuazione delle operazioni di pre-clearing	Identificazione dell'area di effettuazione delle operazioni di pre-clearing	Es. Molo V (Samer Seaports and Terminals), Molo VII (Trieste Marine Terminal – TO DELTA), ecc.	Per i treni in uscita da area di Punto Franco Nuovo

Hereafter the Sinfomar train management module dedicated to railway manifest declarations is reported. All the data collected in FREEeste and shared with Sinfomar are listed in similar pre-existing section.

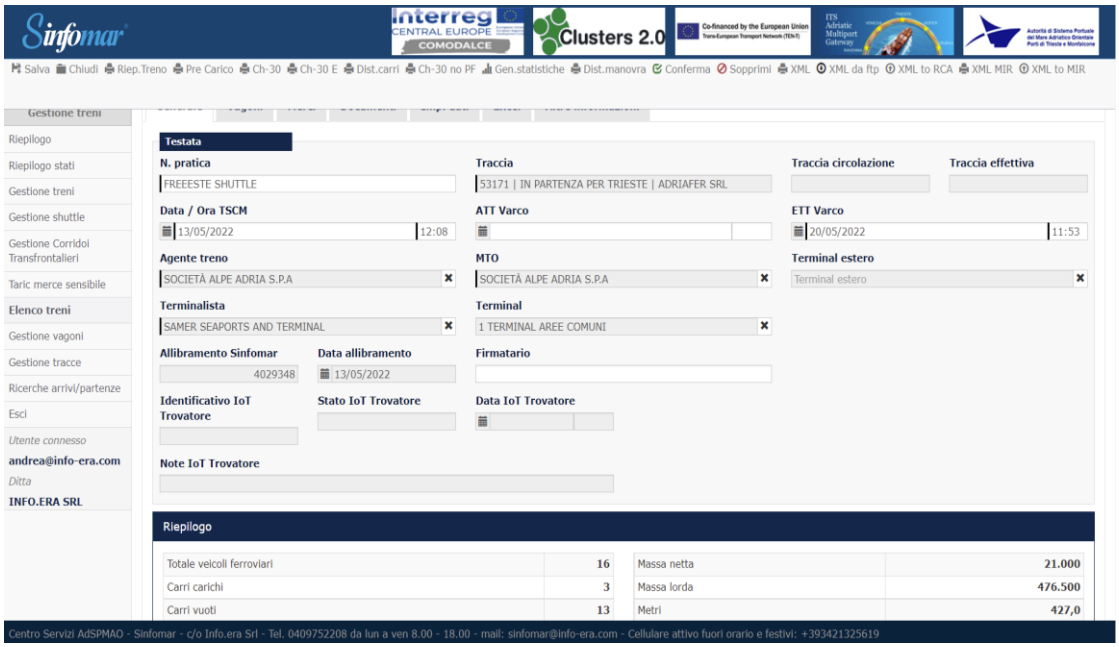

Figure 6: Sinfomar Train Module user interface.

2 Stakeholders

Stakeholders – e.g. Trieste Port Authority, inland terminal, freight forwarders, Customs Agency, Financial Police – have been kept constantly updated about the implementation of the activities through informal ad-hoc communication actions.

3 Impacts and replicability

The impacts are:

- the increase of data accuracy and the certification that goods moving between Free Zone areas do not change path;
- reduction of data entry processing concerning inbound / outbound trains;
- enhanced data visibility along the supply chain.

The pilot action is fully replicable in other contexts, even beyond the Programme Area.