Smarttwin
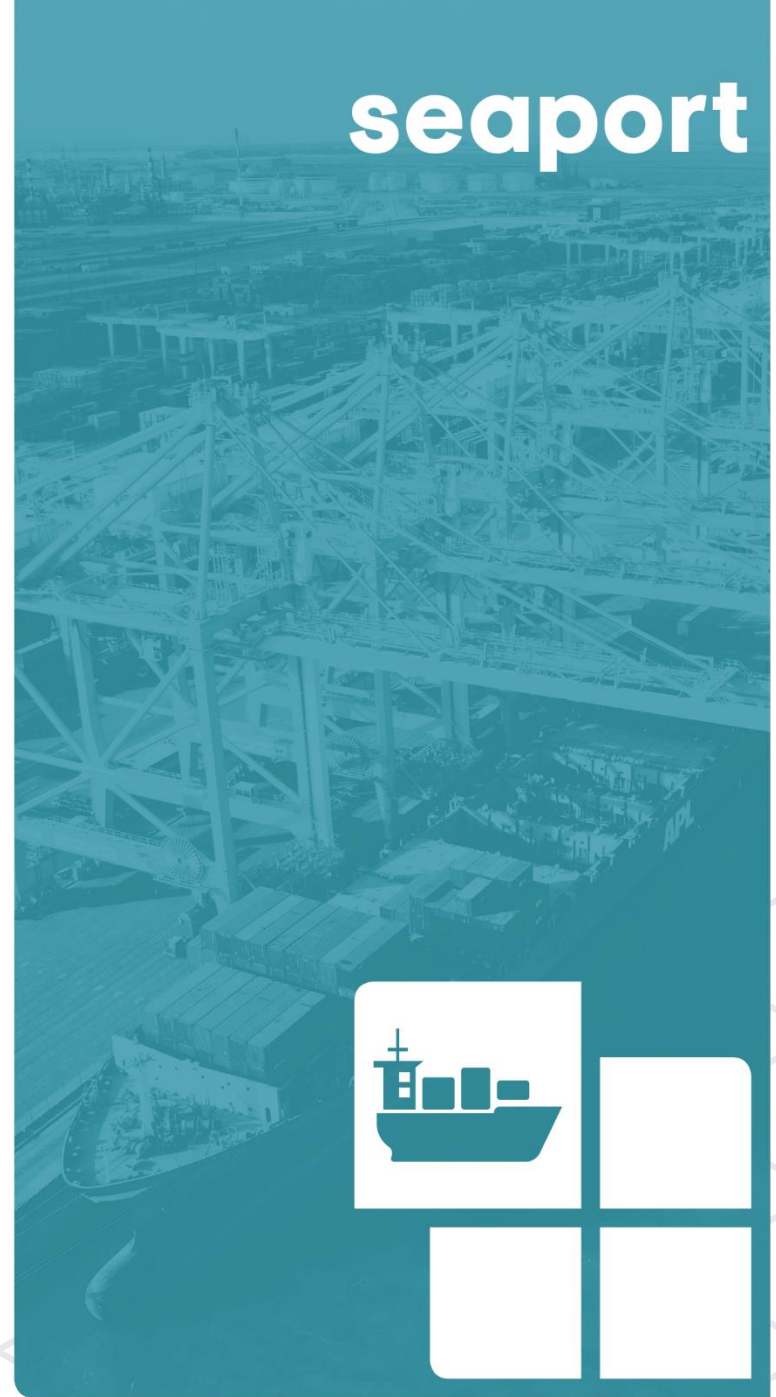
seaport

DIGITAL TWIN – FASHION OR NECESSITY?

SmartTwin (ST) - Solution known as «Enterprise Digital Twin» means the paradigm connection of physical and digital world through the interaction of a person, equipment and analytical software. Enables control and improvement of production cycle operations, thereby simplifying operational activity, saving resources, diminishing the number of failures, extending the service life of the equipment

INFORMATION SYSTEMS

HUMAN RESOURCE MANAGEMENT (HRM)

ENTERPRISE ASSET MANAGEMENT (EAM)

GLOBAL NAVIGATION SATELLITE SYSTEM (GPS/GLONASS)

BUSINESS INTELLIGENCE (BI), DASHBOARDS

QUALITY MANAGEMENT (QM)

MATERIAL REQUIREMENTS PLANNING (MRP) SUPPLY CHAIN MANAGEMENT (SCM)

THINKING PROCESSES (THEORY OF CONSTRAINTS (TOS))

PRODUCTION ACCOUNTING (MES, ERP)

KNOWLEDGE MANAGEMENT (KM)

AUGMENTED REALITY (AR)

REAL-TIME MANAGEMENT

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)

ADVANCED PLANNING AND SCHEDULING (APS)

VOLUMETRIC DIGITAL MODEL

SITUATIONAL ANALYSIS

BIG DATA

Smartwin

STRATEGIC DECISIONS

+ The only entry point for obtaining information

+ Data accumulation and plenty of objects to control

+ Modeling of divisions activities and objects locations

+ Production analysis

+ Production process optimization

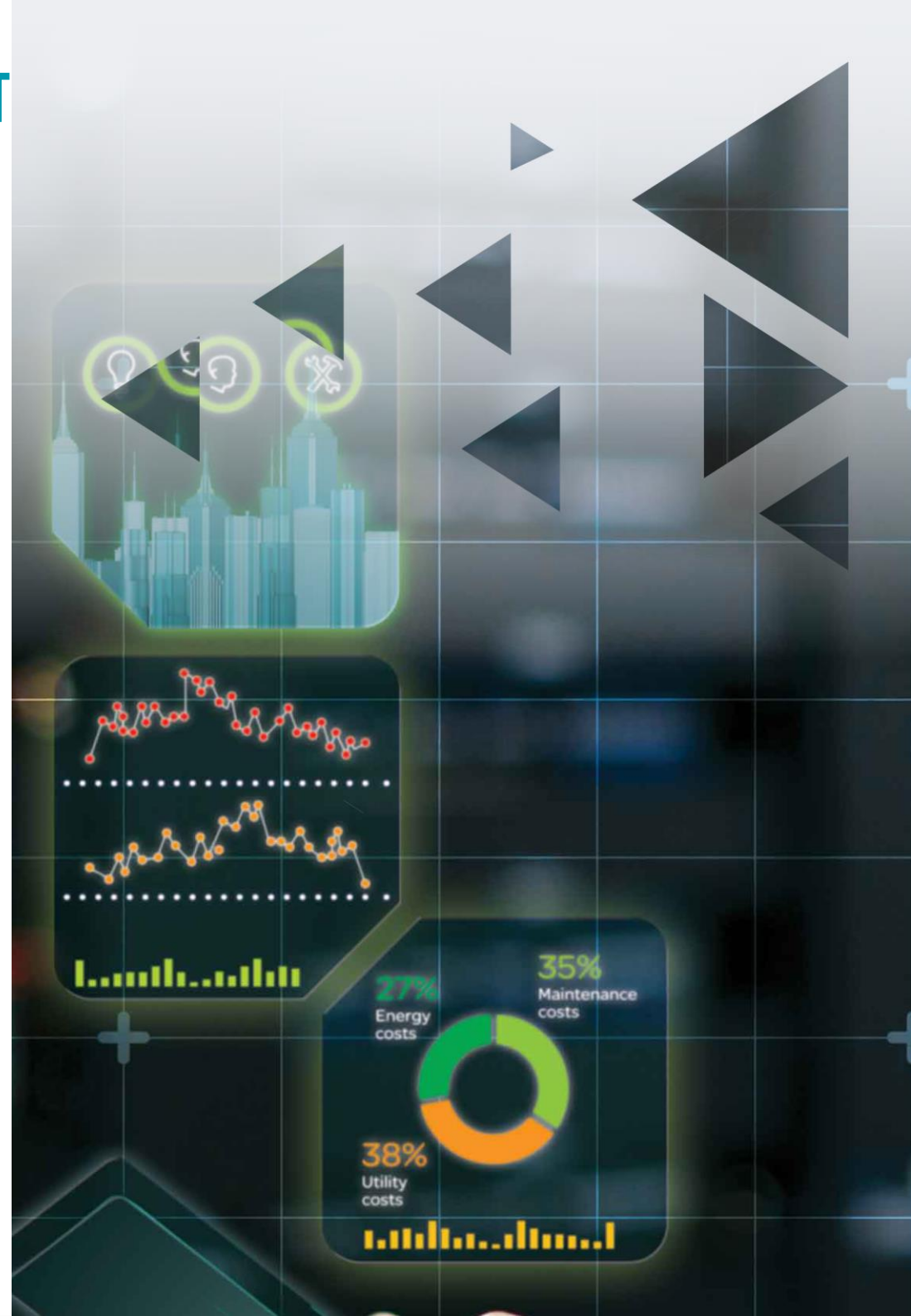+ **Management of the enterprise and decision support!**

PRODUCTION PROCESS SUPPORT

+ Visualization of analytical, statistical and dynamic information

+ Up to 50% acceleration in resolution of various production tasks

+ Repairs and downtime duration and quantities reduction

+ Machinery and equipment maintenance costs reduction

+ Accident free ship berthing

+ Work planning and monitoring of operation condition of crane equipment

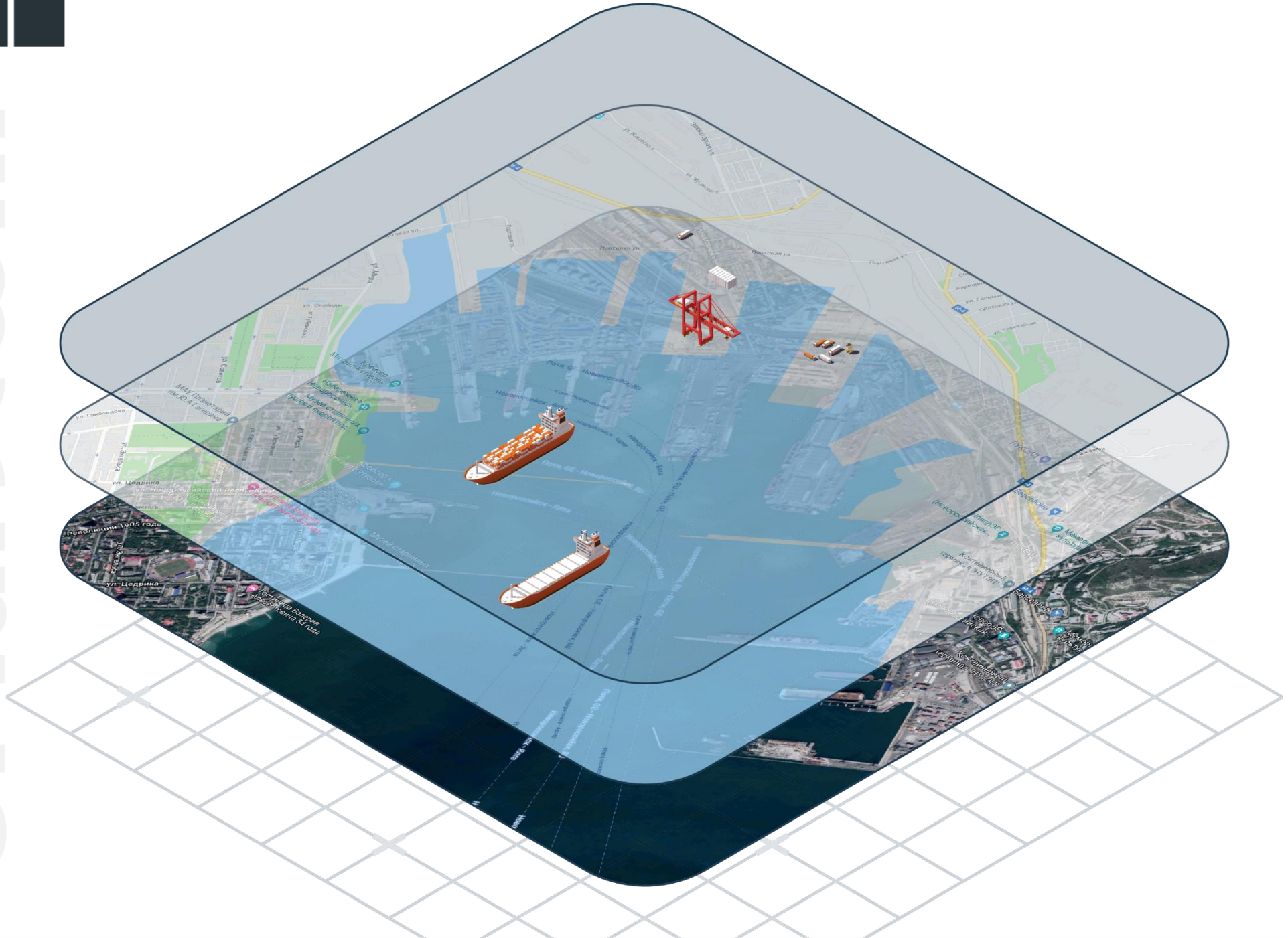# PRODUCTION PROCESS SUPPORT

+ Planning of cargo placement and control of warehouse capacities

+ Vessel cargo loading process optimization

+ Railway and truck traffic management

+ Asset management

+ Technological processes visualization
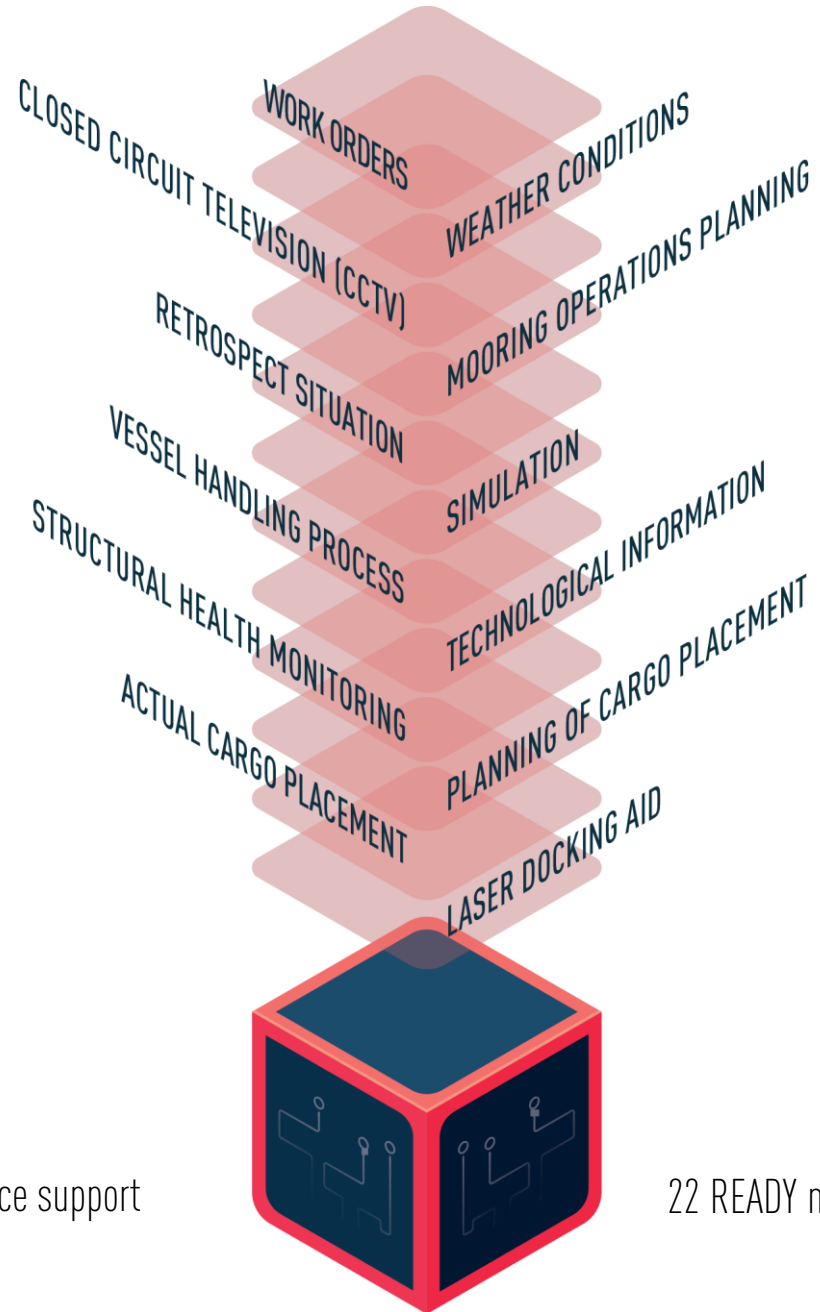
+ Providing timely and reliable information

SmartJus

INTERACTIVE MULTILAYERED VISUALIZATION

EVERYTHING IN "SINGLE-WINDOW" MODE

WORK ORDERS

WEATHER CONDITIONS

CLOSED CIRCUIT TELEVISION (CCTV)

MOORING OPERATIONS PLANNING

RETROSPECT SITUATION

SIMULATION

VESSEL HANDLING PROCESS

TECHNOLOGICAL INFORMATION

STRUCTURAL HEALTH MONITORING

PLANNING OF CARGO PLACEMENT

ACTUAL CARGO PLACEMENT

LASER DOCKING AID

Multi-language user interface support

22 READY made information layers for the port

SmartWin

ABOUT THE SYSTEM

+ Accurate geographic coordinates display of port area allows to determine correct distance between objects (points) on the map

+ 2D and 3D display

+ Zoom-in-out support

+ Interactive displaying of objects and their parameters in real time and retrospect (location and condition changes of objects) in layers

+ Adding and editing map objects

ABOUT THE SYSTEM

Smartjus

+ Receiving and displaying data from weather sensors and weather monitoring systems

+ Objects and cargo search

+ Role-based security permissions model
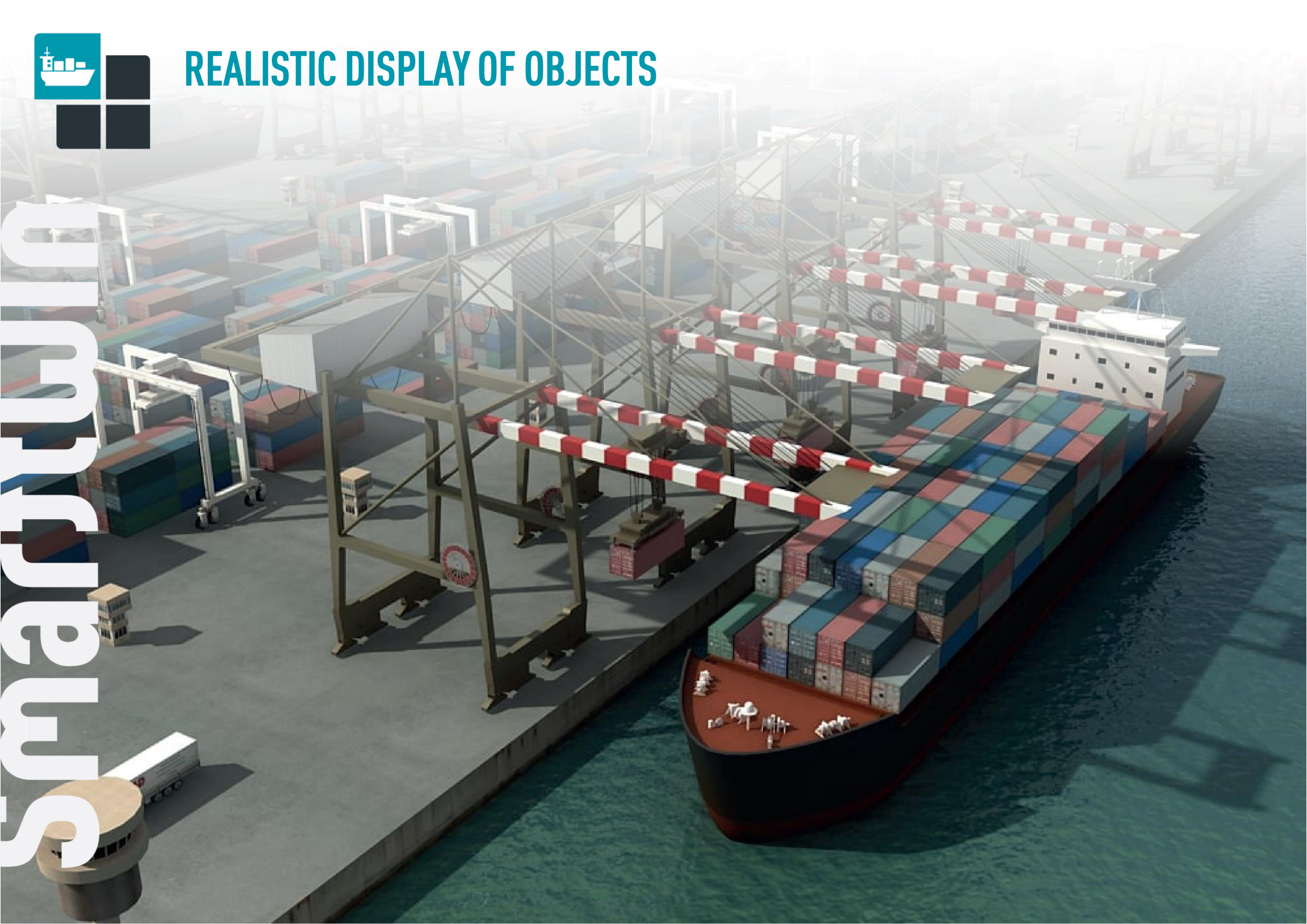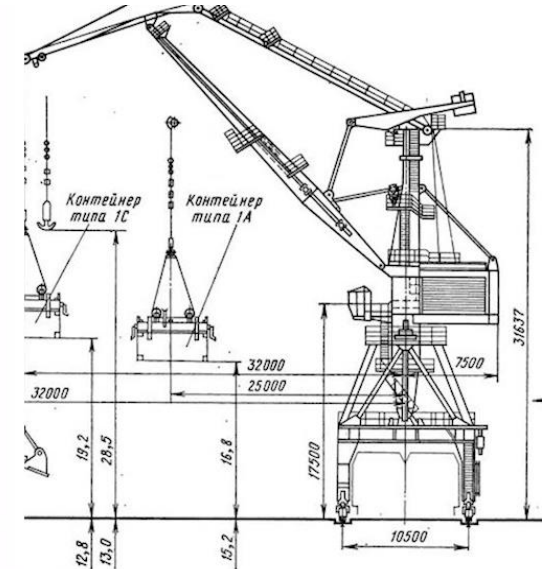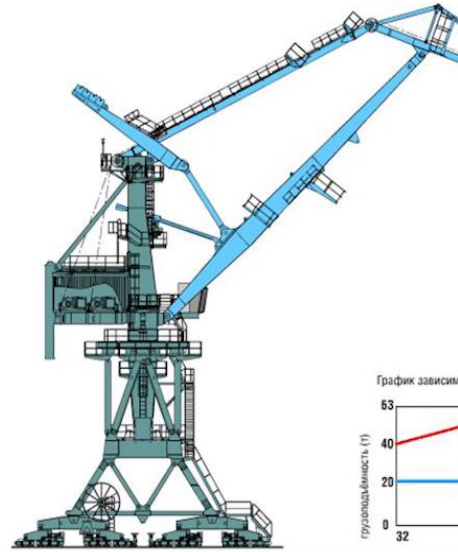
+ Personal user settings

+ Objects change log

INFORMATION ABOUT VESSELS AND THEIR LOCATION IN THE HARBOR

+ Integration with Automatic Identification System (AIS)

+ Collision prevention means (ship-to-ship mode)

+ Means of obtaining information about vessels by coast guard personnel

+ Vessel traffic control center tool (ship-to-coast mode)

+ Vessel monitoring and tracking tool

OPERATIONAL CONTROL

+ Mooring operations

+ Container terminal operations and cargo handling operations

+ Checkpoints management and trucks visit management

+ Security systems management

+ Providing detailed information about cargo, vessel, consignee, consignor etc.

+ Providing the detailed information about conditions of equipment and machinery

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WAREHOUSING

+ Storage places markup

+ Visual planning of cargo placement in storage area

+ Obtaining visual information of the implementation of the cargo placement plan

+ Obtaining visual information about containers actual placement

+ Obtaining visual information about planned containers placement
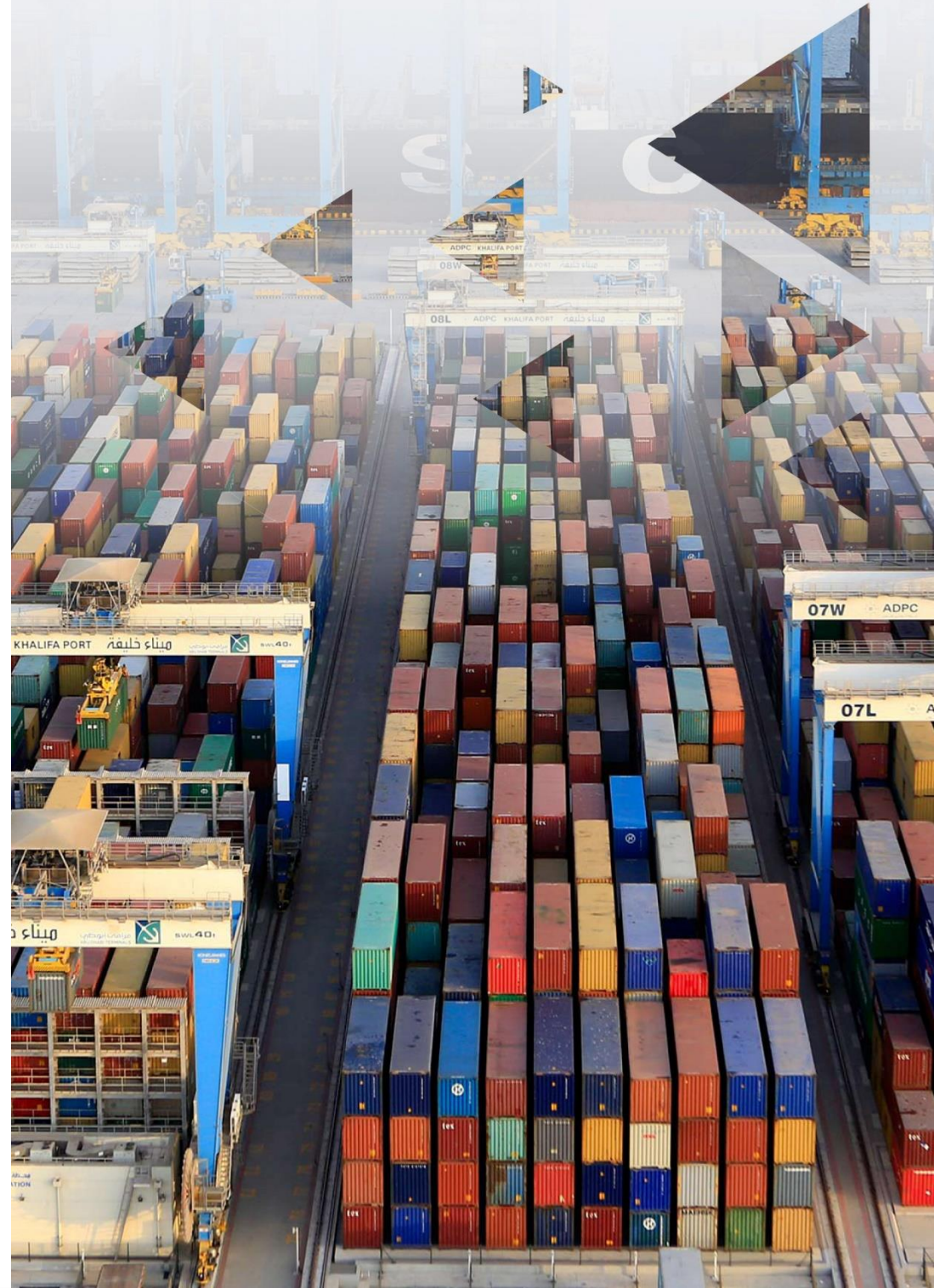
+ Obtaining detailed cargo information from invoices

WAREHOUSING

+ Obtaining visual information on the implementation of the cargo placement plan

+ Obtaining visual information of cargo placement, planned for handling of the vessel

+ Obtaining actual and planned status of filling oil reservoirs and granaries

+ Obtaining actual characteristics and history of changes in the state of units of grain pipelines and oil pipelines
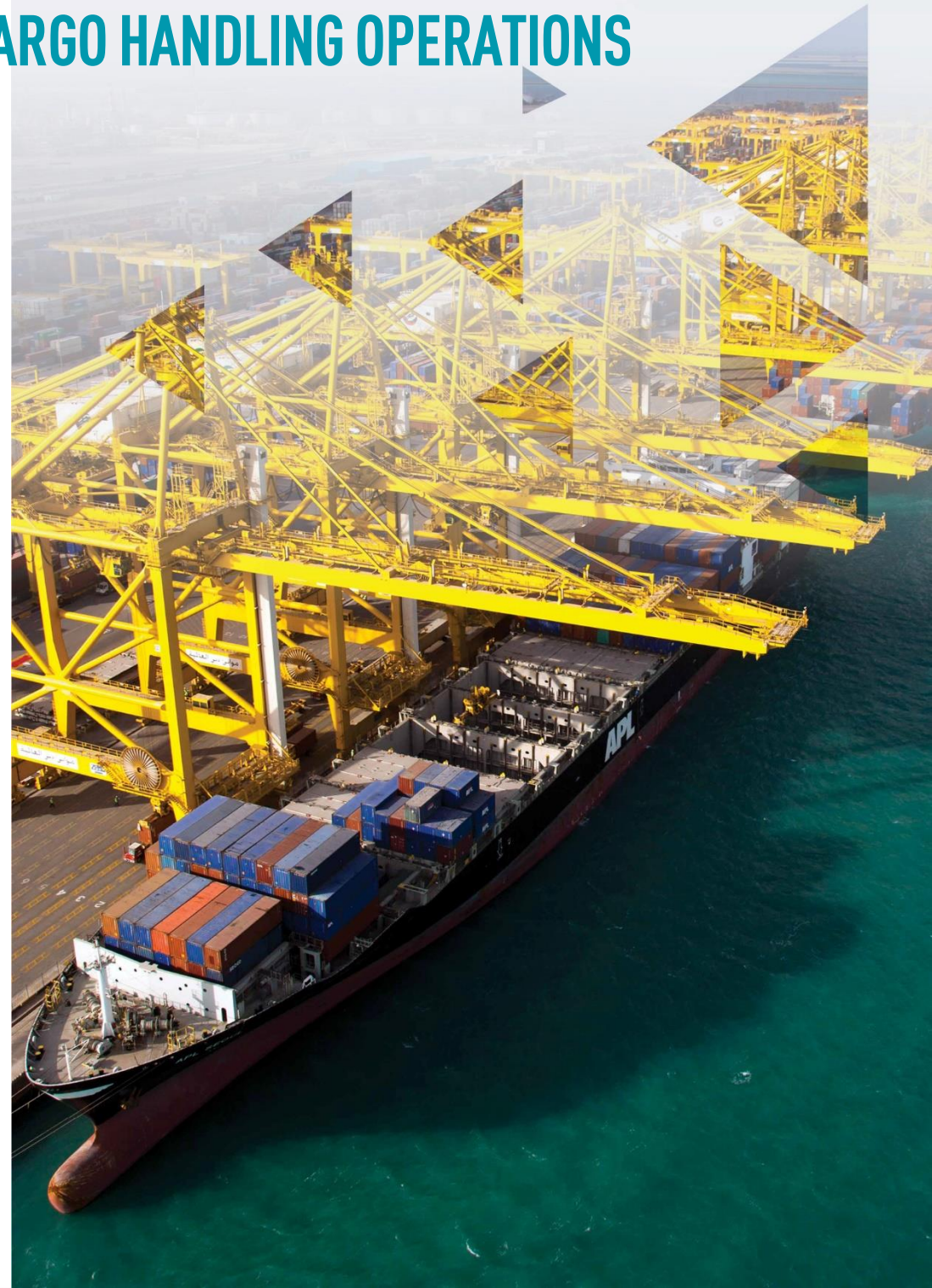
SmartWIn

DISPATCHING AND EXECUTING CARGO HANDLING OPERATIONS

+ Mooring planning and confirmation tools

+ Visualization of vessel processing cycle: planning, mooring, handling, unmooring etc.

+ Obtaining real time information from Automatic Identification System (AIS)

+ Predictive vessels position modeling tool at berths

+ Visualization of condition of cranes, vehicles, handling machinery

+ Visualization of location of cranes, vehicles, handling machinery

SmartJaUS

VESSEL HANDLING INFORMATION

+ Vessel handling process tracking

+ Obtaining visual information about the actual placement of cargo in the holds of vessels (In case of the data availability in the main information system)

+ Obtaining visual information about containers actual placement at vessel

SmartJus

CRANES AND HANDLING MACHINERY

+ Display of equipment by types and groups

+ Display of the actual location and condition of the equipment in real time

+ Obtaining real time technological information about equipment (fuel level, engine hours etc)

+ Obtaining change log of equipment location and condition, execute visual analysis

SPECIALIZED VEHICLES

+ Location control based on satellite monitoring systems

+ Determination of allowed areas for parking, moving and working

+ Informing vehicles driver's about allowed areas according to work orders

+ Processing of critical violations up to the blocking of further movements of vehicles

ENGINEERING NETWORKS AND SYSTEMS

+ Display of engineering networks in 3D

+ visualization of conditions of hosts, units, sensors with change log

+ Loading objects from computer-aided design (CAD) systems

+ Providing access to drawings of the objects

SmartUin

SECURITY SYSTEMS

+ Visualization of the location objects of CCTV system

+ Viewing streaming video from CCTV objects

+ Pan-tilt-zoom (PTZ) cameras control

+ Display covered areas with CCTV system

+ Visualization of the boarders and conditions of Physical Access Control System (PACS) objects

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RAILWAY TRANSPORT AND TRUCKS

+ Visualization of the trucks location at map

+ Visualization of the wagons location at railway schema

+ Obtaining information about cargo, carrier, consignee, consignor etc.

+ Obtaining information about actual condition and cargo handling plans

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INTELLIGENT LIGHTING AND ENERGY EFFICIENCY

+ Takes into account the level of natural light

+ Control of the elements of the power network in manual mode and / or semi-automatic mode

+ Providing energy efficiency statistics

TECHNOLOGICAL MONITORING

+ Monitoring of technological process parameters

+ Equipment loading monitoring

+ Monitoring of equipment resource costs

+ Monitoring stock balances

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TECHNOLOGICAL MONITORING

+ Monitoring of quality indicators

+ Environmental monitoring

+ Energy consumption monitoring

+ Digest and production reports

SmartWin

ENERGY MANAGEMENT

+ Providing statistics on the efficiency of the energy resources usage

+ Aligning of measured parameters of resource consumption and a production to a single standardized units of measurement (tonnes,Nm3, TOE, Gkal)

+ Energy resource consumption monitoring by areas, workshops and resource allocations schemes

SmartWMS

SITUATION CENTER

SmartTwin is able to self-aggregate in itself all port systems (from low- level controllers, IoT, sensors to business systems), thereby being the main element of the **SITUATION CENTER**

BIG DATA AND ANALYTICS

+ Accumulation of a high number of indicators values from controllers, sensors, devices and systems

+ Ability to access to any snapshot (as to the history of a separate object and the system as a whole)

+ Analytical processing, forecasting and modeling based on data collected over the entire accumulated history

INTEGRATION

+ Providing integration with any information system that is not a closed one

+ Providing wide list of ready connectors to :

- DBMS Oracle, MS SQL Server, PostgreSQL etc.

- Solvo.TOS, Master Terminal, iPortman etc.

- MS Dynamics AX, SAP HANA

- Red Hat JBoss Fuse, IBM Integration Bus, MS BizTalk Server
- MOORiNET

- 1C, ERP Галактика

- MS Office etc.

THANKS

SMART PORT – DIGITAL PORT

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