



WHEREHOWS

WHERE TO STORE, HOW TO HANDLE

WHEREHOWS Logistic Consultants
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Creating value in warehouse

Approach

1

Material-handling, storage & orderpick systems



2

Warehouse planning / (re)-design



3

Multi-channel & e-commerce integration



4

Audits / Benchmarks / Performance management



5

Dashboards / KPI-reports / Supply chain analytics



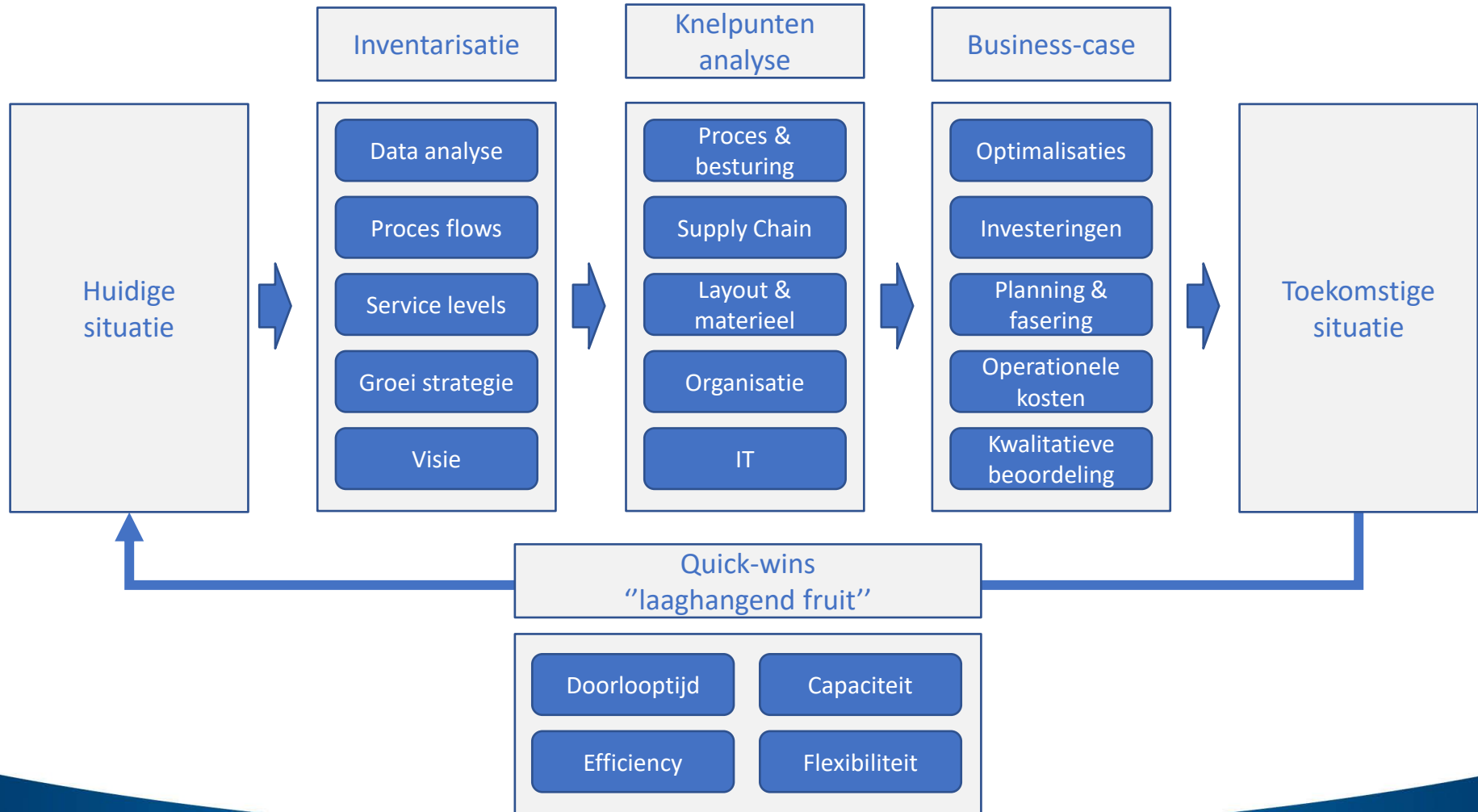
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Feasibility study/second opinions warehouse automation



Project Scope

Approach



Planning (re)design projects

Approach

Goals

A logistics concept which includes:

- Processflows and Material Flow Diagram
- Layout of the new building
- Applicable (material-handling) systems
- Visualization of logistics flows
- Required people and resources
- Investments and cost indications
- Processcontrols and required IT systems



Planning (re)design projects

Approach

Plan of action

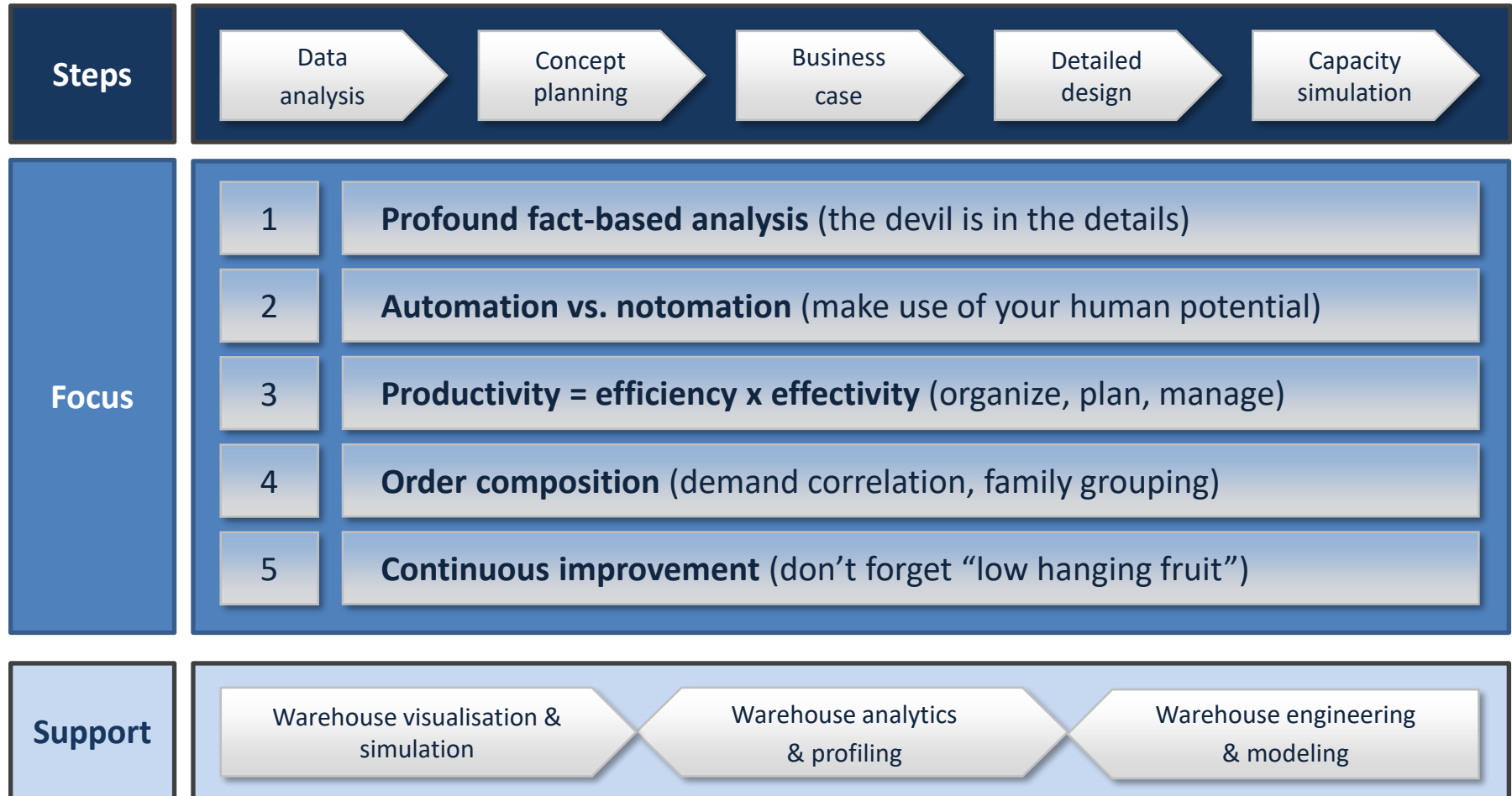
The project consists of the following activities:

- Workshop about the current and future operation
- Analysis of historical data
- Elaboration of logistics processes and flow charts
- Design of a logistics concept with multiple scenarios
- Choice of preferred scenario based on quantitative and qualitative arguments
- Final presentation of the results



Combining data and practical know-how

Approach



Using a complete professional toolbox

Approach

Data
analysis

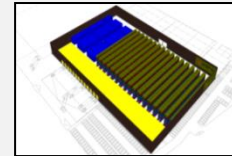
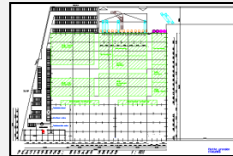


tableau



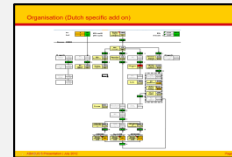
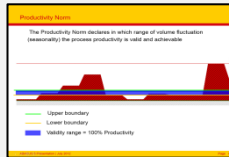
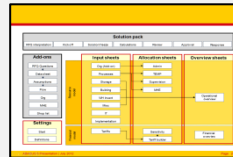
BI, Business analytics, Datamining

Concept
planning



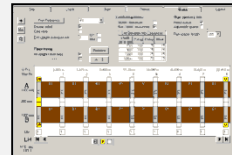
Warehouse Layout design (2d/3d)

Business
case



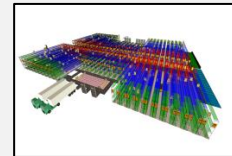
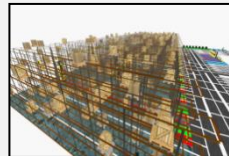
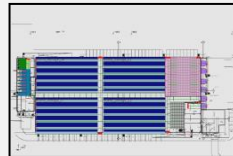
Resource & cost modeling

Detailed
design



Racking, trucks, cranes, AGV configurators

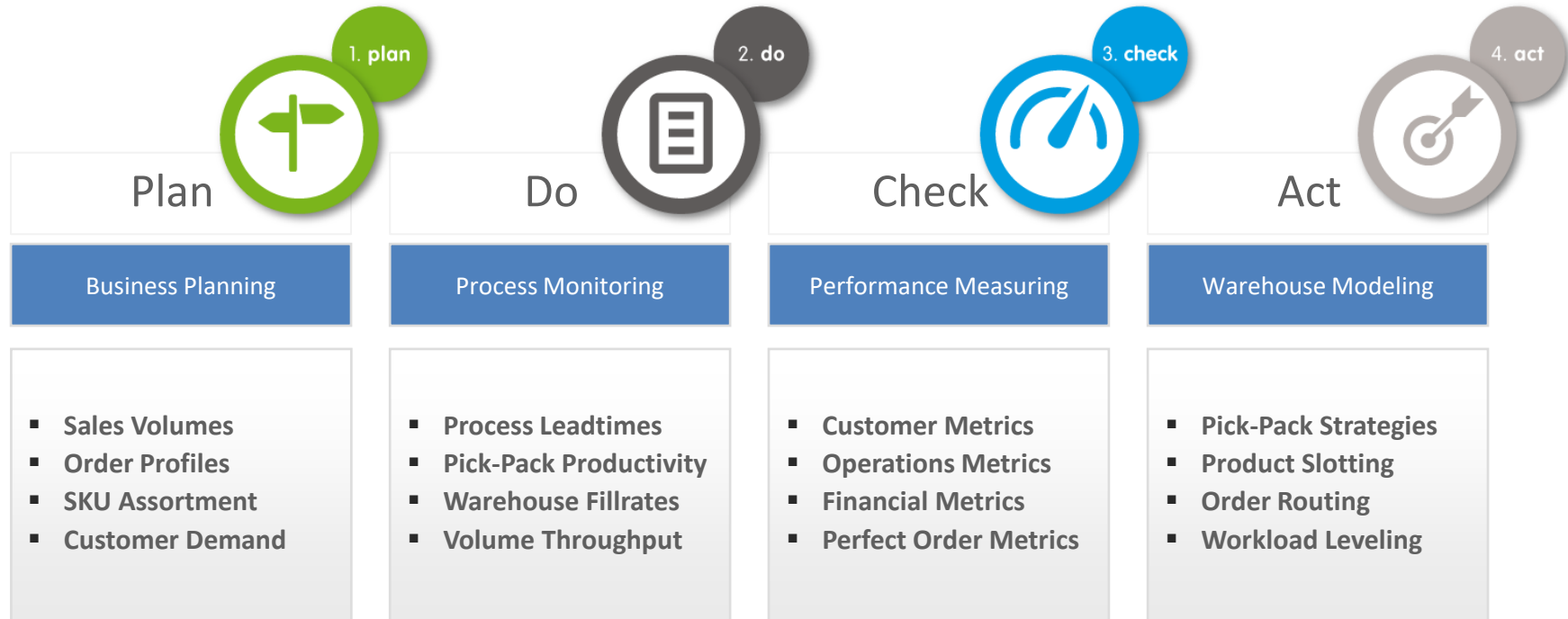
Capacity
simulation



Animation & simulation automated and conventional warehouses

Hyper Analyzer

Support: Warehouse analytics

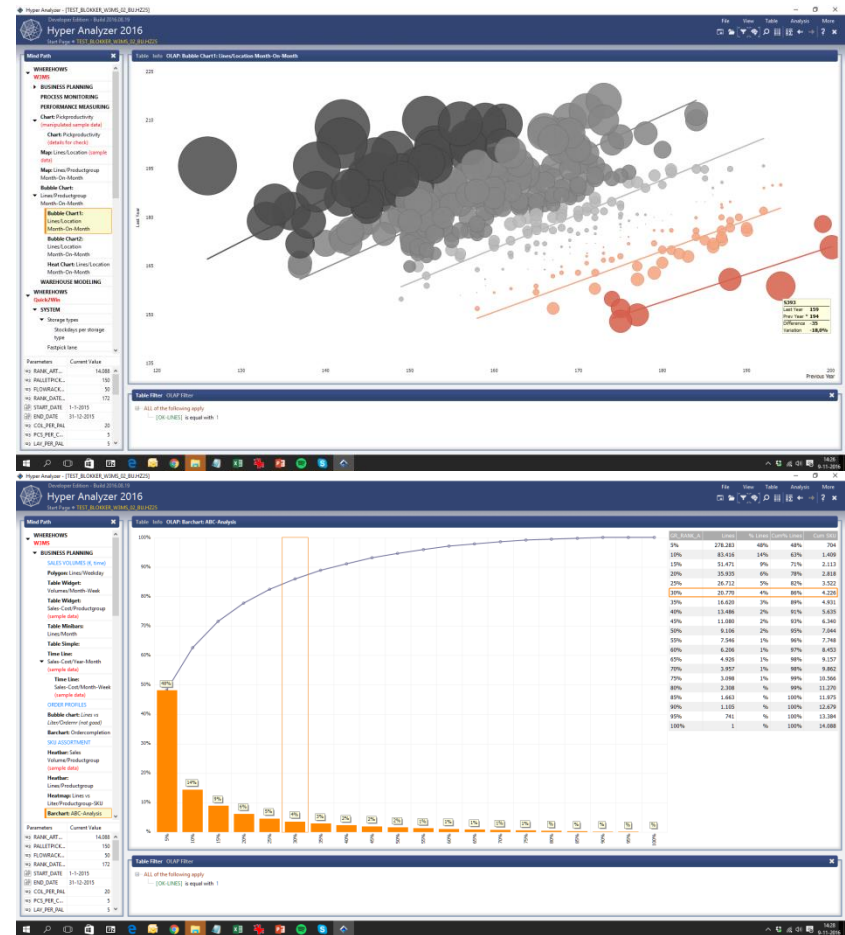
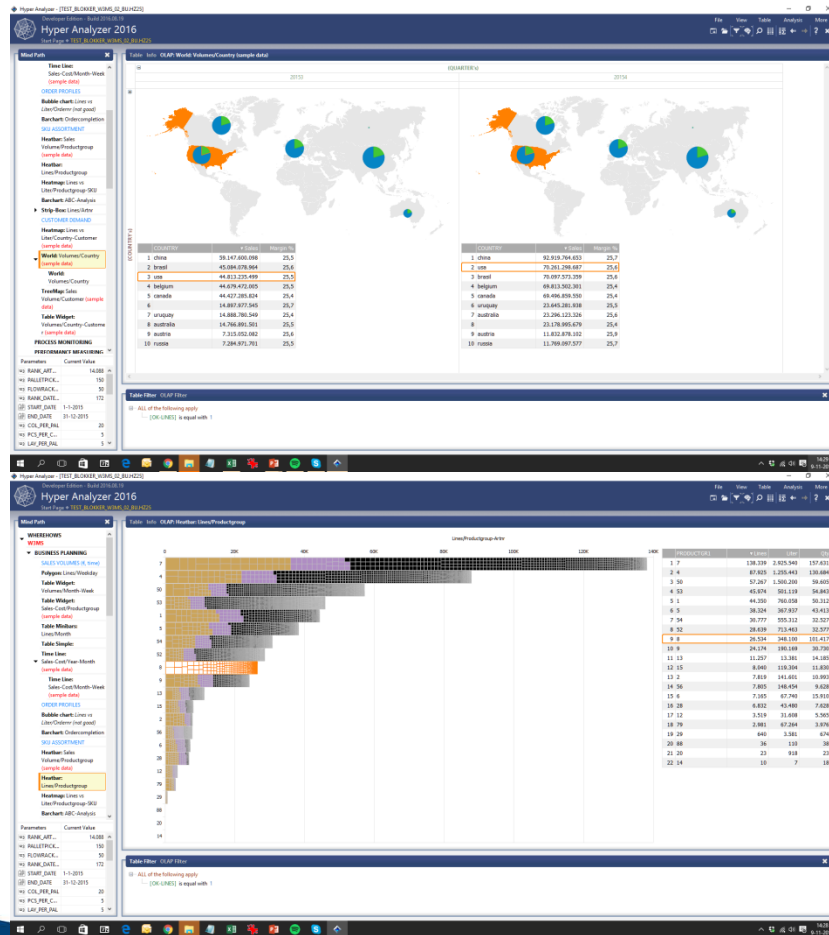


Warehouse Analytics

Order Composition / Item Activity / Demand Correlation / Process Relations / Sales Forecast / Seasonality Distribution / Stock Variability

Advanced graphs, (heat)maps etc

Support: Warehouse analytics



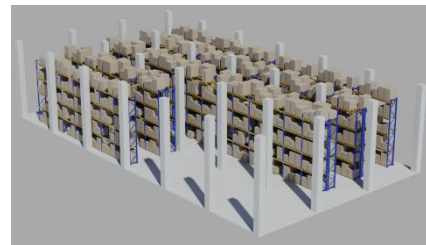
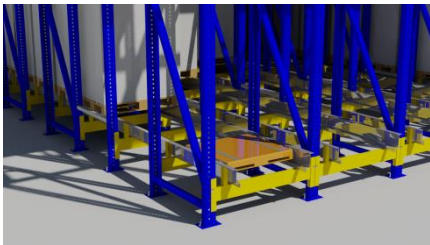
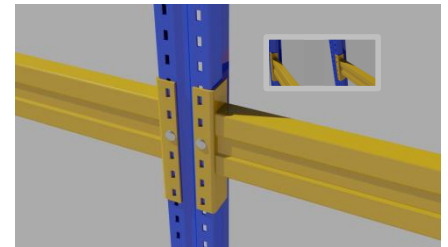
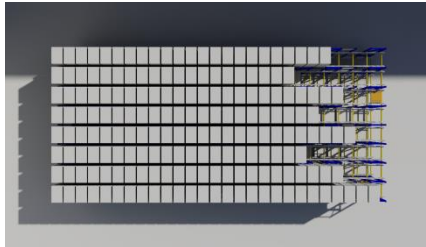
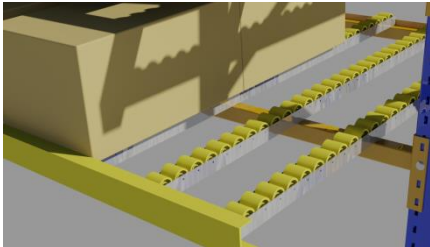
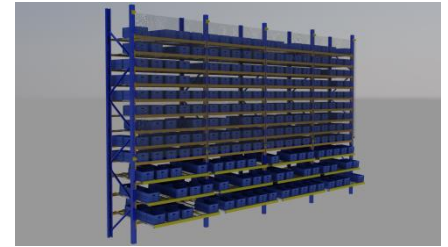
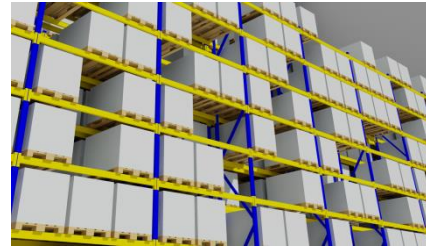
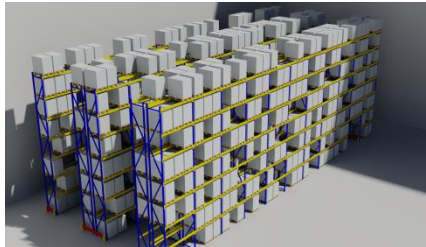
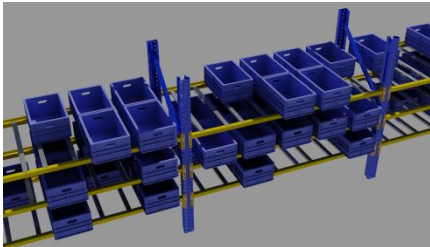
Mapping warehouse layouts

Support: Warehouse analytics



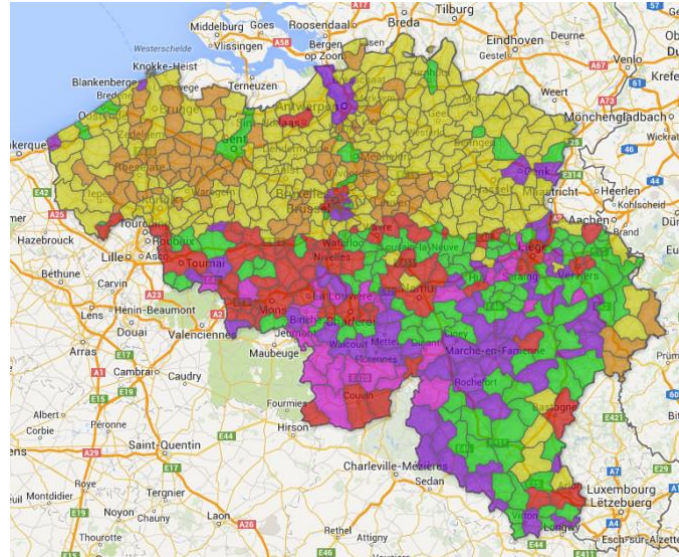
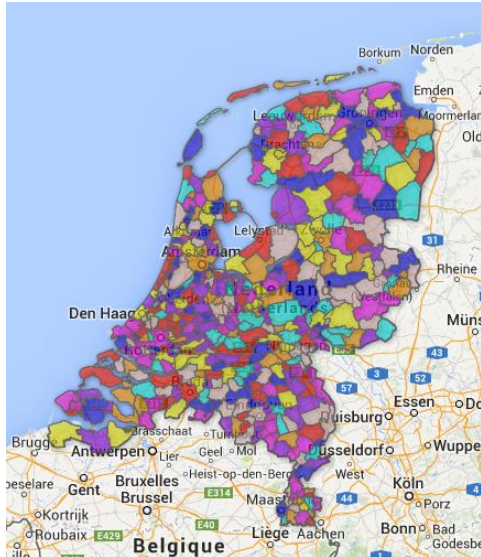
3D library

Support: Warehouse visualization



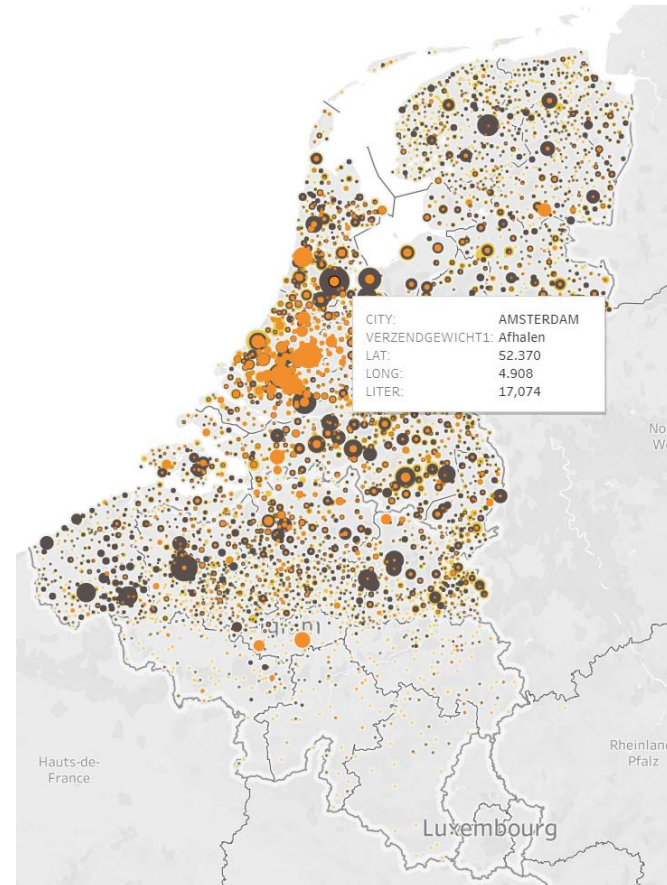
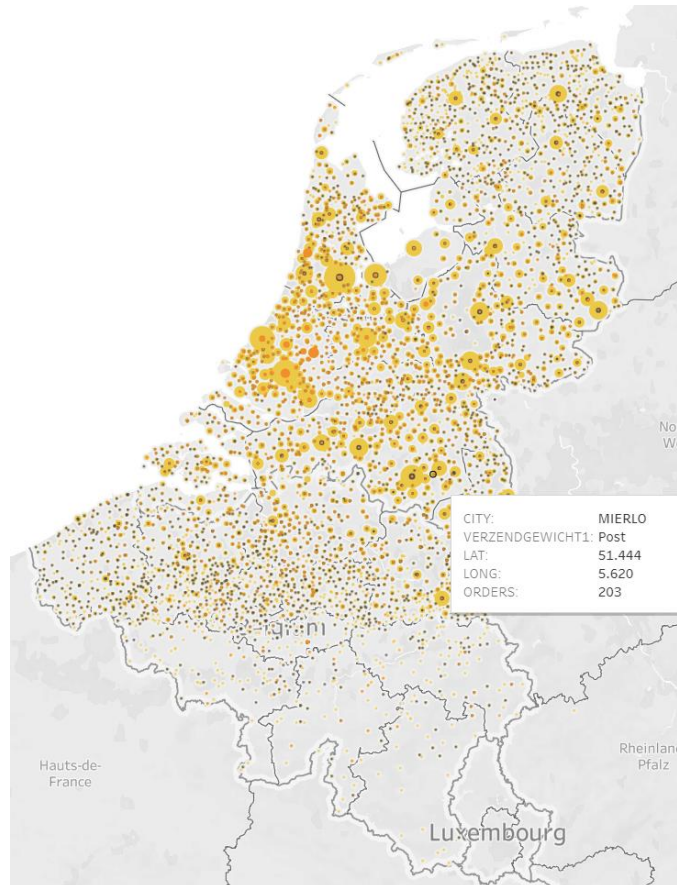
Geocoding and mapping

Support: Warehouse visualization



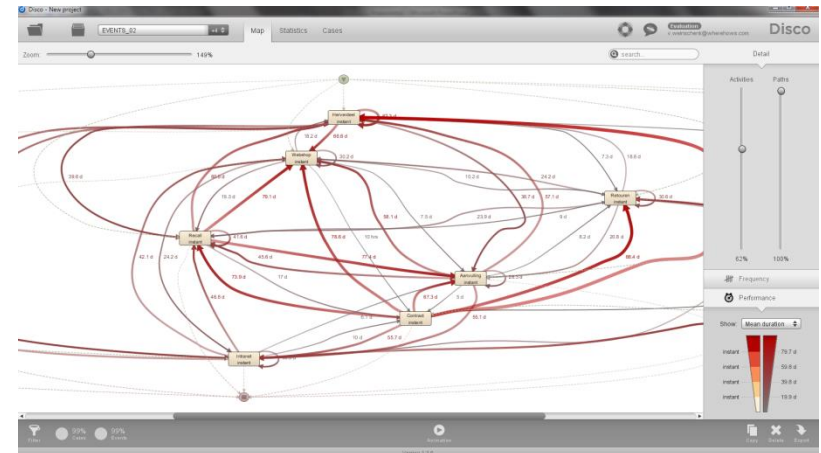
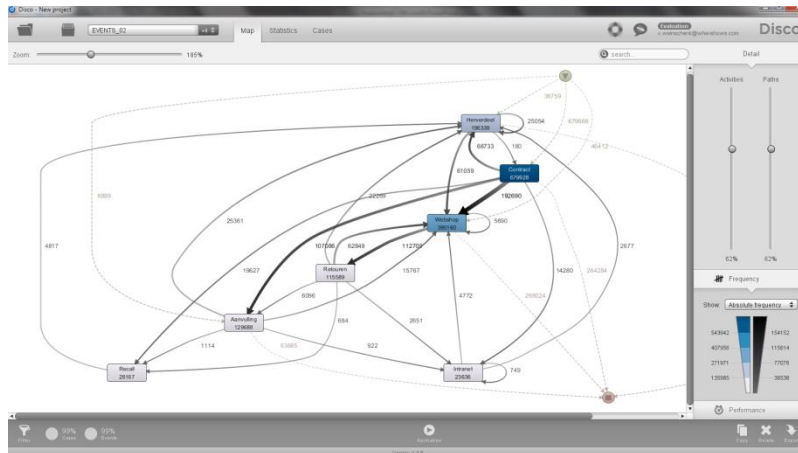
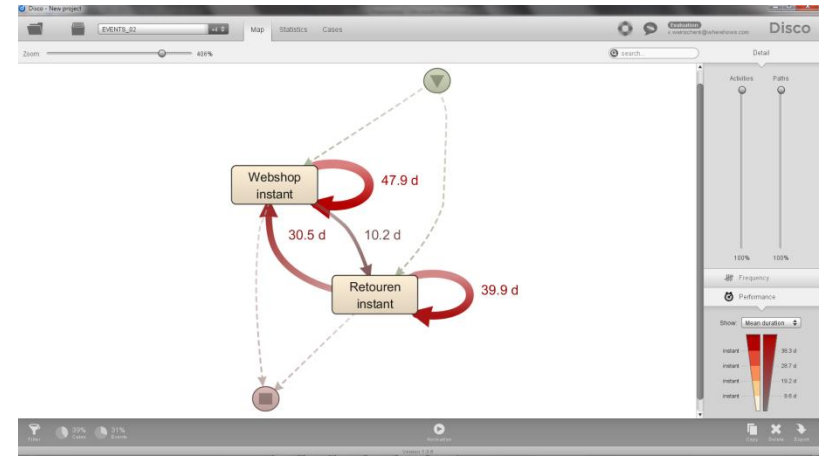
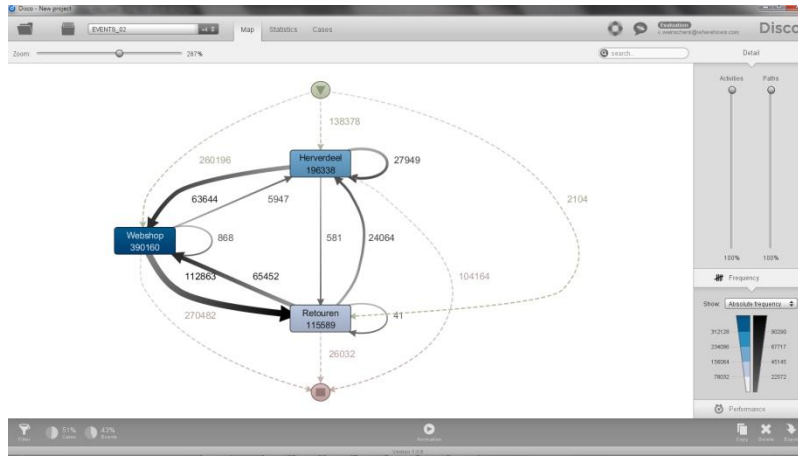
Geocoding and mapping

Support: Warehouse visualization



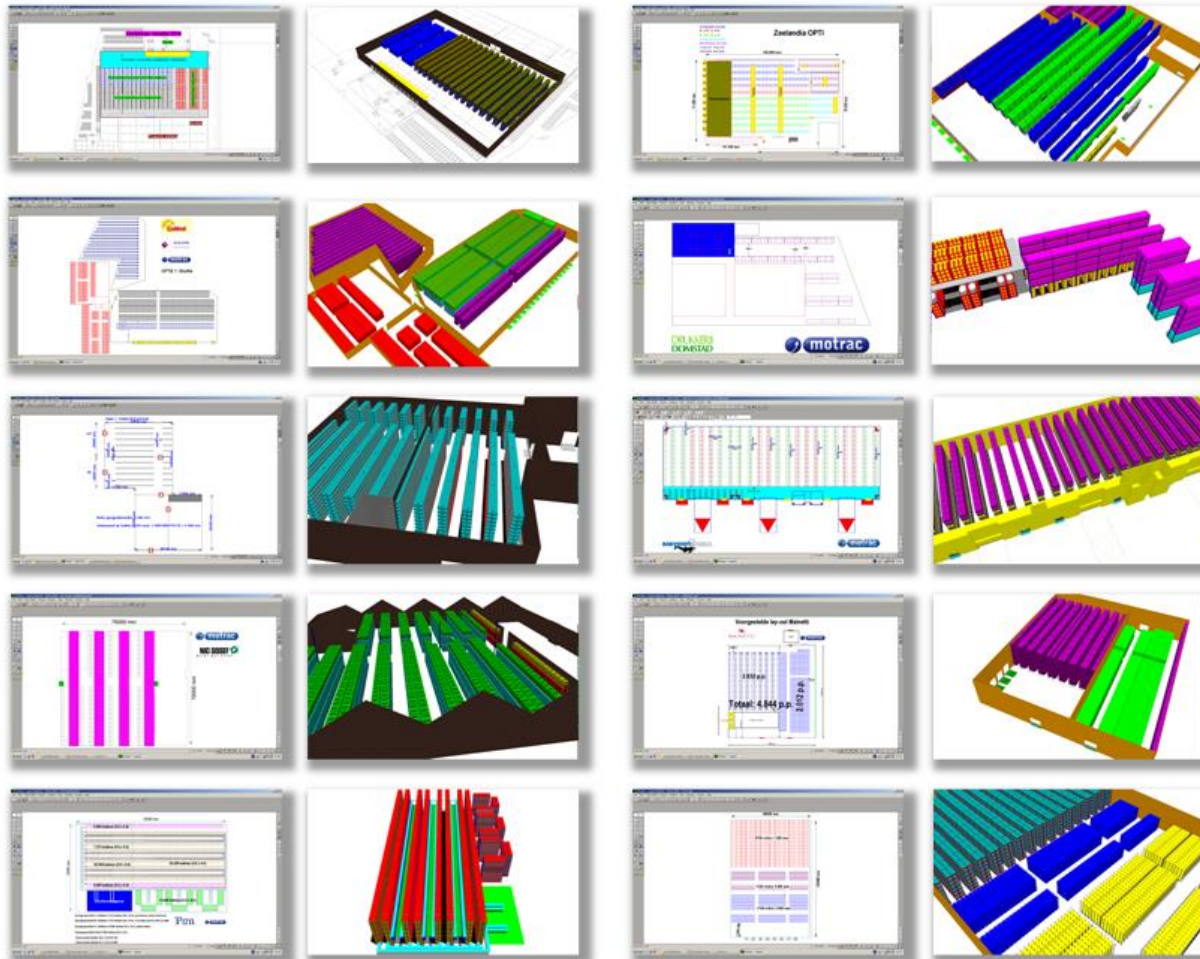
Process mining

Support: Warehouse visualization



Layout planning

Support: Warehouse engineering



Cost- & Resource modeling

Support: Warehouse engineering

Processes

PROCESS STATUS: **ACTIVE**

VALUES		PDF ALLOWANCES		OPERATIONAL SUMMARY	
PERSONAL	2.0%	PERSONAL	2.0%	TRUCKS / HOUR	5.3
FATIGUE	3.0%	FATIGUE	3.0%	DIRECT FTE'S	0.3
SKILL	1.0%	SKILL	1.0%	WORKING HOURS / YEAR	686.1
HEIGHT	0.0%	HEIGHT	0.0%	EQUIPMENT HOURS	686.1
PED. TRAFFIC	0.0%	PED. TRAFFIC	0.0%	GROSS PRODUCTIVITY	5.6
2-WAY TRAFFIC	2.0%	2-WAY TRAFFIC	2.0%	PDF ALLOWANCES	17.0%
SCHEDULING	5.0%	SCHEDULING	5.0%	BASELINE PRODUCTIVITY	5.6
PICK STOCK	3.0%	PICK STOCK	3.0%	CYCLE TIME (SEC)	546.6
TIME DOWN UNITS / CYCLE					

SHIFT ALLOCATION		COST SUMMARY	
SHIFT 1 (06:00-14:00)	20.0%	DIRECT SWPOWER	11.962
SHIFT 2 (06:00-14:00)	40.0%	- DHL Staff	10.023
SHIFT 3 (14:30-23:00)	20.0%	- Temporary Staff	1.538
SHIFT 4 (23:00-06:00)	20.0%	DIRECT SHIFT	301
SHIFT 5 (00:00-23:00)	0.0%	DIRECT EQUIPMENT	0
SHIFT 6 (00:00-23:00)	0.0%	TOTAL COSTS	11.862

Resources

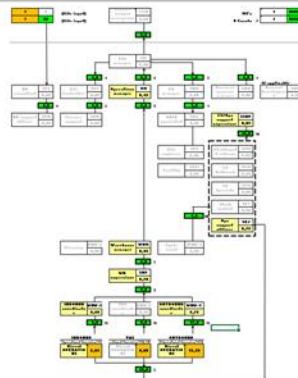
CHL FTE/WEEK: TEMP FTE/WEEK: RISK FOR EXCESS

Picking Cases

WORKGROUPS	TOTAL FTEs				FTE SHIFT DISTRIBUTION (AVG.)					
	AVG.	MAX	MIN	SPAN	S1	S2	S3	S4	S5	S6
RECEIVING KRETSMA										
Warehouse worker unqualified	4.0	4.0	4.0		4.0					
RECEIVING BAT										
Warehouse worker unqualified										
RECEIVING PM										
Warehouse worker unqualified										
PICKING										
Warehouse worker unqualified	6.6	10.4	5.4	5.0	2.6	1.3	1.3	1.3		
Lift truck driver senior	20.0	31.6	16.3	15.3	20.0					
PICKING CASES										
Warehouse worker qualified	0.3	0.5	0.2	0.2	0.1	0.1	0.1	0.1		
Warehouse worker specialist	0.4	0.7	0.3	0.3	0.1	0.2	0.1	0.1		

TEST 5

Flowchart



FINANCIAL OVERVIEW

INVESTMENTS (in months)

SUMMARY	INVESTMENT	COMMITMENT	DEPR. PERIOD
WAREHOUSE INSTALLATIONS	917.600	0	
OFFICE	7.270	0	
IT	121.540	0	
MISC.	0	0	
WAREHOUSE INVENTORY	0	0	
SOCIAL ROOMS AND CANTEENS	0	0	
RENTAL COMMITMENTS	0	1.811.720	
MATERIAL HANDLING EQUIPMENT (MHE)	0	349.573	
TOTAL NEW INVESTMENTS	1.046.410	2.161.293	
EXISTING ASSETS	0	0	
TOTAL INVESTMENTS	1.046.410	2.161.293	
Investment < Contract Period	0		
Investment > Contract Period	128.810		
Investment > Contract Period	917.600		
Asset book value at contract end	642.320		

DETAIL	INVESTMENT	COMMITMENT	DEPR. PERIOD
WAREHOUSE INSTALLATIONS			
Pallet Racking	297.600	0	
Shelves	500.000	0	
Mezzanine	120.000	0	
TOTALS	917.600	0	

Costs

Material Flow Diagram

Support: Warehouse engineering

