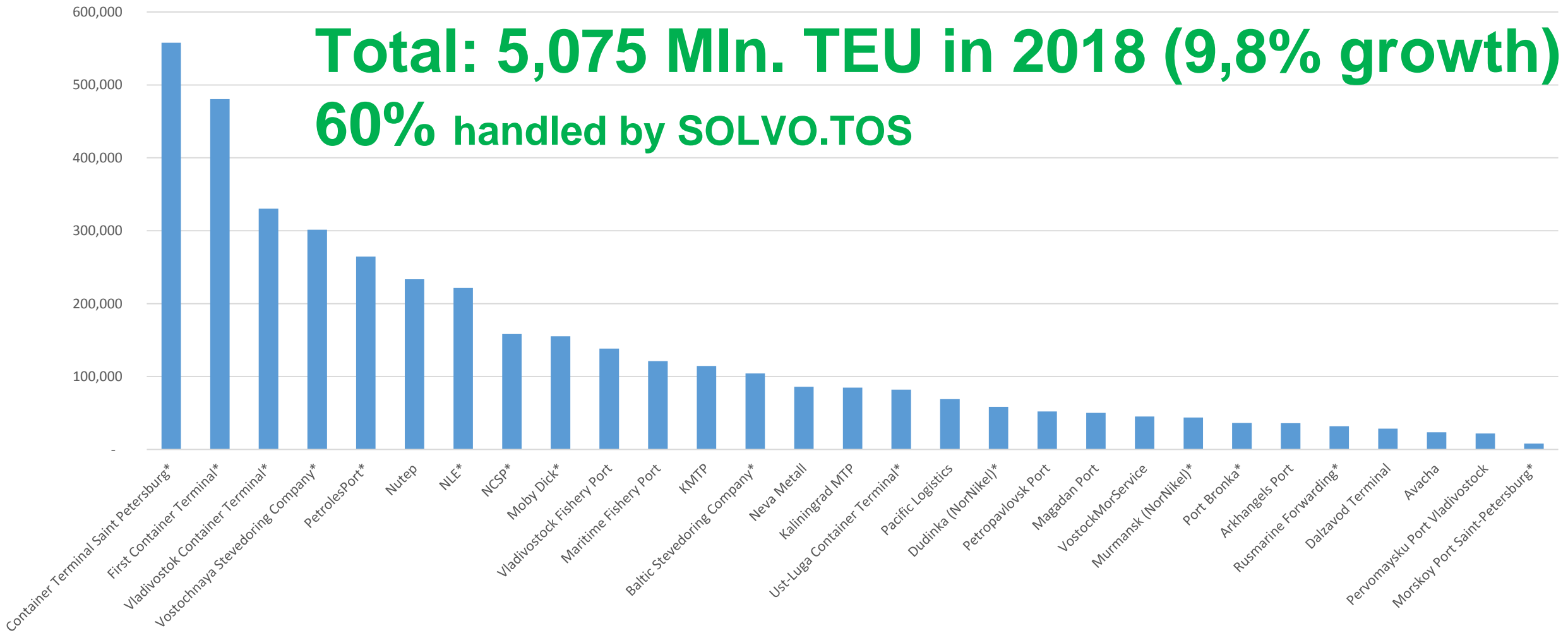# How modern information technology helps boosting efficiency of maritime logistics from the terminal operator's perspective

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Turnover of container terminal operators in Russia (TEU) 2018

Total: 5,075 Mln. TEU in 2018 (9,8% growth)

60% handled by SOLVO.TOS

Bar chart categories (left to right):
- Container Terminal Saint Petersburg*
- First Container Terminal*
- Vladivostok Container Terminal*
- Vostochnaya Stevedoring Company*
- PetrolesPort*
- Nutep
- NLE*
- NCSP*
- Moby Dick*
- Vladivostock Fishery Port
- Maritime Fishery Port
- KMTP
- Baltic Stevedoring Company*
- Neva Metall
- Kaliningrad MTP
- Ust-Luga Container Terminal*
- Pacific Logistics
- Dudinka (NorNikel)*
- Petropavlovsk Port
- Magadan Port
- VostockMorService
- Murmansk (NorNikel)*
- Port Bronka*
- Arkhangels Port
- Rusmarine Forwarding*
- Dalzavod Terminal
- Avacha
- Pervomaysku Port Vladivostock
- Morskoy Port Saint-Petersburg*

- Universalization instead of specialization

- Port-centric logistics

- Increased range & quality of services

- Integration of port & warehouse logistics

Comprehensive terminal operating system for all types of cargo

Port Aktau is the sea-gate of modern Kazakhstan. Today, Aktau Port is a multi-purpose, intermodal terminal with many prospects and capabilities

Terminal specification

- Two multi-purpose terminal berths

- Storage yard 80,000 m2

- Covered transit storehouse 2,000 m2

- Area for transshipment of scrap metals and bulk goods 22.5 x 65m

- One different purpose terminal berth

- Berth for grain export and heavy-weight cargo

- Berth for small-sized vessels

- Tug - 2720, 1700 hp for towing and docking approach operations

Equipment:
- 5 portal cranes
- 2 mobile portal cranes
- 4 port tractors
- 1 forklift

Project results:

- ✓ Single unified cargo nomenclature for all storage zones

- ✓ Optimized receiving, storage and operations involving returns

- ✓ Implementation of general cargo, container, and ro-ro search function – displays the current status and history of the cargo load moving through the port

- ✓ Optimized operations with pickup/drop-off and gate requests for the port; a standardized request form was developed reducing the time needed for truck processing as well as the overall workload on personnel

- ✓ Real time management of personnel through implementation of RDT and specifically bar-coding technologies for break-bulk cargoes such as metal slabs

- ✓ Yard optimization: reduced time for assembling orders, reduce defects, excess loads

- ✓ Improved resource usage and efficiency thanks to effective allocation of resources

Project results:

✓ The SOLVO database records and keeps track of virtually all operational data

✓ Web portal and integrated billing modules help calculate fees for the services rendered and invoicing the customers giving them the necessary details

✓ Truck driver's entry security and gate checking modules enable control over operations and personnel; several cases of theft attempts were prevented

✓ Automatic loading of BoL thanks to TOS integration with third-party software using a standard excel form eliminated manual entry and human errors

✓ Full support of all CFS operations (stuffing, unstuffing, restuffing, security check)

✓ The electronic truck driver's queue management module at the ferry complex helps sorting the truck drivers' queues both inside the terminal and in the pre-gate areas

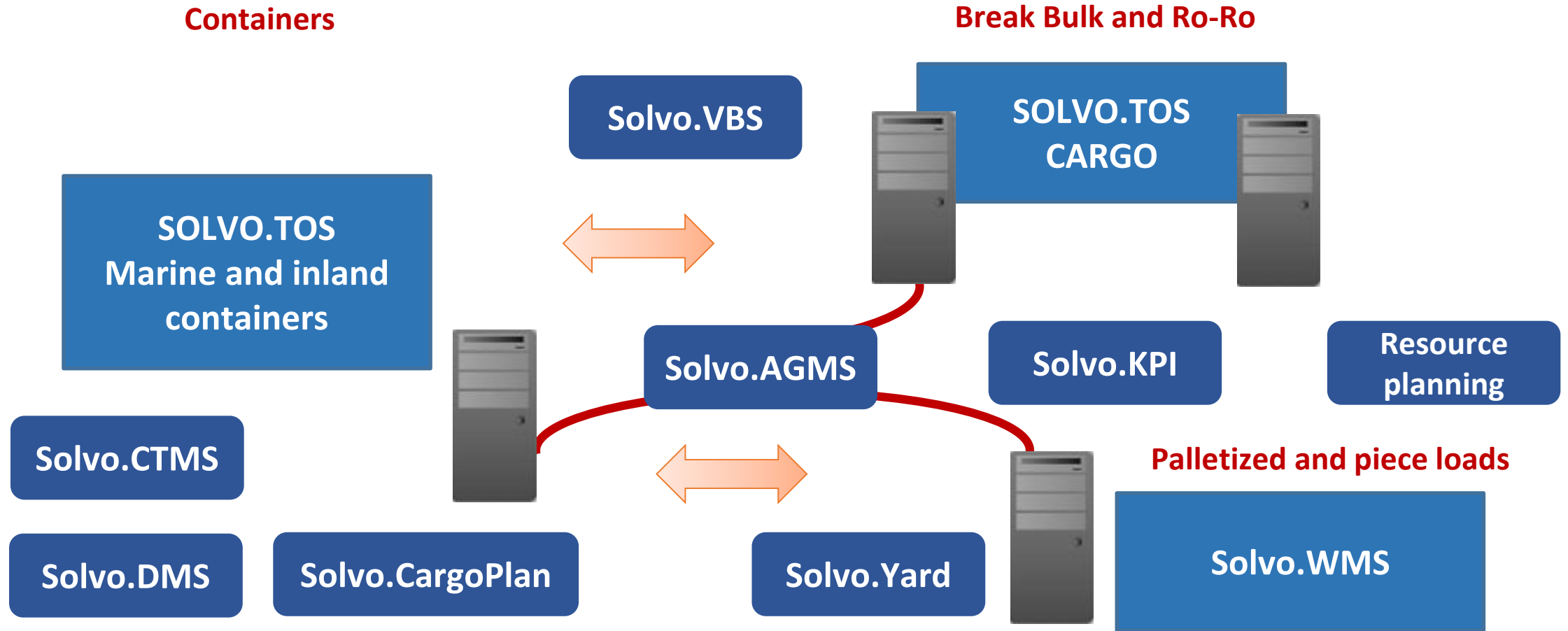# Expanding services from container to commercial operations
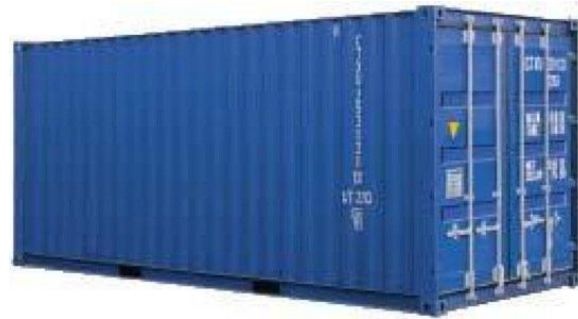
Managing container processing only
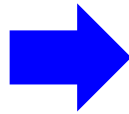
General cargo management & record-keeping
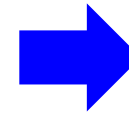
Commercial logistics

System implementation enables:

Increase cargo handling efficiency

Help support the increase in terminal throughput

Increase personnel & equipment productivity

Standardize technological and business processes

Improve transparency of technological and commercial processes

Customer request can be received via EDI messages.

The EDI module supports all types of EDIFACT messages for maritime industry and even more – .xml, .xls and other formats.

The system can generate notifications triggered by a specific event and send those to the interested parties. The messages can be created in XML, PDF, XLS or e-mail formats.

40-60%
of all document transactions are in e-format

System implementation enables to lead the following in electronic format:

- Contracts with clients
- Reference lists
  - Stakeholders
  - Services
  - Documents
  - Rates
- Individual rates for each client
- Service request execution accounting
- Automatic document creation for subsequent billing
- Ability to confirm documents with e-signatures

The system supports various types of cargo receiving depending on the type of inventory:
- Cars (units by VIN number)
- Regular receiving (by unit/tons)
- Receiving by volume (m3)
- Receiving of big packs

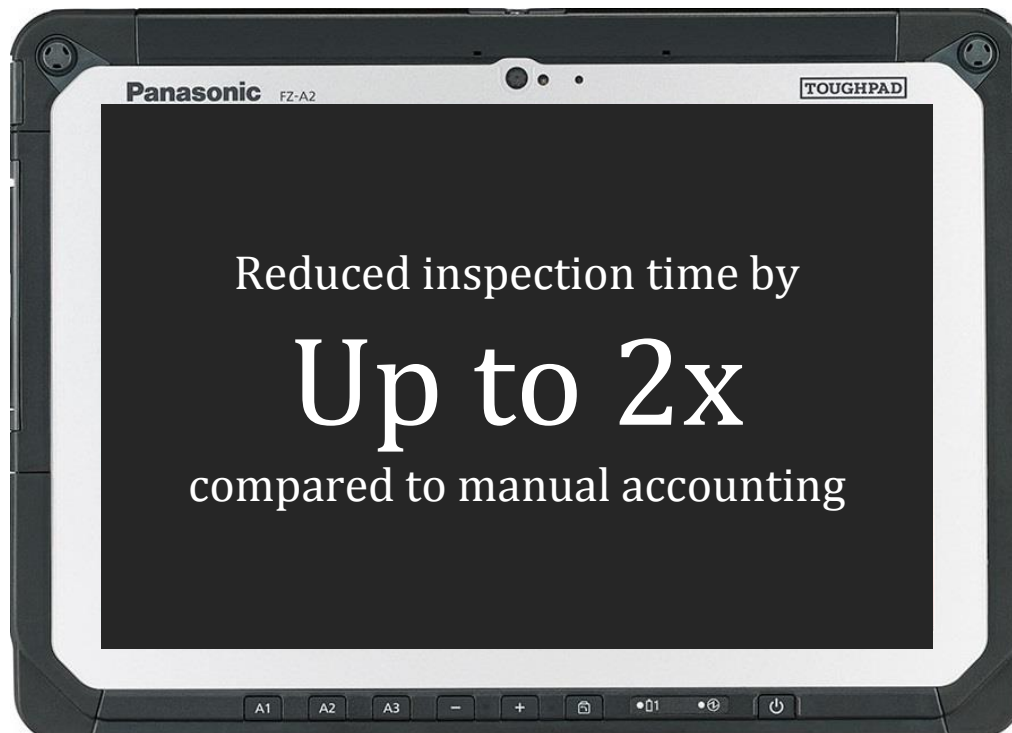Tallyman from Ust-Luga port (Ferry complex)

Inspector from Ust-Luga port (Break-Bulk terminal)

Batch

Unique

Terminal workers check seal numbers, inspect the containers using the radio terminals (RDT):

Reduced inspection time by

Up to 2x

compared to manual accounting

- Decrease in errors and increase in personnel productivity thanks to automatic cargo data fill-in and omitting paperwork
- Increased transparency - container data is sent to the system in real time

Installed at the mounted terminal into the STS crane's cabin. Allows real-time confirmation of all container moves during loading discharging

QC efficiency increased by **5%**
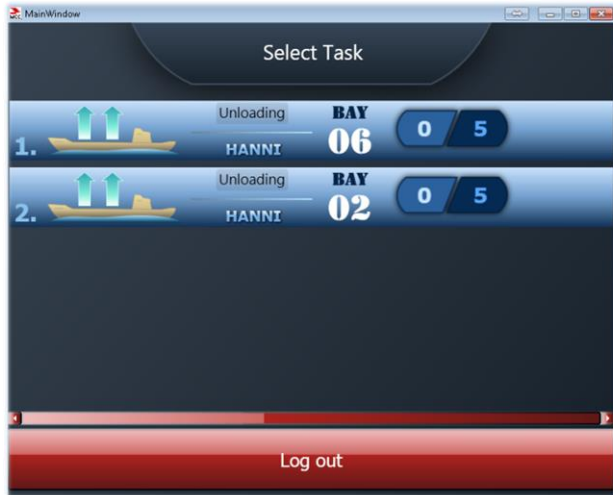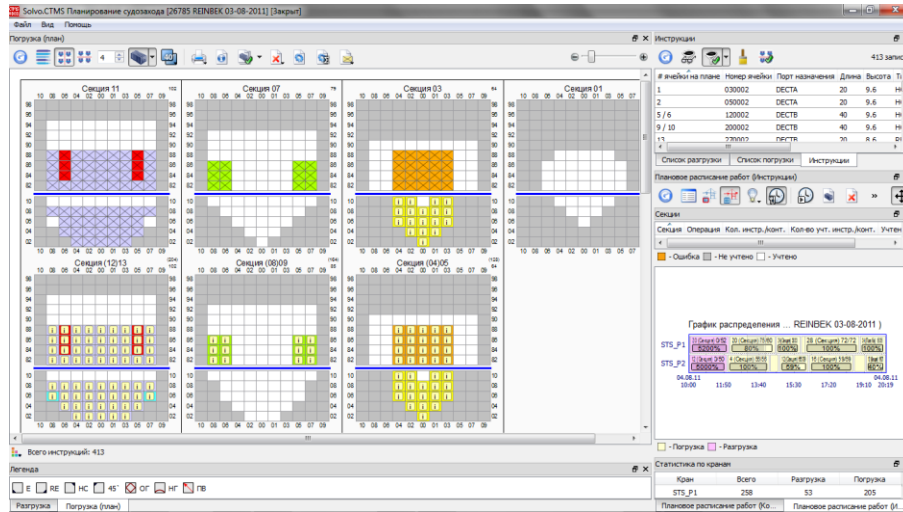
- Improve vessel planning
- Automate cargo planning process
- Reduce errors when creating and executing cargo plans
- Automate cargo handling operation planning
- Monitor vessel processing in real time
- Automate information exchange with
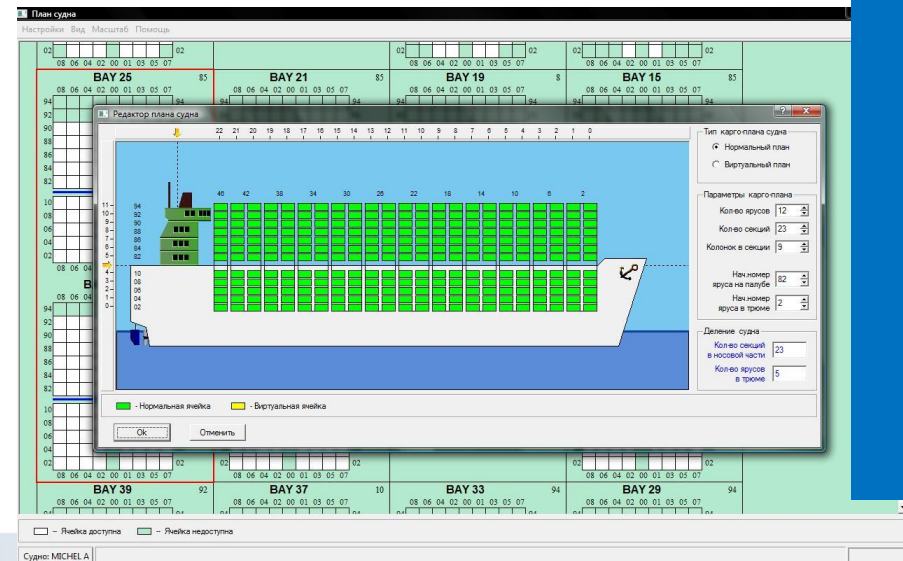
Load and discharge planning increase
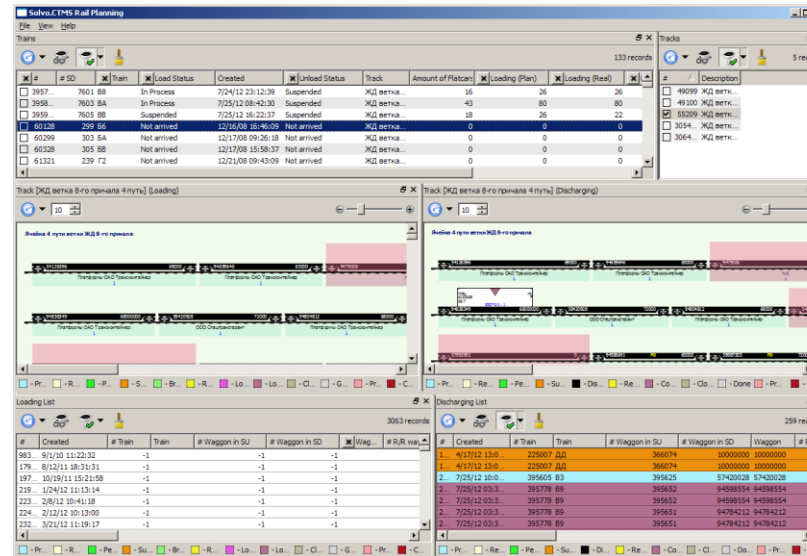
From 6 hours to 20 min

SOLVO.TOS blocks delivery and loading of container onto the vessel without VGM data

Time saved at rail operations comprised up to

25%

Compared to manual accounting

- Automatic planning of rail car staging increases personnel productivity
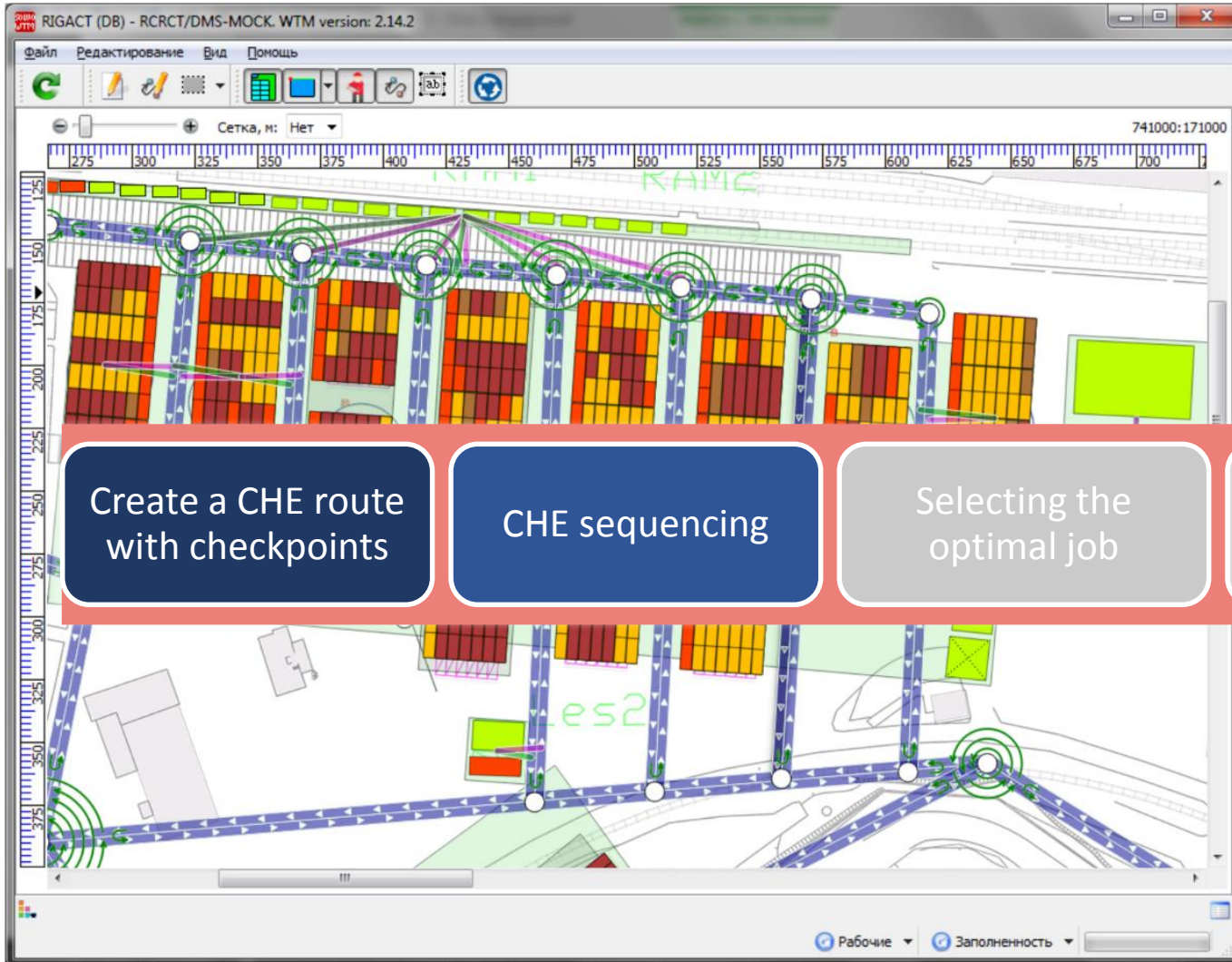- Reduced number of errors when creating rail car plan

The system makes it possible to automate:

1. Planning of rail car staging
2. Registration of rail consignment notes
3. Registration of rail car arrival/departure
4. Loading/discharging planning
5. Train and cargo inspection
6. Train loading and unloading

up to 30%

Reduction of empty runs (Dual Cycling for RS)

| Create a CHE route with checkpoints | CHE sequencing | Selecting the optimal job | Route search | Control job performance |

15%

Increased efficiency of MHEs (forecasting methods when work order is generated)

After launching the "Bird-eye view and editor of the terminal's layout" into operation all processes at the terminal are displayed in graphical form in real-time – container moves, warehouse status, machinery and personnel movements:
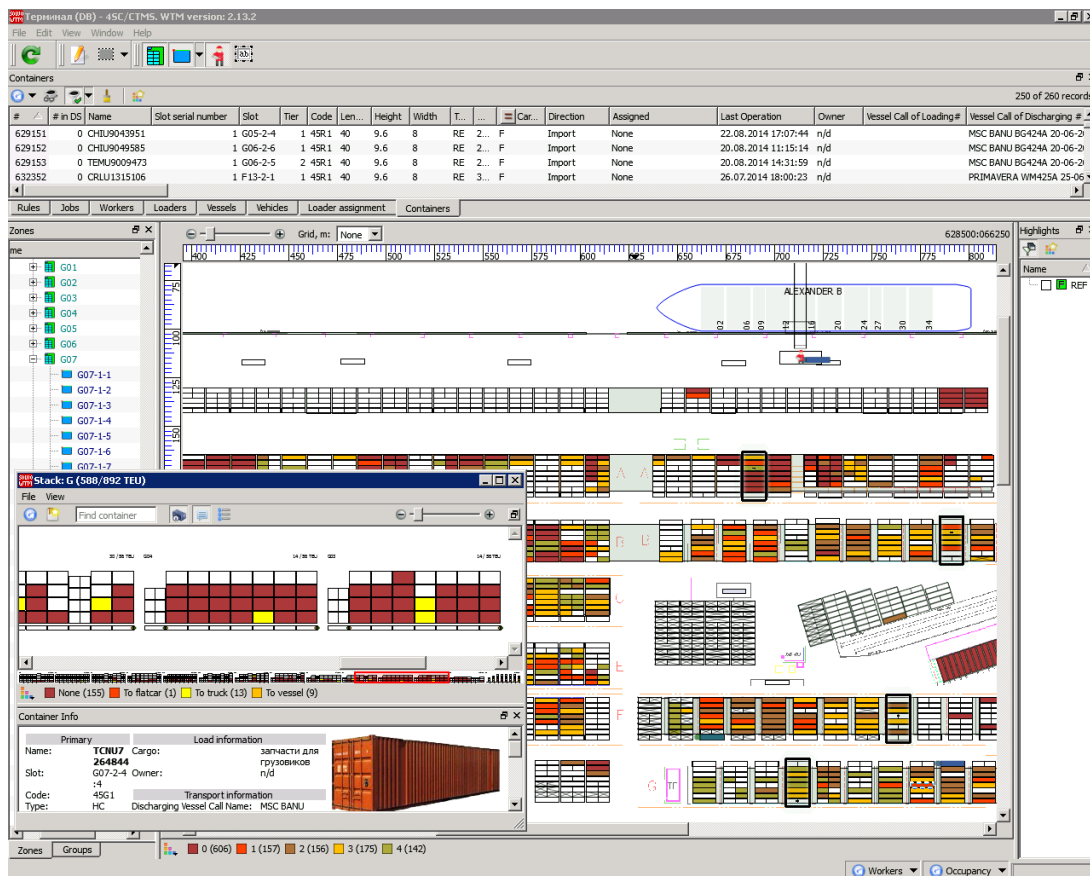
- Decrease in human errors
- Improved visibility of warehouse status and transparency of technological processes
- Forecasting of possible problems during cargo putaway at the warehouse
- Reduced time to determine operational status
- Additional tool for controlling personnel

An address system is used to store containers at the warehouse – each container is stored in a separate location, where each address is unique:
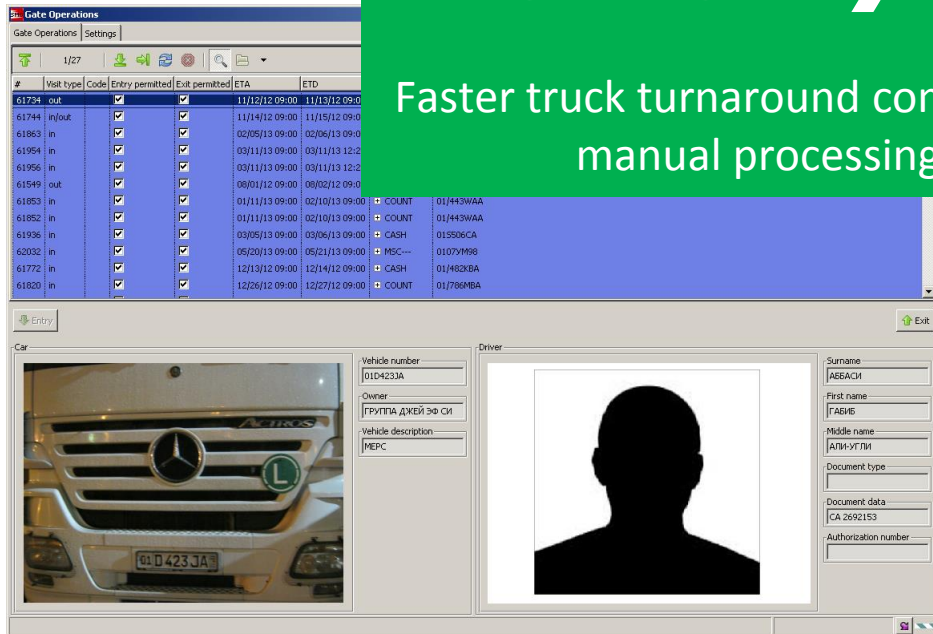
Time to find a container in a stack reduced by

90%

Compared to manual accounting

- Address-based storage is assigned automatically by the system
- Container history at the terminal is stored
- Reduced risk of container theft or loss
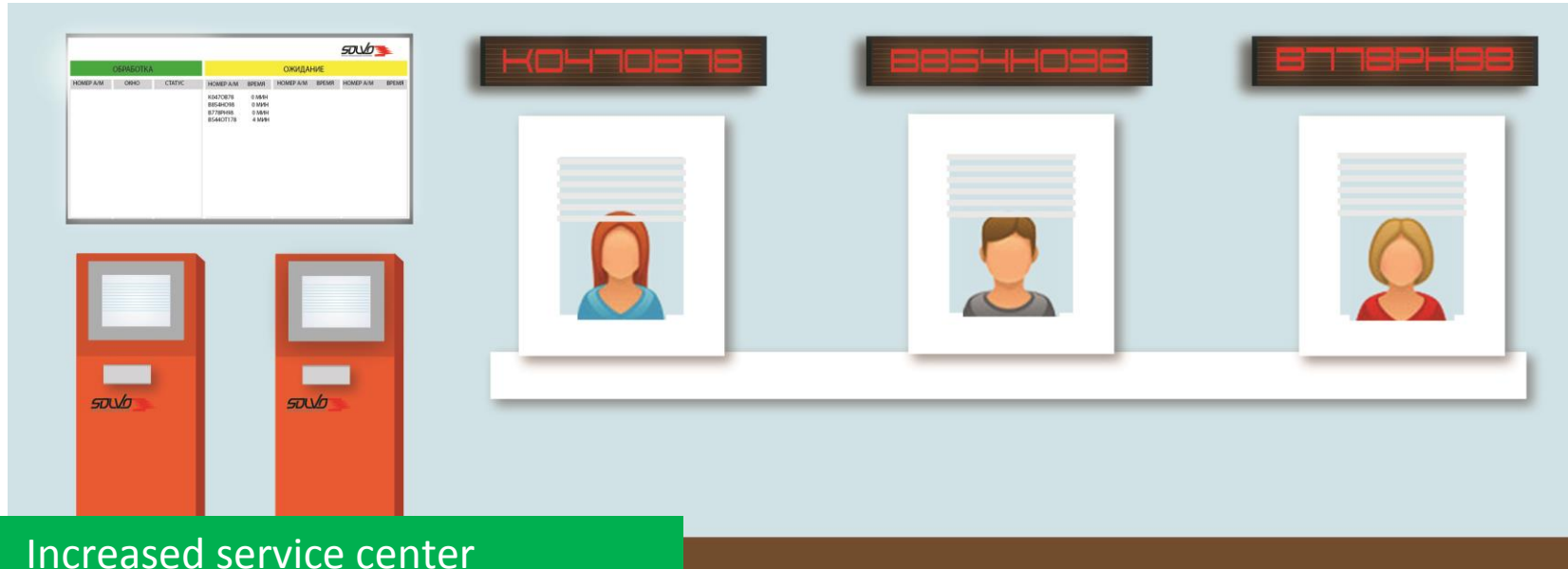- Reduced time to find cargo during operations

30%

Faster truck turnaround compared to manual processing

The system automates each process during truck processing:

1. Gate access permits
2. Preliminary truck visit requests via WEB portal
3. In-gate visit registration
4. Document control
5. Cargo handling operations
6. Paperwork
7. Departure from terminal

- Increased service center productivity
- Service center technician performance report
- Reduced number of re-handles at the warehouse due to dynamic queue management

Arriving at the service center, the driver receives a queue number for document processing. The system will display the estimates wait time.
A service center employee will then call the driver via a special interface.

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