Operations Research & Advanced ANALYTICS for Grocery Retailers

Value added decision support systems

ACTOR
Analytics Control Technology OPERATIONS RESEARCH

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ACTOR for Grocery Retailers

- ACTOR has developed a **high level of specialization** on the Retail Industry working for several years with major players in the list of the top 100
- **20+ years** of experience on advanced analytics as **unique core-business**;
- Innovative **technology**
- Support to the **change management** and low-risk approach to the introduction of innovation

ACTOR for Grocery Retailers

ACTOR provides an important support to retailers willing to **increase the excellence** in their operations and market positioning.

ACTOR is a **trustable partner** to apply **advanced analytics**: from the demand forecast to the distribution optimization, price and promotion optimization.

What can we do:
Warehouse & DC Optimization-Simulation

Distribution Centers & DC Optimization and Simulation

The distribution centers have a crucial role for the retailers. First of all to guaranty the correct service to their network of stores.

Once this goal is ensured, the next goal is to ensure the minimum costs and an adequate flexibility to manage the business.

ACTOR supports:

- the design of processes and infrastructures
- the daily operations, empowering existing WMS by optimization algorithms.

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Distribution Centers & DC Optimization and Simulation

ACTOR helps Grocery Retailers to:

1. Optimize the picking lay-out and the pricking processes;
2. Optimize the utilization of resources within the distribution center;
3. Optimize the stock capacity (volume);
4. Optimize the design of the network;
5. Correctly apply cross-docking and other processes to manage the specific type of flows (eg. promotions)
6. Ensure the quality of the preparation as well as monitor the quality of the received goods

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Distribution Centers & DC Optimization and Simulation

Modules	Short Description
OPT Slotting	Optimal slotting of Items. Optimal management of Fast Picking Area Optimal management of automatic-vertical-storage
OPT Picking	Optimal picking list
OPT Stock	Optimal Optimization of Stock
Net Solver	Optimal dynamic dispatching of tasks for operators or AGV
Speedy-Batch	Optimal definition of batches to feed downstream processes like a sorting
OPT Loading	Optimal composition of Handling Unites (eg cases, pallets or Containers)
OPT Heights	Optimal design of shelves
WFP	Predictive workforce Planning (include sophisticated forecast of workloads)
DQC	Dynamic Quality Control (quality management via statistical sampling)

CASE STUDY

Context:

Texas grocery stores retailers adding over 30 new stores. They were expanding the current warehouse where they manage: grocery, dairy and frozen food.

Challenges:

Increase productivity that was also affected by a not-optimal shelving.

Solution:

1. Decide the best (math-optimal) position for each SKU (OPT Slotting)
2. Understand impact on operations: productivity & traffic (Simulator & OPT Picking)
3. Optimize the design of the racks (impacting pallet-replenishment productivity & efficiency of volume utilization (OPT Racking)

Benefits:

Productivity improvement 21%

Service level improvement 20%

Reduction of traveling for picking activities 30%

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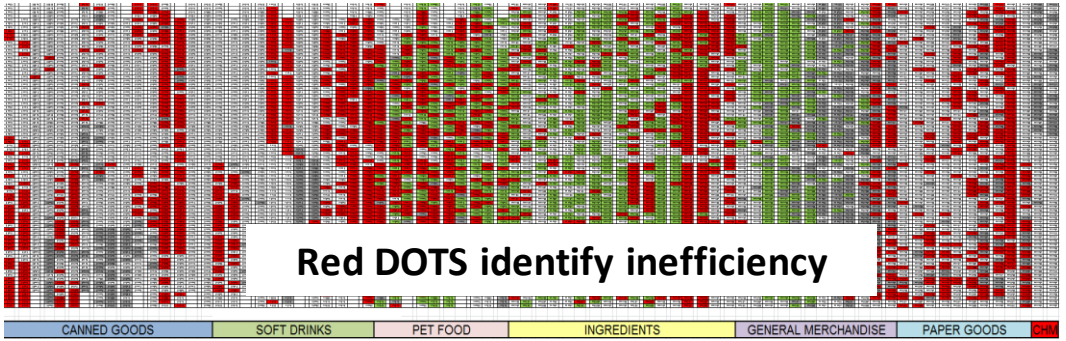
BEFORE



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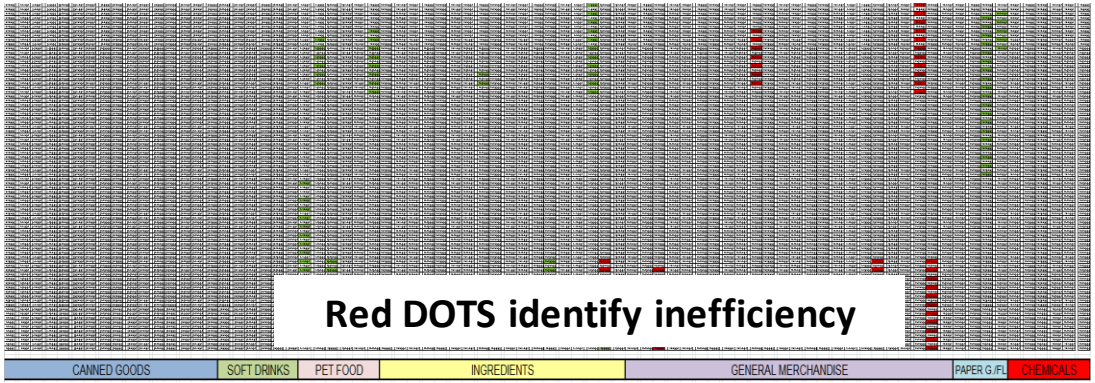

What can we do:
Transport & Distribution Optimization

Transport & Distribution Optimization

Transportation for retailers is a significant cost component impacting the profitability.
Usually retailers outsource the service to a Logistics Partner. It is important that the retailer maintains a good control, ensuring that operations minimize the cost and respect the service level.
A good practice suggests that the retailer addresses the utilization of specific tools in order to ensure such control. ACTOR has a combination of optimization tools in order optimally manage the distribution.

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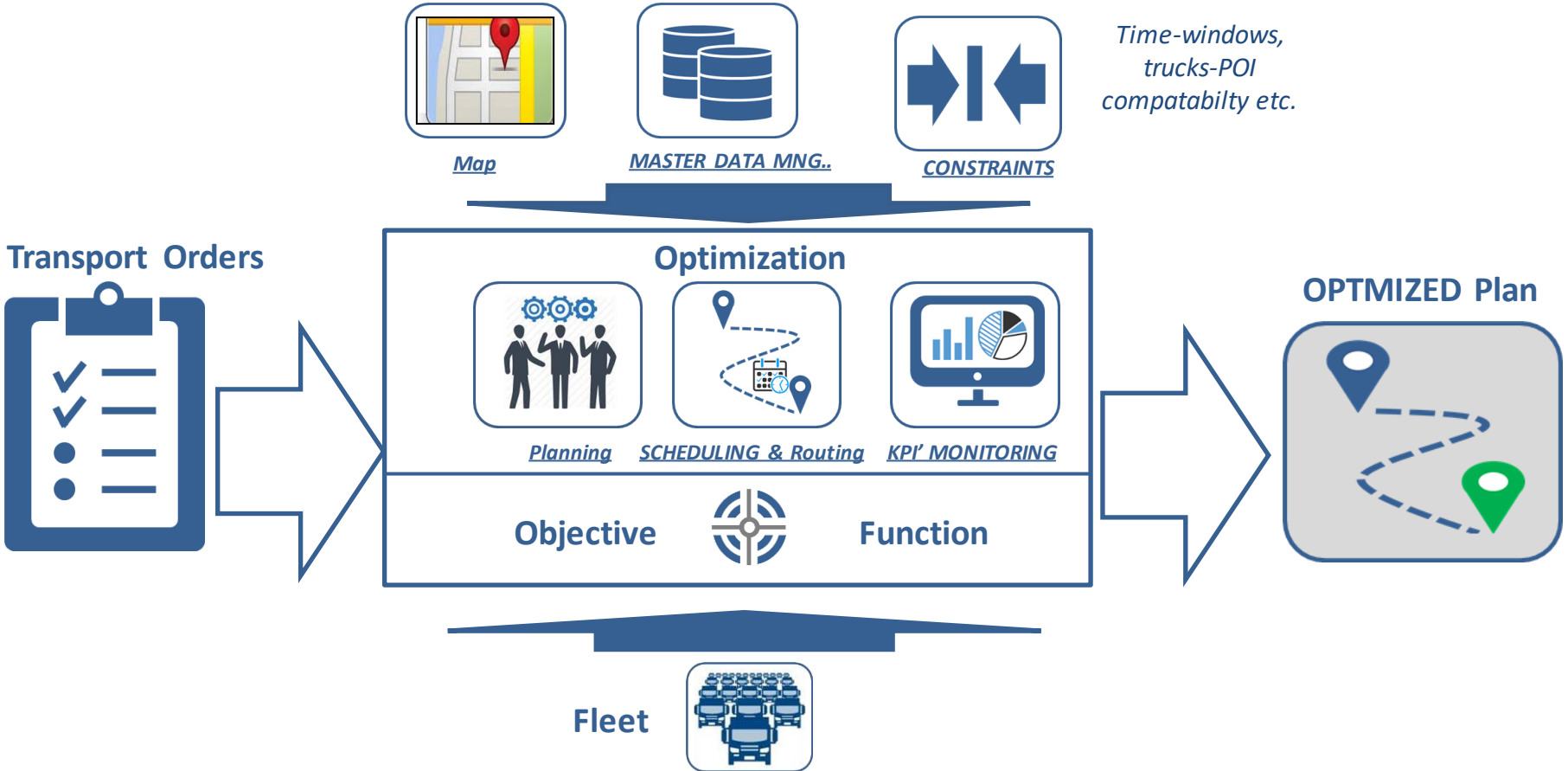
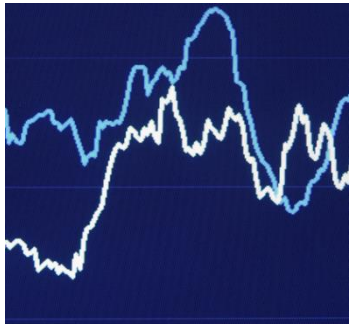
Transport & Distribution Optimization



Transport & Distribution Optimization

OPT Runner: scheduling and routing optimization system. It is a TMS with a strong focused on the optimization. It includes functionalities to calculate costs, receive real-time data from the vehicles to generate alerts etc.
OPT Calendar: creates the optimal delivery-calendars. The main goal is to cut the travelling distances. The output it is the list of days of the week, and time-windows, to visit each single store. Calendars are usually update on season based.

OPT Net: optimization of the design of the supply chain network.



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CASE STUDY -

Context:
The logistics partner of our Customer (a Grocery Retailer) claimed for a significant increase of the transportation costs due to the policy required by the retailer. On the other side the retailer needed to increase the service level without impacting on the costs.

Challenges:
Explore any possibility to improve the process governance, avoiding extra-costs to improve the service level and apply it in case of positive findings.

Solution:

The solution has been obtained by 2 phases:

1) off-line analysis, simulating an optimal distribution. Such simulation included the optimization of the fleet scheduling (by OPT Runner) and an optimization of the delivery-calendars by OPT Calendar.
2) Roll-out of OPT Runner as TMS for the daily management. Optimization of the delivery calendars on seasonal base.

Benefits

Costs reduction: 13%

Reduction of the variability in terms of volume delivered per day : 36%. As a consequence it has improved the fleet utilization, in particular for smaller vehicles (often a bottleneck to deliver in city centers).

	As-is	Optimized	Savings
# of tours per week	525	478	9%
Km per week	33.500	29.338	12.3%
€/Pallet	5.08	4.41	13 %

What can we do:
Predictive Inventory Optimization

DC Inventory Optimization

The **policy that a retailer uses to manage the stock has an important impact on service level as well as on the profit.** The policy is impacted by discounts that suppliers offer to the retailers. Such opportunities are not always an actual benefit.

The ACTOR solution provides the optimal quantity of product to order to supplier based on an accurate forecasts and stock projection. The solution permits to manage the stock of a network of distribution centers connected to local warehouses.

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DC Inventory Optimization

Modules	Short Description
Before! Predictive Analytics	Automatically predict the demand considering all the influencing variables
OPT Replenishments-DC	Create the optimal order to suppliers. For a secondary warehouses the systems create the order to the primary warehouses and direct orders to suppliers.
Before! Promo	Vertical module to predict promotions
OPT Buying	Optimization of purchase of goods under promotion.

CASE STUDY

Context:
35 warehouses connected to 5 Distribution Centers
More than 5.000 suppliers managed.

Challenges:
Reduce the inventory costs
Increase the service level
Manage transfer of goods between warehouses when necessary;
Centralize the governance of the process;

Solution:
The ACTOR platform composed by Before! Predictive Analytics and OPT Replenishment has been introduced.
Orders are generated automatically over-night, after a user checks of the alerts, orders are transferred to the ERP.

Benefits:
Stock-out near to zero (service level near to 100%)
Inventory costs reduced by 30%
Process is now centralized in a unique buying-center.

What we can do:
Predictive Store Replenishments

Stores Replenishment

The solution permits to:

1) **Predict the daily demand**, for the single store - single SKU;
2) Calculate the **stock-projection** and the risks of stock-out with a dynamic re-order point;
3) Optimize the quantity to order to the Distribution Center or direct-to-supplier. The system create the orders and automatically send them to the ERP;
4) Manage fresh-food, recopies and menu;
5) Favorite a smart **collaboration** between store distribution center & suppliers.

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Store Replenishment

Modules	Short Description
Before!Predictive Analytics	Automatically predict the demand considering all the influencing variables
OPT Replenishments-Store	Create the optimal order to replenish the store with different logics depending on the type of products.

CASE STUDY

Context:

Network of 400+ stores of various dimension (from big supermarkets to proximity stores in city-centers). Significant seasonality (eg. touristic zones). Important products consumption impacted by weathers.

Challenges:

1. Avoid understocking and overstocking;
2. Cut the no-value-added time to manually issues orders at the stores.
3. leave to the operators higher-value tasks: check predictive alerts, manage contingencies, support customers.
4. Provide the management with aggregated forecast in order to better use the promotional level.

Solution:
Automatic forecast of the demand, considering influencing variables (eg prices, holidays etc) by Before! Predictive Analytics.
Automatic calculation of stock-projections & Alerts
Automatic generation of orders respecting all the constraints and calendars;

Benefits:
Stock-out near to zero
Order-cost reduced of 80%.

What can we do:
Promotion & Price Optimization

Promotion & Price Optimization

The solution permits to:

1) **Predict the demand** of a certain promoted product at single store (Before!Promo). The forecasts consider the effect of the different promotion mechanics.
   The system is able to estimate the demand of new products or products that will be promoted for the fist time in a certain stores.
2) The system allows a what-if analysis to support the design of promotions
3) A specific optimization system (DPO – dynamic price optimization) permits dynamically to optimize the prices.

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Promotion & Price Optimization

Modules	Short Description
Before!Predictive Analytics	Automatically Predict the demand considering all the influencing variables
Before! Impact Item Analysis	The module of before provide an analytical ranking of SKU in terms of impact on the customers expectation
Before! Promo	Vertical module to predict promotions and perform what-if analysis.
OPT Buying	Optimization of purchases of goods under promotion
Dynamic Price Optimization	Price Optimizer

DC Inventory Optimization

Modules	Short Description
Before!Predictive Analytics	Automatically Predict the demand considering all the influencing variables
OPT Replenishments-DC	Create the optimal order to suppliers and from a secondary warehouses to the prime warehouses/supplier
Before! Promo	Vertical module to predict promotions and perform what-if analysis.
OPT Buying	Optimization of purchase of goods under promotion.

CASE STUDY

Context:

Grocery Retailer with a network of about 450 stores.

Promotions managed on weekly base and every 2-weeks depending on the case. Promotion are differentiated by type of stores. Several new products are introduced by a promotion.

Challenge:

Reduce the stock-out of goods during the promotion for the important products;

Limit the overstocking and waste of fresh-food due to underperform promotions.

Support by what-if the merchandize during the design of the promotions.

Solution:
Before!Promo and OPT Buying have been installed. The application it has been interfaced with the GOLD ERP. The application is used by the buyer to support the procurement and by the merchandize to analyze and design the promotion.

Benefits:
Dramatic reduction to missed sales up to 40% depending on the category
Significant reduction of over-stock, up to 60% depending on the category

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