PILOT ACTION FINAL REPORT – ADRIA KOMBI

DELIVERABLE D.T2.2.8

Version 1

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1. Ex-ante situation

- The current situation of the information exchange between the intermodal operator "Adria kombi" and at the container terminal in the port of Koper is reduced to the data exchange regarding train number, wagon positions in the train, container positions within the wagon. This information is as accurate as the person who has entered the data. Field checks are not an option as they are time-consuming.

- The TNA needs were defined to enable the complete digitalization of the process documents that are currently exchanged. Such as:

  - DAILY LOADING PLANS

  - LOADING LISTS

  - OFFLOADING LISTS

  - TRANSFER SHEETS

  - IRREGULARITY PROTOCOLS

  - ANNEX 7, TO CIM CONSIGNMENT NOTE

- The result of the OCR system would be in machine checking of the state of containers on trains. This would speed up the current process and enable the Port Community to increase daily capacity for trains, calling Container Terminal in Port of Koper

2. Pilot action description

- The pilot action will aim to install OCR scanning system in the port of Koper, at the container terminal, for the scanning of wagons and containers transported through railway in the port of Koper. The system will scan the trains with containers at terminal's gate and will provide all the data through a video detection of the wagons/containers. This action is run by Port Koper JSC, as a only competent manager of the container terminal

- By getting a dataset from intermodal operators, Port Koper OCR system will check the accuracy of the data and the state of the units.

- Adria kombi as a Pilot Action Partner sends the information about trains in advance to Port Koper System. On the fig.1 it is shown with which systems Adria kombi system is connected, to be able to receive and process live data. Through Adria kombi client platform, the shippers and consignees or sdhipping lines will be able to follow the development inside the port, while their unit is on the train. Furthermore the unberthed vessels which carry containers for Port Koper are analysed in a manner to put a tag (figurative: data mark) on containers arriving with the vessel to be stacked onto train-outgoing positions. Beside that the train loading plan is issued (see fig. 5).
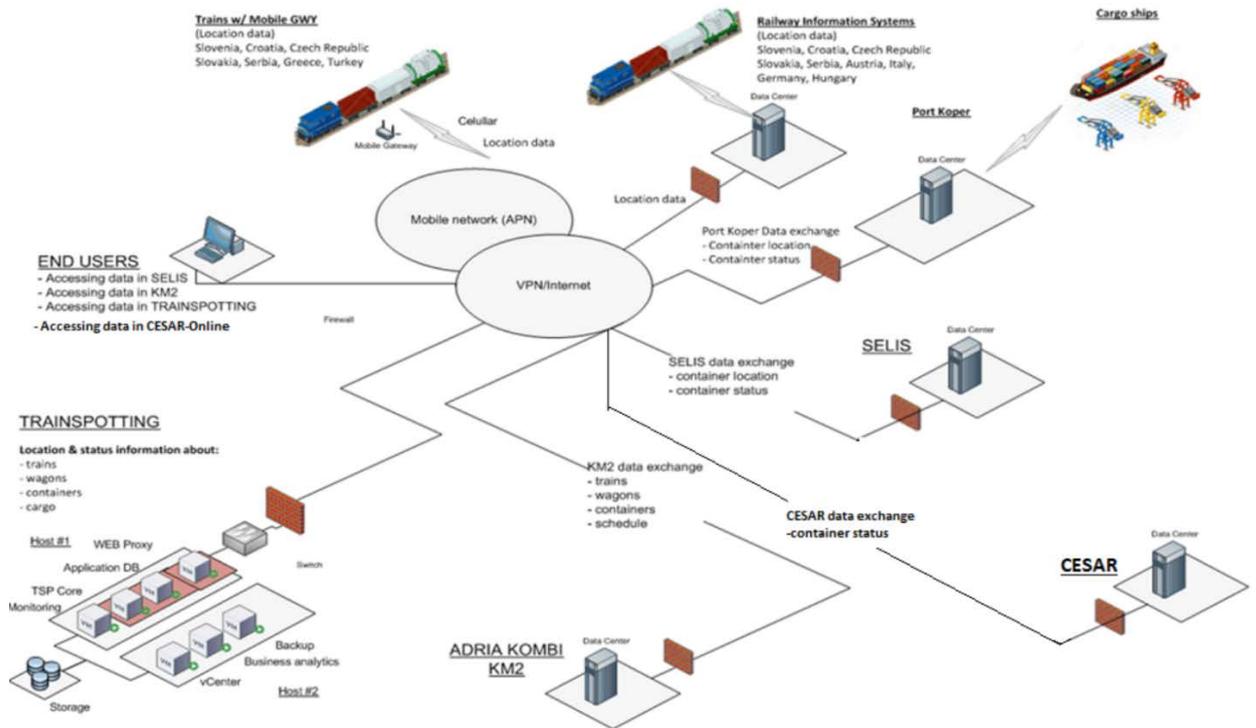
Figure 1. IT System Adria kombi

Fig.1 shows that the intermodal operator has connections to various systems that are running in the intermodal transport chain, such as: shipping lines, continental terminals, partner intermodal operators, railway undertakings, railway infrastructure managers and clients.

Thus, Adria kombi has position of vital information on each unit before the unit arrives at the port either from sea or from land.
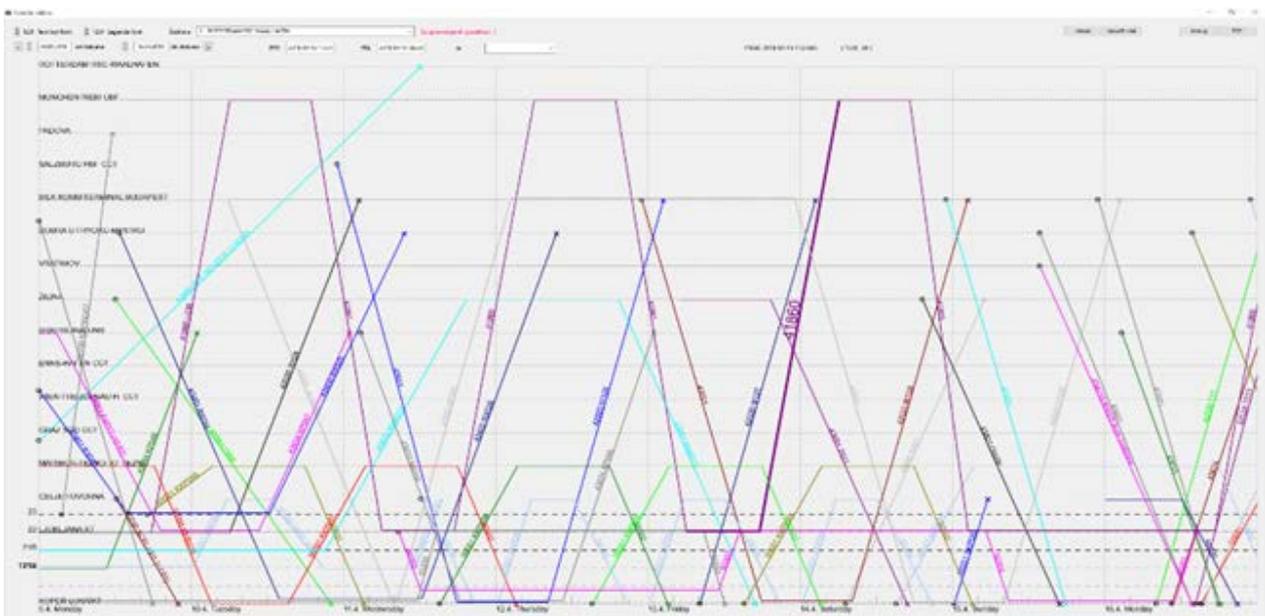

Figure 2: plan of trains calling Port Koper

Figure 2 shows a plan of trains coming to container terminal (in this case Port Koper) in the specific time slots (time windows). This information can be sent to Port Koper System to be processed in module with OCR.
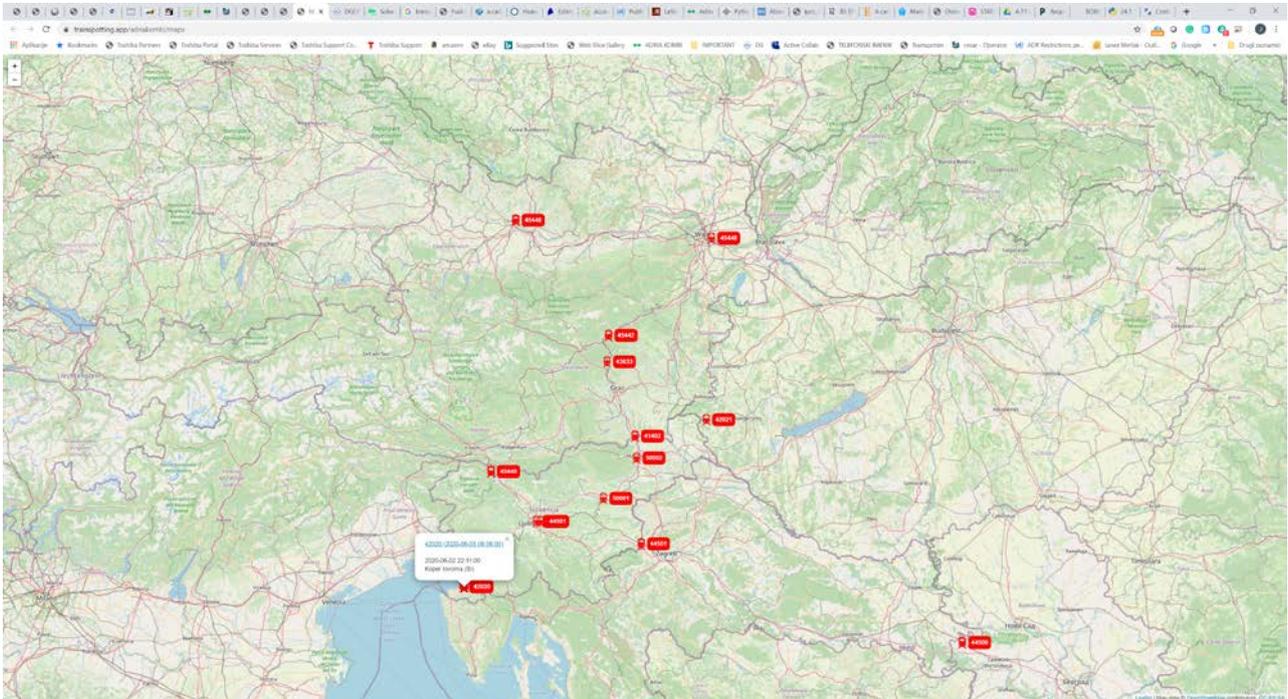

Figure 3: actual train positions approaching port of Koper

The fig.3 is showing actual positions of trains in approach to Port Koper. Each train will get unloaded and loaded for departure in the same time-window inside CT. Plan of loadings and actual loading will not always match, but having the data in the system, can help for ML and AI in near future.

The figure 4 shows the plan sent by the operator Adria kombi 24 hours in advance to the Port Koper, railways and to the shunting (last-mile) provider. Each train pair has it's time window in the Port. The port internal railway undertaking and the terminal determine the manipulative track for each train pair.

Dostava na tir	Naloga	Vlak	Vagoni	Kontejnerji	Odhod	Prihod	Cutoff
20.04.2022 07:00							
	Naklad	50001 KPCEMB088		40 (40F: 10 40E: 10 20F: 10 20E: 10)	20.04.2022 14:41	20.04.2022 22:47	
	Razklad	50000		40 (40F: 10 40E: 10 20F: 10 20E: 10)	19.04.2022 19:03	20.04.2022 03:11	20.04.2022 09:00
20.04.2022 09:00							
	Naklad	50003 KPCE057		40 (40F: 10 40E: 10 20F: 10 20E: 10)	21.04.2022 00:50	21.04.2022 05:44	
	Razklad	50002		40 (40F: 10 40E: 10 20F: 10 20E: 10)	19.04.2022 20:20	20.04.2022 01:42	20.04.2022 12:00
20.04.2022 15:00							
	Naklad	50353 KPLJ057		40 (40F: 10 40E: 10 20F: 10 20E: 10)	21.04.2022 03:25	21.04.2022 07:54	
	Razklad	50352		40 (40F: 10 40E: 10 20F: 10 20E: 10)	19.04.2022 04:38	19.04.2022 08:45	20.04.2022 17:00
20.04.2022 18:00							
	Naklad	43600 KMS034	337949600064	42 (40F: 38 40E: 0 20F: 4 20E: 0)	21.04.2022 04:37	22.04.2022 05:00	
	Razklad	43601 Z015	337949600866	42 (40F: 10 40E: 28 20F: 0 20E: 4)	17.04.2022 22:17	18.04.2022 16:48	
20.04.2022 20:00							
	Naklad	43634 PUBLIC04		50 (40F: 30 40E: 0 20F: 20 20E: 0)	21.04.2022 06:12	22.04.2022 00:43	
	Razklad	43633 BA020		50 (40F: 15 40E: 15 20F: 10 20E: 10)	20.04.2022 02:47	20.04.2022 19:17	
20.04.2022 22:00							
	Naklad	42020 W075	26 R/S	52 (40F: 26 40E: 0 20F: 26 20E: 0)	21.04.2022 07:57	22.04.2022 10:26	
20.04.2022 23:59							
	Naklad	42024 W076-Triangle	26 R/S	(40F: 40E: 20F: 20E:)	21.04.2022 13:58	22.04.2022 09:11	

Figure 4: Plan of Adria kombi in Port Koper trains for April, 20th, 2022
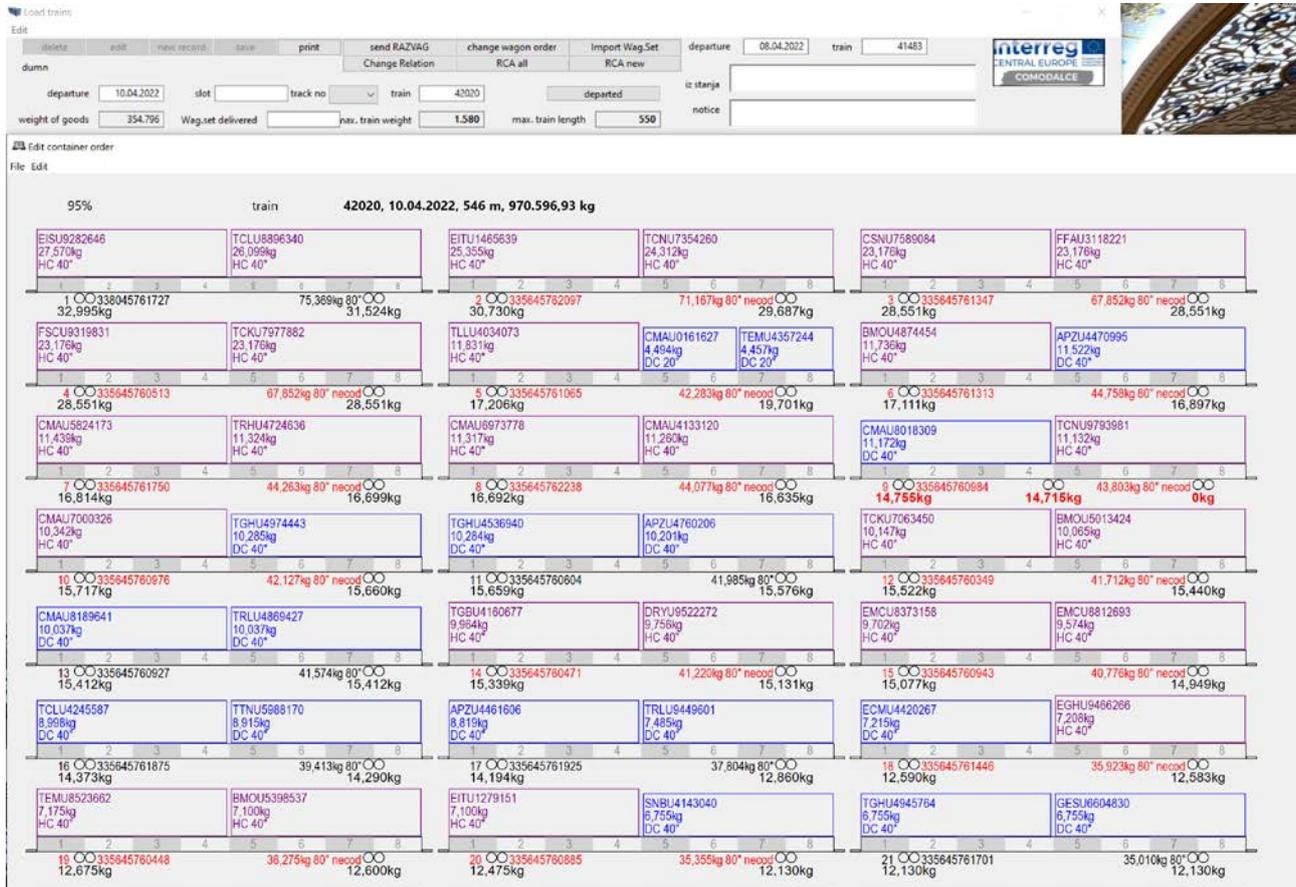
Figure 5: actual positions of Container Units on Wagons within the train

The figure 5 shows the actual confirmed load-plan of a train, made by the consignor. The OCR gate confirms or rejects the loading plan sent prior to the port system. Should some irregularities exist, the system operator needs to check, regulate and confirm the change. Not every irregularity is fatal. If we check the containers on fig. 5, and if we'd change positions of two similar containers, forty footers, with approximately same weight, the train is still able to run, however the correction has to be made in the system and the change needs to be confirmed by the competent person. The data of final loading plan has to be distributed on the departure to every shareholder.

3. Current status

The actual status in the port of Koper:

- Stakeholders meeting for the identification of needs (completed);

- Internal meetings between operational department and IT department in Adria kombi (completed);

- Detailed definition of data sets is completed and the equipment has been installed (completed);

- Setting the data set or data format with Port Koper is tested and confirmed (completed)

- Technical completion of OCR gates by Luka Koper (completed).

Adria kombi IT department has been outsourced, but firmly committed and has completed the work. The testing has been done and passed successfully.

4. Outlook

- We still have to wait for the other operators to join in and implement this protocol.

- All resources will be assigned to the IT solution and data interchange.

- The next step will be the Machine Learning tool that will be developed to predict every mismatch of information and actual status in the future.