ACTION PLAN FOR FOSTERING COORDINATED MULTIMODAL FREIGHT TRANSPORT THROUGHT ICT SYSTEMS – PP 10 – MAHART CONTAINER CENTER

DELIVERABLE D.T3.2.9

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1. Executive summary

Mahart Container Center is a trimodal terminal located in Budapest. The terminal connects rail, road and river (barge) transport, able to handle any kind of unaccompanied intermodal means of transport, like containers (ISO containers, tank containers, 45' pallet wide containers), semi-trailers and swap bodies.

The whole Hungarian volumes are basically served by three big terminals in Budapest, 92,5% of the Hungarian export/import volumes are served from Budapest. Due to the locations, the extensive capacity growth of the terminals is limited, therefore further capacity increase must come mainly from efficiency. For example shortening trains' turn time would allow more trains to be handled at the terminals. Turn time can be shortened by better handling processes as well as shortening the trains' administration time.

Therefore, MCC identified the need of fasten and automize some administrative processes that were done by manpower, manually. With automated data process the administration work can be shortened and can be done with less mistakes, so the trains' turn time is faster and terminal capacities increase.

The two identifies areas of the development were the TOS sofware and it's communication with the other stakeholders of the intermodal transport chain. The selected partner for development of EDI standardized communication tool was Port of Trieste with whom the EDI connection was developed and standardized.

The other pilot action is a scanning system for identification of arriving wagons and containers, a system that can scan wagon numbers and container numbers and check them with the expected numbers, so that the trains' turn time is increased.

These pilot actions are fully alligned with the strategic aim of project COMODALCE, "Enhancing COordination on multiMODAL freight transport in CE", as both projects increase the possibility of further development of intermodal transport to and from Hungary, Budapest.

Both pilot actions were developed within the given time frame, during WP2 till June 2020, both developments are fully operational and granting the expected benefit of increase capacity with process improvements through ICT.

During WPT3 the main aim is to make it possible to utilise the developments at wider scope with different stakeholders, therefore we are startin projects of EDI connection with other players in the intermodal supply chain.

2. The strategy and the pilot action

The COMODALCE Pilot Actions developed by MCC have the challenge of increasing capacity utilisation of intermodal terminals around Budapest through two Pilot Actions.

The first Pilot Action is the upgrade of the MCC IT Platform as to enable:

- one-to-one data exchange with the Port of Trieste on inbound/outbound trains with electronic data interchange (connected with the Port of Trieste Pilot Action)

- agreement on data specification and format

- process development to upload received data in the terminal system

- standardization of the platform, making the communication available to other parties

- connection of the platform with the invoicing system

- development of an IT interchange platform and application to communicate with mobile equipment

The second Pilot Action is the installation of the OCR Gate character identification and the implementation of automated data process in the MCC Terminal. In this way the system can:

- scan and identify inbound container numbers, wagon numbers and IMDG labels, IMO numbers

- compare data with the data previously registered in the system by EDI

- process the identified data into terminal system

- alert in case of discrepancies

- avoid manual work that is needed only in case of the data in the system does not correspond to the data scanned

Due to expensive and difficult infrastructure investments, the capacity will be increased through new solutions, such as reduce train turn time with process automation, a quicker administration and less manual work in character identification and data processing.

Therefore, the intermodal traffic in the region can be fostered by ICT development.

The "Strategy for fostering coordinated multimodal freight transport through ICT systems - RRT of Mahart" (D.T1.3.9) set a course for fostering intermodal transport through ICT solutions, in pilot action with upgrading IT platform we learnt that with better and faster communication and automated data processing, we can shorten administration time of the arriving trains, with less manual intervention and better data accuracy. With the pilot action of OCR gate, we learnt that with preliminary data input and automatic scanning and identification of data the train receipt is much faster and data process is automated.

The railway OCR gate is the first one to be used in Hungary, so it can be considered as an experimental project.

One of the most important objectives of the strategy elaborated by MCC is to work with paperless administration, automated data transfer, involving as low manual work as possible, optimizing capacities with helping hand of digitalization and data transfer, software, adopting manual intervention into the ICT only when there is a mismatch between data compared, in order to avoid potential human error.

Having set a medium and long-term vision investing in ICT for automatic data transfer wherever possible will ensure for the concerned territory and target groups enhanced efficiency and competitiveness.

The whole intermodal industry will benefit, who were selected as stakeholders, such as railway companies, operators, forwarders and shipping line. Benefit is partly the increased capacity, partly the quicker service time.

The new projects developed by MCC will be the basis for spreading out the best practices to other business areas. Pilot Action no II. already involves all trains that arrive into the terminal via the transit gate, while Pilot Action no.I. was developed in a way, that the standardized data exchange can easily be rolled out to other rail projects.

The communication tool, the CH30 file is standardized, the specification is elaborated, so this standardized format can be used by other operators and destinations.

Mainly the railway companies and the operators can benefit from this project, as they can receive EDI messages automatically, instead of sending files and manually input the data.

The results gained from the strategy itself and from the further pilot actions are durable and transferable to other projects and contexts. Indeed, innovations in the ICT field go far beyond the Programme Area.

Medium term goals (5 years):

1. Goal no. 1: **MCC will use OCR gate for automatically identify characters and upload them to TOS to compare with data received electronically**

2. Goal no. 2: **MCC will develop electronic data exchange with Port of Trieste, as a pilot. The communication file will be standardized to involve more partners in the EDI communication.**

Long term goals (10 years):

1. Goal no. 4: **MCC will introduce paperless administration**

2. Goal no. 5: MCC will exchange data with all partners without manual intervention, using standardized EDI (Electronic Data Interchange) files that are automatically uploaded and downloaded from and to TOS.

Medium Term Goal no.1.

MCC will use OCR gate for automatically identify characters and upload them to TOS to compare with data received electronically

Perspectives	Goal	Measurement
1. Environmental and safety perspective	Terminal workers must go to receive the train only in case digits cannot be read or there is a data mismatch, no need to print expected container and wagon numbers on paper. This means less papers used and more safe work as workers must go less at the rails and wagons	- paper used by MCC per trains unloaded (number of paper packs bought a year / trains entered the terminal) - accident rate
2. Internal processes perspectives	All trains can enter under the OCR gate, data of all trains must be obtained before train's arrival and put into the system. ICT will compare the data and manual input needed at data error only.	- number of arriving trains per administration personnel - number of manual correction needed on data read by OCR gate
3. Innovation and growth perspective	The OCR gate itself is the innovation as this is not used in any other terminals in Hungary. With use of OCR gate and data identification the available capacity can be better utilised, providing further capacities for growth.	- number of trains entering terminal below the OCR gate - Number of trains and containers handled by the terminal annually
4. Customer / Partner perspective	Customers / Partners will get more precise data and will be able to bring more trains and containers to the terminal	- number of arrival / departure notifications without error - number of trains and containers handled by MCC
5. Financial	OCR gate will be financed by MCC while software development and	- financing ratio (Comodalce vs own financing)

| perspective | installation will be financed party through Comodalce funds | - finance need after finishing Comodalce project (between years 2-5) |

VISION:

Mahart Container Center will work with paperless administration, automated data transfer, involving as low manual work as possible. The manual intervention into the ICT will be necessary when there is a mismatch between data compared.

Medium Term Goal no.2.

MCC will develop electronic data exchange with Port of Trieste, as a pilot. The communication file will be standardized to involve more partners in the EDI communication.

Perspectives	Goal	Measurement
1. Environmental and safety perspective	No need to print received train list and input manually. More containers arrive by train.	- printing papers bought by MCC annually
2. Internal processes perspectives	Administrators must check correctness of the data, instead of manual input	- number of trains processed by number of admin. employees
3. Innovation and growth perspective	The automated data exchange and process will be further used by more partners	- number of train data processed through the standardized EDI file
4. Customer / Partner perspective	Data correctness to customer will improve, reaching better customer satisfaction. Partners involved will also have more efficiency with avoiding manual input	- number of customers complaints per train - number of partners using EDI interface
5. Financial perspective	Pilot communication method and development of TOS will be financed through Comodalce, further customers' involvement will be financed by MCC	- financing ratio (Comodalce vs. own funds) - cost of new partners' involvement

VISION:

Mahart Container Center will work with paperless administration, automated data transfer, involving as low manual work as possible. The manual intervention into the ICT will be necessary when there is a mismatch between data compared.

Long Term Goal no.1.

MCC will introduce paperless administration

Perspectives	Goal	Measurement
1. Environmental and safety perspective	Much less papers used for administration, will protect environment	- printing paper bought by MCC a year vs. number of trains handled
2. Internal processes perspectives	New role of administrative staff: instead of data processing, checking data and improve processes	- number of trains handled annually vs number of administrative staff
3. Innovation and growth perspective	With more reliable data, more and more partners involved in automated data process, ending with all partners involved and no papers used.	- number of partners, customers using EDI files and no manual involvement in data exchange
4. Customer / Partner perspective	Partners, customers also need to automate processes, that means more efficient administration at their side too.	- number of partners using EDI - data punctuality improvement: number of customers' complaints
5. Financial perspective	Roll-out of the pilot project will be financed by MCC	- amount of financing needed by partner roll-out

VISION:

Mahart Container Center will work with paperless administration, automated data transfer, involving as low manual work as possible. The manual intervention into the ICT will be necessary when there is a mismatch between data compared.

Long Term Goal no.2.

MCC will exchange data with all partners without manual intervention, using standardized EDI (Electronic Data Interchange) files that are automatically uploaded and downloaded from and to TOS.

Perspectives	Goal	Measurement
1. Environmental and safety perspective	Both at MCC and partners much less papers used	- printing paper bought by MCC and partners a year vs. number of trains handled
2. Internal processes perspectives	New role of administrative staff: instead of data processing, checking data and improve processes	- number of trains handled annually vs number of administrative staff
3. Innovation and growth perspective	MCC will be the most innovative terminal in Budapest and can jointly grow with the customers, handling more trains and containers at MCC	- number of customers at the terminal - number of trains and containers handled annually
4. Customer / Partner perspective	Partners, customers also need to automate processes, that means more efficient administration at their side too.	- number of partners using EDI - data punctuality improvement: number of customers' complaints

5. Financial perspective	Roll-out of the pilot project will be financed by MCC	- amount of financing needed by partner roll-out

VISION:

Mahart Container Center will work with paperless administration, automated data transfer, involving as low manual work as possible. The manual intervention into the ICT will be necessary when there is a mismatch between data compared.

2.1. Wish list of ICT measures

Wish list of ICT measures			
Title	**Short description**	**Link to the strategic goal**	**Link to the pilot action**
1.	Select the OCR gate software, customise to the local needs and implement in in MCC	Goal no.1.: MCC will use OCR gate for automatically identify characters and upload them to TOS to compare with data received electronically	This measure will be tested in the pilot action, as the OCR gate must function during WP2.
2.	Develop Terminal Operation System (TOS) in order to receive and process data received	Goal no.1.: MCC will use OCR gate for automatically identify characters and upload them to TOS to compare with data received electronically	This measure will be tested in the pilot action, as the OCR gate must function during WP2.
3.	Define, structure and standardize communication file together with Port of Trieste, in order to use electronic data interchange and communicate data with them.	Goal no.2.: MCC will develop electronic data exchange with Port of Trieste, as a pilot. The communication file will be standardized to involve more partners in the EDI communication.	This measure will be tested in pilot action, standardized communication file available during WP2.
4.	Develop Terminal Operation System (TOS) in order to receive and process data received	Goal no.2.: MCC will develop electronic data exchange with Port of Trieste, as a pilot. The communication file will be standardized to involve more partners in the EDI communication.	This measure will be tested in pilot action, data upload and download must be availableduring WP2.

Two Pilot Actions were defined, the first two answers the identified weaknesses and needs, while we are committed to expand the pilot actions to be accessible to all stakeholders of the intermodal chain in order to get closed to our strategic goal of paperless processes and automated data exchange.

Pilot Action No. I:

UPGRADE IT PLATFORM

MAHART Container Center Pilot Action in Comodalce project is upgrading its IT Platform as to enable one-to-one data exchange with the Port of Trieste on inbound/outbound trains, to reduce entry/exit time

- Develop IT platform for electronic data interchange

- Agree on data specification and format

- Develop process to upload received data in the terminal system

The Pilot Action was implemented and completed, now the trains between Port of Trieste and Mahart Container Center are going with pre-announced data of all details of the packing list, enabling automated electronic data exchange before trains' arrival at destination, so data is uploaded into TOS system and MCC does not have to put all data manually in the system. In the same way during export trains the data is downloaded from the system and sent to Port of Trieste in a standardized format, enabling Trieste port to process data automatically.

Pilot Action No.II.:

GATE SCANNING AND DATA IDENTIFICATION

Mahart Container Center Pilot Action in Comodalce project is implementing a scanning system which can

- Scan and identify inbound container numbers

- Scan and identify inbound wagon numbers

- Scan and identify inbound IMDG labels, IMO numbers

- Compare data with the data previously registered in the system by EDI

- Alert in case of discrepancies

- Manual work is needed only in case of the data in the system does not correspond to the data scanned

The OCR Gate is ready and functioning, all trains that go below the gate are scanned, data of the containers and wagons are identified and compared with the data that are uploaded before train's arrival (if any). The receipt of the trains is quicker and less manual, in this was the trains' turnover time was reduced and throughput capacity of the terminal increase

3. Identification of the actions

3.1. Mapping the actions

ACTION/MEASURE	ESTIMATED COST	TIME HORIZON
Develop Terminal Operation System (TOS) in order to receive and process data received	*200.000 euros*	*2025*
Define, structure and standardize communication file together with Port of Trieste, in order to use electronic data interchange and communicate data with them.	*20.000 euros*	*2025*
Select and maintain the OCR gate software, customise to the local needs and implement in in MCC	*25,000 euros*	*2030*

3.2. Setting the actions

Action no. 1: Develop Terminal Operation System (TOS) in order to receive and process data received	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	**MCC has to further develop the ICT system in order to be able to use new innovations (GPS based location control) , as well as more automated data process**
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	**Define needs for the software development, agree with the developer(s), standardize and harmonise with newest ICT available developments, prepare interface with the new applications**
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	**Customers, Shipping Lines, Operators, Railway Companies, other destination terminals (Maersk Line, MSC, Evergreen, TX Logistics, GySEV, RCH, Port of Trieste**
Timeline *Indicate the time horizon for the implementation of the action*	**by 2025**
Investment cost	**around 200,000 Euros**

How much will cost the construction/realization of the future initiative/action/technology?	
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	Private capital
Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	quicker and more reliable data interchange, paperless and automated communication
KPIs *Please identify the KPI to be used for measuring the action's impact*	Data error percentage, data transfer in minutes after departure of a train

Action no. 2: Define, structure and standardize communication file together with Port of Trieste, in order to use electronic data interchange and communicate data with them.	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Finish and communicate standardized format of data interchange with the stakeholders
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc...)*	The framework and the Italian version of the data interchange format is ready, it has to be translated to German and English and publish availability to all stakeholders in a standardized way.
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Customers, Shipping Lines, Operators, Railway Companies, other destination terminals (Maersk Line, MSC, Evergreen, TX Logistics, GySEV, RCH, Port of Trieste. Thea are the direct beneficiaries by enabling them for EDI connections
Timeline *Indicate the time horizon for the implementation of the action*	2025
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	20,000 EUR

| Sources of financing
What are the sources of financing? Private capital, public capital, CEF, etc...
How much is the share covered by each of them?	Private Capital
Impact of the initiative
Describe the expected future economic, social, environmental impacts of this initiative	automated data exchange and process, paperless and timely communication
KPIs
Please identify the KPI to be used for measuring the action's impact	Number of data sent out of EDI, data reliability percentage

Action no. 3: Select and maintain the OCR gate software, customise to the local needs and implement in in MCC	
Description of action/measure
Describe the action foreseen and the expected results from its implementation	The selected OCR software provider must maintain the system, in order to keep it updated and reliable for data identification.
Description of the main steps for its implementation
List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc...)	CAMCO, who is the software provider will have an on-line remote help-desk, as well as on-site service for maintenance. They will provide updated versions for the next 3 years
Stakeholders involved
List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?	Railway companies (GySEV, RCH, PKP Cargo) and railway operators (TX Logistics, TO Delta, Maersk, RCO), with quicker turn time the utilisation of the equipment is higher
Timeline
Indicate the time horizon for the implementation of the action	2030
Investment cost
How much will cost the construction/realization of the future initiative/action/technology?	25,000 EUR
Sources of financing	Private capital

What are the sources of financing? Private capital, public capital, CEF, etc... How much is the share covered by each of them?	
Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	**MCC will keep receiving trains with OCR railway gate, which can identify and compare container and wagon data. This means quicker turnover of a train and increased capacities.**
KPIs *Please identify the KPI to be used for measuring the action's impact*	**Train turn time, time for receipt of a train**

Conclusion

The vision of the PP-10 is: Mahart Container Center will work with paperless administration, automated data transfer, involving as low manual work as possible. The manual intervention into the ICT will be necessary when there is a mismatch between data compared.

Both Pilot Actions as well as the action plan of the future years underlines the strategy and helps MCC to develop towards the agreed goal: automated, paperless processes, less manual input and intervention, in order to improve data reliability and speed of data transfer.

The OCR Gate helps the strategic vision by automated identification of the incoming train's data, including container and wagon details. The OCR Gate compares data which are uploaded into the system before arrival with the actual data and alerts in case of discrepancy. This means – in case we receive the expected containers and wagons – a train can be received without manual work, only the seal number has to be checked by the colleagues.

This allows capacity increase due to quicker administration, therefore more environmentally friendly trains can be handled in the terminal and terminal uses less paper in order to save woods and forests.

In the same way the TOS development and the standardized data transfer allows us to automate data interchange processes, limiting the manual input of the data. The data transfer is timely, reaches the receiving party on line, upon trains' departure, so no unnecessary papers and manual interventions are needed. The data will be as accurate as in the rail waybill, as rail waybill is also uploaded from the same system by the same data. Therefore, the EDI standardized connection also fully fits into the vision, allowing paperless administration, automated data transfer, involving as low manual work as possible