



Digitalization and Optimization of Railway Last Mile Operation inside ports areas

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2nd Baltic Ports & Shipping 2018

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- Rail Freight scenario in the Baltic Region
- Rail Last Mile Management Model:
 - Operative Level
 - Basic SW solution
 - Evoluted SW solution
 - Optimization SW solution
- Future Roadmap

CIRCLE - GEOGRAPHICAL PRESENCE

Circle operates, through branch and representative offices, both in Europe and Middle East and numbers a network of partners for local geographical alliances in order to offer consultancy and innovative solutions enriched with the contribution of complementary market leaders, maintaining at the same time a lean and flexible structure.



- **Italy** (Genoa, Milan and Trieste)
- **Belgium** (Bruxelles – also with ADS Insight)
- **Portugal** (Porto - with Magellan)
- **Romania** (Galati - with CN Apdm)
- **Turkey** (Istanbul and Mersin - with AkanSel)
- **Saudi Arabia** (Riyad, Jeddah - with SmartWay)
- **Spain** (Barcelona - with IETS)
- **Iran** (Teheran)

MAIN NETWORK PARTNERS

- Alice
- Log@Sea (with Aitek and IB)
- Ticass
- Tecnomar
- Transit

Rail Cargo Transport in the ports of Latvia

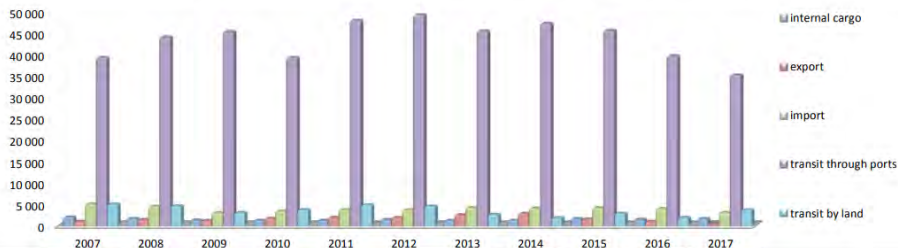
In 2017, 43.8 mill. tonnes of freight were carried by rail.

87% of the railway traffic was transported as transit through ports

Rail freight in Latvia up 6.5% in first eight months of 2018

Comparison of railway cargo turnover by types
2007. - 2017.

Type of cargo	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	+/-, % 2016./ 2015.
Total volume of cargo	52 164.0	56 060.9	53 681.2	49 165.2	59 385.9	60 603.3	55 832.0	57 040.2	55 646.7	47 821.4	43 791.7	-8.4
Internal cargo volume	2 000.0	1 687.2	1 300.8	1 262.9	1 192.8	1 429.0	1 177.6	1 256.7	1 672.1	1 482.5	1 653.4	11.5
International cargo volume	50 164.0	54 373.7	52 380.4	47 902.3	58 193.1	59 174.3	54 654.4	55 784.2	53 974.6	46 338.9	42 138.3	-9.1
Export cargo volume	997.2	1 410.3	1 177.4	1 706.9	1 937.2	1 903.8	2 573.1	2 822.6	1 515.2	989.5	351.8	-64.4
Import cargo volume	5 058.1	4 486.5	3 019.3	3 417.1	3 695.0	3 675.4	4 212.7	4 065.6	4 172.1	3 951.7	3 067.3	-22.4
Total transit cargo volume	44 108.7	48 476.9	48 183.7	42 778.3	52 561.0	53 595.1	47 868.6	48 895.3	48 287.3	41 397.7	38 719.2	-6.5
Transit through ports	39 076.4	43 866.2	45 117.4	39 055.8	47 738.6	49 036.9	45 240.4	47 041.5	45 438.8	39 481.2	35 039.1	-11.3
Transit through territory by land	5 032.3	4 610.7	3 066.3	3 722.5	4 822.4	4 558.1	2 628.2	1 853.8	2 848.5	1 916.5	3 680.1	92.0

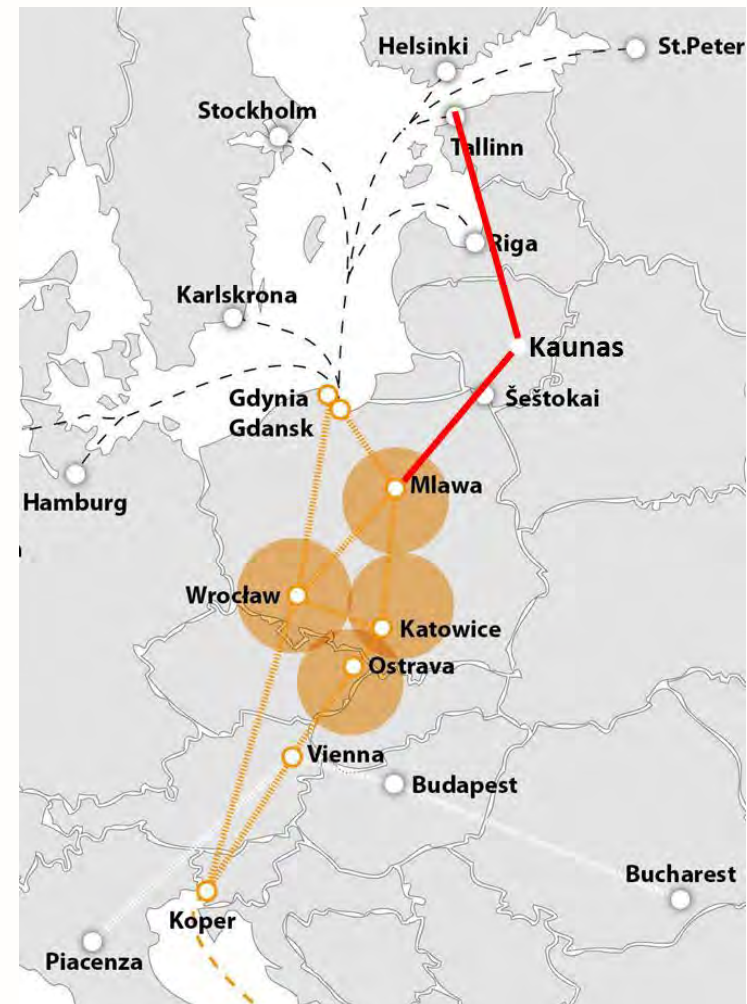


Rail Baltica - Port of Riga case

Rail Baltica is a greenfield rail transport infrastructure project with a goal to integrate the Baltic States in the European rail network. The port of Riga is connected to Central Europe thanks the **North Sea-Baltic corridor**. The **European corridor** connects the ports of the eastern shore of the Baltic Sea with ports of the North Sea, situated in **Northern Germany, Belgium and the Netherlands**. The most significant aspect of project is the rail connection among the **Estonia, Latvia and Lithuania to Poland** and its **logistics hubs**. It will connect Helsinki, Tallinn, Riga, Kaunas, Mława. The Baltic part of the Rail Baltica project is referred to as the Rail Baltica Global Project.

The project provides a direct link between the **Baltic Sea** and the **Mediterranean Sea** thanks to the train connection between the port of **Gdynia** (and the subsequent connection with the ports of **Riga** and **Tallin**) and the port of **Koper**.

- 2 trains per week between Poland and the port of Koper.
- Internal rail transit time 30 hours.
- 3 direct oceanic services a week in the Far East.
- Increase in connections between the Mediterranean, North Africa and the Middle East.
- Polish export, fruit and vegetables.



RAIL LAST MILE MANAGEMENT – WHAT IS?



Informatics and informative **interoperability model** among the subjects involved in the optimal **Rail Last Mile management**, considering as last mile the way between **port's** and **inland terminals**.



Port Terminal Infrastructure

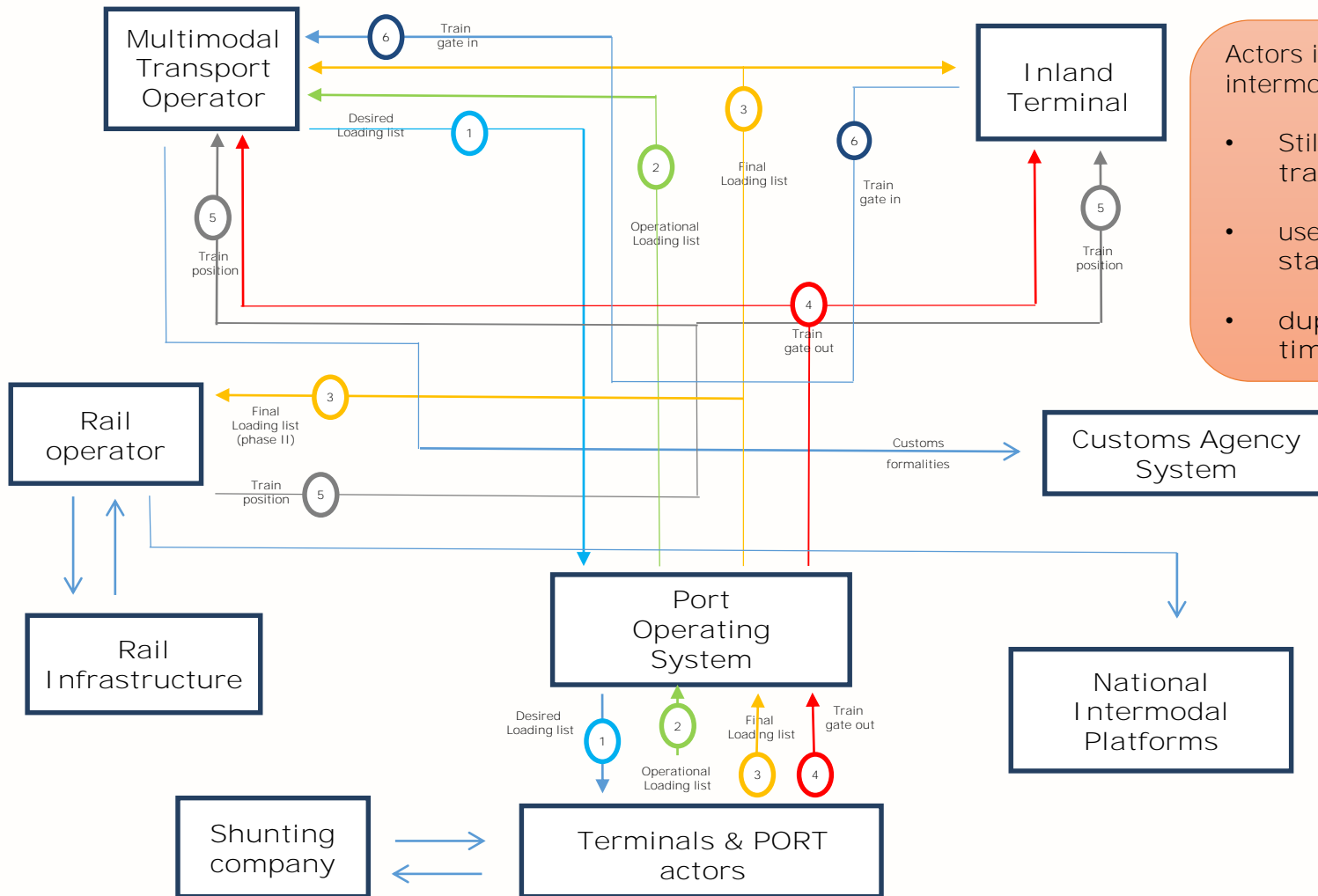


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RAIL LAST MILE - EXAMPLE OF INFORMATION FLOW COMPLEXITY



Actors involved in the intermodal transport process:

- Still use Paper transport documents;
- use different standards;
- duplicate and share not timely information.

RAIL LAST MILE MANAGEMENT – GENERAL OVERVIEW

OPERATIVE LEVEL

Definition of the **processes in detail**

ACTUAL SW SCENARIO

Analysis of the **AS-IS SW scenario**

DIGITALIZATION AND AUTOMATION SW

Digitalization and automation of information flow

OPTIMIZATION SW

Implementation of **Optimization Tool**



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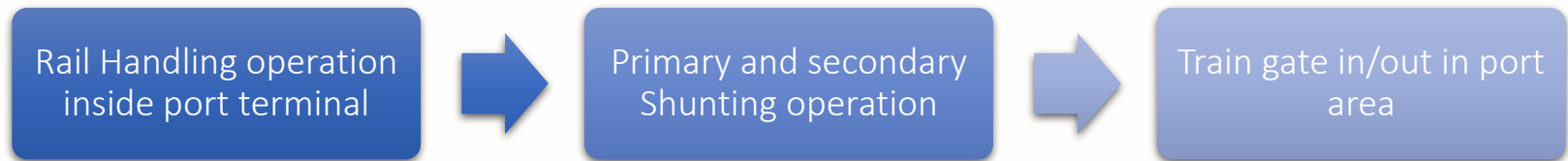
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RAIL LAST MILE MANAGEMENT – OPERATIVE LEVEL

We focused on the main **rail operation** involved in the Rail Last Mile inside the port area



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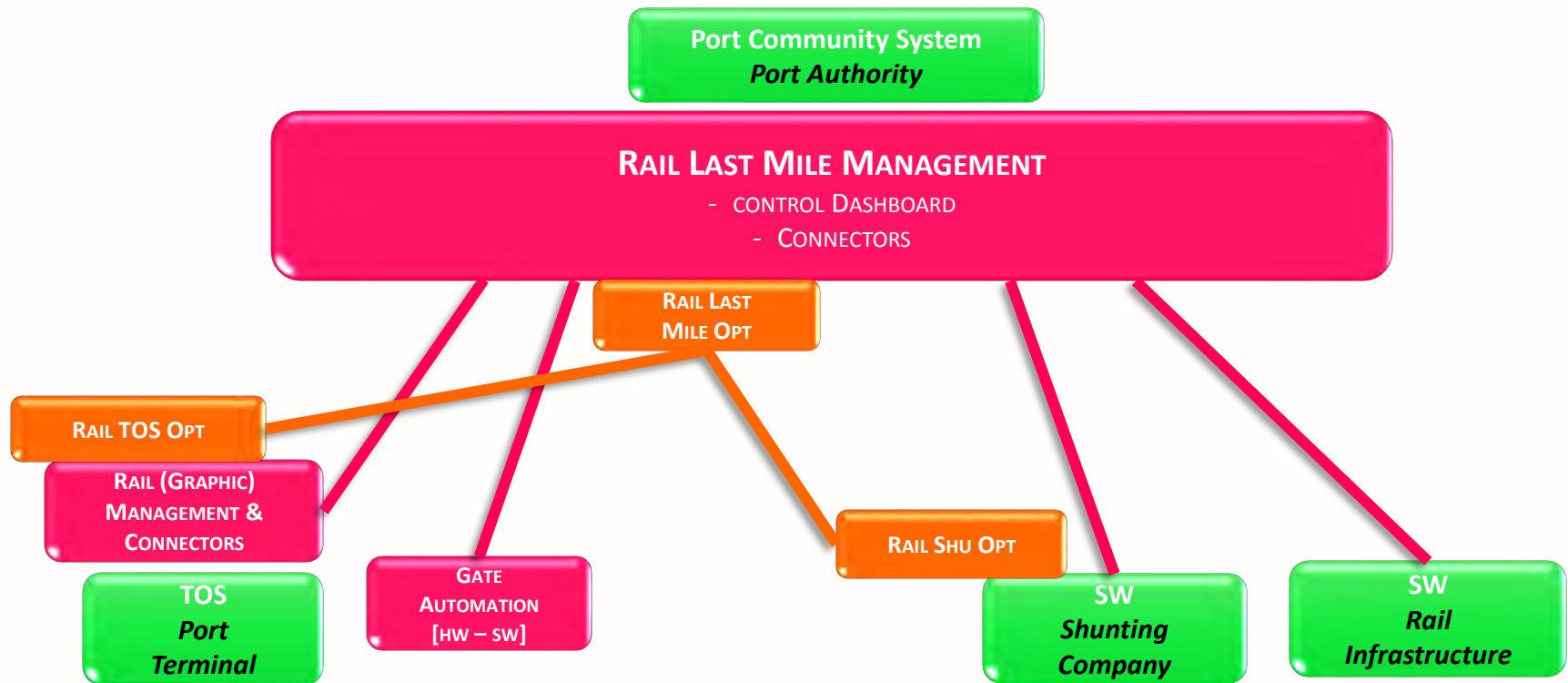


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RAIL LAST MILE MANAGEMENT – GENERAL SW OVERVIEW



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RAIL LAST MILE MANAGEMENT – ACTUAL SW SCENARIO

ACTUAL SW SCENARIO



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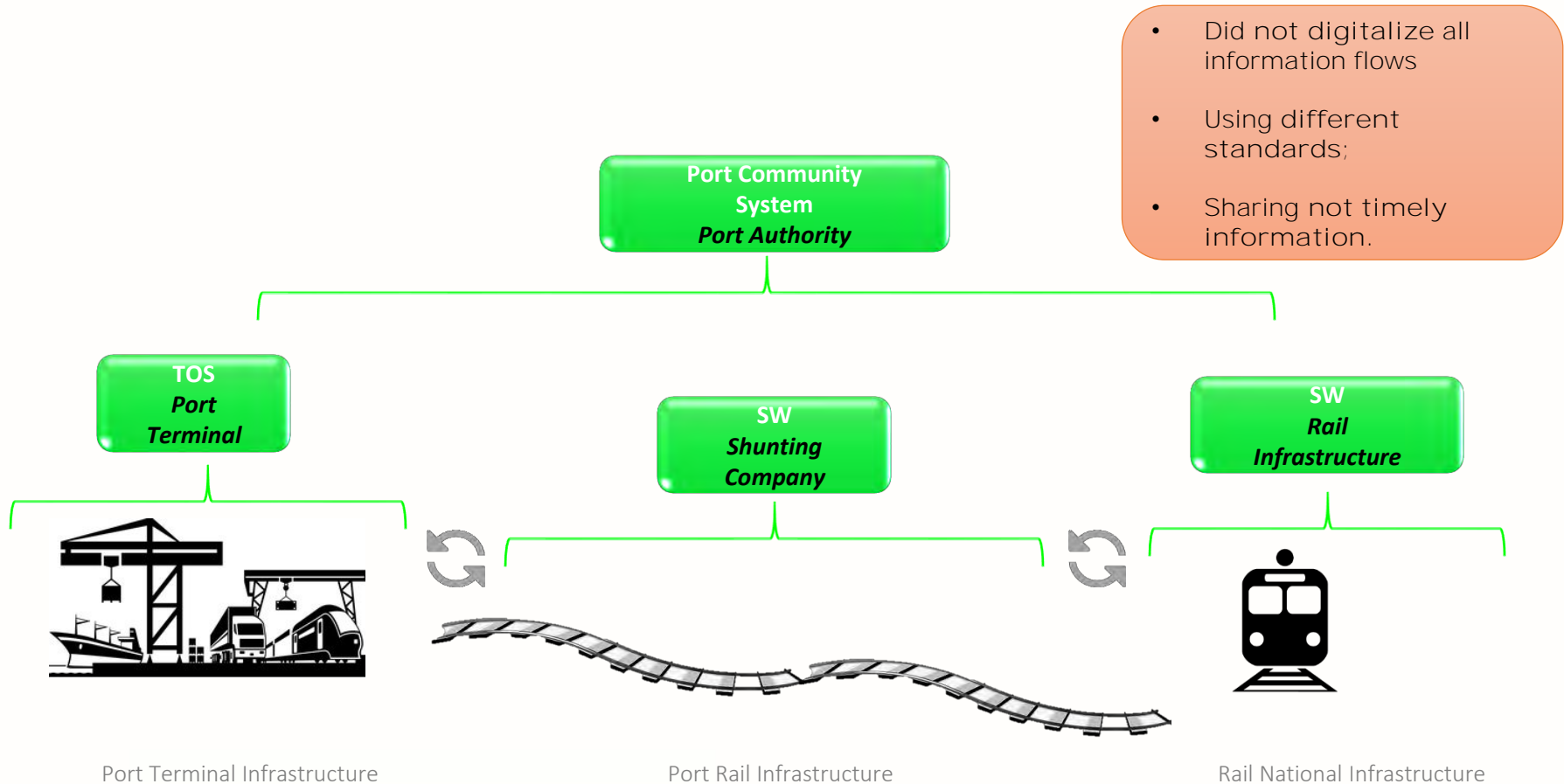


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RAIL LAST MILE MANAGEMENT - ACTUAL SW SCENARIO



RAIL LAST MILE MANAGEMENT – DIGITALIZATION & AUTOMATION

DIGITALIZATION & AUTOMATION SW



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DIGITALIZATION & AUTOMATION - RAIL (GRAPHIC) MANAGEMENT & CONNECTORS

TOS
Port
Terminal



RAIL (GRAPHIC) MANAGEMENT
& CONNECTORS

The screenshot displays a rail management interface. At the top, it shows user information: 'User: admin Sede: Lugo Termina'. Below this, a summary table provides key data:

Voyage	055382-16022017-190800	Total length	490,01 m
Route	LUG-GIO-18	Tot weight	998,681 tons
Direction	OUT	Tot wagons tare m.	492,2 tons
Status	treno arrivato	Tot units tare mass	100,43 tons
ETD	16/02/2017 19:08	Tot goods net	406,051 tons
ETA	17/02/2017 07:10	Tot goods gross	506,481 tons

The main visual is a 3D-style representation of a train on tracks, with individual wagons labeled with weights such as '3200 Kg' and '32370 Kg'. Below the train, a table lists the details for each wagon:

Lin...	Client	Load Unit	Gross Weight	Unit type	Cov...	Status	Full route	Prev...	F/E	Goods	RID
166-2	GUIDO BER...	G8TU0020801		CASSA BOX...	No	ARRIVATO	FIORENZUOLA-LUGO-GL	31804..	EM..	No	No
166-8	GUIDO BER...	G8TU0021686		CASSA BOX...	No	ARRIVATO	FIORENZUOLA-LUGO-GL	31804..	EM..	No	No
166-12	GUIDO BER...	G8TU0016289		CASSA BOX...	No	RICHiesto	FIORENZUOLA-LUGO-GL	37804..	EM..	No	No
166-4	GUIDO BER...	G8TU0020440		CASSA BOX...	No	RICHiesto	FIORENZUOLA-LUGO-GL	37804..	EM..	No	No
166-6	GUIDO BER...	G8TU0020442		CASSA BOX...	No	RICHiesto	FIORENZUOLA-LUGO-GL	37804..	EM..	No	No
167-1	F.LLI DI GRE...	TRLU9041203	12050.000	CONTAINE...	No	ARRIVATO	LUGO-GIOVINAZZO		FULL TRONCHI	No	No
167-2	F.LLI DI GRE...	TOLU4243572	9550.000	CONTAINE...	No	ARRIVATO	LUGO-GIOVINAZZO		FULL TRONCHI	No	No
167-3	F.LLI DI GRE...	TRLU9030111	12050.000	CONTAINE...	No	ARRIVATO	LUGO-GIOVINAZZO		FULL TRONCHI	No	No
167-4	F.LLI DI GRE...	TOLU4593776	16050.000	CONTAINE...	No	ARRIVATO	LUGO-GIOVINAZZO		FULL TRONCHI	No	No

Additional details on the right side of the interface include 'Unit type: CASSA BOX MULTIFUNZIONE 30', 'Int. code: 30', 'Tare mass: 3200.000 Kg', 'Capacity: 54.990 Kg', 'Max weight: 36000.000 Kg', 'Length: 9.125 m', 'Height: 2.750 m', 'Width: 2.550 m', 'Rail profile: C30', and 'Iso Size Type:'.

REAL TIME
STATUS OF RAIL
YARD

EASY PLANNING
OF HANDLING
OPERATION

DIGITALIZED
FLOWS TO
THIRD SYSTEMS

DIGITALIZATION & AUTOMATION - GATE AUTOMATION

Port Community System
Port Authority

GATE AUTOMATION
[HW – SW]

AUTOMATIC DATA
ACQUISITION OF
TRAIN
COMPOSITION,
DAMAGE, ETC.

INTEROPERABILITY WITH
PORT ACTORS AND
CUSTOMS
ADMINISTRATION

AUTOMATIC DATA
ACQUISITION



Port Railway gate infrastructure OCR / RFID

DIGITALIZATION & AUTOMATION - RAIL LAST MILE MANAGEMENT

Port Community System
Port Authority

RAIL LAST MILE MANAGEMENT

- CONTROL DASHBOARD
- CONNECTORS

REAL TIME STATUS OF THE RAIL YARD INSIDE PORT

IT PROVIDES ALERT AND STATISTICS

FULL CONTROL OVER THE RAIL PROCESS INSIDE PORT

Date	Origin	Train No.	Status	Destination	Notes
27/10/2017 06:55	ISU - WELS	42249	PRATICA APERTA	RIVA TRIANA	D - DEFINITIVO
27/10/2017 07:18	MONACO - TRIESTE	41861	PRATICA APERTA	MOLO SESTO	D - DEFINITIVO
27/10/2017 07:30	FERRIERA	51357	PRATICA APERTA	BANCHINA EX ITALSIDER	D - DEFINITIVO
27/10/2017 08:00	WACKER CHEMIE EXPRESS	41841	PRATICA APERTA	MOLO VII	D - DEFINITIVO
27/10/2017 08:00	WACKER CHEMIE EXPRESS	41841	PRATICA APERTA	MOLO VII	D - DEFINITIVO
27/10/2017 08:44	OLIO COMBUSTIBILE	47221	PRATICA APERTA	DEPOSITI COG TIERI	D - DEFINITIVO
27/10/2017 09:03	MILANO	51143	C - CONFERMATO	MOLO VII	8054 X - ENTRATA D. Q - ENTRATA I.
27/10/2017 09:45	ISU - WELS	40247	PRATICA APERTA	RIVA TRIANA	D - DEFINITIVO
27/10/2017 15:00	(A) EKOL - LUDWIGSHAFEN	41853	PRATICA APERTA	MOLO SESTO	D - DEFINITIVO
27/10/2017 16:00	FERRIERA	51355	PRATICA APERTA	BANCHINA EX ITALSIDER	D - DEFINITIVO
27/10/2017 16:05	BUDAPEST MAHART	48159	PRATICA APERTA	MOLO VII	D - DEFINITIVO
27/10/2017 17:19	VILLACO	45265	PRATICA APERTA	MOLO VII	D - DEFINITIVO
27/10/2017 17:20	SAMSKIP	41851	PRATICA APERTA	RIVA TRIANA	D - DEFINITIVO
27/10/2017 17:30	SAMSKIP	63155	PRATICA APERTA	RIVA TRIANA	D - DEFINITIVO
27/10/2017 18:00	FERRIERA	51191	PRATICA APERTA	BANCHINA EX ITALSIDER	D - DEFINITIVO
27/10/2017 18:58	(A) LUDWIGSHAFEN - OPEN	41855	PRATICA APERTA	MOLO SESTO	D - DEFINITIVO
27/10/2017 19:00	LUBA	50587	PRATICA APERTA	MOLO SESTO	D - DEFINITIVO
27/10/2017 19:03	LUDWIG	141855	PRATICA APERTA	RIVA TRIANA	D - DEFINITIVO
27/10/2017 21:00	(A) EKOL - OSTRAVA	43501	PRATICA APERTA	MOLO SESTO	D - DEFINITIVO
27/10/2017 21:40	(A) EKOL - KÖLN	41857	PRATICA APERTA	MOLO SESTO	8058 D - DEFINITIVO
27/10/2017 22:00	KARLSRUHE	45981	PRATICA APERTA	MOLO SESTO	D - DEFINITIVO

RAIL LAST MILE MANAGEMENT – OPTIMIZATION TOOLS

OPTIMIZATION TOOLS



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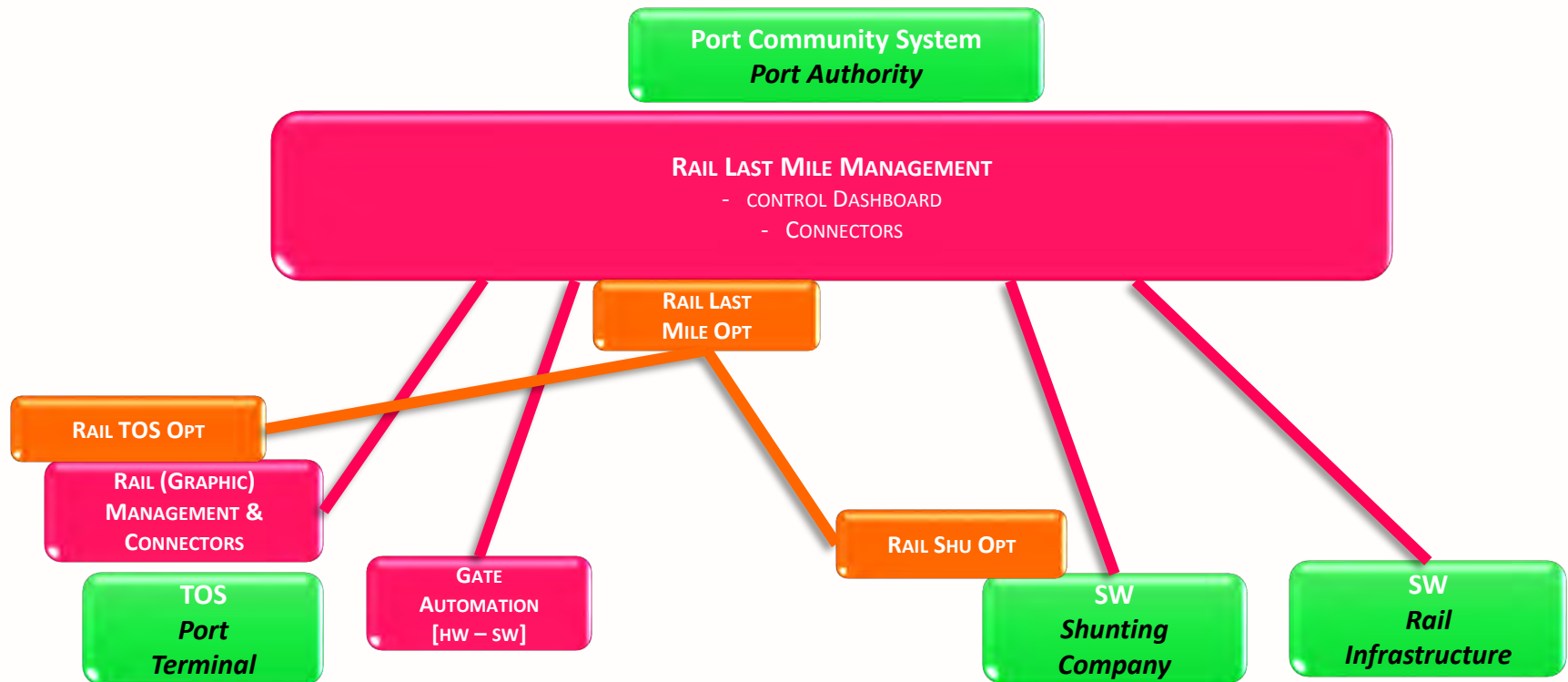


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RAIL LAST MILE MANAGEMENT – OPTIMIZATION SW



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RAIL LAST MILE MANAGEMENT – OPTIMIZATION SW MODULES

MAXIMIZATION OF THE NUMBER OF TRAINS TO/FROM THE PORT

RAIL
SHUNTING
OPTIMIZATION

RAIL LAST
MILE
OPTIMIZATION



RAIL TERMINAL
OPTIMIZATION

OPTIMIZATION OF TRAINS' PLANNING ACTIVITIES

OPTIMIZATION OF INFRASTRUCTURE'S UTILIZATION

RAIL LAST MILE
OPTIMIZATION TOOL
PROVIDE THE OPTIMIZED
SOLUTION IN CASE OF
CONFLICTS



- REDUCING PORT CONGESTION
- REDUCING DWELL TIME
- INCREASING TRAIN OPERATED

MILOS RAIL LAST MILE MANAGEMENT ROADMAP

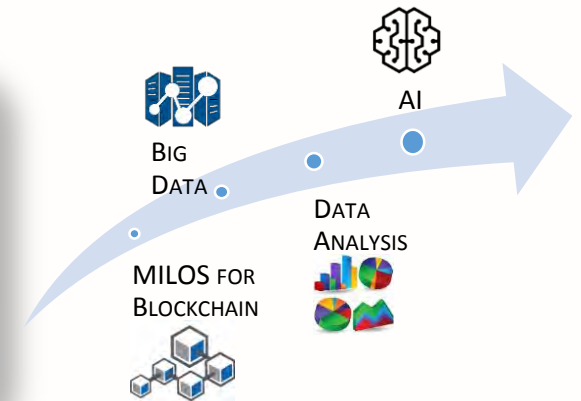
Roadmap 2020



SCIENTIFIC
RESEARCH
ACTIVITIES IN
PROGRESS



MILOS
OPTIMIZATION



SUPPLY CHAIN 4.0 OPTIMIZATION

CONCRETE PROPOSAL

Within the next few months the ***digitalisation and optimisation of rail last mile transport operations and documents*** are further used and tested in ongoing EU projects and also in new CEF proposals

More than 28 international actors of the Rail Transport industry have already signed an Expression of Interest

There are concrete opportunities for ***Baltic Sea Region ports and logistic actors.***

Deadline for joining as stakeholder **31.10.2018**

Contact us at siria@circletouch.eu

Or

visit us @
our stand
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