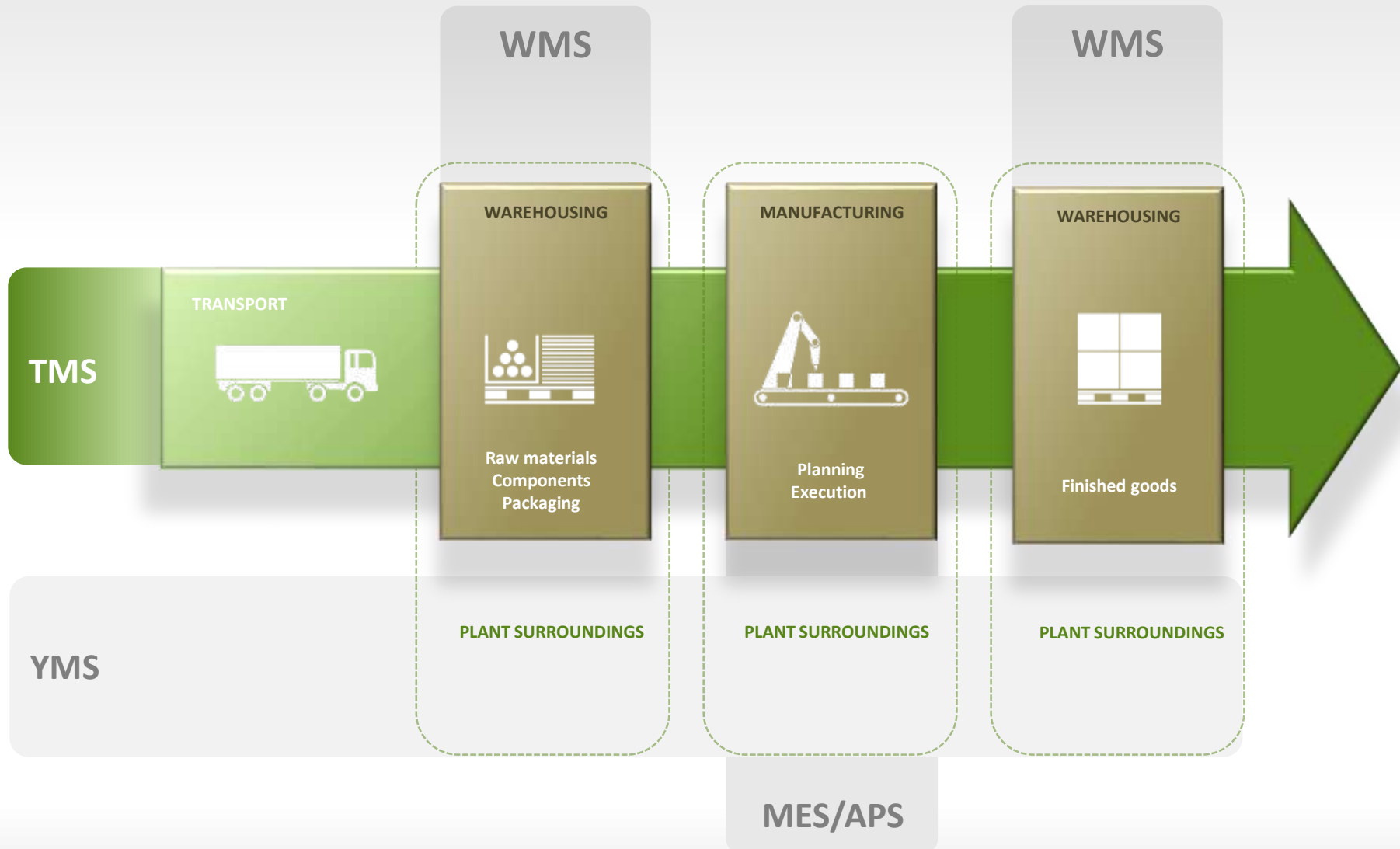
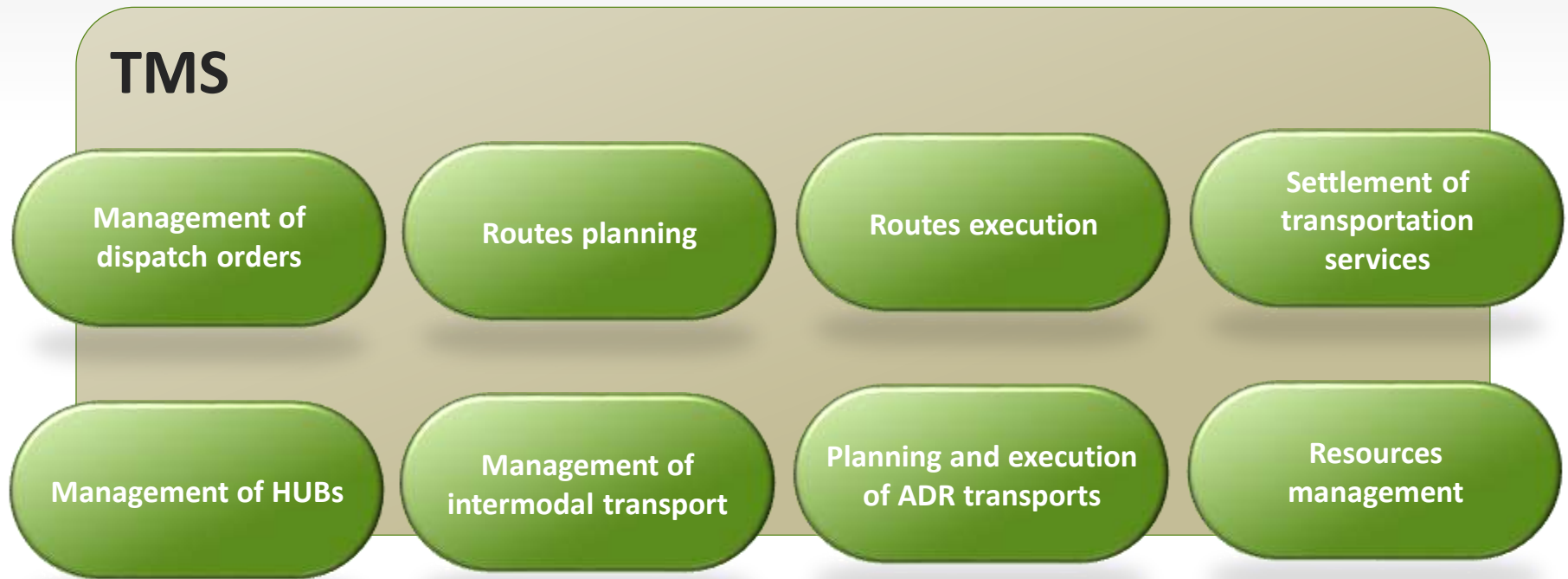
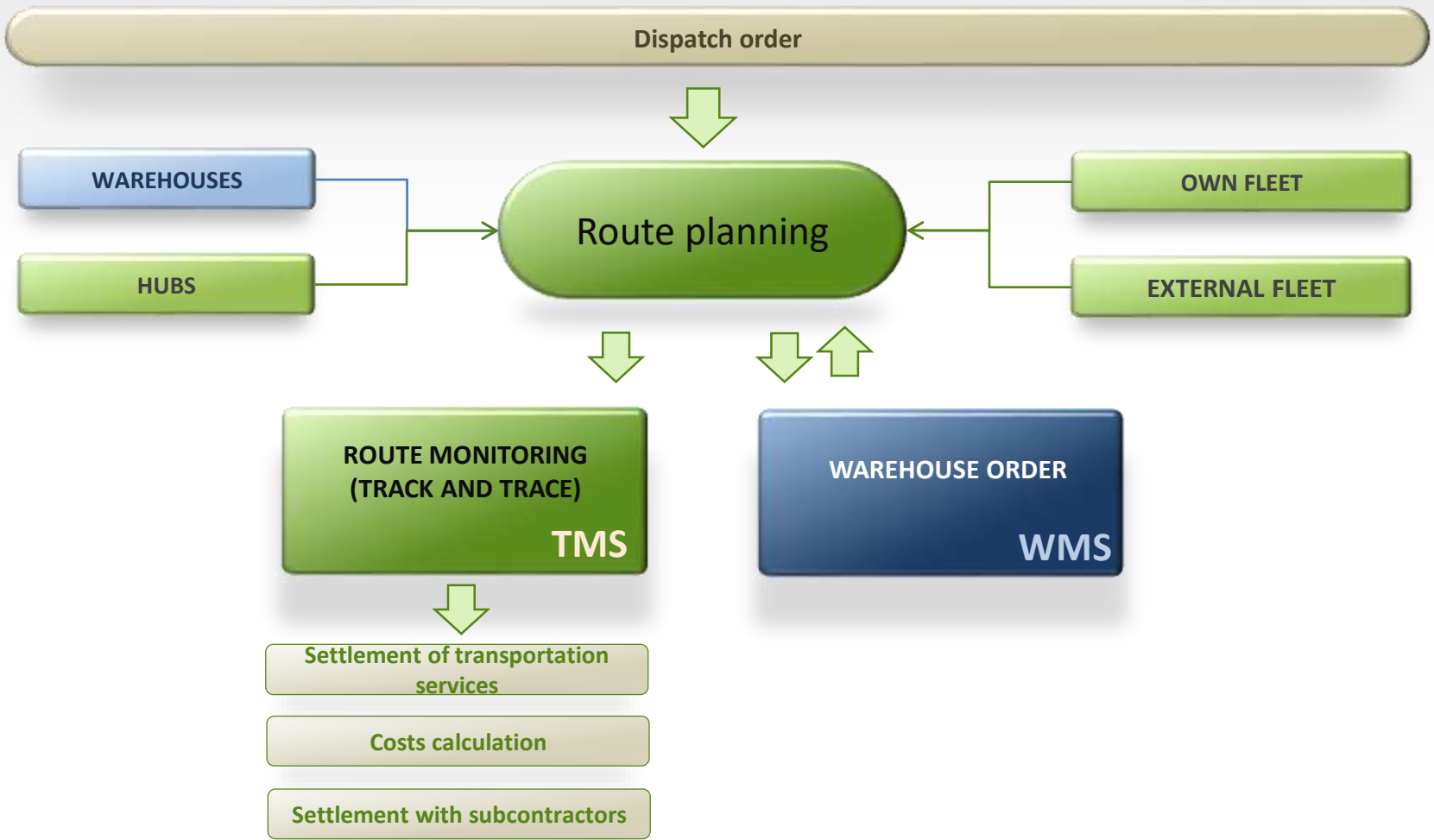


QGUAR TMS according to SCM





Main functional blocks – process approach



DISPATCH ORDER

order to perform transport of goods (calculated into load units), their delivery at a specified date and time, at a specified place, to a specified recipient, not necessarily transported by the same means of transport.

COMPOUND DISPATCH ORDER

set of Dispatching Orders, typically having the same common feature, like: the same ordering customer, the same, common price

LOAD

Defined number of homogenous goods transported between 2 locations as a part of one dispatch order.
Load – means goods with the same features and requirements from transportation point of view.

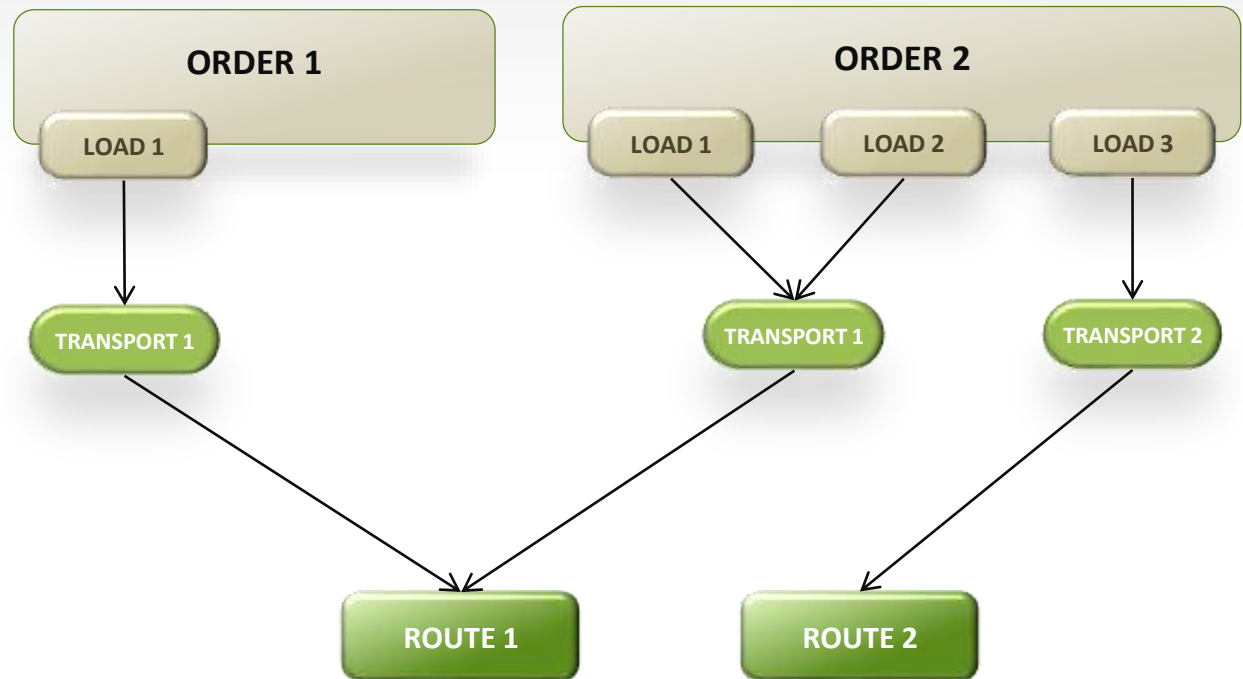
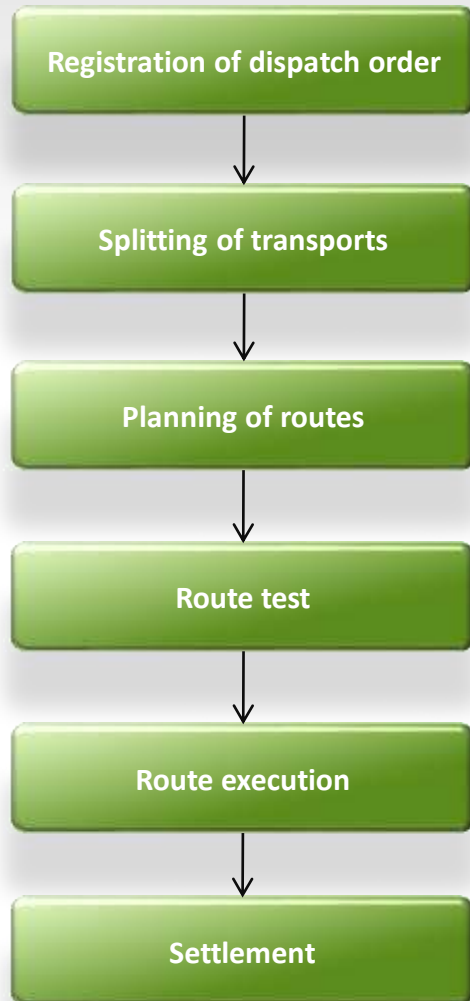
TRANSPORT

item on the waybill and a transport order, using an assigned means of transport, for a specified quantity of load units loaded (e.g.: pallets), transported at the same time, locations, dates and times of their loading and unloading.

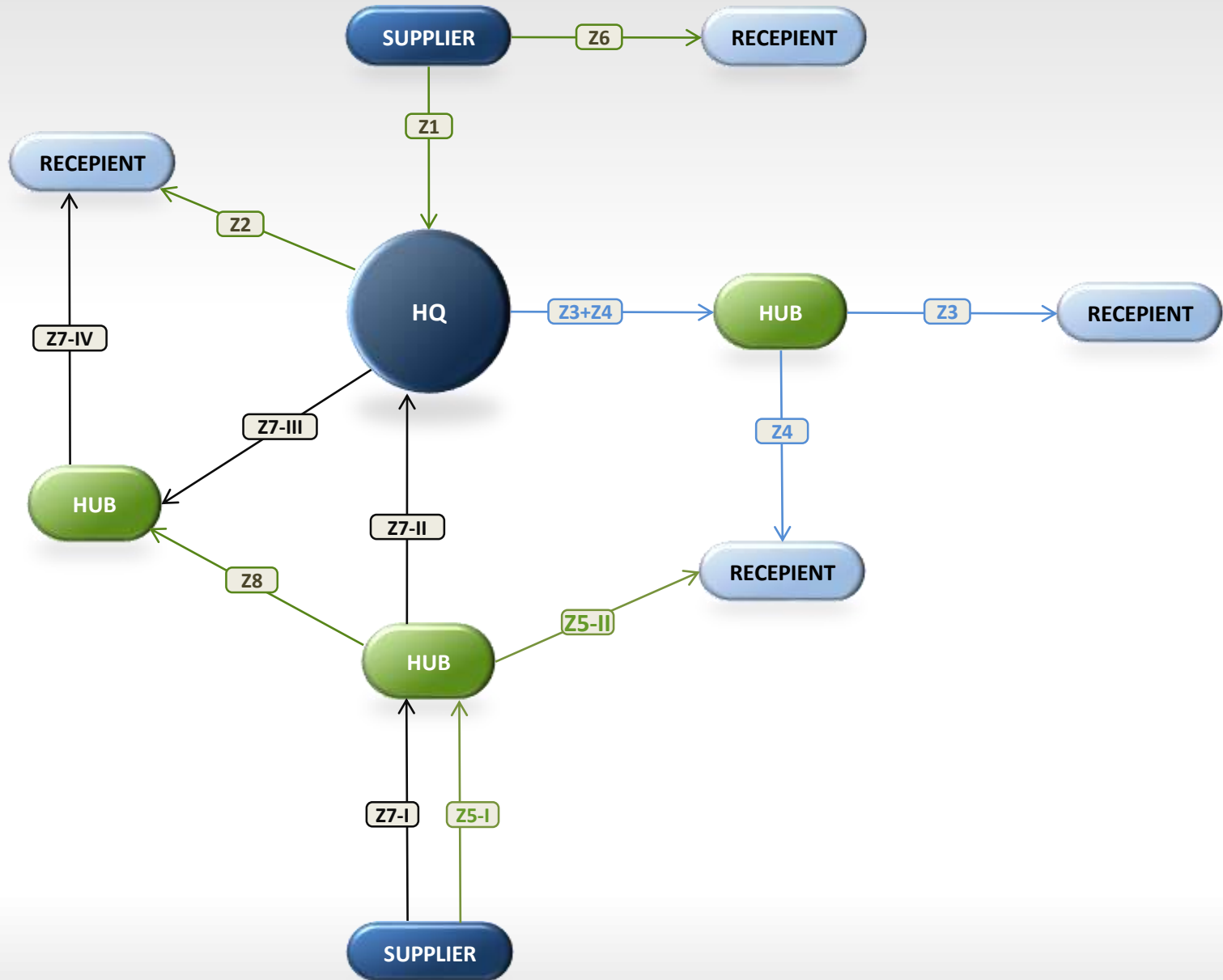
ROUTE

one way of one means of transport, having 1 start, 0..n intermediate stations and 1 end, at each station it is possible to load and unload the load units, the route executes 1..n transports assigned to it, as entire or partial dispatching order.

Course of transportation process



Transport network model



- ✓ Grouping of orders into routes
- ✓ Assignment of transport means
- ✓ Possibility of transportation through HUB
- ✓ Possibility to split the loads and their execution on different routes and transport means.
- ✓ Possibility of routes planning by using reloading points (HUBs)
- ✓ Possibility of multi stage dispatch order execution with controll of:
 - Line haul (to the HUB) and transport to the final destination point
 - Transport with load splitting
 - Combination of both
- ✓ Centralized of dispersed planning (done in the HUBs)
- ✓ Possibility to group the routes on following stages
- ✓ Management of HUBs hierarchy





GPS

Tracking of processes in SCM



GPRS

Sending of package GSM data



GS1

Global system for barcoding of logistic units



RFID

Electronic tags

Dispatch orders – management model

Dispatch order registration

Manually or automatically (import from external system)

Consolidation of orders

Merging of few orders from one supplier, recipient, sender with the same locations into one order

Splitting of orders

Management orders, which are too big for one transport

Linking of orders

Allows for common settlement of orders coming from one orderer

Settlement of orders

Calculation of price of order execution, based on defined pricelists and settlement processes

Choosing the forwarder

Searching the cheapest forwarder for the given order

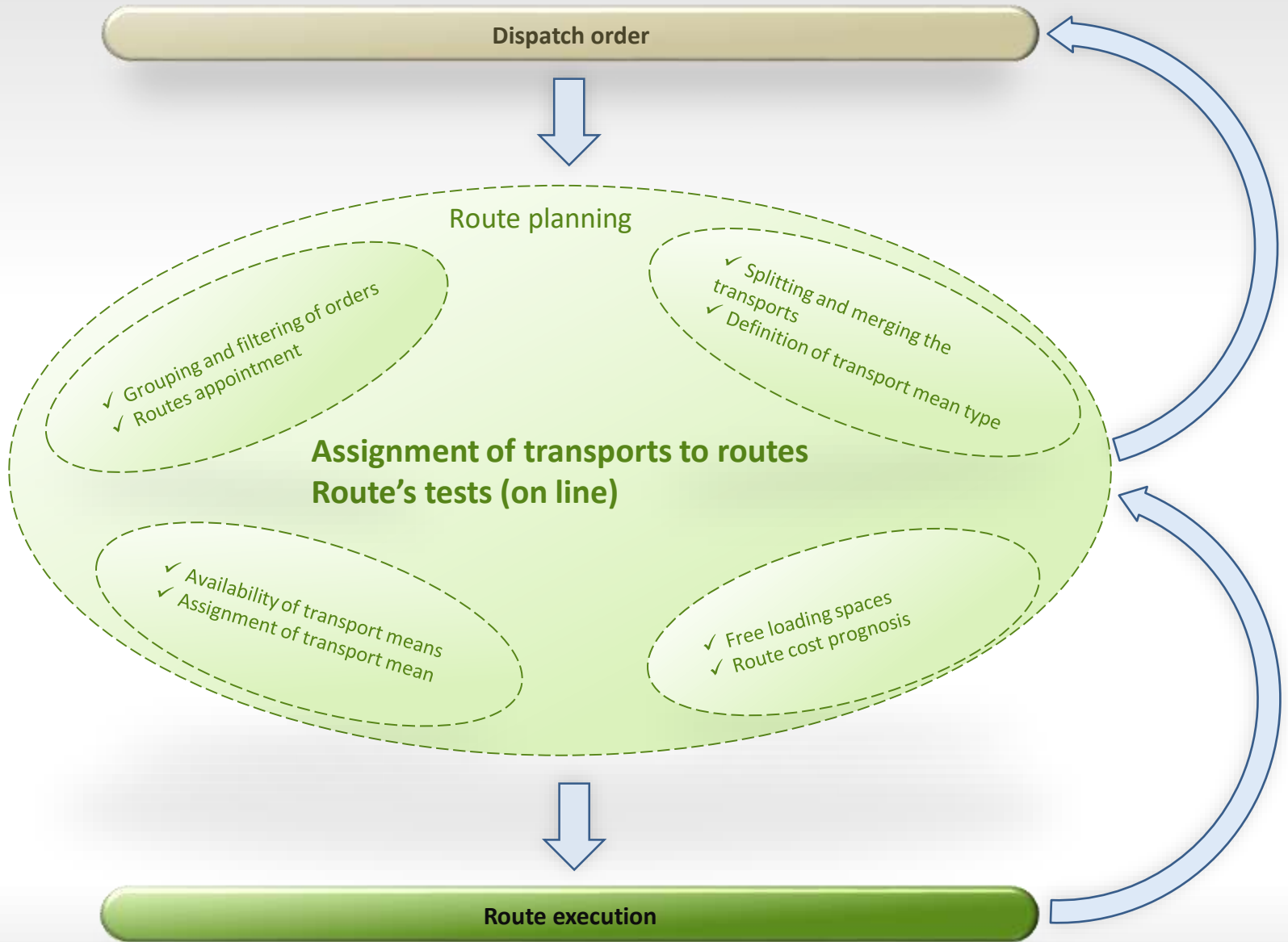
Management of full truck orders

System creates automatically route and blocks assignment of any other orders

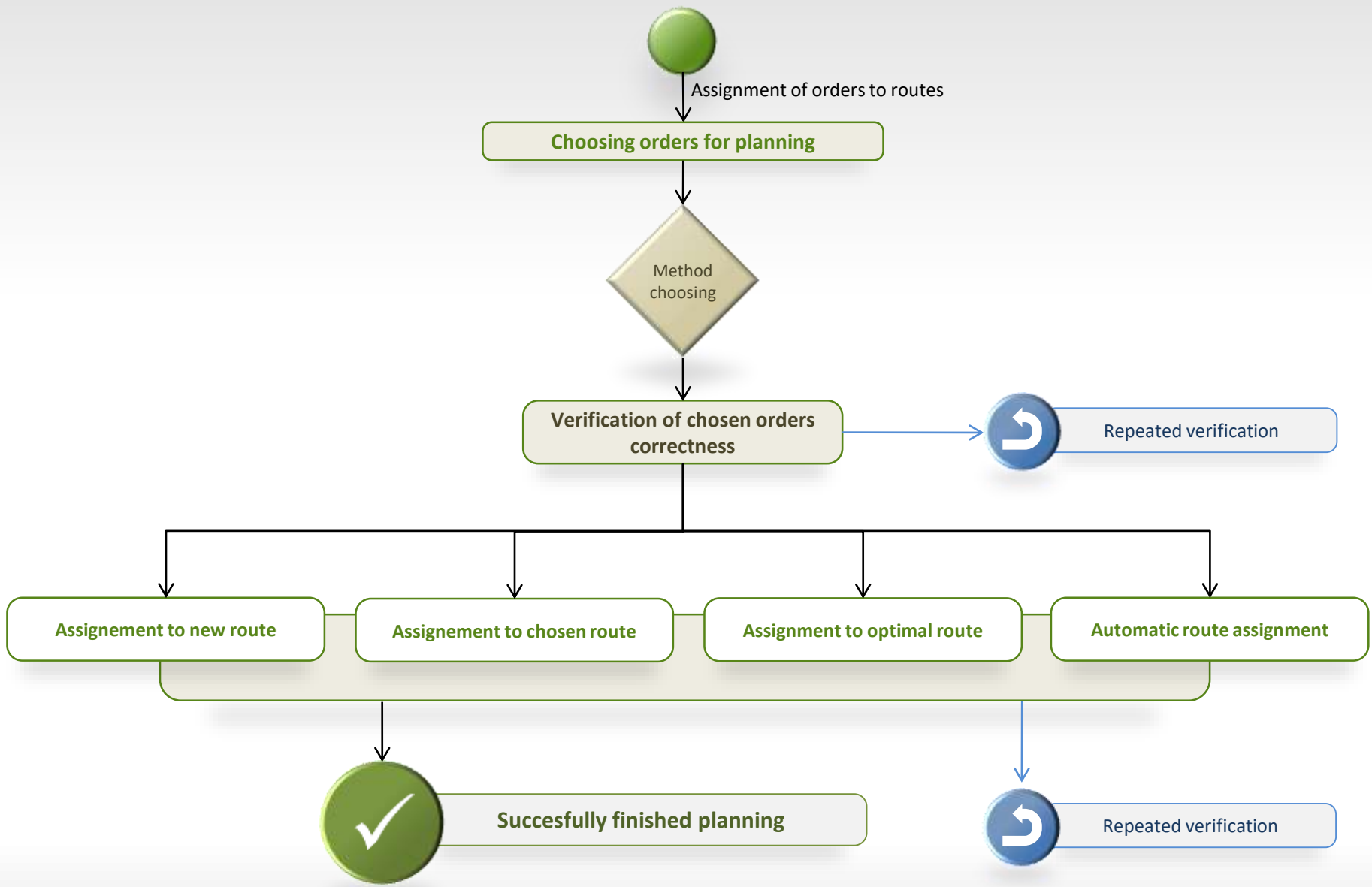
Execution of dispatch orders

Real dispatch order's execution – planning and execution of proper transports and routes

Model of routes planning



Assignment of orders to routes



Grouping of orders into routes

Automatic methods

They allow for planning of many orders in the same moment.

- ✓ **Heuristic methods** – fast methods adjusted to the way of planning in a given company. They rely on choosing the proper algorithm depending on specific nature of dispatch tasks.
- ✓ **Optimization methods** – rely on searching for better solutions for given orders. Those methods take into consideration the whole space of available solutions. Effectiveness depends on time of calculation

Manual methods

Those methods allow for manual planning of order assignment to the routes – in this way they enable management of untypical situations.

The manual methods base on data base functions, e.g. sorting of orders according to delivery hour, the same client, etc.

In this case automatic finding of existing optimal route for the chosen order is also possible.

Process of orders grouping is supported by route correctness check mechanism

Algorithms of automatic planning

The screenshot displays the Qguar TMS web interface. At the top, a browser window shows the URL `localhost:8000/tms/desktop?app=TMS&token=1460016942411#7694`. Below the browser, a table lists various algorithms:

Name	Algorithm	Maximum length (km)	Maximum driving time (h)	Active	Unloading time (min)	Loading time (min)	Max route time (h)
APT	Planning by region	1000	24	Yes	10	10	32
ASDA	Planning by region	400	1000	Yes	10	10	1000

The 'Algorithms of automatic planning' configuration window is open, showing the following settings:

- Name: APT
- Active: Yes
- Algorithm: Planning by region
- Max planning time: 6000000
- Max length of the route with no return (km): 1000
- Max number of unloading stops for the route: 10
- Maximum driving time (h): 24
- Max route time (h): 32
- Default unloading time: 10
- Default loading time: 10
- Load units qty. control:
- Weight control:
- Volume control:
- Maximum transport mean fulfilled (%): 0

Buttons for 'New', 'Save', and 'Close' are visible at the bottom of the configuration window.

Control over route execution

Management of route stops

Allows for changing the course of route during its executions, verification of arrival time, stoppage, loading/unloading time.

Management of orders during execution

System allows for adding new orders to the route during its execution.

Control over drivers work time

Allows for control over drivers work time on the basis of defined regulations
Planning of relax time on the level of route stage is possible.

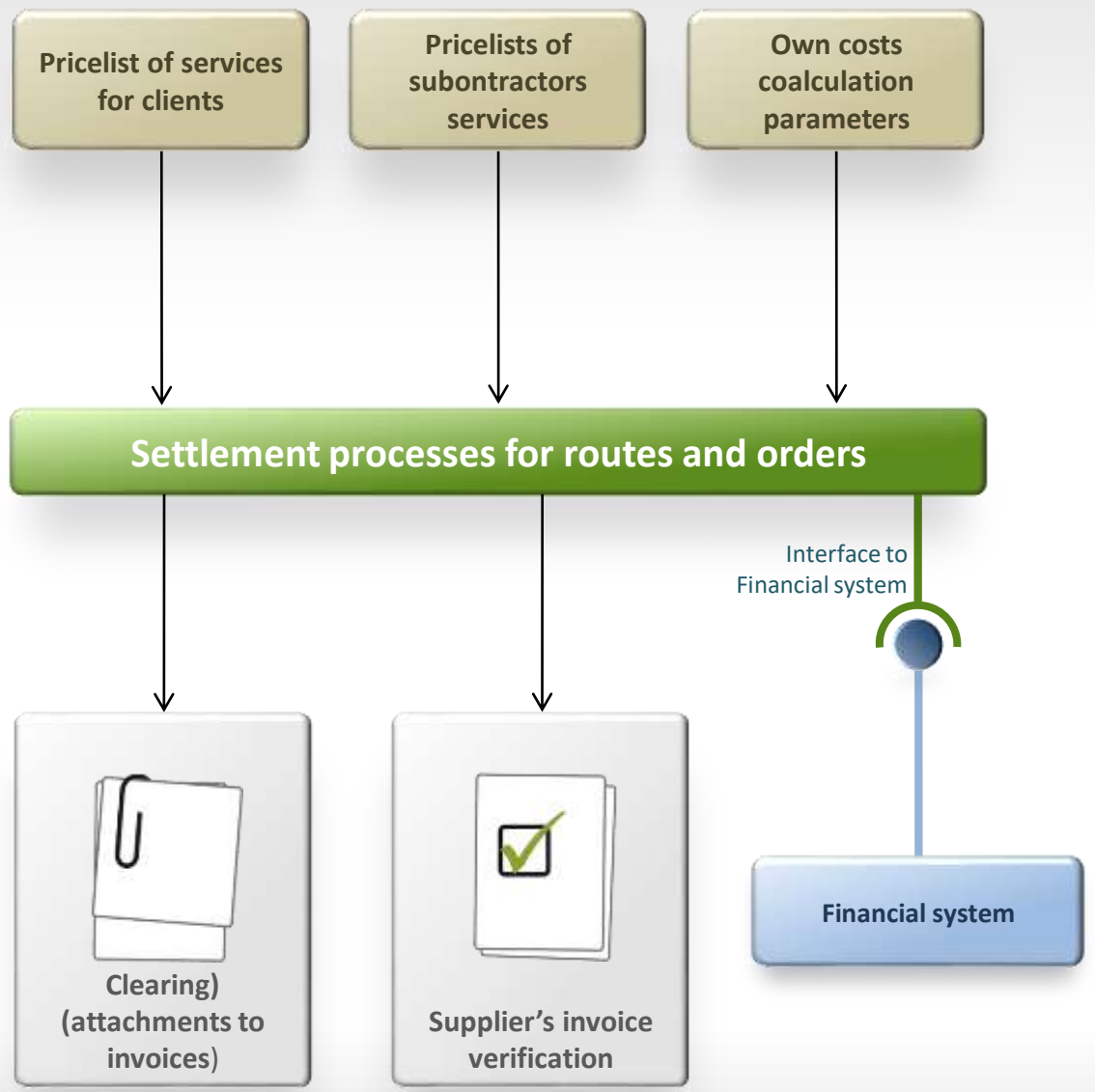
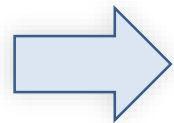
Registration of refuelling and mileage

System enables keeping records of refuelling and update the mileage records

Tracing of load units

Monitoring of transported load units history.

Settlement of services and costs



Settlement

The screenshot displays the Qguar TMS Settlement interface. At the top, the browser address bar shows the URL: localhost:8000/tms/desktop?app=TMS&token=1460021688352#. The main interface is divided into several sections:

- Router's planing:** Includes tabs for 'Route planing', 'Settlements', 'Routes', 'Settlements and packages', and 'Routes in settlement planing'.
- Router's planing:** A sidebar on the left showing a list of routes with columns for 'Route no.', 'Name', 'Current no.', 'Dist. (km)', 'Status', and 'Type'. The 'Status' column shows 'TUPED' for most routes.
- Route Details:** A central panel showing details for a selected route (Route 7). It includes fields for 'Legitim contract', 'Settlement date', 'Settlement status', 'Calculated price (PLN)', 'Mediabus (+) (PLN)', 'Mediabus - description', 'Route price', 'Current color', 'Payment time', and 'Settlement about accounting'. The 'Settlement date' is 2010-04-07 23:30:43.
- Settlement logs:** A modal window titled 'Settlement logs' is open, showing a list of logs with columns for 'Settlement log', 'Page', and 'Status'. The logs include entries like 'Beginning of accounting process' and 'Accounting process RT...'. The window also has a search bar and a 'Filter' section.
- Bottom Panel:** Includes buttons for 'Route', 'Package', 'Print', 'Save', and 'Close'. There are also 'Add', 'Change', and 'Delete' buttons for the route details.

Management of reloading hubs and
control over loading and unloading

Registration of loadings and
unloadings

Monitoring of actions

Control over stock levels in the
hubs

Stocktaking of load units

Tracing of loads

Monitoring of deliveries to the
hub

Monitoring of shipments

Loadings / unloading

The screenshot displays the Quar TMS web interface. A modal window titled "Load transactions" is open, showing details for a specific stop. The modal is divided into two main sections: "To loading/unloading" and "Loaded/unloaded".

To loading/unloading

Load ref no.	Transport ref	Order no.	Operation type	Started
16	3	28151140018300	Loading	
17	3	28151140018300	Loading	
18	3	28151140018300	Loading	
19	3	28151140018300	Loading	
20	3	28151140018300	Loading	
21	3	28151140018300	Loading	
22	3	28151140018300	Loading	
23	3	28151140018300	Loading	
24	3	28151140018300	Loading	
25	3	28151140018300	Loading	
26	3	28151140018300	Loading	

Loaded/unloaded

Load ref no.	Transport ref	Order no.	Operation type	Started
--------------	---------------	-----------	----------------	---------

Additional information

Reason:

Responsibility:

Description:

Buttons:

Intermodal orders

Locations with the feature - reloading:

Automotive

Railway

Maritime

Aviation

Intermodal transport consists in loads, which can be viewed in any constituent order (*)

(*) Constituent order: :

- ✓ external order: railway, maritime, aviation
- ✓ transport mean order : dispatch order, standard

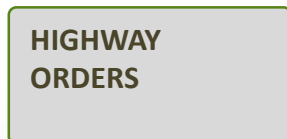
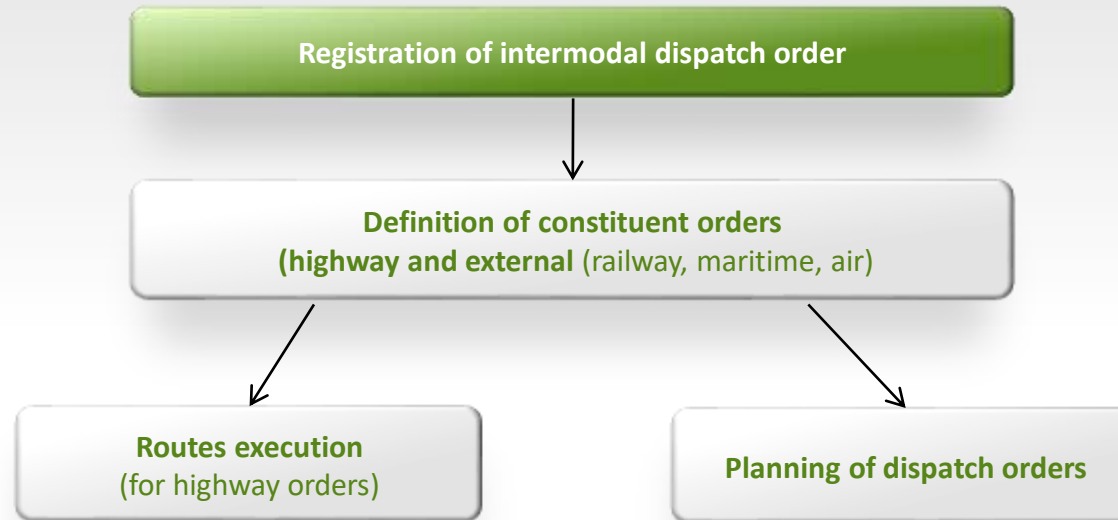
Intermodal dispatches

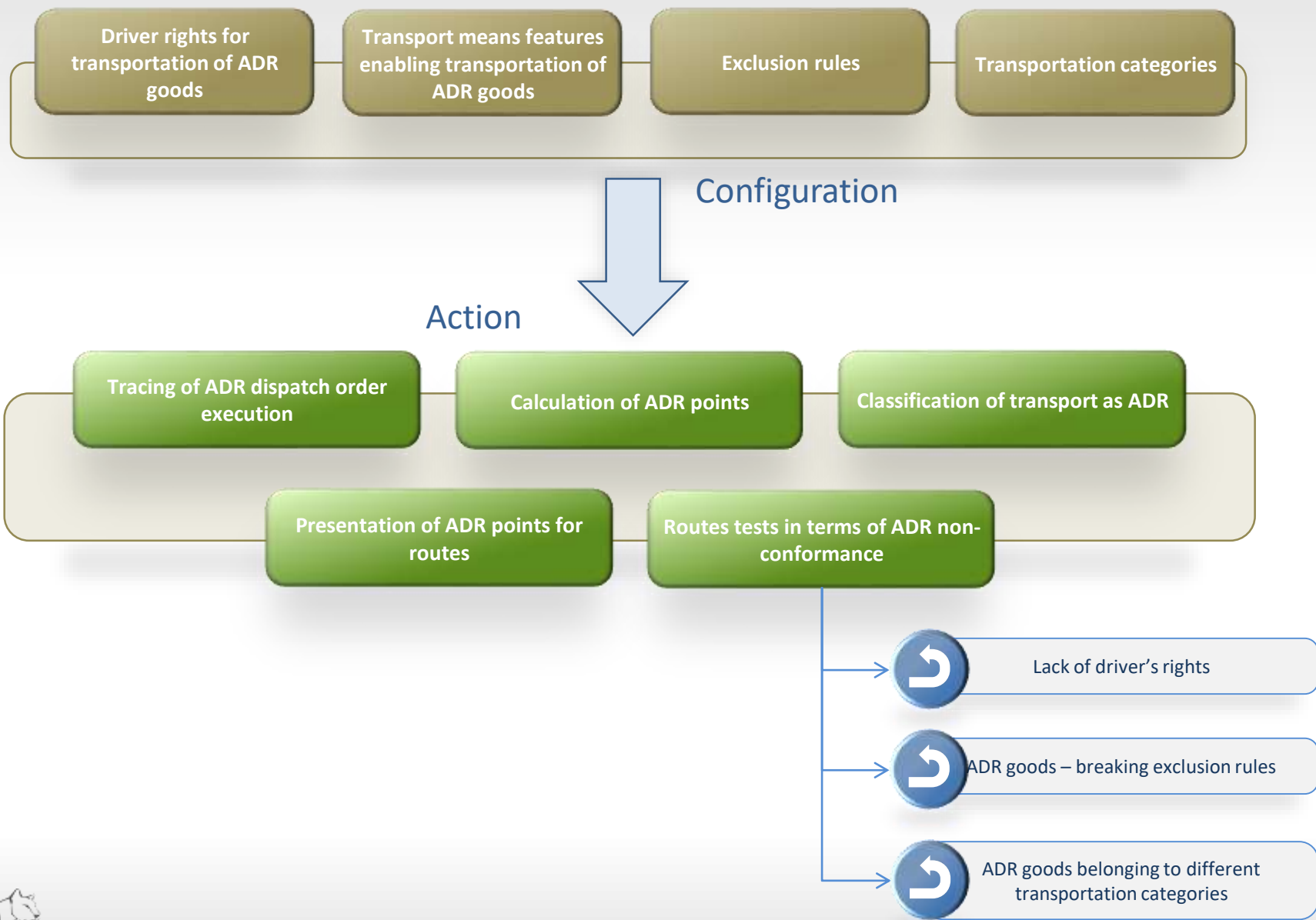
Railway

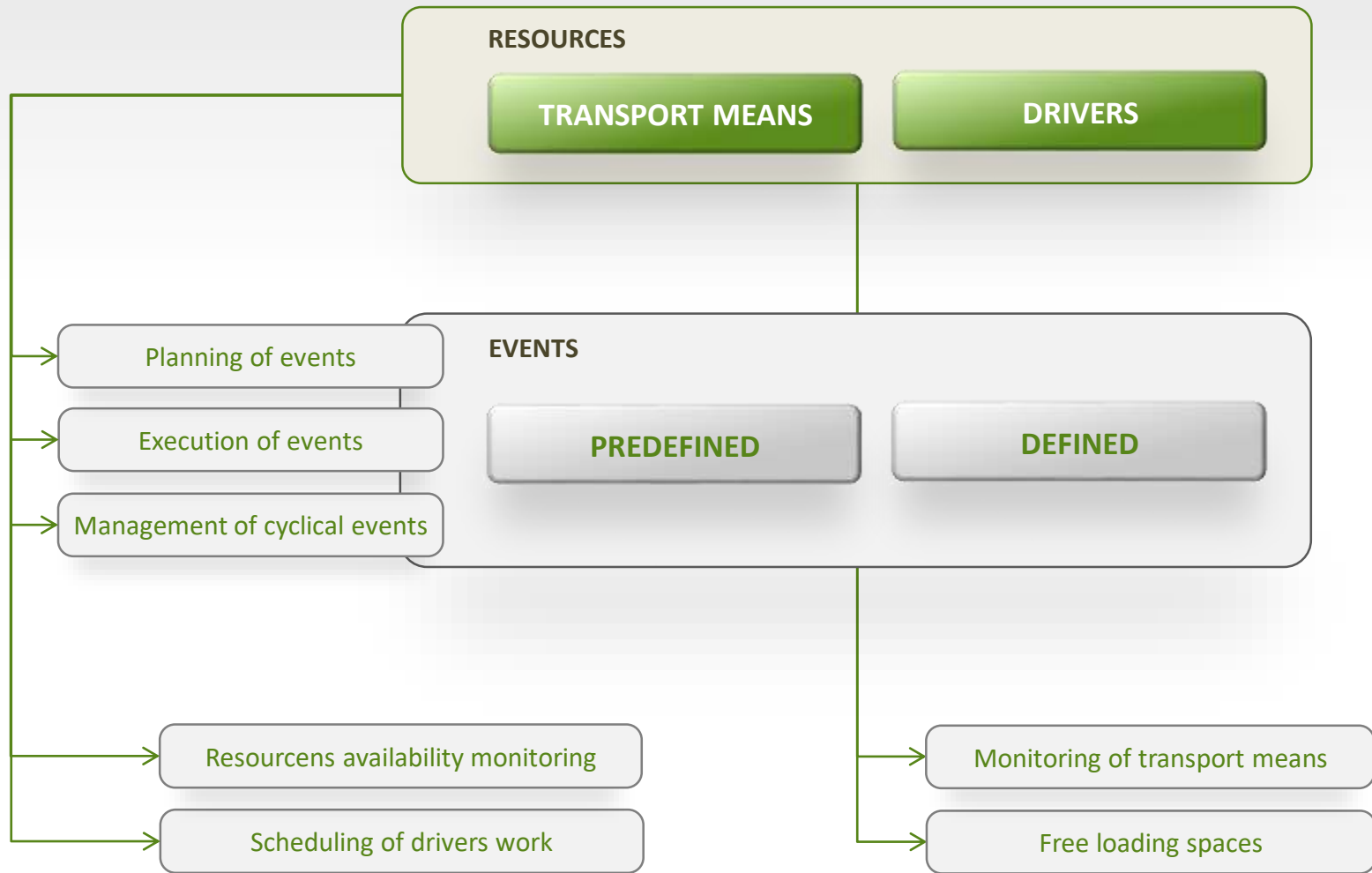
Maritime

Aviation

External orders with different types (railway, maritime, aviation) are grouped into dispatches (railway, maritime, aviation) in order to pass them on to adequate forwarder.







Digital Map

The screenshot displays the Qguar TMS desktop application. The main window shows a digital map of a region in Poland, with a blue route highlighted. The interface includes a sidebar with filters, a search form, and a data table at the bottom.

Search Form:

- Country: Polska
- Province: [Dropdown]
- District: [Dropdown]
- City: [Text Input]
- Street: [Text Input]
- House number: [Text Input]
- Post code: [Text Input]
- Find: [Button]

Data Table (Top):

Route no.	Vehicle	Contract no.	Stock no.	Vehicle type	Vehicle name	Driver	Driver name	Target no.	Target name	Planned date	Planned time	Route status	Source	Account status
16	TU0P02	NR1001	NR1001	Full Panel	Kawka Dąb	Ernesto Quares	OTK Wrocław	2015-02-01 08:00	2015-02-01 01:00	200 A1	Wrocław	Wrocław		
9	02047UM	NR1001	NR1001	Wakacyjne Czoł	Wakacje Ry	ZPE S. Szwed	Malmö Ry	2015-05-16 10:50	2015-05-16 11:50	790	Wrocław	Wrocław		
9	TU0P02	NR1001	NR1001	Star T102	10000 Jaki	ZHO S. Bana	NR031	2015-05-18 09:00	2015-05-18 11:00	100	Wrocław	Wrocław		

Data Table (Bottom):

Id	Route name	Id	Contract name	Vehicle no.	Vehicle name	Id	Vehicle	Contract name	Target no.	Target name	Vehicle name of target no.	Vehicle name of target no.	Track of
1	Cracow-Quar	9	0	0	0	0	0	0	0	0	0	0	0
2	Wrocław	902											

Digital Map

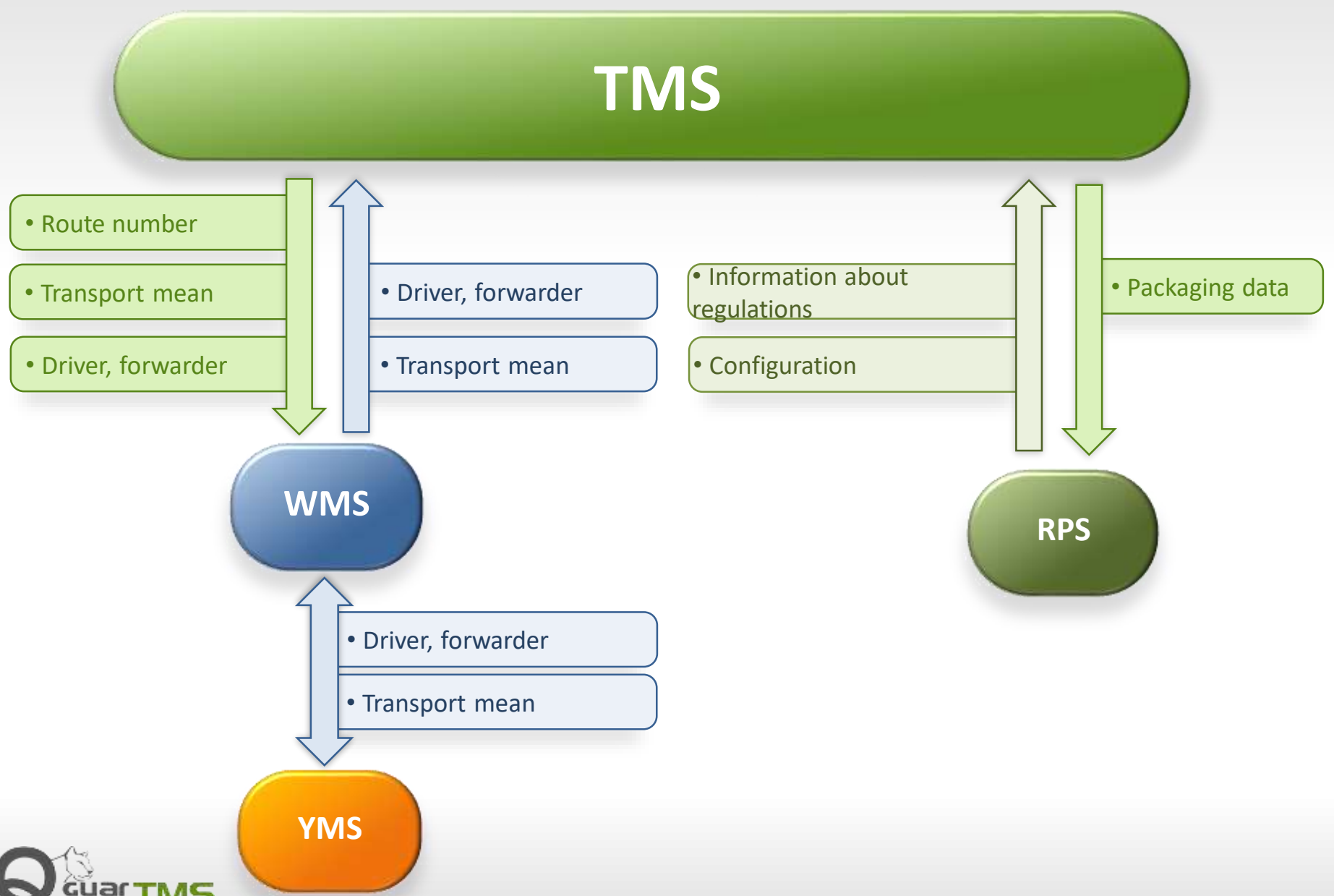
The screenshot displays the Qguar TMS web application interface. At the top, the browser address bar shows the URL: localhost:8000/tms/desktop/app=TMS&token=1460016942411. The main interface is divided into several sections:

- Header:** Includes the user name "Radosław's browsing" and navigation tabs for "Reporting period", "Locations", "Routes", "Locations submitted overview", and "Locations submitted overview".
- Left Sidebar:** Contains a "Routes" section with a list of routes, including "Unassigned transports".
- Main Content Area:** Features a table with columns: "Route no.", "Name", "Contract no.", "Dist. no.", "Vehicle type", "Status", "Route location", "Target no.", "Pl. loading date", "Pl. unloading date", "Pl. start time", "Route status", "Vehicle", and "Route's status". The table lists several routes, with the first one highlighted in blue.
- Map Overlay:** A map of Poland is displayed, showing a search overlay with a "Searching" button and input fields for "Country/Polka", "Province", "District", "City", "Street", "House number", and "Post code". A "Find" button is located at the bottom of the search overlay. The map shows a route highlighted in blue and pink, connecting various cities like Gdynia, Katowice, and Wrocław.
- Bottom Section:** Contains a "Current route" section with a "Route no." field and a "Refresh" button, and a "Route status" section with a "Route no." field and a "Refresh" button.

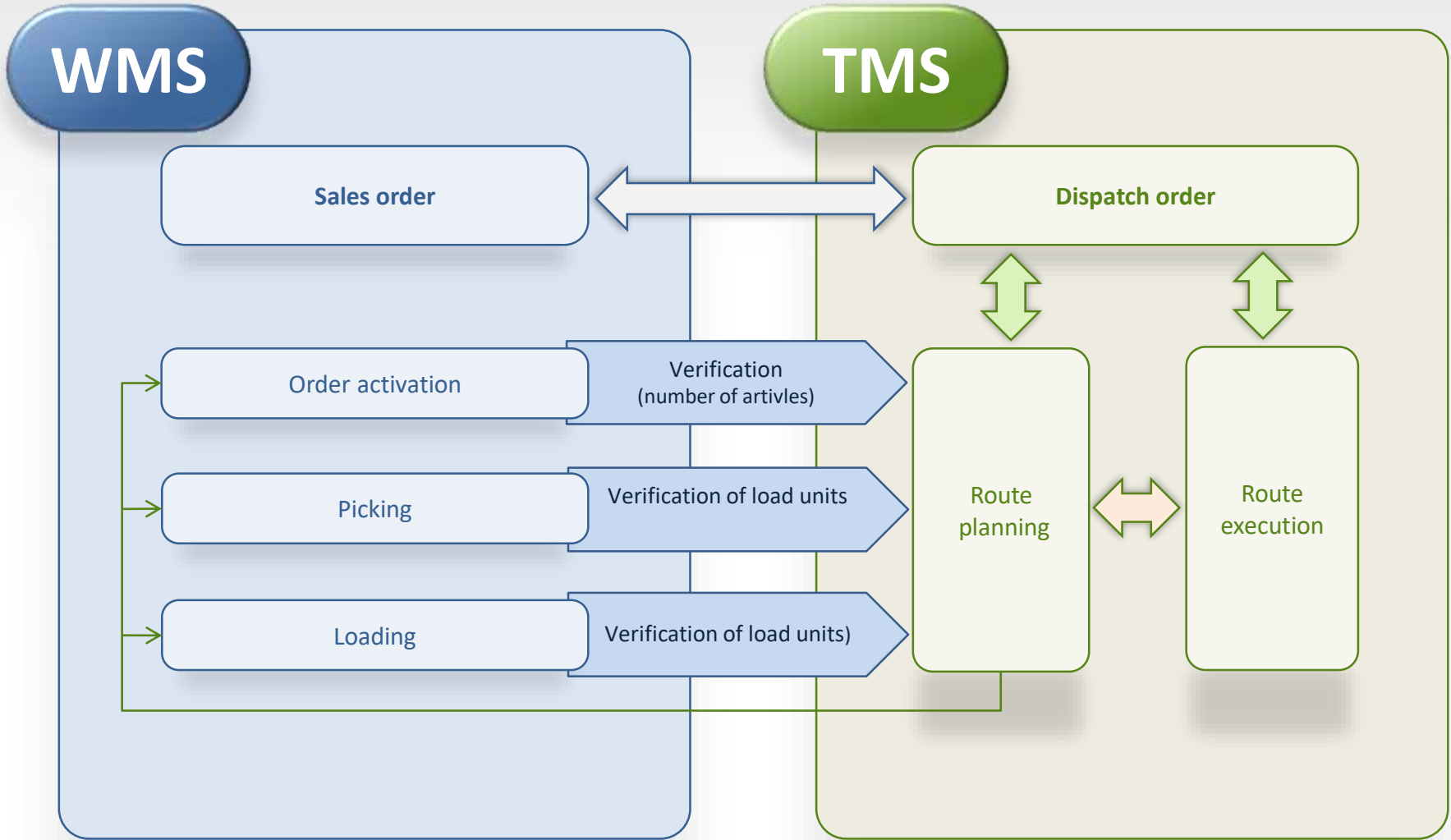
- ✓ Integration with digital maps (emapa, navigox)
- ✓ Cooperation with mobile equipment
- ✓ Archiving external documents (system enables recording in the database and reading from the database in order to save or read the external documents)
- ✓ Database link with other Qguar modules
- ✓ Standard file interface
- ✓ Management of messages

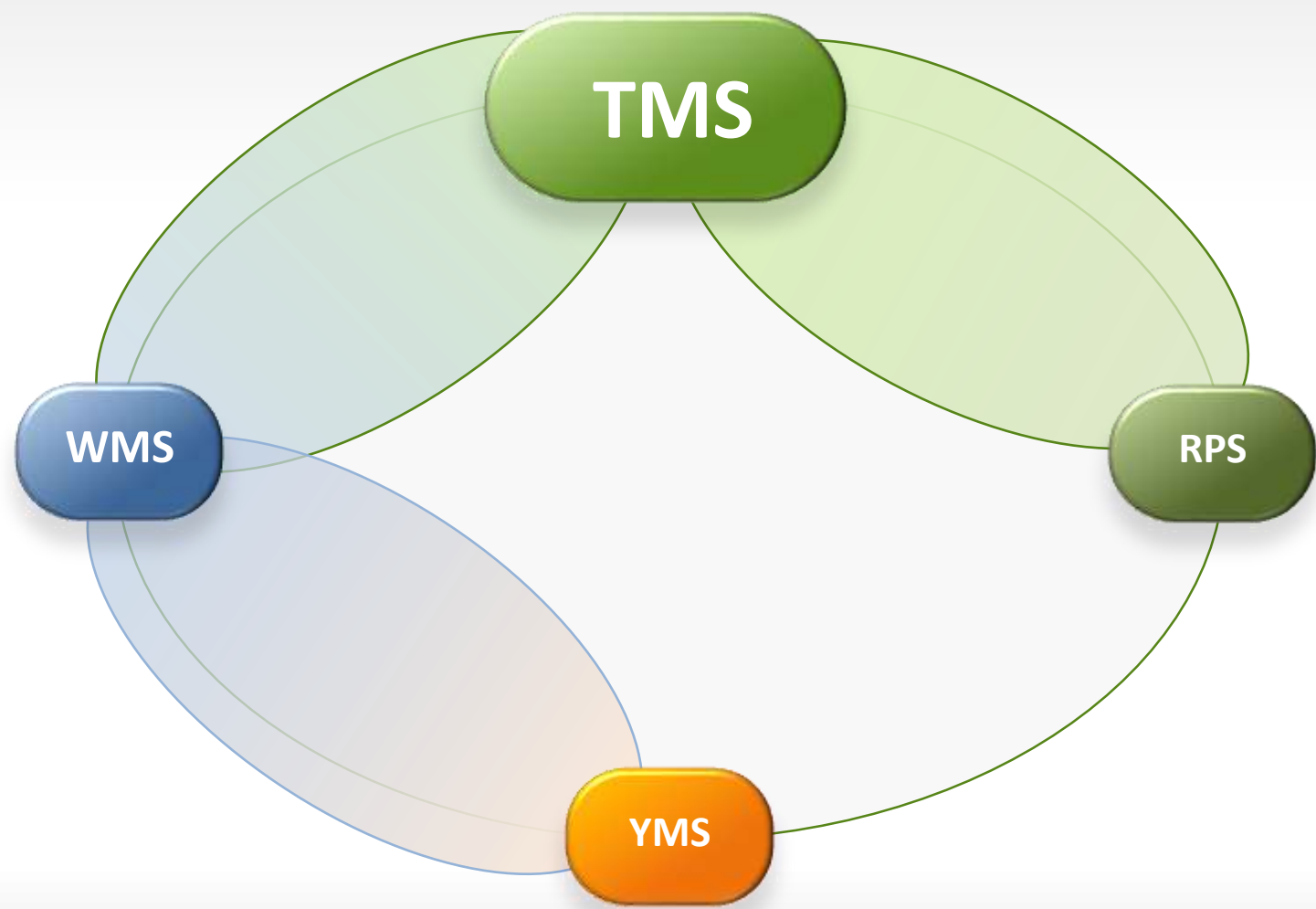


Information exchange between QGUAR TMS and the other QGUAR modules



Power of detailed integration between WMS and TMS





Messages:

SAR

Import of article master data

SKH

Import of company master data

TAD

Import of addresses

TTO

Import of dispatch orders

TSO

Simplified import of dispatch orders
(with addresses)

TRT

Export of dispatches:

TRT.01 – export of routes

TRT.02 – export of routes and stops

TRT.03 – export of routes, stops and orders

TRT.04 – export of routes, stops, orders and load
units

TRT.05 – export of routes and orders

TRT.06 – export of routes, orders and load units

TRT.07 – export of orders

TRANSACTIONAL DATA

Executed dispatch orders

Reloadings in the hubs

Routes for executed dispatch orders

ADR notofications

Dispatch order

Transport order

Loading list

List of planned loadungs/unloadings in the HUBs

ADR order

Weekly dispatch report

Specification for forwarder

Cost decreations

Order's profitability

Settlement of drivers

History of changes on the route

Annual ADR reports

STATISTICS AND ANALYSES

Drivers master data

Conflicts of postal codes

Report of filling the transport mean

Delays on routes

Level of filling the transport mean by dispatcher

Order's profitability

Opus TMS

localhost:8000/tms/desktop?app=TMS&token=1460016942411

Order profitability

Order no.: Transport no.: Route no.: Ordering hub: Hub clearing cost: Order status:

Page 1 of 1

Quantity of rows in site 25

Order	Order no.	Composed order no.	Order no.	Transport no.	Transport type	Route no.	Dir.	Y&R	Route status	Planned loading date	Planned receiving date	Order status	Delivery	Planned volume	Actual volume	EU Count	Qty of pack	Weight	Distance	Profit	Margin
QUANTUM			2015/11/4/90	1		1- ADH right	KR	KAT	In planning	2015-11-30 19:20:10		In realization	2015-12-20	0	0		0		400	0	
QUANTUM			2015/11/4/90	2		2- load/unloads	KR	KAT	In realization	2015-12-01 19:20:22		In realization	2015-12-20	0	0		15	80	500	518	0
QUANTUM			2015/11/4/90	3		3- load/unloads	KR	KAT	In realization	2015-12-02 19:20:24		In realization	2015-12-20	0	0		15	80	500	1	0
QUANTUM			2015/11/4/90	4		4- load/unloads	KR	KAT	In realization	2015-12-03 19:20:28		In realization	2015-12-20	0	0		15	80	500	1	0
QUANTUM			2015/11/4/90	5		5- load/unloads	KR	KAT	In realization	2015-12-04 19:20:28		In realization	2015-12-20	0	0		15	80	500	712	0
QUANTUM			2015/11/4/90	6		6- load/unloads	KR	KAT	Confirmed	2015-12-05 19:20:24		In realization	2015-12-20	0	0		18	80	500	312	0
QUANTUM			2015/11/4/90	7		7- load/unloads	KR	KAT	Confirmed	2015-12-06 19:20:28		In realization	2015-12-20	0	0		15	80	500	712	0
TSTK			2015/11/19/1	8			YR	YR	In realization	2011-05-10 10:55:00		In realization	2015-12-00	0	0		12	30	560	518	0
TSTK			2015/11/19/1	9			YR	YR	In realization	2011-05-10 10:55:00		In realization	2015-12-00	0	0		12	30	44.5	442	0
TSTK			2015/11/19/1	10			YR	YR	In realization	2011-05-10 10:55:00		In realization	2015-12-00	0	0		12	30	44.5	45	0
QUANTUM			2015/11/6/1	11			KR	KAT	In realization	2015-12-01 00:00:00		In realization	2015-12-20	0	0		1	0	150	289.41	
QUANTUM			2015/11/6/1	12			KR	KAT	Confirmed	2015-12-02 10:00:00		In realization	2015-12-20	0	0		0	0		322.13	

Order pro.

I-Net Crystal Clear

- ✓ documents
- ✓ labels
- ✓ Current and statistical reports

Sending the printout directly to printer or with with view possibility on the screen

Possibility to change the existing printouts

Creation of own printouts by the user

Controll queries

Defined as query in SQL

Fast speed of creation – under condition of knowing the database structure

Possibiity to create own filters

Effect:
Classic table of Qguar

Instert of own lists into menu

Export od data into MS Excel

Export of any table from Qguar

Possibility to choose exported columns

Further processing of data in MS EXcel



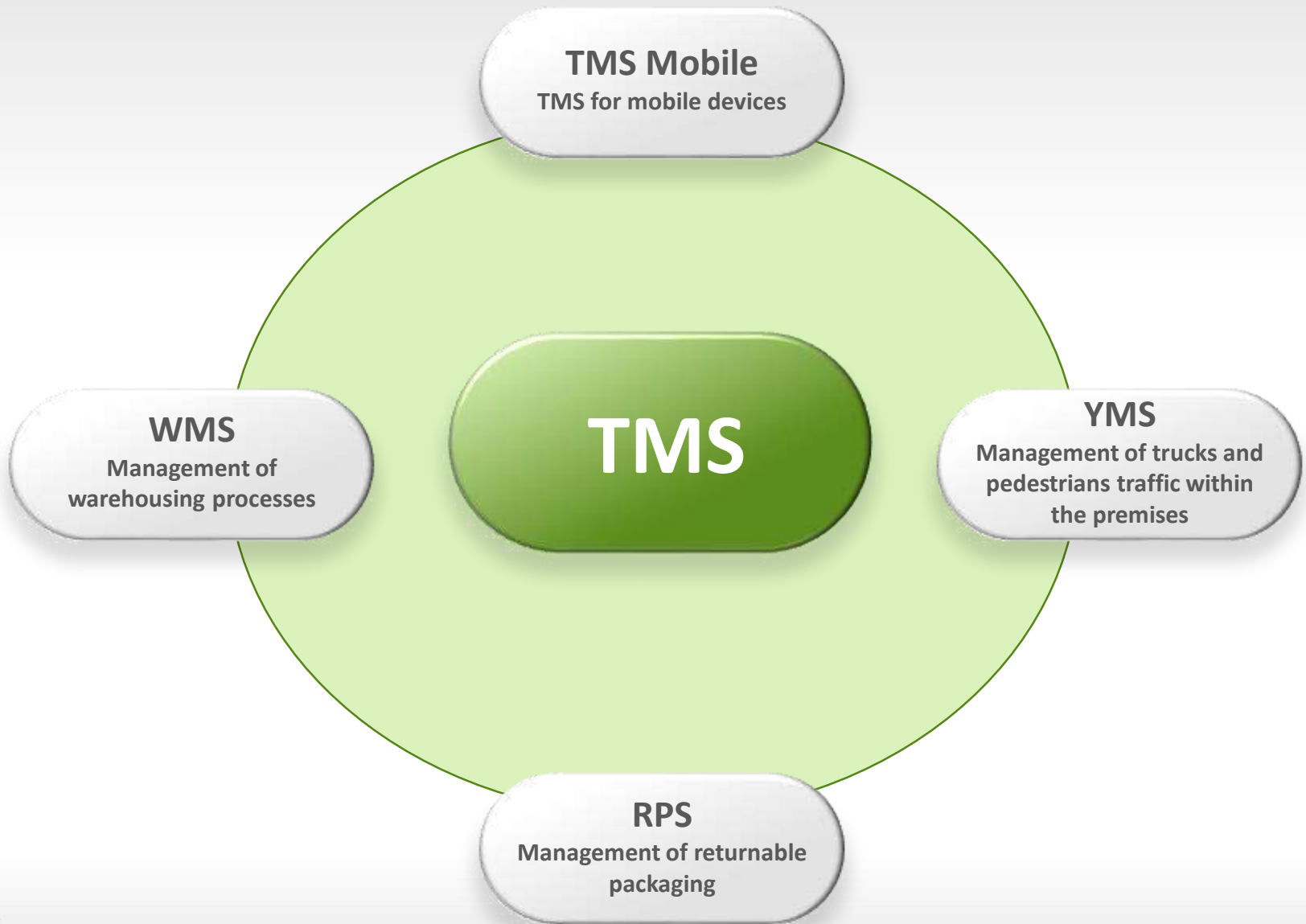
- ✓ Monitoring of events connected with transportation
- ✓ Optimization of transport processes
- ✓ Improvement of transport services settlement
- ✓ Logistic costs reduction
- ✓ Processes automation
- ✓ Possibility to carry out statistics and analyses
- ✓ Fast access to historical data
- ✓ Precise cost controll
- ✓ Improvement of work efficiency

Work improvements indicators after QGUAR TMS implementation

- ✓ Reduction of time needed for servicing the transport events
- ✓ Decrease of transportation costs
- ✓ Synchronisation of processes between hubs
- ✓ Better detection of conflicts regarding the planned transport mean and its assignment to other earlier planned routes
- ✓ Better detection of conflicts regarding the availability of the load compared with planned route start
- ✓ Automation of route planning
- ✓ Optimization of route planning
- ✓ Improvement of forwarding documents creation process
- ✓ Controll over road completion
- ✓ Time schedule of arrivals, departures, unloadings, loadings.



- ✓ Number of orders completed
- ✓ Number of delayed transports
- ✓ Conformity of time of delivery with the required one
- ✓ Conformity of load availability with the planned date of route execution start
- ✓ Income from transportation services
- ✓ Costs of transportation services
- ✓ Value of settled transports
- ✓ Number of settled orders/routes
- ✓ Average time of order completion
- ✓ Level of not fulfilled orders
- ✓ Level of fulfilled orders
- ✓ Average transport cost per forwarder
- ✓ Efficiency of orders





**Thank you for
attention!**

Quantum^{QUANTUM}