Information technology to boost operations efficiency and reduce congestion at container and mixed cargo ports

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Global technology trends in port and terminal logistics

- **Terminal automation** = challenge for CTs to handle fewer but very large calls
- Digital supply chain and collaboration
- Port-centric logistics
- Single window system
- Enhanced information security
- Hosting IT infrastructure in the cloud
- Artificial intelligence on steroids

IT solutions zoo of the terminal operator

Containers

Container TOS

VBS

ERP

MHE routing optimization

Break Bulk and Ro-Ro

TOS.
General Cargo, Bulk, Ro-Ro

GOS

Equipment automation

Resource planning

Truck-load optimization

Automated vessel cargo plan

Automated rail cargo plan

Palletized and piece loads

WMS

PMS/PCS, etc

Automated yard allocation

All-in-one comprehensive solution

- Integrated VBS
- Integrated GOS
- Yard optimization
- Automated rail cargo plan
- Combined container and general cargo yard management
- MHE routing optimization
- Integrated resource planning
- Automated vessel cargo stowage planning
- Integrated terminal automation
- WMS-addon
- Integrated billing

Prerequisites of successful implementaion

#1 Universal solution

#2 Proven track record

#3 The team

#4 The pilot

#5 The technology

What we expect from the implementation?

Increase cargo handling efficiency

Reduce empty runs of equipment

Increase personnel & equipment productivity

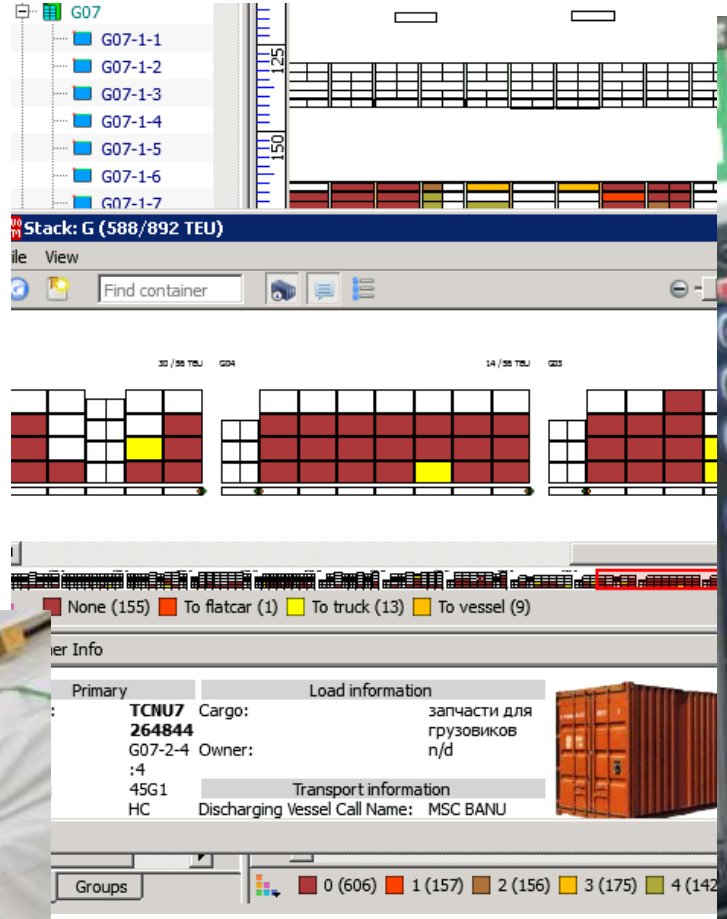
Standardize technological and business processes

Improve transparency of technological and commercial processes

Core technologies

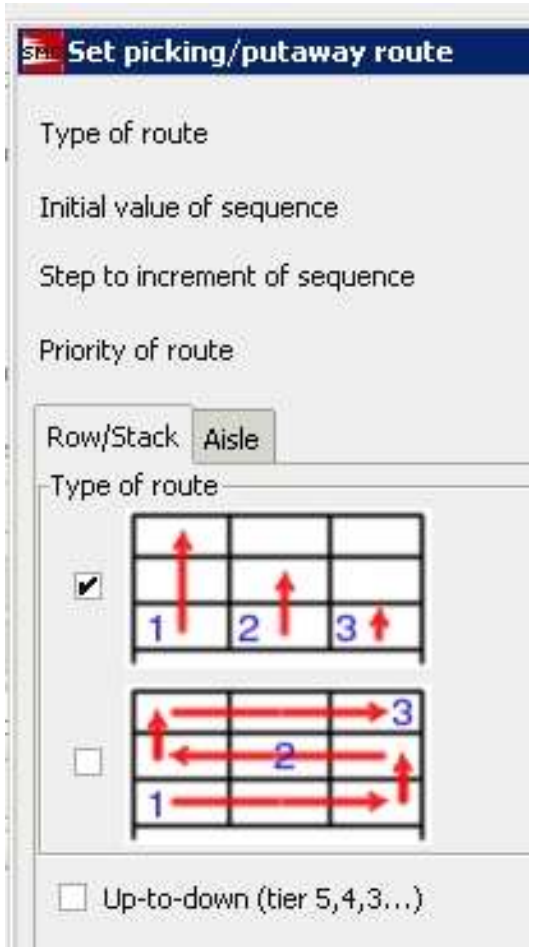
Auto-ID and data collection

Address-based storage

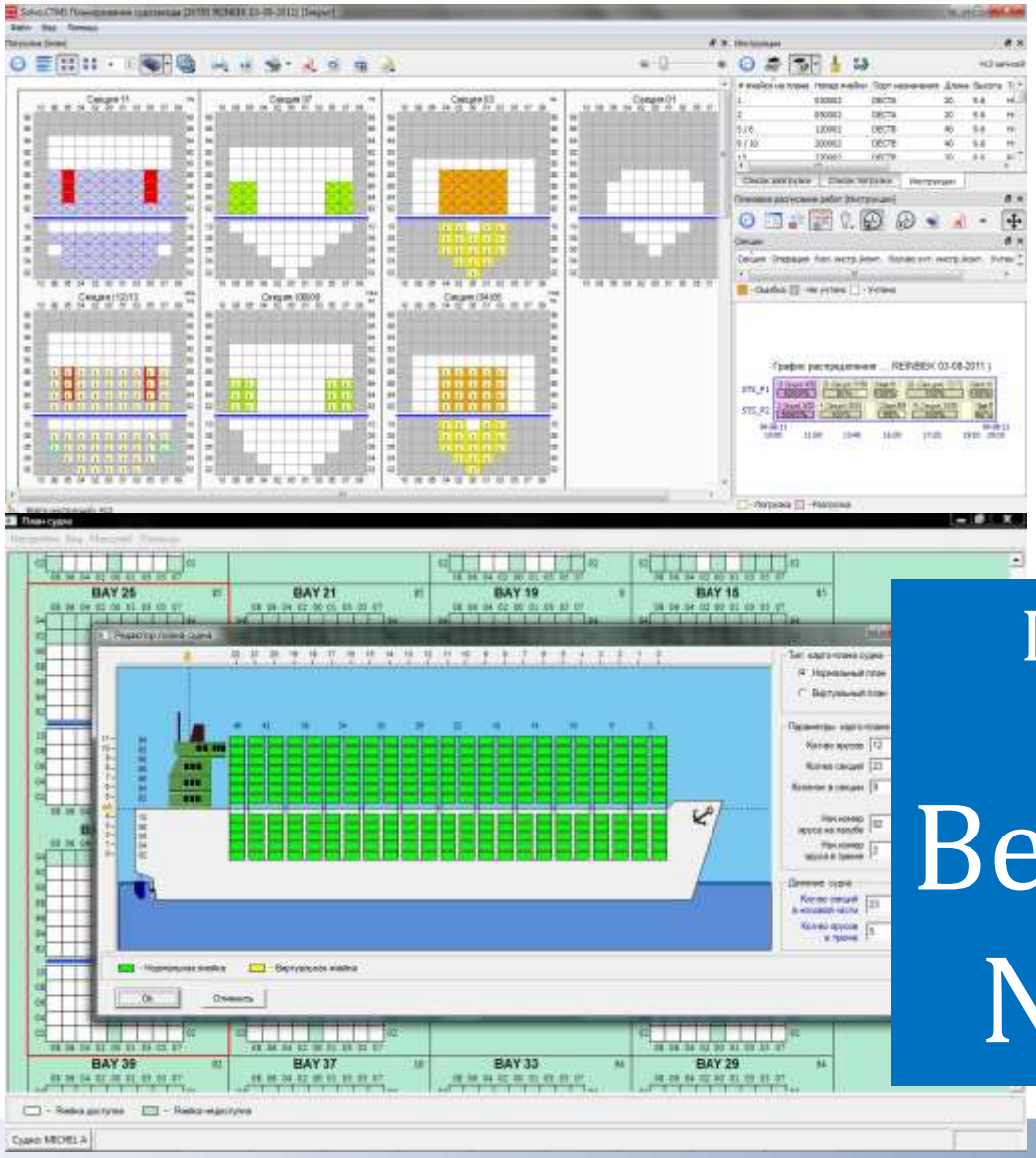


Remote management of labor

Business rules and strategies



Vessel planning efficiency boost



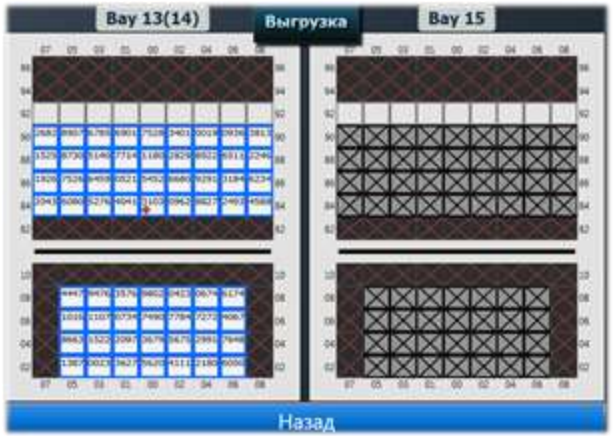
- Automate load and discharge planning
- Automatically sequence cranes
- Reduce errors when creating and executing cargo plans
- Monitor vessel processing in real time
- Automate information exchange with agents
- Store entire vessel call and cargo plan history in one central location

Load and discharge planning time

Before: 6 hours

Now: 15 min

Quay crane operator's efficiency



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

QC efficiency increased by 7%

VRT (Voice recognition technology)

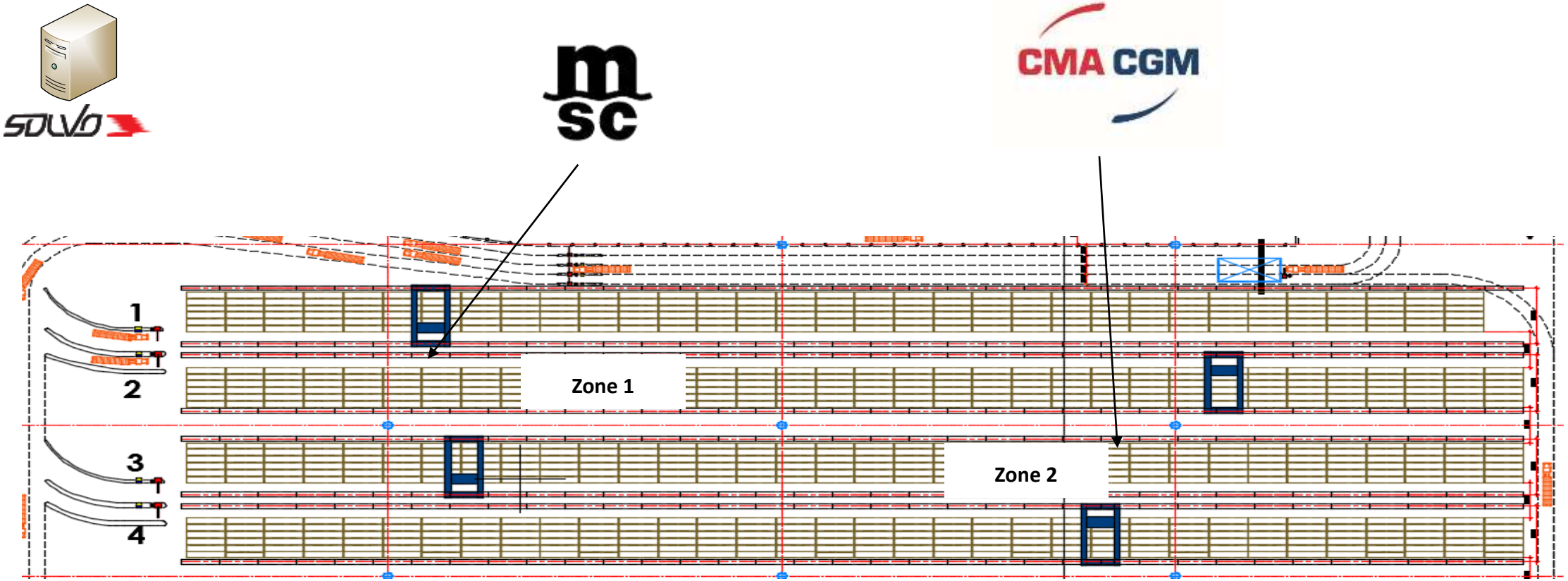
Voice recognition technology (VRT) provides communications between the crane operator and the ground personnel.

Example: TOS disables vessel container loading without VGM

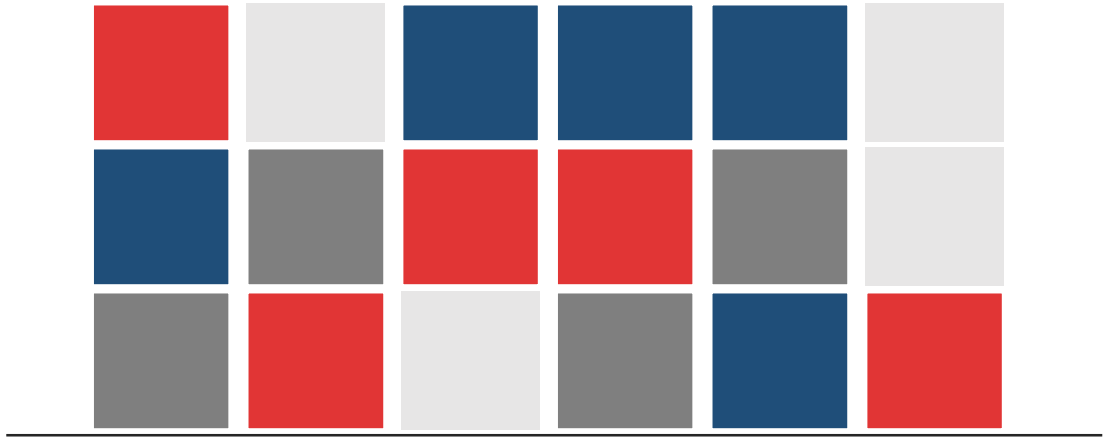
Solvo.TOS blocks delivery and loading of container onto the vessel without VGM data

Dynamic stacking: rules

The system finds a stack for the load based on putaway rules.
For example, all MSC containers are to be placed in zone 1 of the yard storage area, while CMA containers go to the stacks in zone 2.

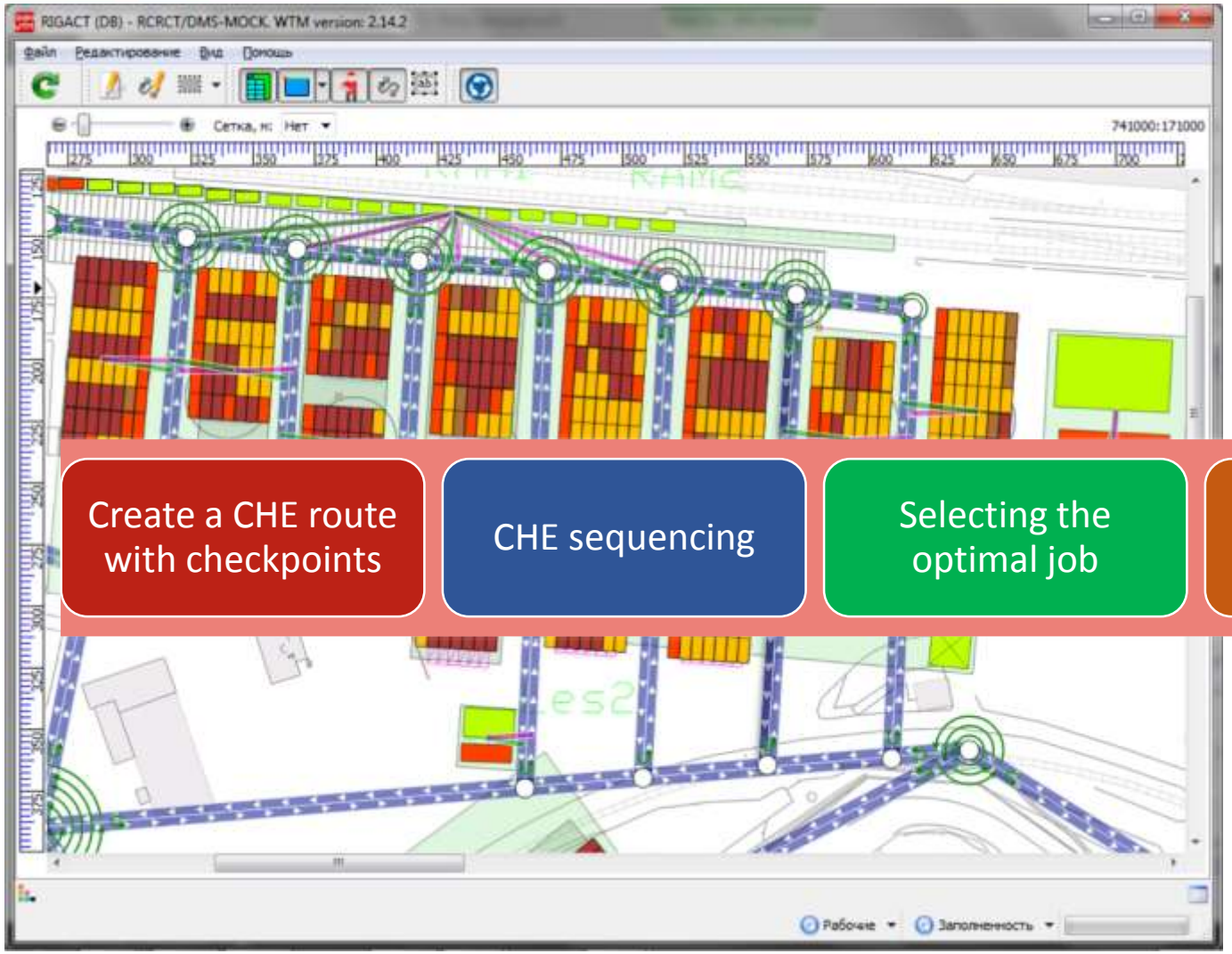


Dynamic stacking: strategies



The specific location in a stack is chosen by the system in accordance with assigned putaway strategies. For example, unoccupied locations at the lowest tier are taken first.

Equipment pooling and routing optimization



15%

Increased efficiency of MHEs thanks to using forecasting methods when an assignment is generated

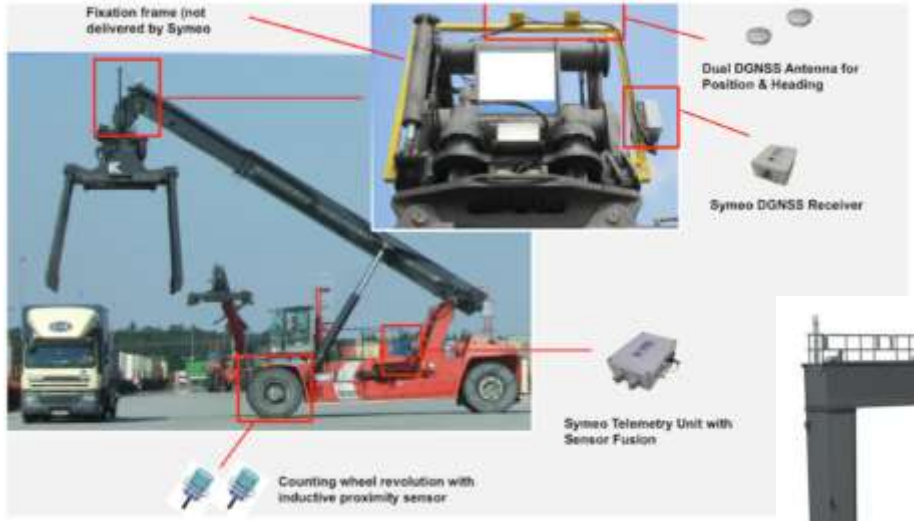
- Create a CHE route with checkpoints
- CHE sequencing
- Selecting the optimal job
- Route search
- Control job performance

RS efficiency

RS empty runs reduction by 35-40% thanks to “dual cycling” or ability of handling 2 containers (inbound and outbound) in one go.

Equipment automation

NIS national navigation services provider GLONASS



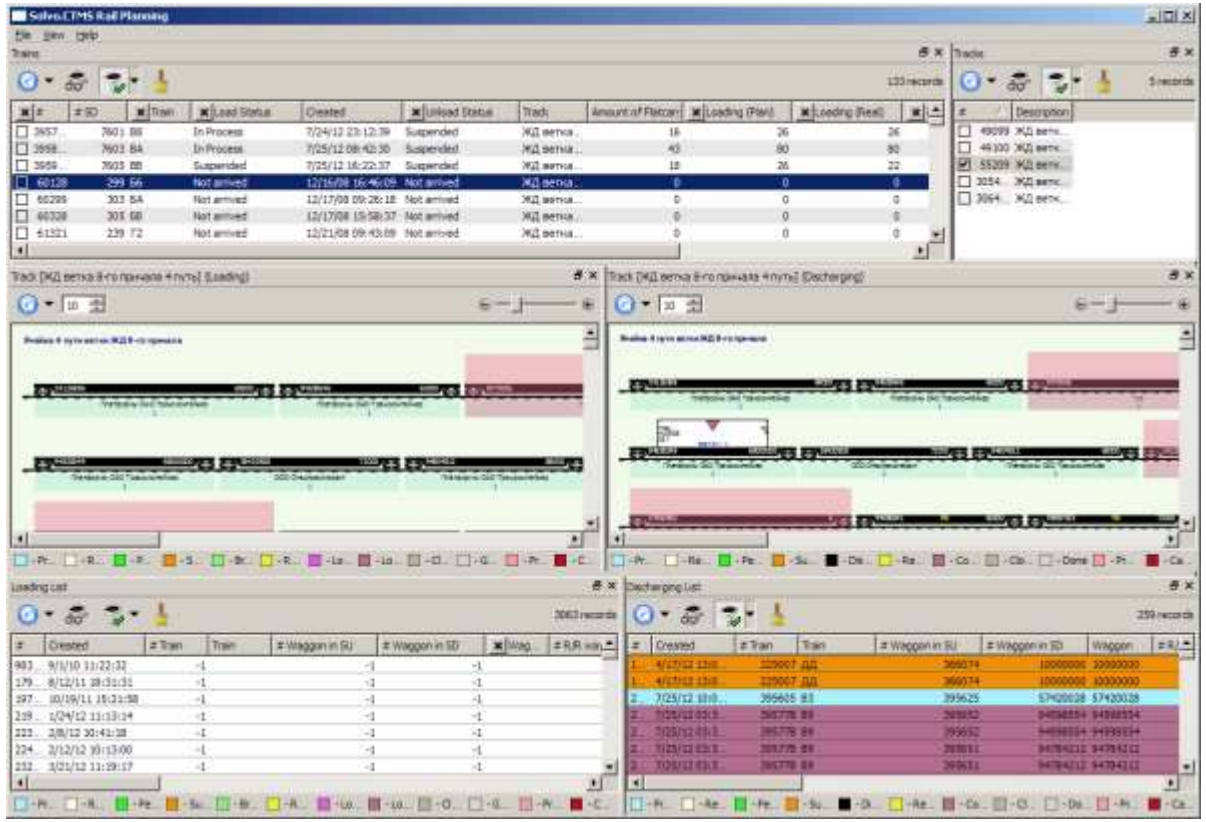
Used **for precise positioning of CHEs under any conditions**, allow to identify the location and other characteristics of CHE even the weight of the container in real time as soon as the container is grabbed by the spreader, even in tight spaces due to closely placed container stacks, which typically block the direct GPS signal between the receiver and satellite

Automated multi-parameter rail load and discharge planning/block train scheduling

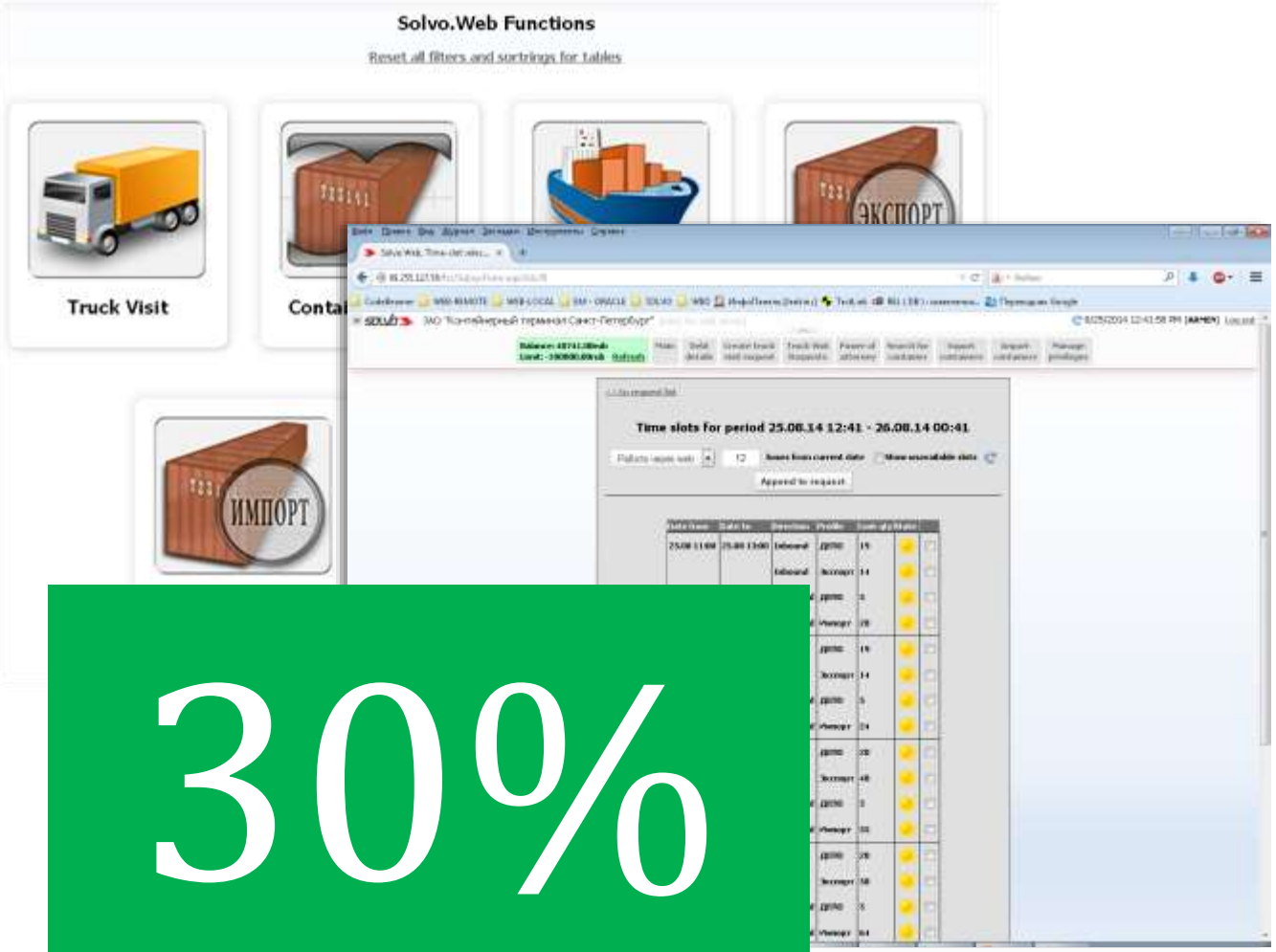
Planning accuracy is increased

28%

Automatic planning of rail car staging increases personnel productivity



Preliminary vehicle booking



30%

Faster truck turnaround

Solvo.VBS regulates traffic flows of containers and heavy trucks to and from the port area and facilitates
automation of the port and terminals gate processes using time-slotting technology and remote truck-visit requests.

Cargo pick-up authorized by e-signatures

Solvo supports the use of electronic authorizations signed with e-signatures for the pick up of import containers at the port.

- Authorizations formalized by forwarders for nominated containers through web-portal
- Authorization can be given to whitelisted truck drivers only
- Authorizations are signed using e-signatures right on the web-portal

90%

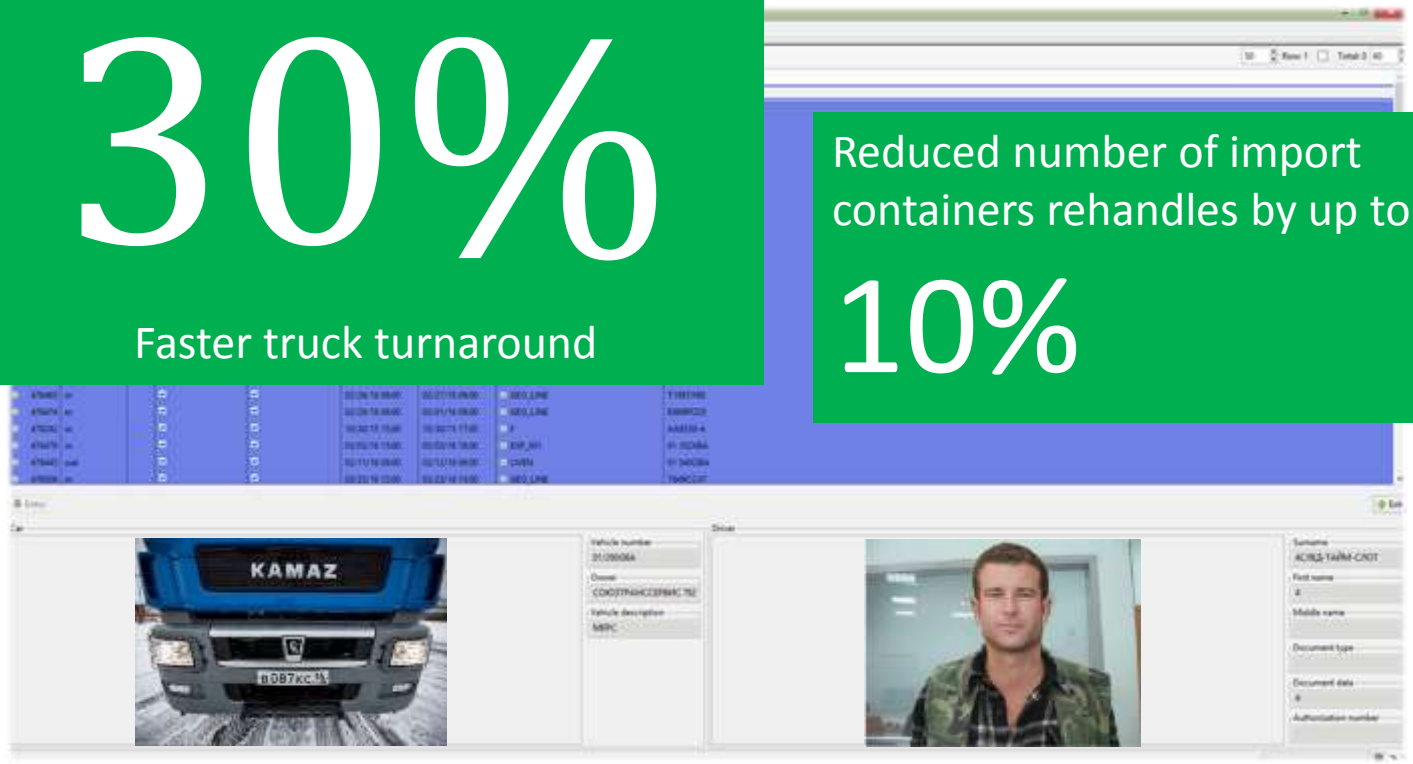
Elimination of the risk of forgery and releasing cargo to unscrupulous carriers or violators

Integrated gate-in/gate-out management

Streamlined gate management processes: gate entry/exit, security check, truck-driver management in service center and more, allowing a significant reduction in truck turn-around time and rehandles in the yard.

30%

Faster truck turnaround



Reduced number of import containers rehandles by up to

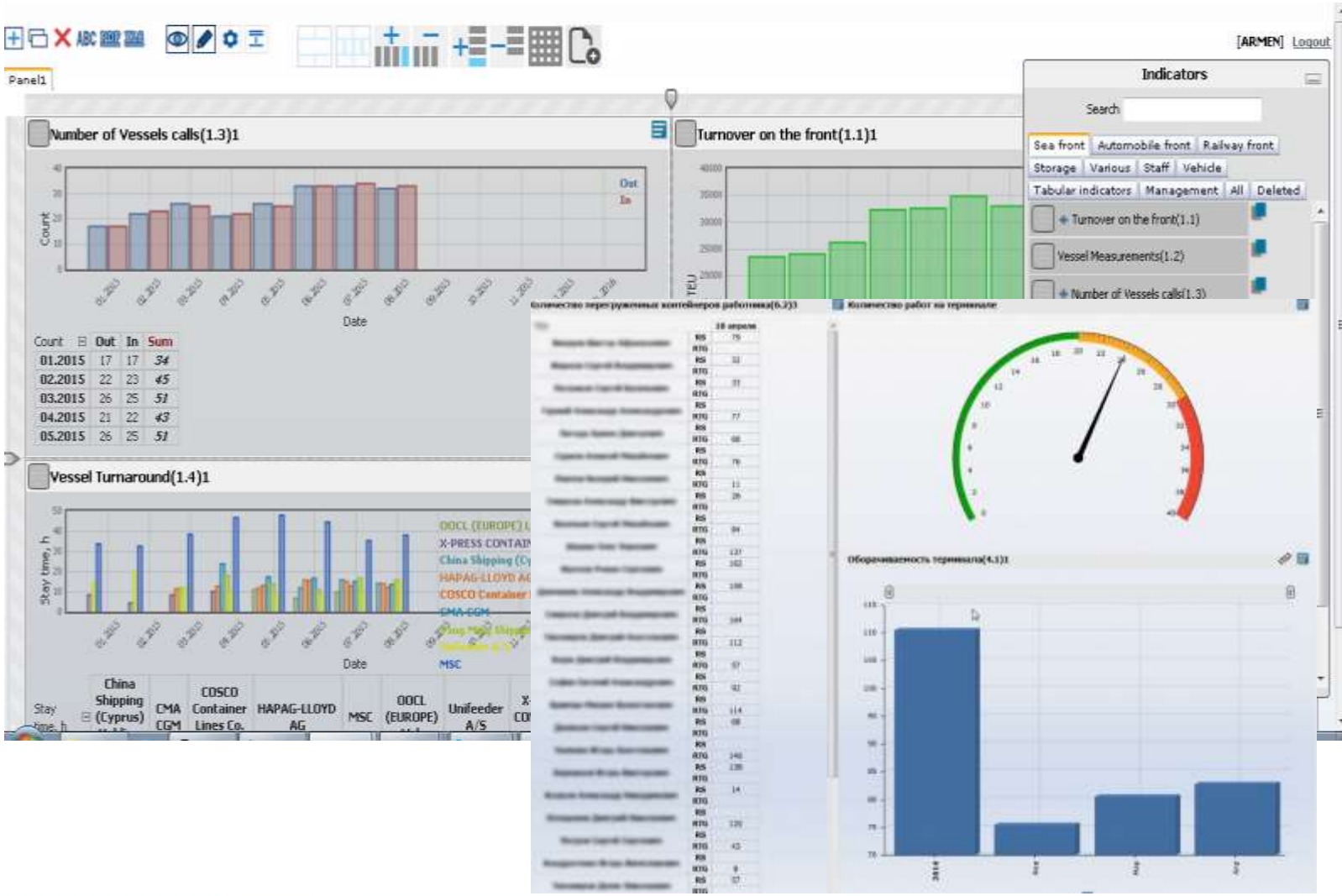
10%

KPI dashboards

Highlights:

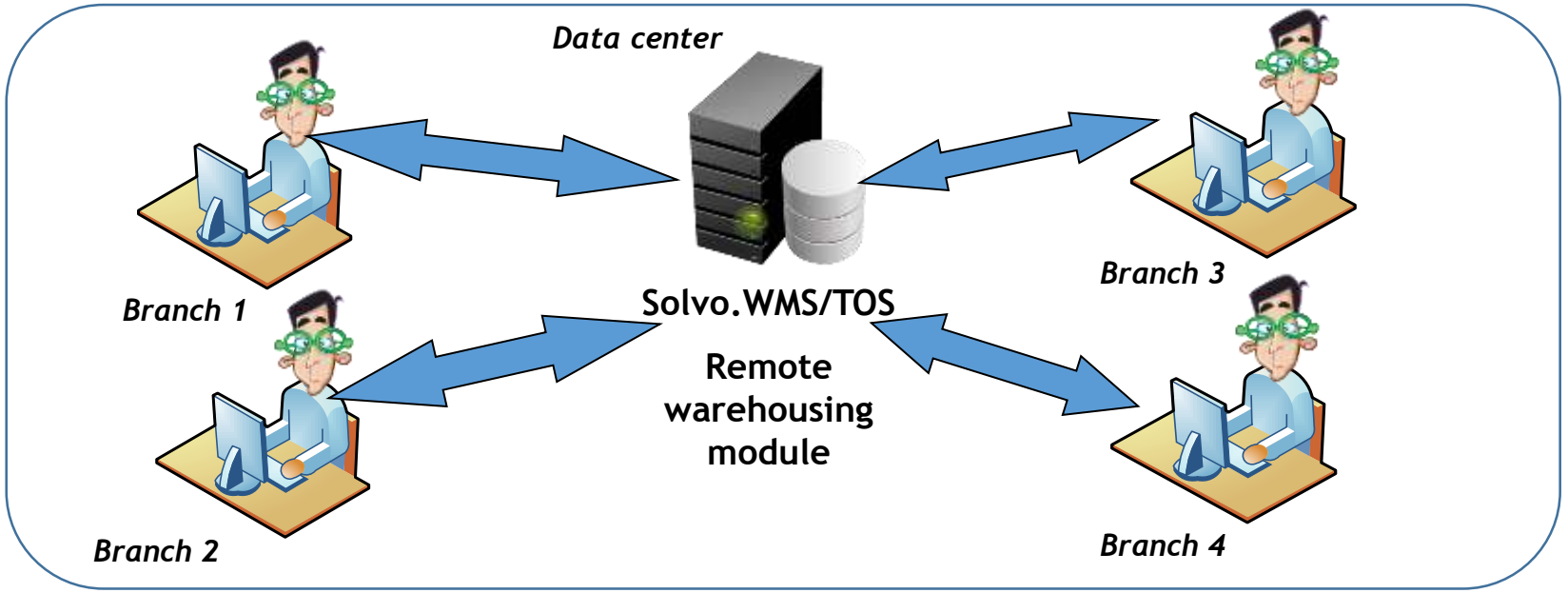
KPI dashboards are designed specifically to visualize all kinds of stats about operations of a stevedoring company.

The user works with KPI indicators through a special web-based GUI. The main window is an interactive dashboard the user can easily manage. The panel or dashboard consists of tabs similar to those of a WEB browser.



Multi-site = better visibility and lower deployment cost

- Allows to manage remote sites from a single location;
- Each warehouse has unique parameters and settings



Conclusion

Small increases in efficiency = Greater efficiency across the entire operation

- Increasing productivity and attractiveness doesn't always require large capital investment (cranes, berths etc)
- There are opportunities for short/medium term gains (ROI)
- Put your organization under the microscope and look for areas where efficiencies can be made

Solvo.TOS

Container terminal operating and document management system

Reefer management	EDI	KPI	Document management	Resource planning
Vessel and berth planning	Equipment dispatch	Gate planning and processing	Rail planning and processing	Yard planning and optimization
CFS	Billing	Web	Customs compliance	Advanced reporting

A state-of-the-art system tailored to the specific needs of the customer. Yet even the most basic out-of-the-box configuration enables effective and streamlined planning, equipment control and terminal workflow management in one database.

General cargo and Ro-Ro handling

Tallyman from Ust-Luga port (Ferry complex)

Inspector from Ust-Luga port (Break-Bulk terminal Yug-2)

Solvo.TOS Cargo

Supports

- ✓ Break-Bulk
- ✓ Project cargo
- ✓ Containers
- ✓ Bulk, liquid cargo
- ✓ Ro-Ro

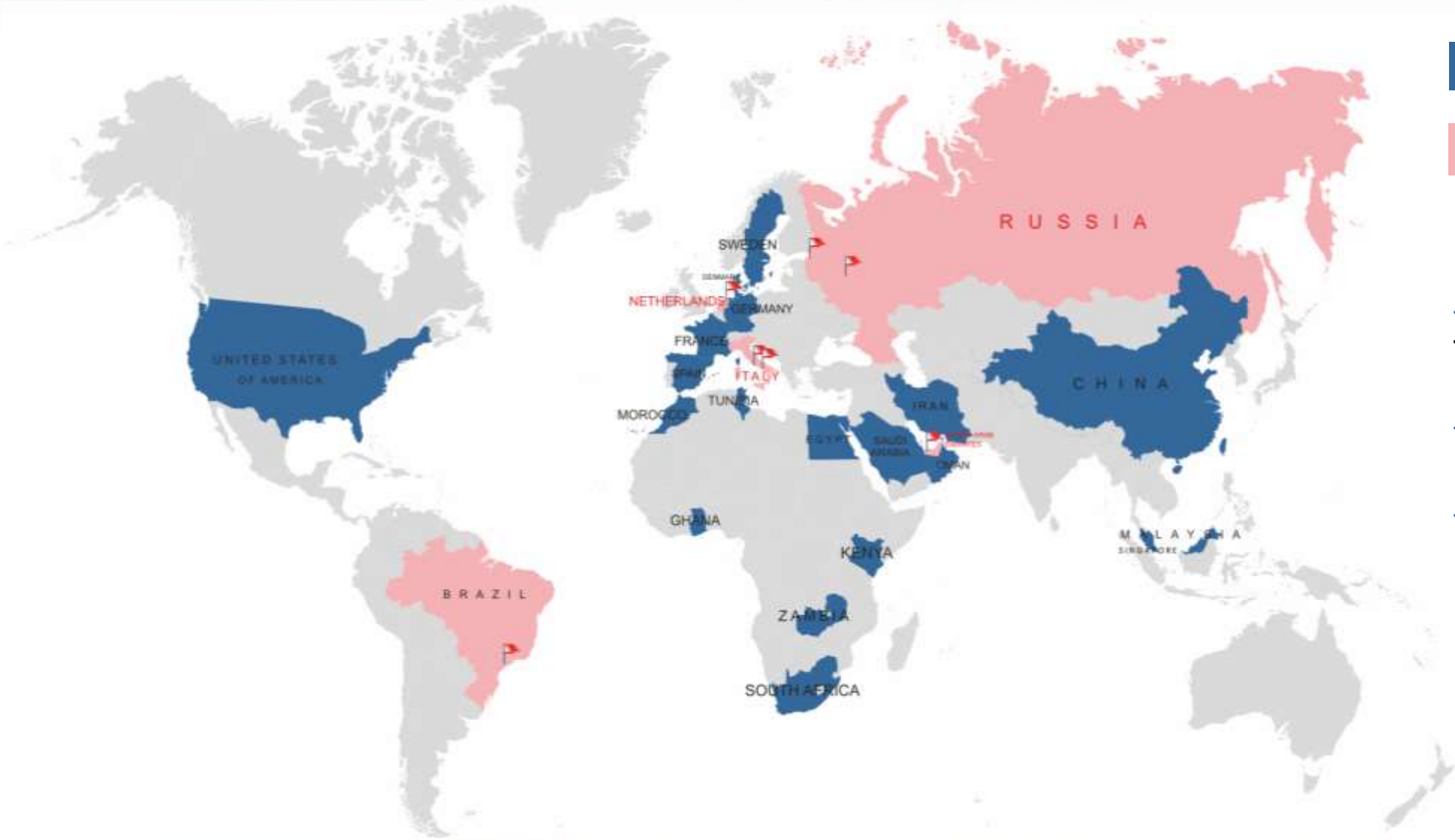
Features

- ✓ All-new WEB-interface
- ✓ Real-time load ID using barcoding or RFID
- ✓ Real-time process management using interactive graphic tools
- ✓ Resource planning and work-order management
- ✓ Integrated billing module

Multinational brands – Solvo's customers

200+ projects

Solvo's international offices and partners



Solvo's partners

Solvo's offices:

HQ: Saint-Petersburg, Russia

International office for Europe: The Hague, The Netherlands

International office for Middle East: Dubai, UAE

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Representative office: Moscow, Russia

Representative office: Rome, Italy

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Thank you for your attention!

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