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Spare parts logistics proposition the Netherlands

Version 1.7

FINAL

March 18, 2017

Holland.

Contents

Chapters

1. Spare Parts – The Netherlands as your service hub
2. Spare Parts - Benchmarking of 18 locations
3. Spare parts definition and service logistics
4. Various segments
5. Regional specialization in the Netherlands
6. Dutch innovations in service logistics

User's guide

The general spare parts logistics proposition (chapter 1) contains overall selling points of the Netherlands

For regional or segment specific information, please refer to chapters 4 and 5

Combining slides and information from the different chapters allows customization for a specific audience, lead or project

Introduction

About this document

This logistics proposition has been composed by HIDC (Holland International Distribution Council) and its members. It is a background document containing information on the sector, logistics characteristics and the Dutch logistics proposition. Also, it is a living document, being updated regularly to reflect changes in the market and supply chains.

The target groups for this document vary from Dutch logistics companies to anyone that is involved in acquiring logistics flows and investments for the Netherlands. As the clientele for this document is broad, its goal is to provide a variety of background information rather than a ready-to-use marketing document.

HIDC welcomes any additions and suggestions to improve this document.

More information:

NDL/HIDC www.hidc.nl
Stan de Caluwe s.decaluwe@ndl.nl

Spare Parts
–
The Netherlands as your service hub

The Netherlands as your service hub

Seven reasons why companies choose the Netherlands as their service hub

- Excellent connectivity to Europe and the world
- Neutral country between major economies
- World class customs
- Supportive fiscal environment
- Wide variety of service providers
- Service logistics knowledge and innovation
- Many are already here …..

Right part, right time, right place …

… is all about connectivity

DHL Global Connectedness Index, 2016

The Netherlands # 1 since 2005

Global connectedness measures cross-border flows of trade, capital, information and people

Source: DHL 2016

Neutral country amidst major economies

- The Netherlands is located **right between Europe's three major economies**: Germany, the U.K. and France

- The **trading mentality** combined with a **cross border business environment** and a positive relationship with other cultures has resulted in many multinational companies establishing their European base in the Netherlands

- The Netherlands is **economically and politically stable**

Sweet spot for spare part distribution

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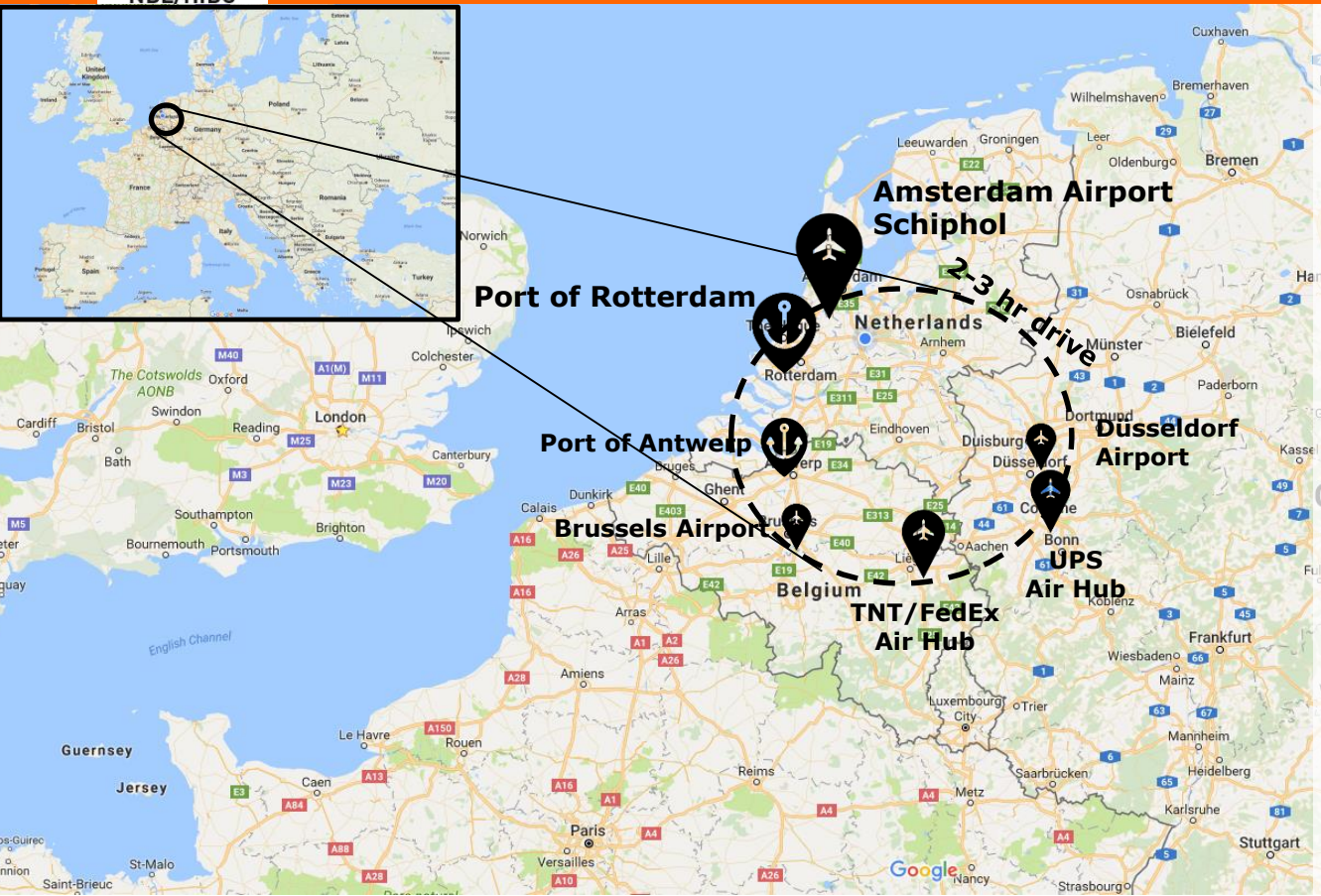

Within a 300 kilometer (180 mile) radius you will find:

Rotterdam and Antwerp
The two largest container ports in Europe

Amsterdam Airport Schiphol
The #2 best connected airport in the world and #2 cargo airport in Europe

UPS and FedEx/TNT Air hubs
Two main European integrator hubs

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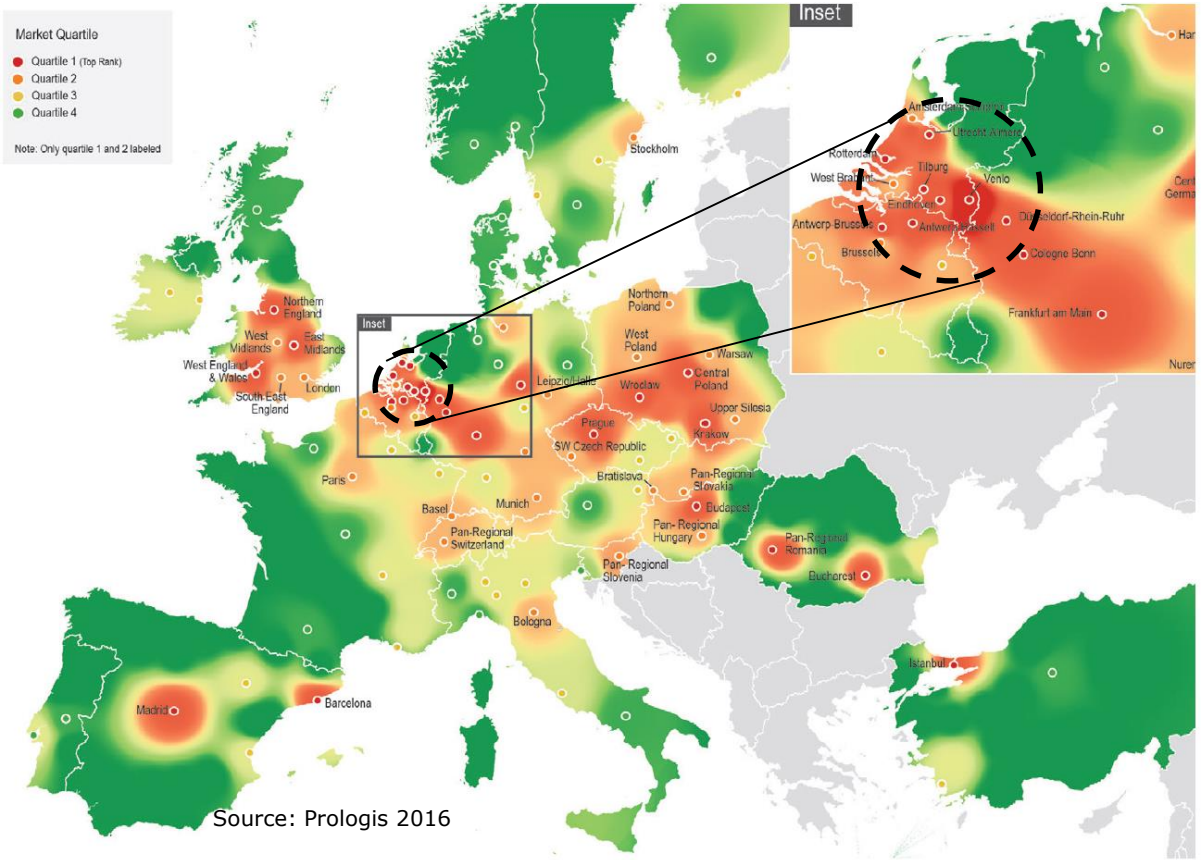
Europe's most desirable logistics locations

The 5 most desirable logistics locations in Europe are all located in this sweet spot; 4 are in the Netherlands

The 5 most popular locations in Europe are:

1. Venlo (NL)
2. Rotterdam (NL)
3. Antwerp-Brussels (BE)
4. Eastern Noord-Brabant (NL)
5. Central Noord-Brabant (NL)



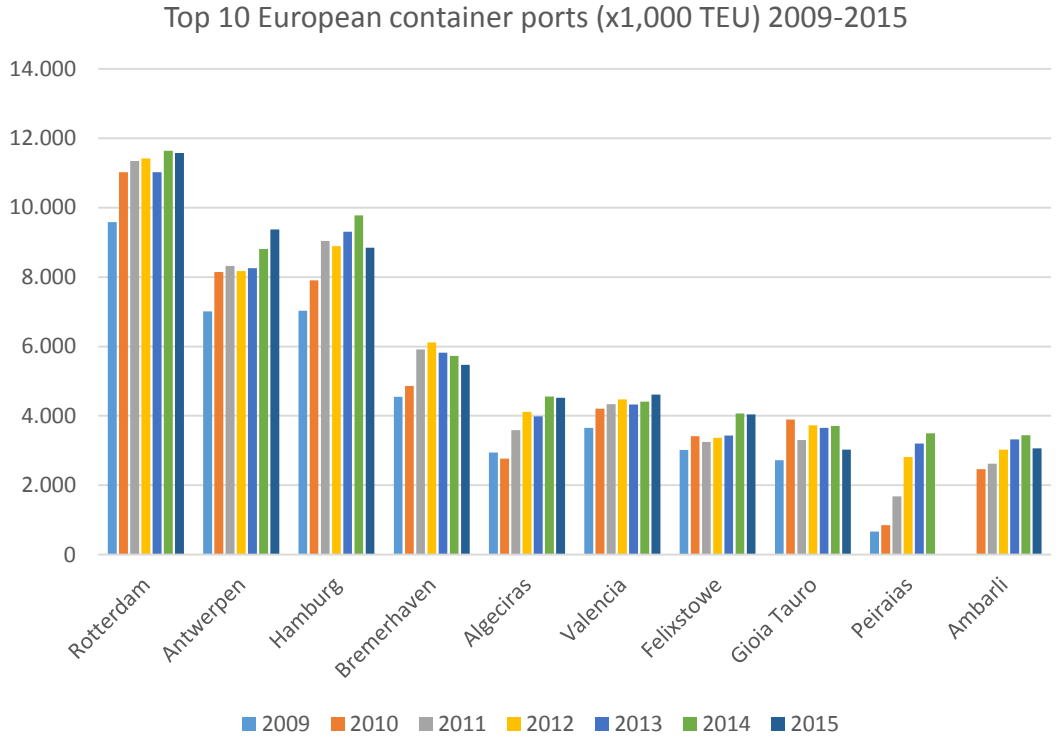
Source: Prologis 2016

Three signature ports

- Rotterdam is the largest allround and container port in Europe
- Amsterdam Airport Schiphol is the second largest cargo airport in Europe
- AMS-IX is the second largest internet exchange in the world

Rotterdam largest container port in Europe

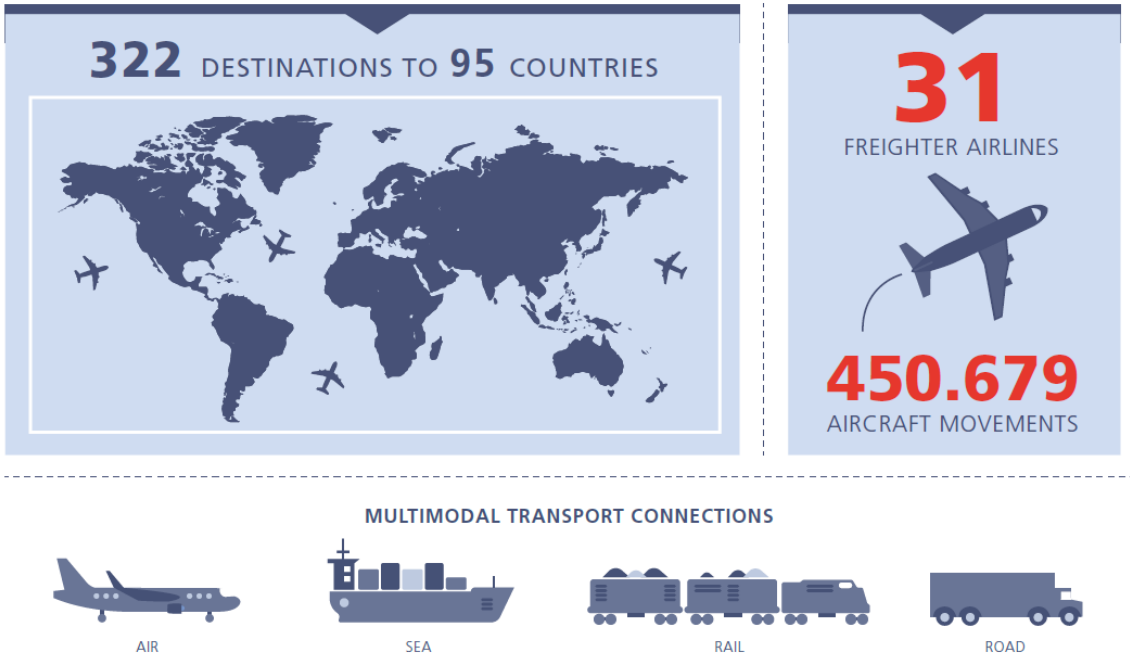
- Port of Rotterdam is the largest container port in Europe
- Maximum size container ships (19,000+ TEU) can be accommodated 24/7
- Total throughput almost at 12 million TEU in 2015 (~twice that of largest US East Coast container port NY)
- Growth is facilitated by the expansion of terminal capacity until at least 2030



Amsterdam Airport Schiphol

AMS a hub for spare parts

- Amsterdam Airport Schiphol is a major European air hub for spare parts
- It connects to 322 destinations in 95 countries
- It hosts 31 different freighter airlines



Source: Amsterdam Airport Schiphol 2016

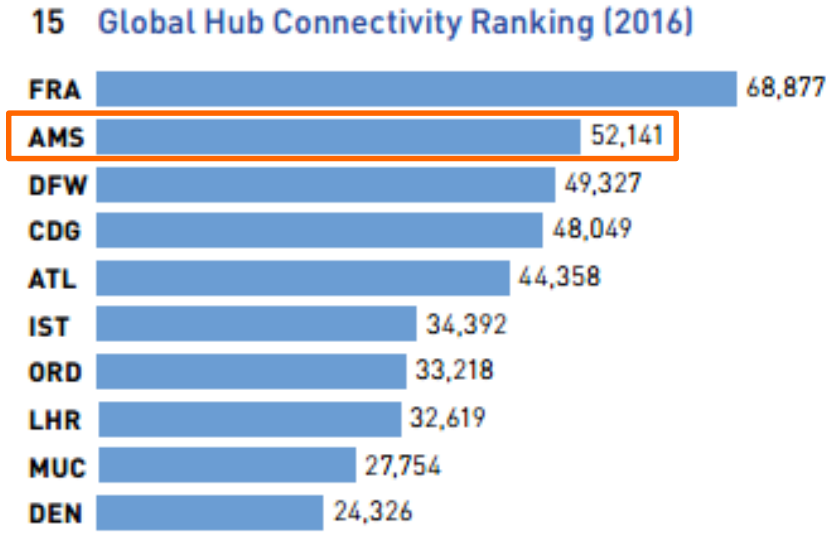
Amsterdam Airport Schiphol

Source:
Schiphol Cargo
2017

Amsterdam Airport Schiphol

AMS number two global hub

- Research shows Amsterdam Airport Schiphol is ranked **number two best connected air hub in the world**
- Hub connectivity is the total number of connections offered through hub airport X
- It allows **swift spare parts distribution** to all parts of the Europe of the world



Source: ACI Europe 2016

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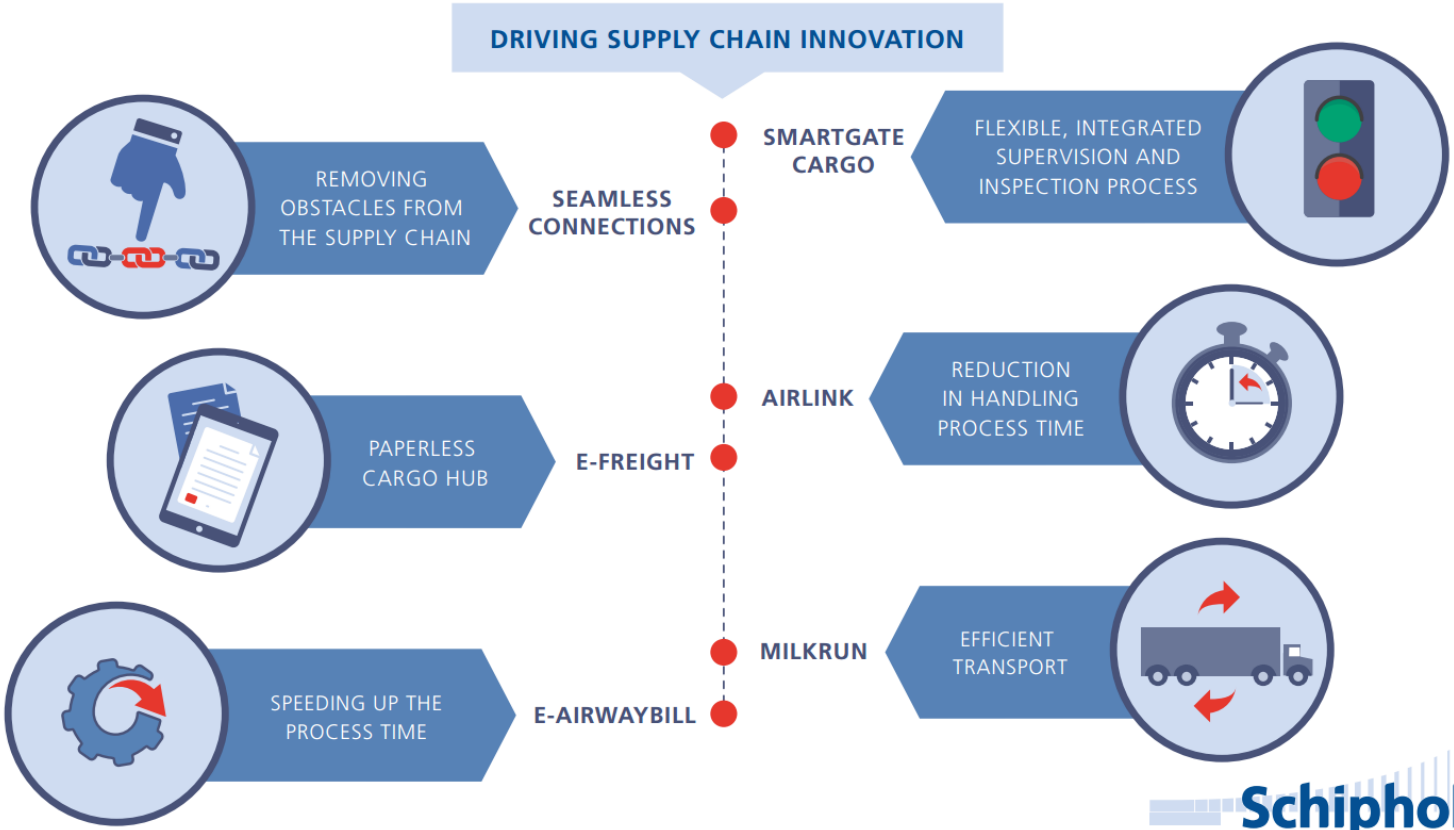
Amsterdam Airport Schiphol

Continuous innovation makes Amsterdam Airport Schiphol a **highly efficient** airport



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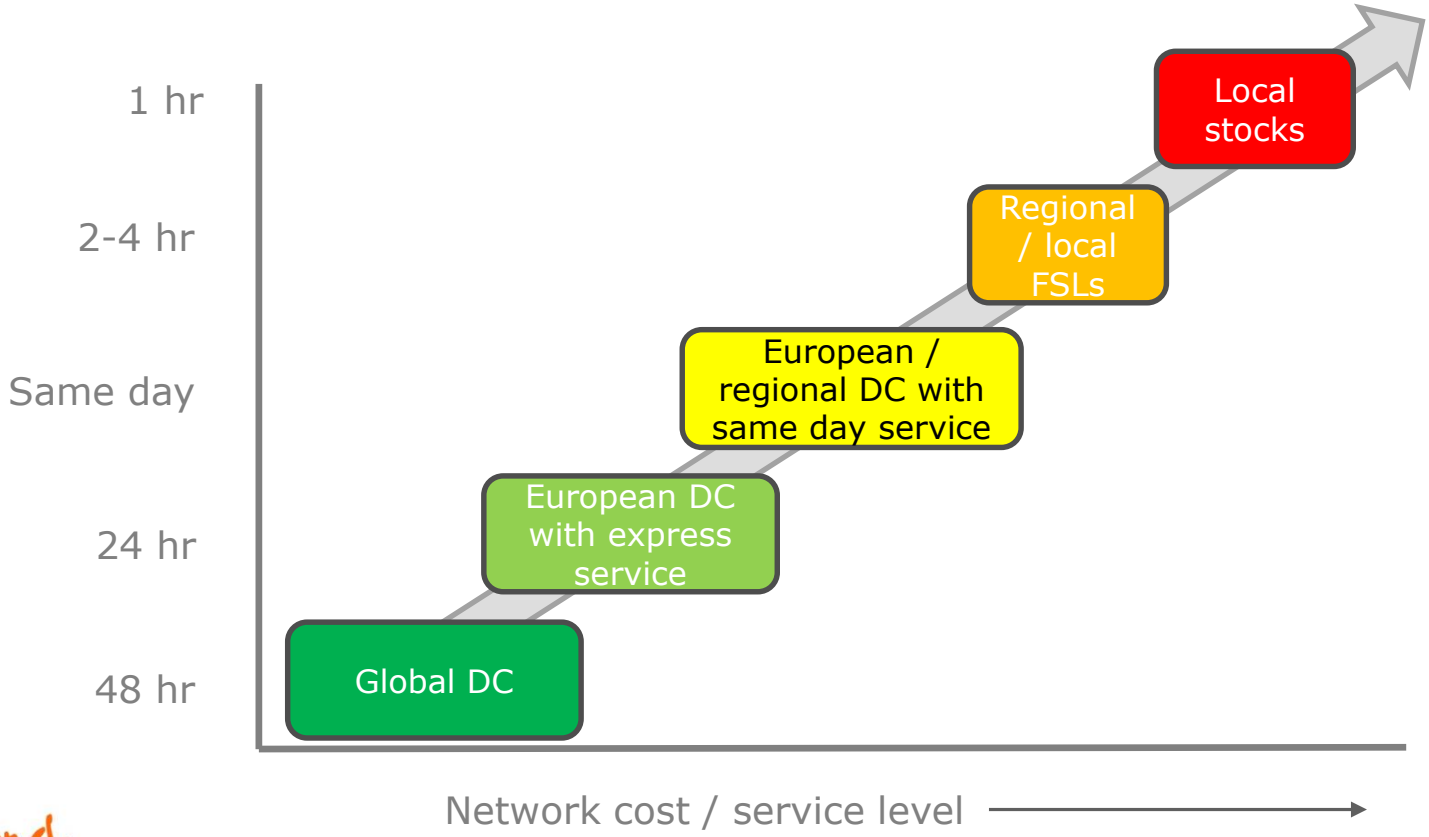
Schiphol Cargo

© Schiphol Cargo www.schipholcargoworld - cargo@schiphol.nl - Based on 2015 data of Schiphol

Spare part supply chain set-up depends on service level

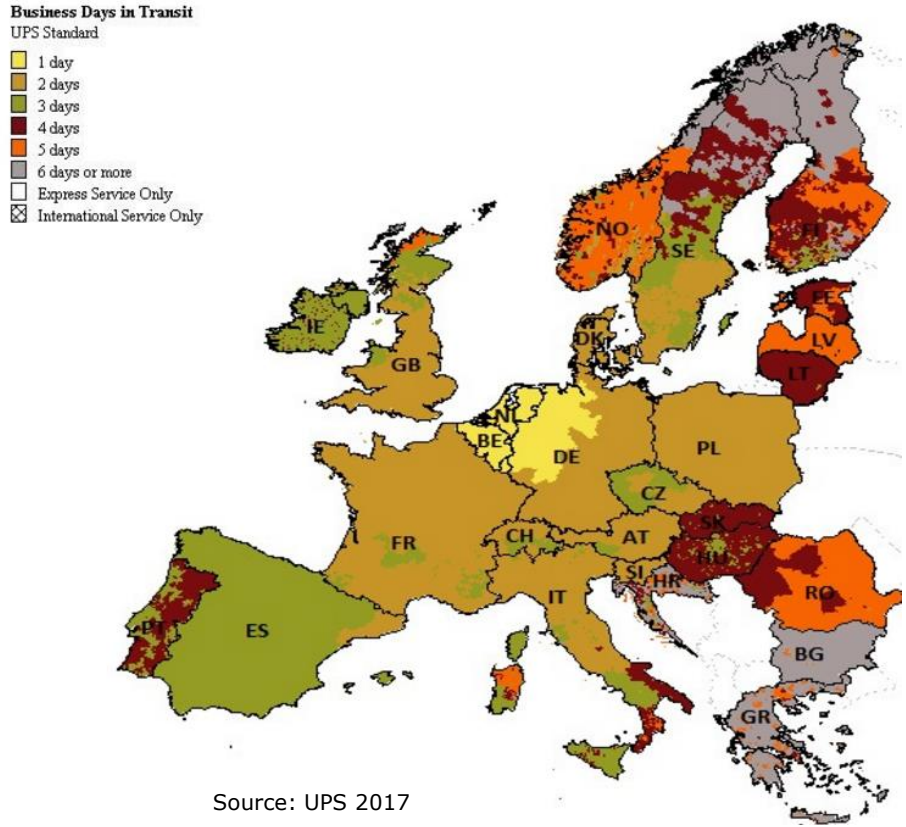


Same day/next morning Europe

- Various service provides offer same day and next morning delivery service throughout (most of) Europe from the Netherlands
- Integrators such as DHL, UPS and FedEx/TNT offer this when close enough to a major hub
- Other innovative companies, such as 12send, utilize existing passenger flight service and their baggage networks for same day delivery

Standard parcel service

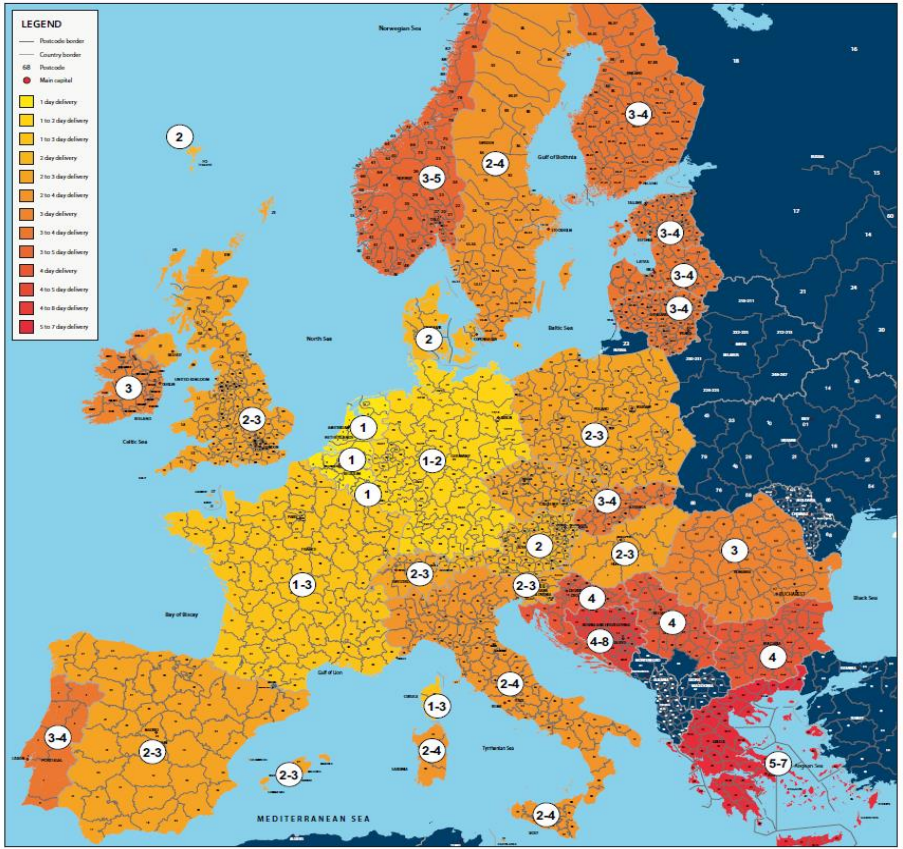
- From the Netherlands, most of the EU can be reached within 2 business days with standard parcel service



Source: UPS 2017

Road express

- Most European countries can be reached within one to three days with regular road transport from the Netherlands
- This is often used for larger parts or replenishment of forward stock locations / regional DCs



Source: Royal Rotra 2017

World class customs

User satisfaction with Dutch customs

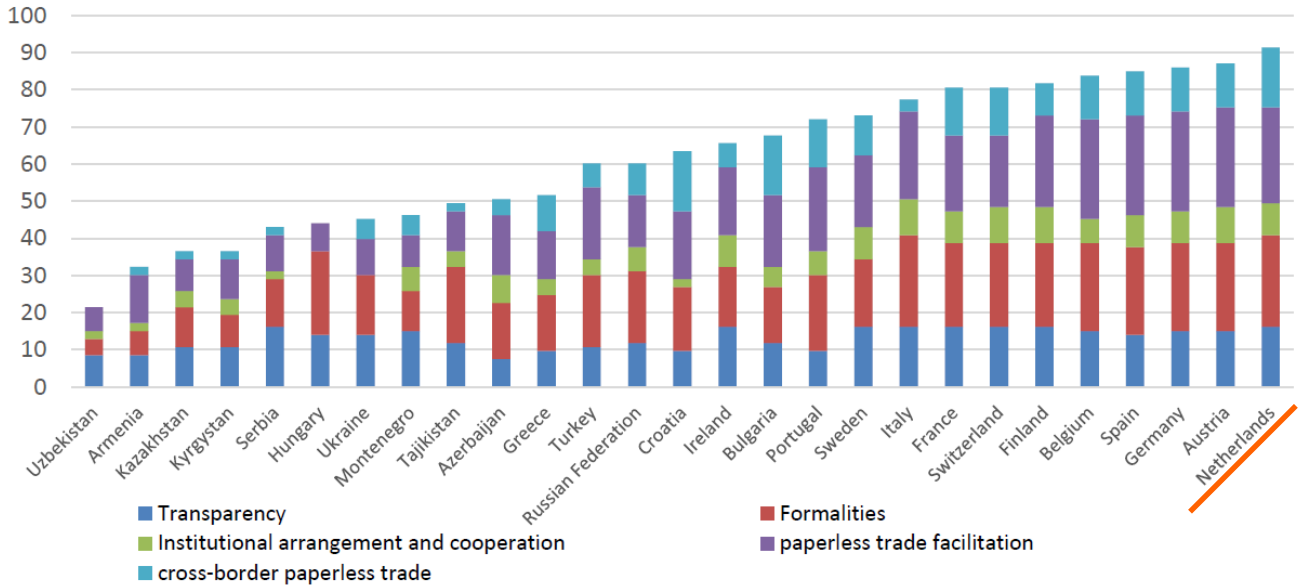
• Clearance and delivery of imports	93%
• Clearance and delivery of exports	100%
• Transparency of other border agencies	93%
• Transparency of customs clearance	100%
• Expedited customs clearance	87%
• Provision of adequate and timely information on regulatory changes	100%

Source: Domestic Logistics Performance Index 2014, The World Bank

World class customs

- According to research by the United Nations, **Dutch customs facilitate trade best**
- The Netherlands stands out as the best overall performer in trade facilitation among 119 countries (2016)

Trade Facilitation Implementation score



Source: UNESCAP 2016

Customs keep goods flowing

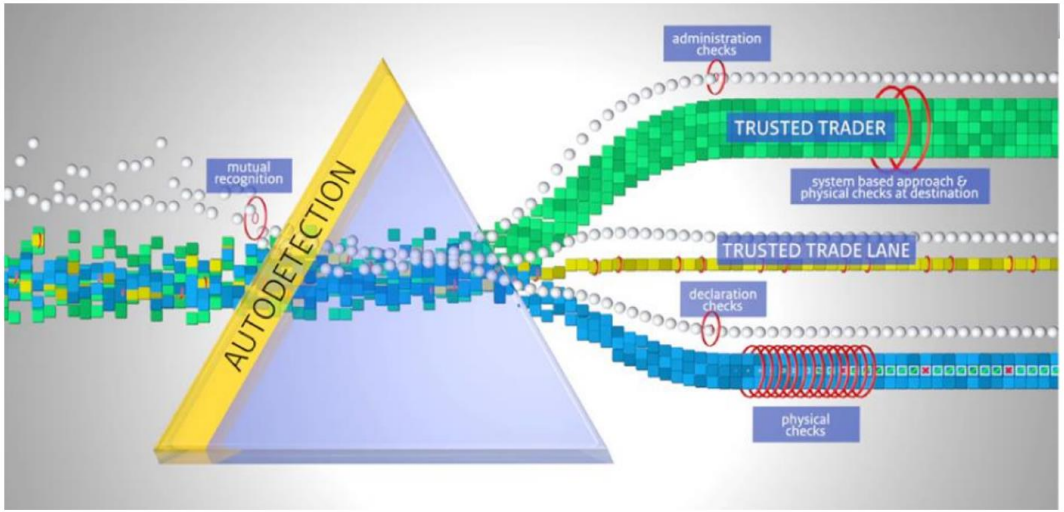
Dutch customs makes **maximum use of technology** to keep goods flowing

A risk assessment divides the goods flow into:

- Unknown Traders
- Trusted Traders
- Trusted Trade Lanes

Spare parts should be in trusted trade lanes - where possible - to expedite clearance

Enforcement vision Dutch customs



Dutch Customs: cash flow benefits

- Single import into the EU: when cleared in the Netherlands, it is cleared for the whole common market

- EU: duties and taxes to be paid at moment of clearance
  - Duties are % of declared product value
    - Same tariff code in all EU member states
    - **NL Benefit: Upfront rulings with local Customs authorities (BTI)**
    - **NL Benefit: wide variety of bonded warehousing options**
  - VAT is % of declared product value, differs from country to country (average 20%)
    - In most EU countries to be paid upon import and then reclaimed
    - **NL Benefit: deferment of VAT payment possible**

The Netherlands provides VAT deferment: NO advanced payment of import VAT

Cash flow benefits

$$

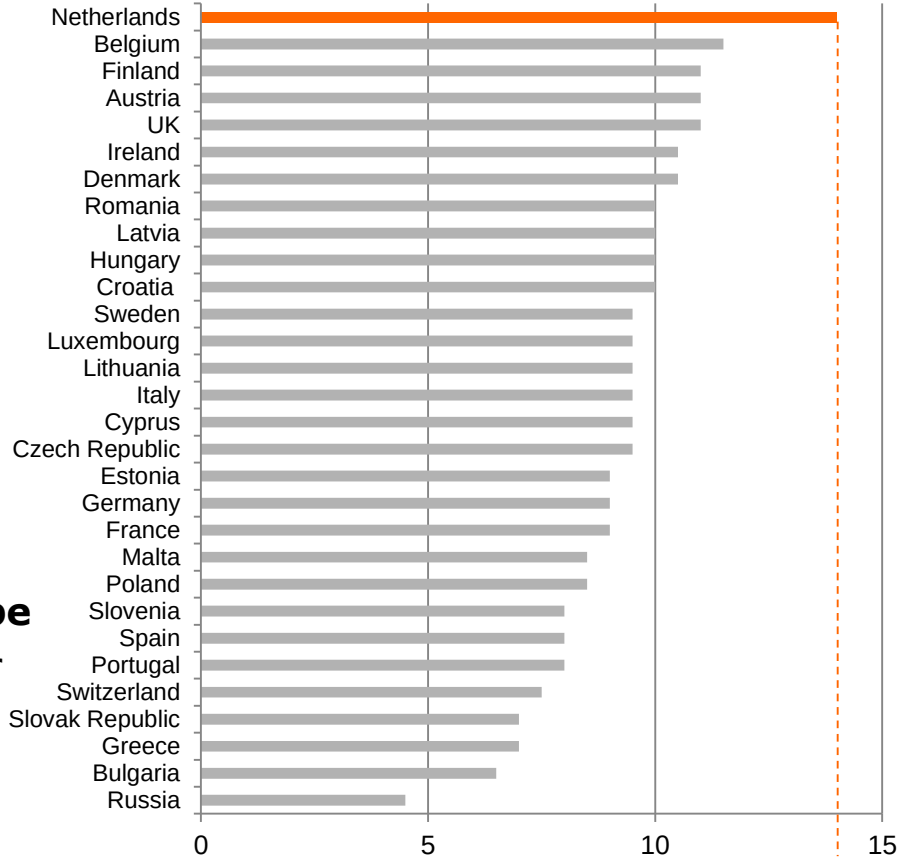
The Netherlands provides bonded warehousing: NO payment import duties until clearance

VAT attractiveness

VAT attractiveness analysis performed on 14 elements regarding VAT compliance, obligations, processes, opportunities and possibilities, such as:

1. VAT filing period
2. Complexity VAT returns
3. VAT groupin
4. Payments VAT refunds
5. Deferment of import VAT
6. VAT bad debt relief, etc.

The Netherlands scores highest in Europe by a significant margin. This results in better cash flow and lower operational costs



Source: Deloitte VAT Index 2016, Overview of administrative and cash flow simplifications implemented in the various EU Member States (+Swi, Lie&Ru)

VAT deferment

- Due to the VAT deferment system in the Netherlands, **no VAT payment at import is required**. This results in a considerable cash flow and interest benefit as normally, VAT reclamation can take a couple of weeks up to a year (in some EU countries)
- VAT deferment requires an article 23 license that can be obtained by a Dutch entity or your Logistics Service Provider / fiscal representative

Example:

Inventory value: €10m

VAT: 21%

Interest: 3%

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	Non-EU	EU
Without VAT deferment	€2.1m payable to tax office	3% interest rate Annual capital costs €63k
	Point of customs clearance	
Article 23 VAT deferment license	VAT payment deferred to periodical VAT returns	No pre-payment of €2.1m VAT Annual savings potential €63k

Bonded warehousing

Arrivals from non EU origins

Distribution to EU and non-EU customers

Point of customs clearance

The advantages of a Customs-bonded warehouse:

- Avoidance of double duty payment
- Postponement of duty payment
- Possibility of storage for an unlimited period of time
- Less customs interference
- Value added logistics (assembly, configuration) in a customs-bonded warehouse

Knowledge of global markets

- Dutch logistics service providers have a **wide and profound knowledge of exporting to other markets** relating to:
  - Import requirements
  - Classification of products
  - Customs procedures
- Reflecting the **Dutch trade mentality**, no other country has more tax treaties than the Netherlands

Wide variety of service providers

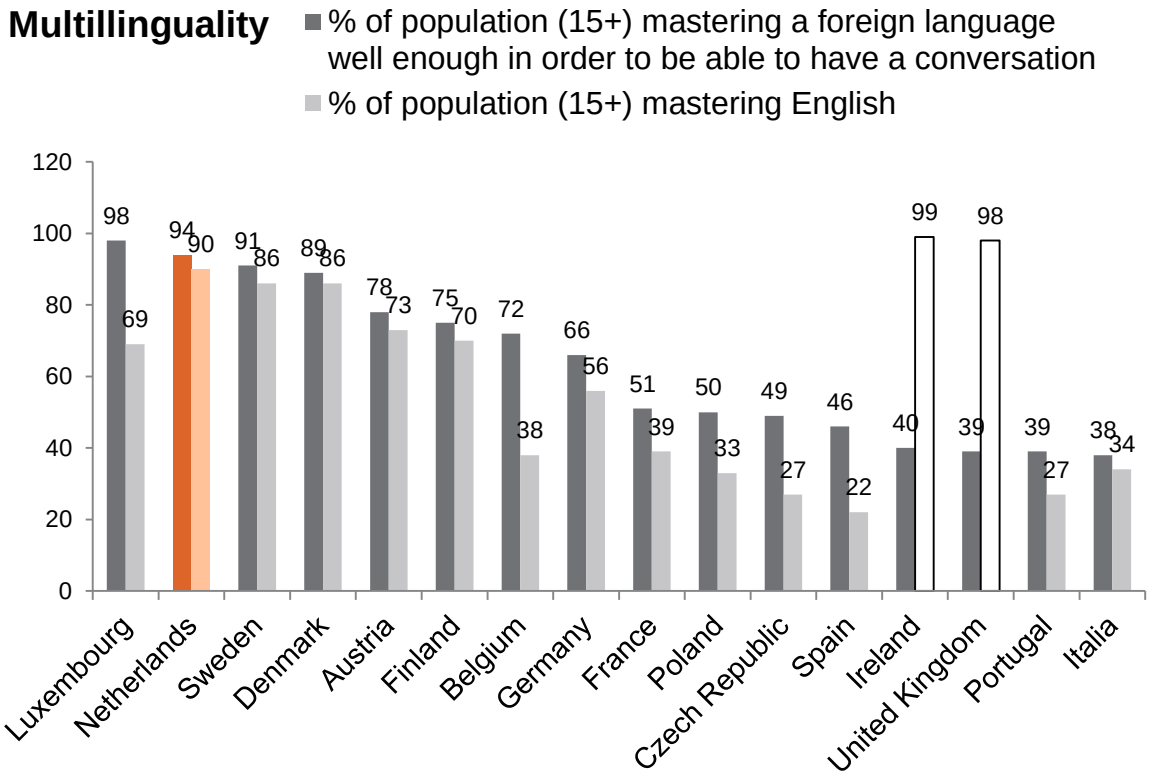
- The Netherlands hosts a wide variety of **logistics service providers** that specialize in spare parts warehousing and freight forwarding

- A 3rd party logistics service providers specialized in spare parts has:
  - Authorized Economic Operater (AEO) certification
  - Bonded warehousing capabilities
  - Stock management capabilities
  - A network of forward stock locations and/or PUDOs
  - Knowledge of customs requirements in other countries and world regions
  - Top of the bill WMS and TMS systems
  - A skilled IT department
  - Control tower functionality

- The Holland International Distribution Council (HIDC) can help you find the right partner for your service parts network

Flexibility of work force

- The Netherlands' workforce is highly educated as well as motivated and flexible
- The Netherlands is one of the most multilingual nations in Europe
- Knowledge, skill level and labor productivity in logistics is high

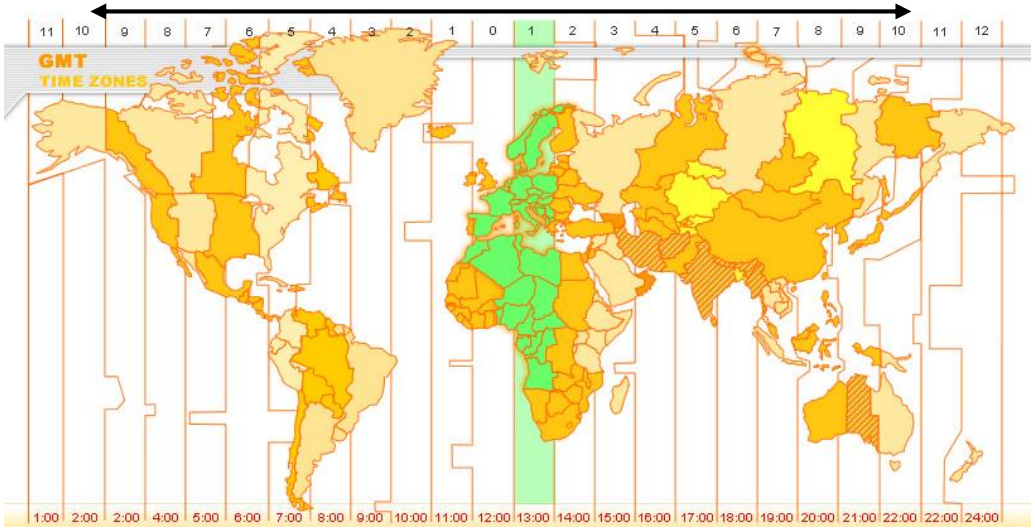


Source: European Commission, Eurobarometer: Europeans and their Languages, 2012

Service the globe from 1 location

- Europe has business hours overlap with all major economies
- This allows global service from 1 location
- Overlap with*
  - U.S. West Coast: 1 hour
  - U.S. East Coast: 4 hours
  - EMEA: 7-8 hours
  - India: 5.5 hours
  - China: 3 hours
  - Japan: 2 hours
- Combined with the working hour flexibility of the Dutch** and the language skills, global service from 1 location can easily be achieved

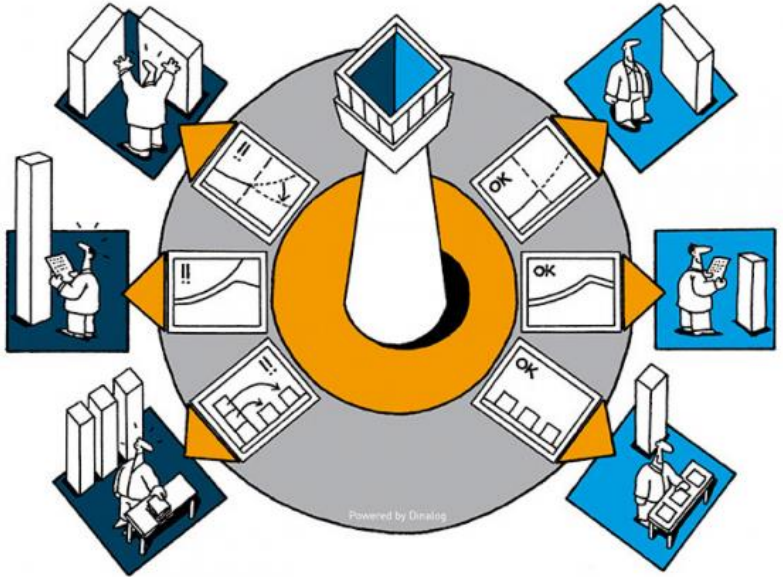
Overlap in business hours



* *Business hours assumed 8 am – 6 pm*
** *52% of Dutch employees regularly works at night or in the weekend, versus 38% EU average. Source: CBS 2017*

Service logistics innovation

- The Netherlands has a history of **high-quality service logistics**
- Many multinational companies have their **spare parts control tower, service or repair center, or spare parts distribution center** in the Netherlands
- Dutch universities have carried out **international trend setting research in the area of Service Logistics**. Research is carried out together with industries, leading to knowledge intensive practical solutions
- Dutch education institutes offer **highly skilled graduates**



Service logistics innovation

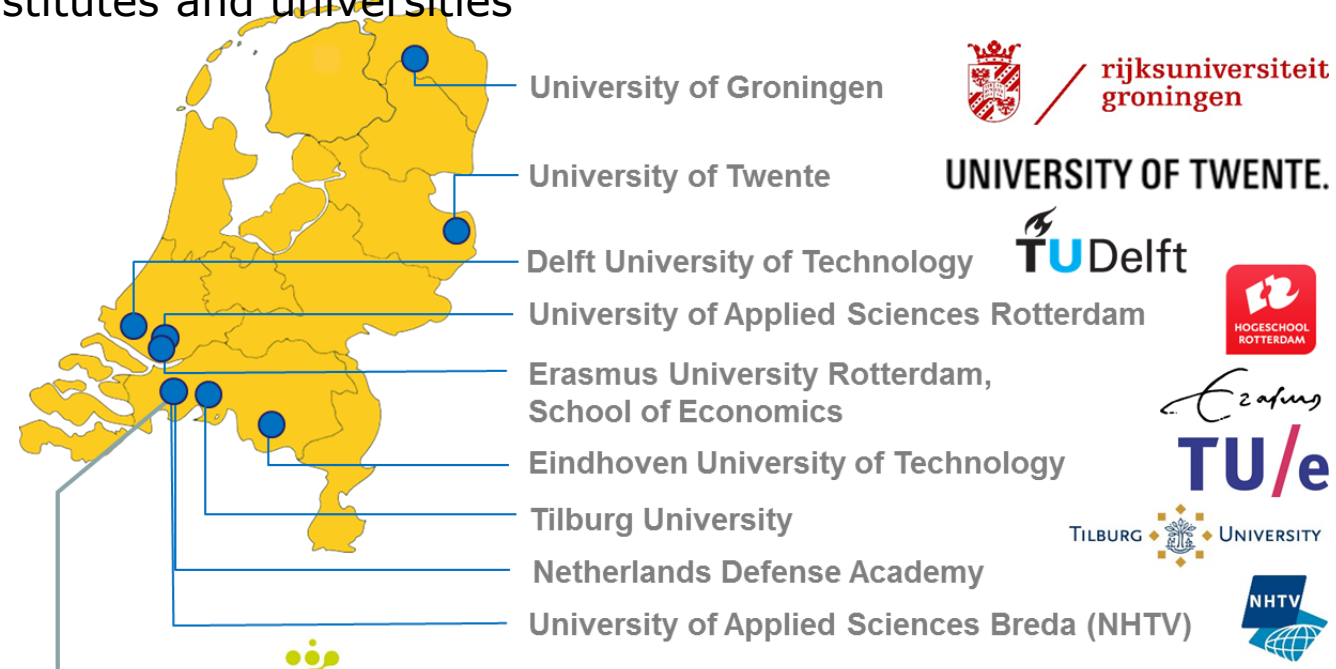
Dutch service providers and academia deploy innovative concepts to tackle service logistics challenges

- New service concepts
- Pooling and Partnership
- Life-cycle Engineering & Management
- Generic Spare Parts Management
- Generic Maintenance

- **Servitization:** Transition from product chains to product based service chains
- **Predictability:** Predictable failure behavior by Condition Based Maintenance and Big Data
- **Internet of Things:** Fully connected systems for optimal usage
- **Mass Service customization:** Online offer of individual service transactions

Service logistics innovation

Service Logistics –
Knowledge institutes and universities



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DINALOG Dutch Institute for Advanced Logistics
DUTCH INSTITUTE WORLD CLASS MAINTENANCE

Innovation roadmap Service Logistics

A selection of topics supported by top sector logistics

New service development:

- (Remote) condition-based maintenance/ logistics
- Total service supply chain coordination concepts
- Service differentiation and service level agreements
- Service process design
- ICT based business support systems/ system planner interaction

Pooling & partnerships:

- Techniques for call screening & diagnostics
- Remote (on-line) diagnostics and maintenance
- Business models for network enterprises, control towers
- Enhancing field service mobility
- Cultural and behavior aspects of network enterprises

Lifecycle engineering and management:

- Obsolescence management
- Installed base forecasting and management
- Life Cycle analysis, closed loop supply chains, cradle-to-cradle
- Design to service

Service Logistics Forum

The **Service Logistics Forum** is the Dutch knowledge base in service logistics for knowledge development and exchange, aiming at the **development of service logistics know-how and skills** of all approx. 50 participating companies and institutions

SLF
SERVICE LOGISTICS FORUM

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The whole service chain is represented

Logistic service providers
Transport, warehousing, value added services

Type of company	Supply chain role	Examples in the Netherlands
Asset owner	Owner of the system, often carries out the maintenance themselves	Airforce, DSM, DOW, Sabic, Marel, KLM, ASML, Shell, Heineken etc
Service provider	Conducts maintenance at systems of asset owner	Alewijnse, Bilfinger, CroonWolter&Dros, ENGIE, Fokker Services, Kropman, Sitech, SPIE, Stork
Parts suppliers	Supply of spare parts and consumables	Biesheuvel Techniek/group IPH, Fabory/WW Grainger, ItsMe, Brammer, ERIKS, MAG45, Rexel, Technische Unie/Sonepar
OEMs	Develops and manufactures systems, often also provides spare parts services	Philips Healthcare, Damen Shipyards, IHC, Wartsila, Vanderlande Industries
Supplier	Develops and manufactures components and subsystems for OEM	Frencken, Dutch Aero, Neways, NTS, Wilting, VDL, Faes

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High Tech spare parts operations in the Netherlands

Automotive spare parts operations in the Netherlands

Maritime and offshore spare parts operations in the Netherlands

Med tech spare parts operations in the Netherlands

Aerospace spare parts operations in the Netherlands

Source:
NFIA 2015

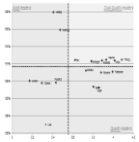
Main operations: MRO, spare parts distribution centers, logistics centers, customer support centers, aircraft component service points, R&D, manufacturing, marketing & sales offices.

Spare Parts
-
Benchmark

Methodology and Scope

The objective of the benchmark is to review competitive Dutch logistics hot spot locations with the top logistics locations in the North West EU region.

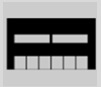
The benchmark has been performed from a source-to-market business perspective based on real life cases in several industry segments based on a Cost-Quality review.



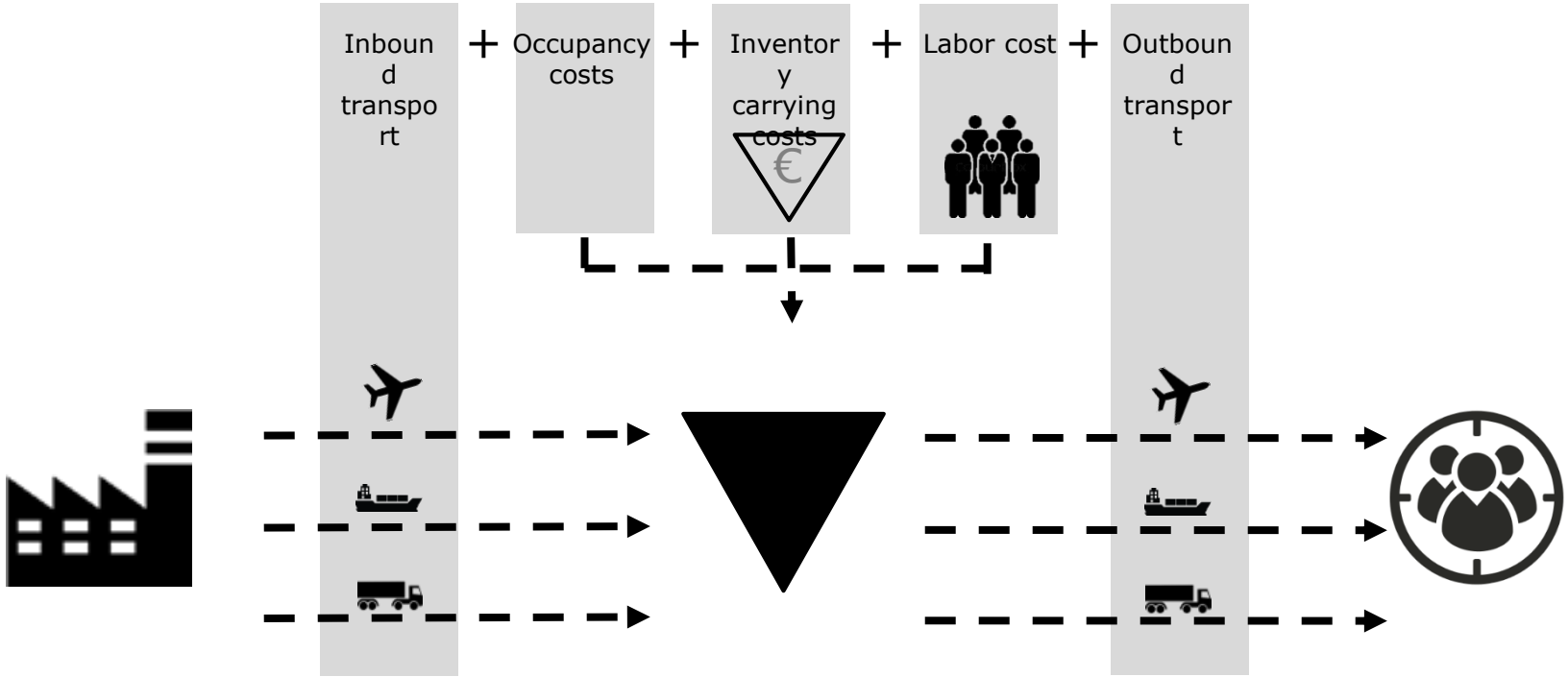
The results of the Cost-Quality review in the benchmark analyses have been reviewed against the supply chain drivers per industry segment.

Industry case studies are by definition case specific. They do not represent all cases in a sector of industry. Some quality factors are difficult to assess in Euro's but still have an impact on the total costs as well.

The 5 cost factors

	Cost factor	Example
Transportation	1 Inbound freight cost	Inbound transportation costs from supplier to DC Calculation: Freight rates x volume per sourcing region
	2 Outbound freight cost	Outbound transportation cost from DC to market (including road taxes, etc.) Calculation: Freight rates x volume per market
Warehouse, labor and inventory 	3 Labor costs	Total labor cost of the working staff in the DC Calculation: Annual employer costs x FTE x available annual hours
	4 Real estate costs	Annual site costs based on prime market rent levels Calculation: Rent per m^2 x m^2
	5 Inventory carrying costs	In transit inventory costs based on actual interest costs Calculation: Pipeline inventory value x interest rate

The cost model



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The 26 quality factors

Quality category		Quality factors
A Infrastructure & accessibility	A1	Highway connections
	A2	Availability of multimodal transport
	A3	Proximity to airports
	A4	Proximity to seaports
B Labor availability and quality	B1	Labor availability
	B2	Flexible and temporary workforce
	B3	Productivity and loyalty
	B4	English language skills
C Labor regulations	C1	Hiring and firing regulations
	C2	Working schedule flexibility
	C3	Workers councils/unions
D Availability of transport hubs	D1	Availability of (dedicated) 3PLs
	D2	Proximity to integrator hubs
	D3	Market maturity
E Facilities and sites	E1	Availability of large sites
	E2	Building permits and timing
	E3	Availability of pre-built sites
	E4	Sustainable and innovative solutions
F Proximity to the market	F1	Weighted proximity to market
	F2	Lead time (inbound & outbound)
	F3	Congestion
G Customs and Taxes	G1	Bonded warehouse solutions & VAT deferment
	G2	Business orientation customs
	G3	Time to obtain licenses/rulings
	G4	Administrative burden
H Incentives	H1	Availability of incentives (on labor, land, real estate and taxes)

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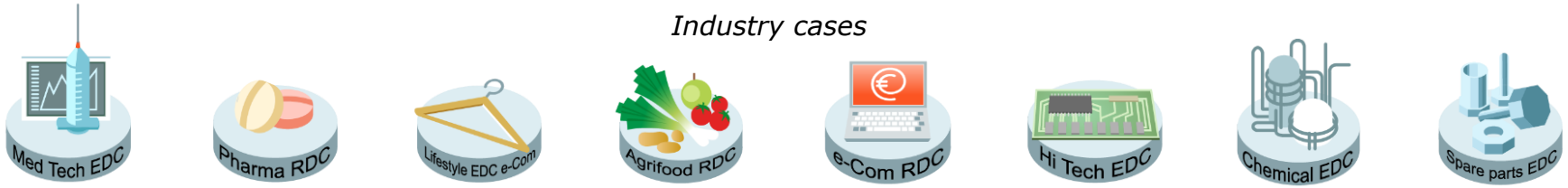
The quality model

Industry cases



per case/location

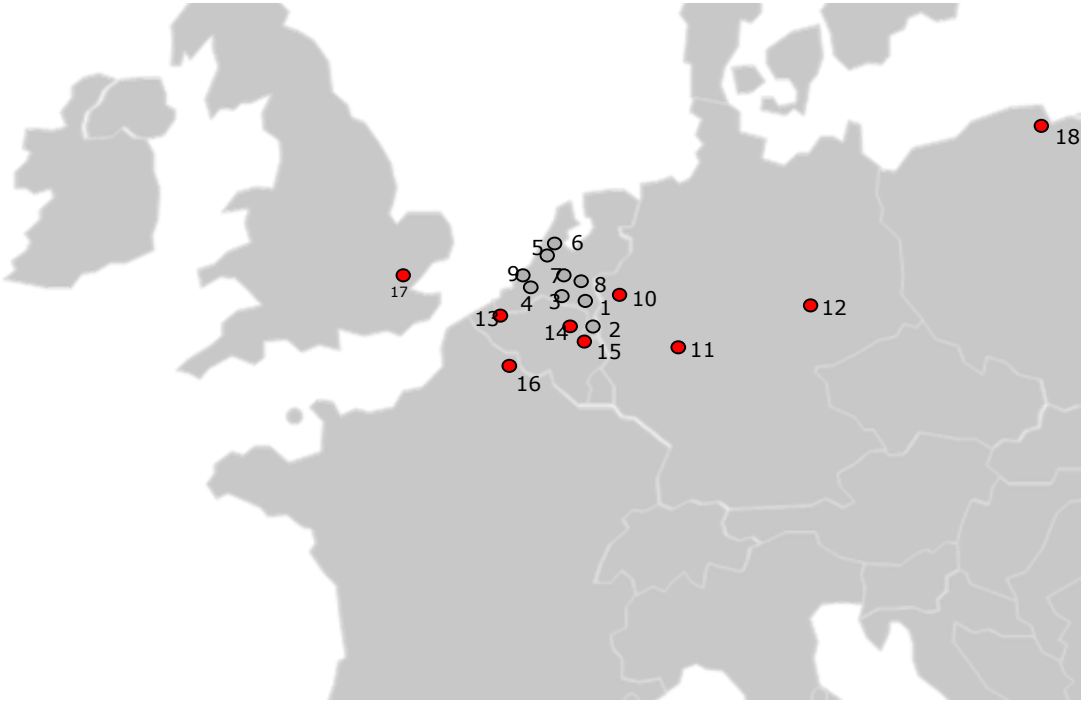
100%

%	%	%	%	%	%	%	%
Infrastructure & accessibilit	Labor availability and quality	Labor regulations	Availability of transport hubs	Facilities and sites	Proximity to market	Customs and taxes	Incentives

Quality model

18 Benchmark locations

1 Venlo
2 Zuid Limburg
3 Tilburg
4 Moerdijk
5 Schiphol
6 Amsterdam
7 Tiel
8 Nijmegen
9 Rotterdam
10 Duisburg
11 Frankfurt
12 Leipzig
13 Antwerpen
14 Genk
15 Liège
16 Lille
17 London
18 Gdansk



Case description and conclusions

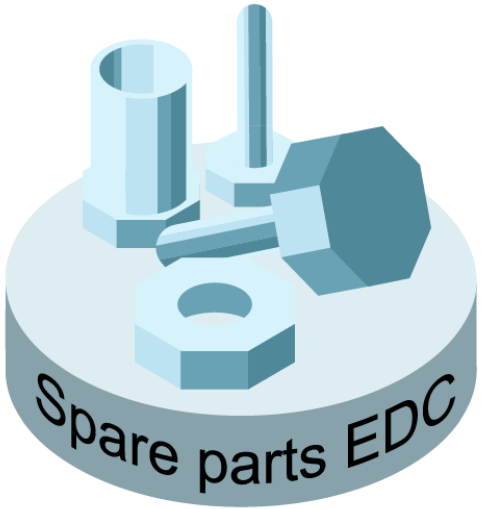
Characteristics of the Spare part case

- Centralized tier 1 operation € 280 million sales/ 10 million units
- A great array of Stock Keeping Units (SKUs), with a mix of industrial components and supplies
- Sourcing regions are Central Asia (10%), Far East (35%), USA (30%), UK (10%) and Central EU (15%)
- In this case the majority of inbound ocean freight is 80-85% of the overseas volumes with the remaining 15 to 20% shipped by air. UK and Central EU inbound volume is 100% FTL
- Main markets are France, Italy, Germany and the UK (representing 30% of total market)
- Outbound shipments are mostly parcel delivery (97%) and only limited LTL transport (3%)
- 15,000m2 warehouse operation consisting 158 FTE staff

Summary of main results Spare parts EDC

Winning locations

- Quality perspective
  - Moerdijk
  - Tilburg
  - Venlo
  - Zuid Limburg
- Cost perspective
  - Duisburg
  - Leipzig
- Overall combined assessment Dutch locations: **Competitive with Quality lead**



Future market challenges

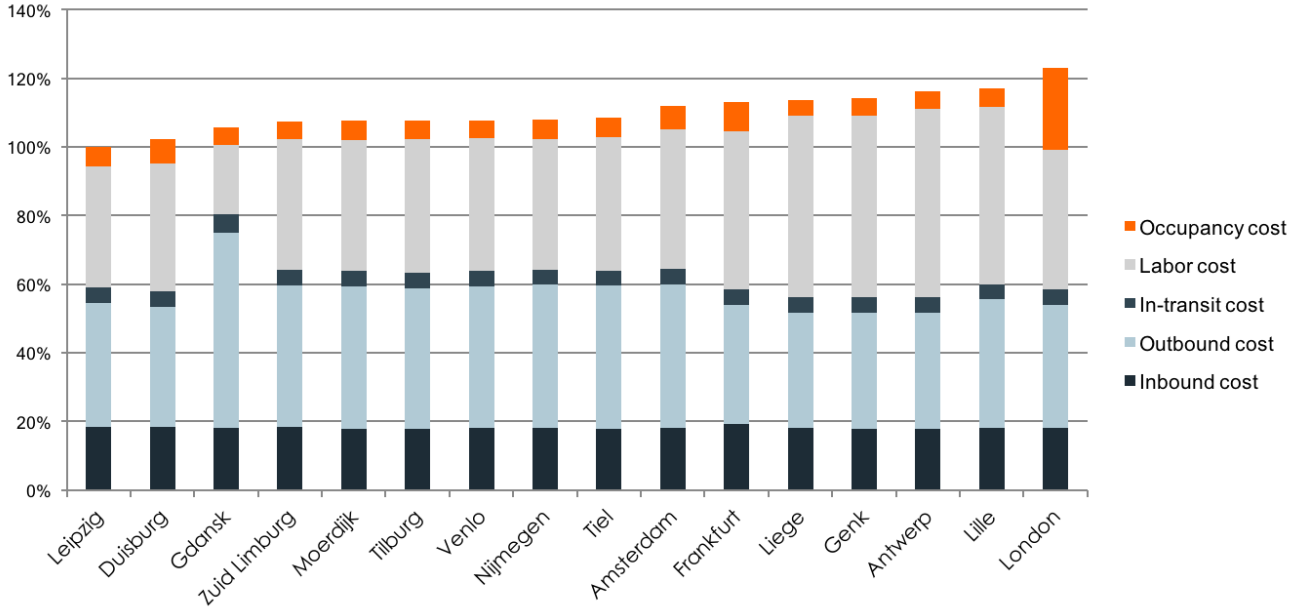
- The spare parts supply chain is based on the service model of the business
- Companies can leverage innovative technologies to effectively design service networks and analyse profitability of service offerings, inventory planning and other resources to achieve service objectives
- Spare parts have a high configuration complexity and service logistics requires rapid fulfilment
- Consolidating fulfilment in quality facilities improves supply chain performance and increases control to mitigate regulatory risks
- Spare parts logistics needs full control and visibility in transportation
- Robust and reliable supply chains with a deep market penetration are a necessity

Supply chain challenges

- The Dutch locations are well positioned to meet Spare parts EDC requirements from a cost as well as a quality perspective. Although there are some points of attention, the Dutch locations incorporate many strong elements for future market challenges
- Very competitive:
  - Proximity to the market
  - Connectivity to the network and flexibility in distribution solutions
  - IT knowledge and infrastructure
  - Tax rulings
- Competitive:
  - Total labor costs and availability
  - Large sites for XL warehouses
  - Competitive international parcel rates

Case Spare parts EDC

- Cost ranking



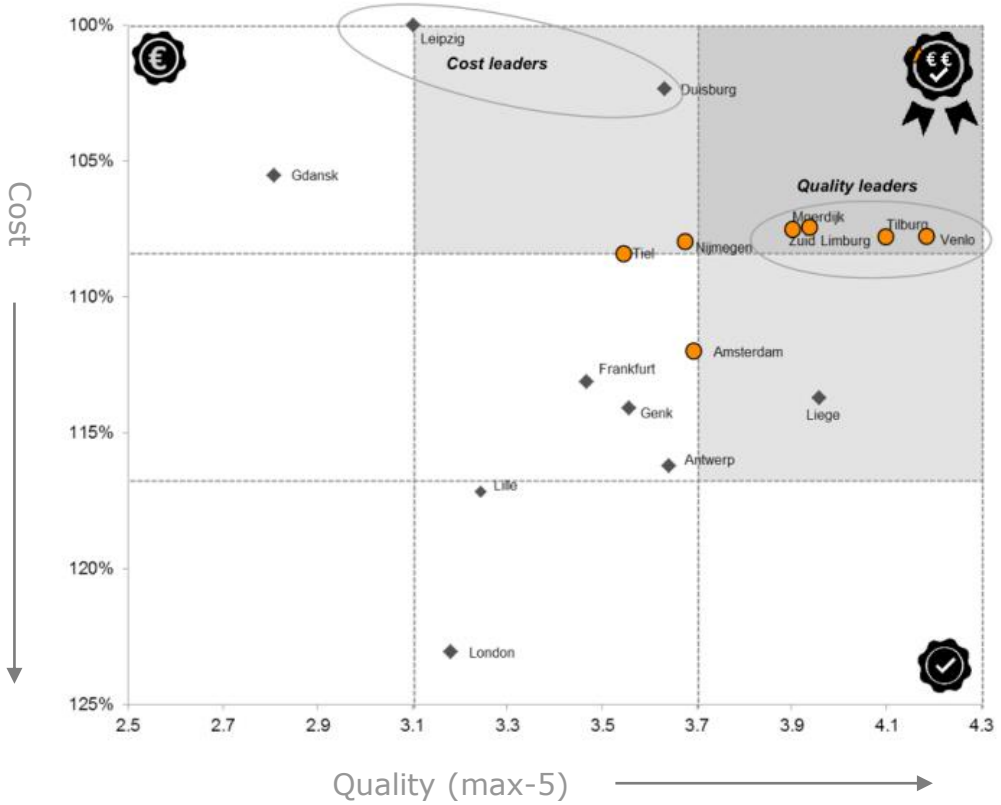
Case Spare parts EDC

- Quality ranking

Rank	Location	Total weighted score 100%	A Infrastructure & Accessibility 20%	B Labor / Quality 15%	C Labor regulations 10%	D Availability of Transport hubs 10%	E Facilities and Sites 10%	F Proximity to the market 20%	G Customs and taxes 10%	H Incentives 5%
1	Venlo	4,19								
2	Tilburg	4,10								
3	Liège	3,96								
4	Zuid Limburg	3,94								
5	Moerdijk	3,90								
6	Amsterdam	3,70								
7	Nijmegen	3,68								
8	Antwerp	3,64								
9	Duisburg	3,63								
10	Genk	3,56								
11	Tiel	3,55								
12	Frankfurt	3,47								
13	Lille	3,24								
14	London	3,12								
15	Leipzig	3,10								
16	Gdansk	2,81								

Case Spare parts EDC

- Cost-Quality matrix



Spare Parts
and
Service logistics

Spare parts - definition

- A spare part, spare, service part, repair part, or replacement part, is an interchangeable part that is kept in an inventory and used for the repair or replacement of failed units.

- Spare parts are an important feature of logistics engineering and supply chain management, often comprising dedicated spare parts management systems.

Spare parts crucial in many businesses

Aerospace

Automotive

Maritime and off shore

Process and energy industries

Defense

Healthcare and medical devices

High tech and telecom

High value capital goods

Service and parts business in global industry

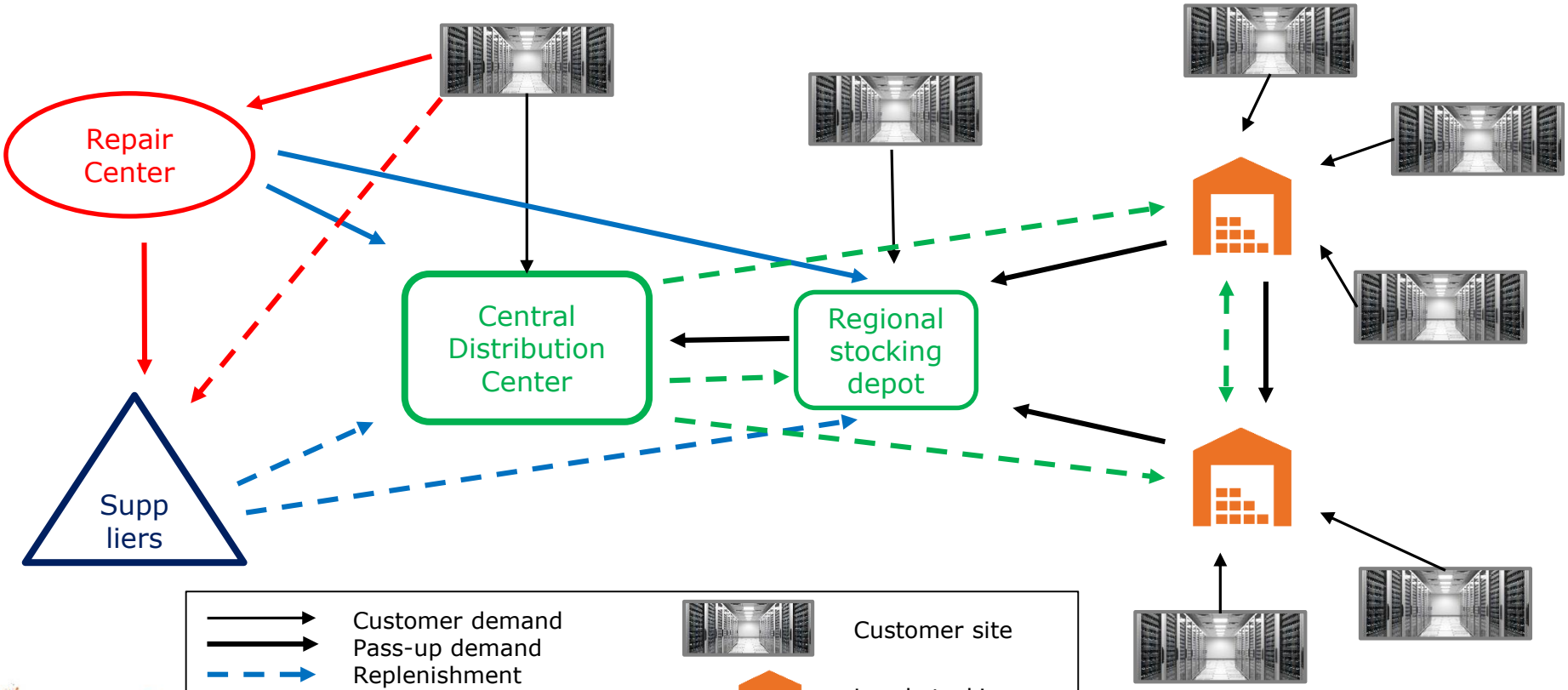
Global industry	Share of service and parts business in overall sales Average (percent)
Aerospace and defense	47%
Automotive and commercial vehicles	37%
Diversified manufacturing and industrial products	20%
High technology and telecommunications equipment	19%
Life sciences/medical devices	21%
All companies	26%

Source: Deloitte Research, based on the Global Service and Parts Management Benchmark, Survey

Trends in spare part logistics

- **Forecasting** future demand for spare parts
- **Service Logistics Control Towers** orchestrate after-sales-service of a product system, including forecasting, planning, inventory management and delivery.
- **Pooling** of spare parts across several supply chains; sharing of high value, slow moving parts.
- **Contract management** – servitization service level agreements
- **Location management** and stock allocation to new parts and repairables to reach target service levels
- **Return logistics**: WEEE directive (Waste Electrical and Electronic Equipment) requires a manufacturer or distributor to collect and recylce products at the end of the product life cycle
- **3D printing** on demand will have major implications on service parts networks

Typical spare part distribution network



Source: DINALOG/HIDC 2017

Service logistics - definition

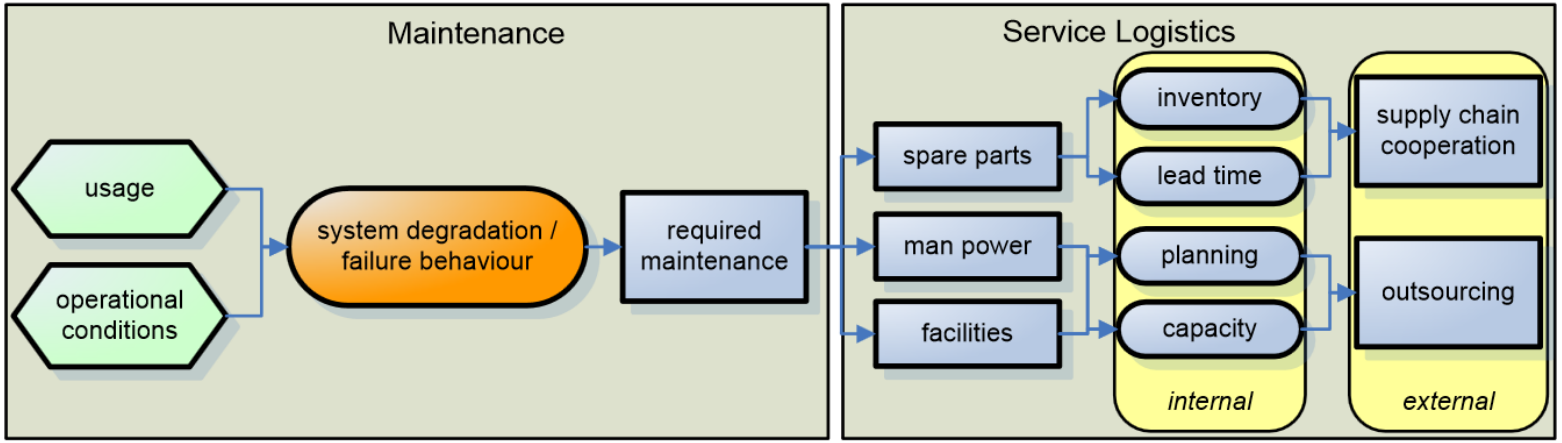
- Service logistics is the control of all after-sales services: from product delivery to the end of a product's life cycle.

- Service logistics regards all logistics activities needed to enable advanced capital goods to function optimally and uninterrupted during the total product life cycle – up until out-of-order/ dismantling or reuse.

- The main function of the service supply chain is to increase the system availability by delivering the maintenance resources within specified time constraints when a system has failed, or to prevent failing and specific maintenance resources are needed to repair it. In general, spare parts and service engineers are the most important resources.

Service supply chain

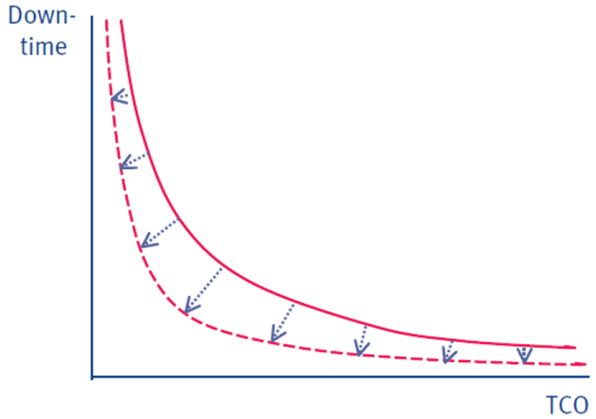
- The main function of the service supply chain is to deliver the maintenance resources within specified time constraints when a system has failed and specific maintenance resources are needed to repair it. In general, spare parts and service engineers are the most important resources.



Source: MaSelMa project plan, 2013

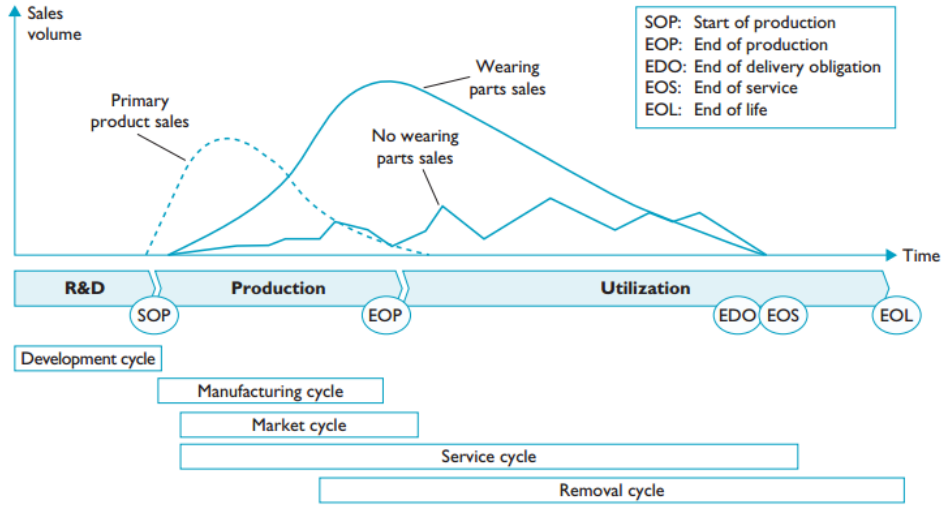
Service logistics - definition

- Service logistics aims at minimizing downtime and minimizing TCO
- The key to service logistics is to have the right **spare parts** at the **right time for maintenance**. Complexity of the planning management of the resources: engineers and spare parts



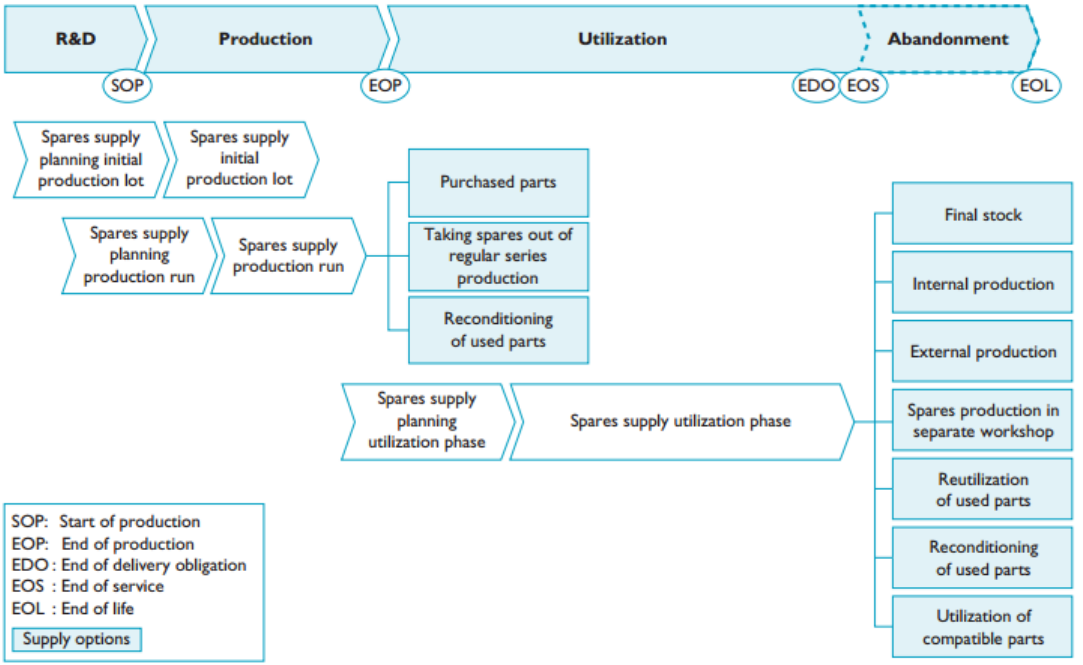
Product life cycle model for spare parts

FIGURE 3. Product Life Cycle Model for Spare Parts



Spare parts supply options

FIGURE 4. Spare Parts Supply Options along the Product Life Cycle



Spare Parts
-
Various segments

Aerospace & defense

Automotive

Process and energy industries

Maritime and off shore

Healthcare and medical devices

High tech capital goods

Aerospace & defense

Key characteristics

- Long life cycles of assets (up to 25 years)
- Total care programs
- Maintenance and repair costs more than 2 times higher than initial acquisition
- Safety critical and downtime costly
- Moving targets in sometimes hard to reach places (especially for defense)

Source: DINALOG 2015

High tech capital goods

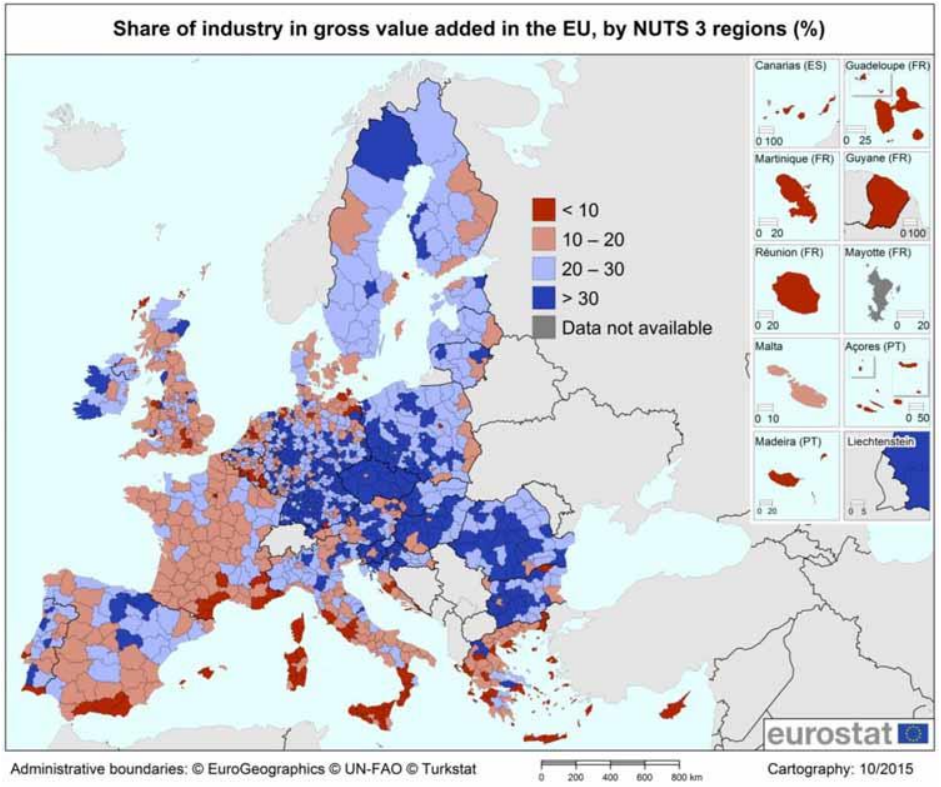
Key characteristics

- Machines or products that are used by manufacturers to produce (e.g. lithography systems, large-scale computers, and baggage handling systems)
- Users' primary processes depend heavily on the availability of these capital goods
- There is a long-term trend with regard to these advanced capital goods in which buyers would rather purchase a function than a product, focusing on the Total Cost of Ownership (TCO)

Source: DINALOG 2015

High tech capital goods

- Industry previals in Germany and Eastern Europe



Process and energy industry

Key characteristics

- Preventive maintenance is the norm
- Most companies operate a small number of (custom-made) complex assets, and obtain limited reliability/process/failure data, making it hard to plan maintenance and preparatory logistics activities
- Multiple disciplines and contractors are involved in maintenance operations, and coordination is required to minimize down-time

Source: DINALOG 2015

Maritime and offshore

Key characteristics

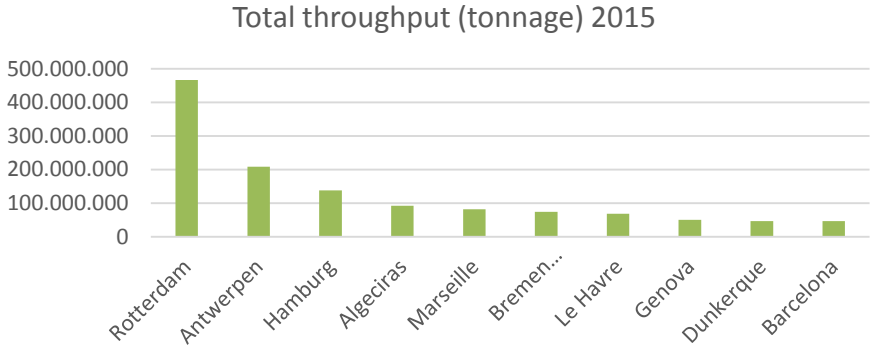
- Ships and offshore platforms are complex and high value assets that encounter severe operating conditions
- Service logistics support and maintenance of systems constitute a significant part of the exploitation costs
- Assets are often operated at remote locations around the world
- Unplanned maintenance requires significant logistic effort and is very costly.
- It is highly uncertain where which spare parts are needed

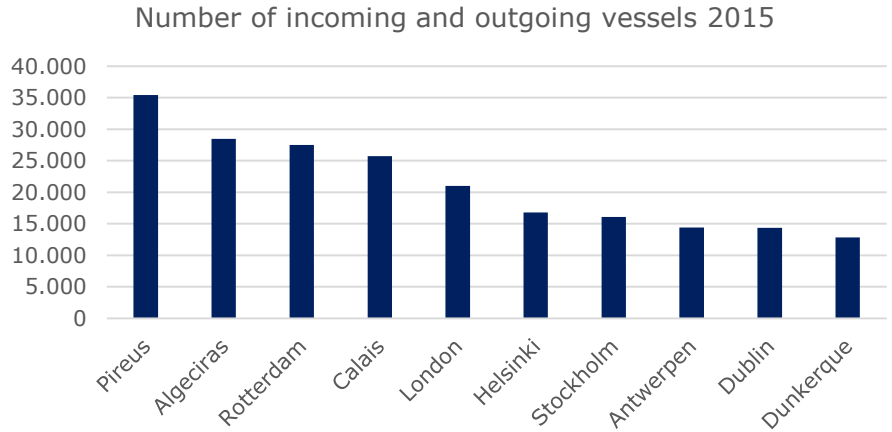
Source: DINALOG 2015

Maritime and offshore

Key characteristics

- The European market for shipping is mainly focused around the large ports
- Total throughput is a good indicator of port activity and therefore required maintenance
- Rotterdam has, by far, the largest total throughput followed by nearby Antwerp
- In terms of number of vessels, Pireus and Algeciras handle more than Rotterdam, since these are important ferry ports

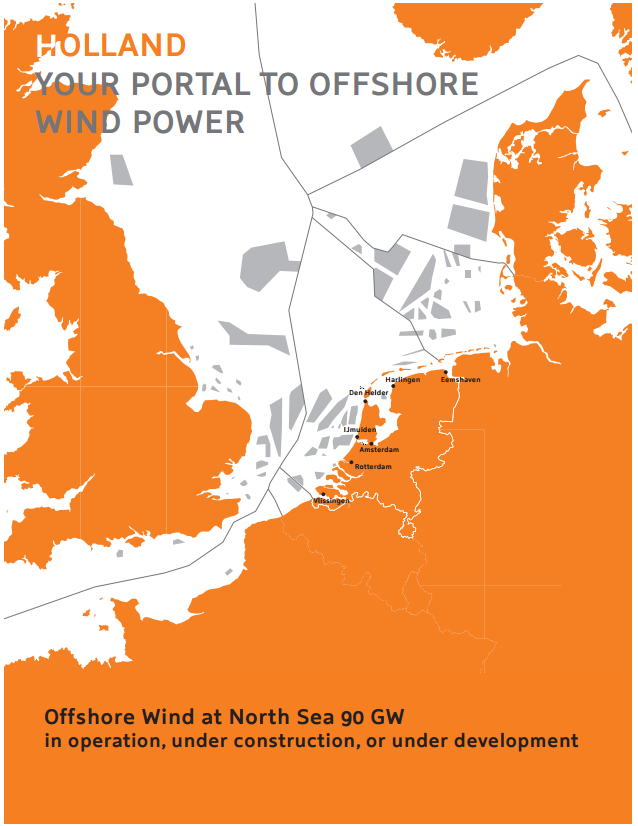




Off shore wind in the Netherlands

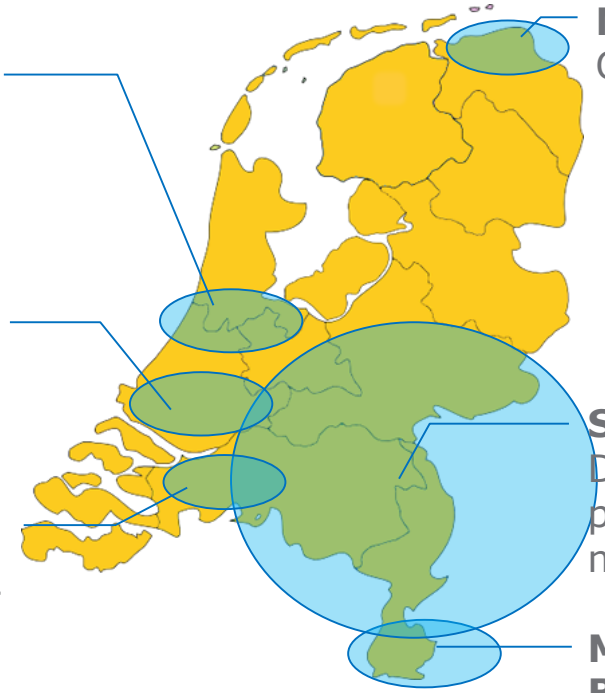
Dutch seaports have proven to be a high quality, safe, and cost-effective operational base for leading international offshore wind energy companies.

More info:
http://investinholland.com/nfia_media/2015/04/Holland-Your-Portal-to-Offshore-Wind-Power_brochure_Sep2014.pdf



Spare Parts
–
Regional specialization

Regional service clusters - examples



Amsterdam Metropolitan Area;
Aircraft parts, maintenance of passenger aircraft and aircraft systems

Rotterdam;
Service industry for marine vessels and process industry

South West-Brabant;
Maintenance of helicopters and jets

North Netherlands;
Offshore wind maintenance

South East Netherlands;
DC's for electronics / med tech spare parts and companies for mechatronics maintenance and repair

Maastricht Maintenance Boulevard;
maintenance repair and overhaul of regional and business aircraft

Amsterdam Metropolitan Area - Aerospace

	10,000
	• Knowledge & tradition from Fokker and KLM heritage • Cluster development plans for MRO, logistics and incubator centre • Strong position in MRO, logistics, training and office functions
	Network Amsterdam Airport Schiphol > direct connections to all major aerospace hubs worldwide
	Many 3PL companies with a dedicated aerospace vertical
	• > 80 aerospace companies, incl. CAE, Fokker, GE, Boeing, P&W, KLM • Recent new establishments: Bombardier, ILFC, Aviation Excellence Mitsubishi Aircraft Corporation
	2 airports: Amsterdam Airport Schiphol, Lelystad Airport (regional)

Amsterdam Metropolitan Area - Aerospace

Why are aerospace companies based in the Amsterdam Metropolitan Area (AMA)?

Connectivity (network)	Significant start-up labour pool	Know-how and expertise aerospace and logistics	Support involved parties like NFIA, NAG, SADC and Amsterdam inbusiness
Strategic location: neutral and access to EU-market	Number of aerospace companies (cluster)	Language skills	
Ambitious aerospace and logistics development plans		Tax advantages	

Amsterdam Metropolitan Area - Aerospace

Aerospace MRO in the Amsterdam Metropolitan Area (AMA) includes:

BOMBARDIER	KLM engineering & maintenance	GE	AAR	EPCOR
AVAC AIRCRAFT SERVICES	Fokker	Honeywell	ZODIAC AEROSPACE	SGI AVIATION
PRATT & WHITNEY DEPENDABLE ENGINES	JetSupport AMSTERDAM	MOOG	AVIATION ENGINEERING & SERVICES aeroconseil	transavia.com

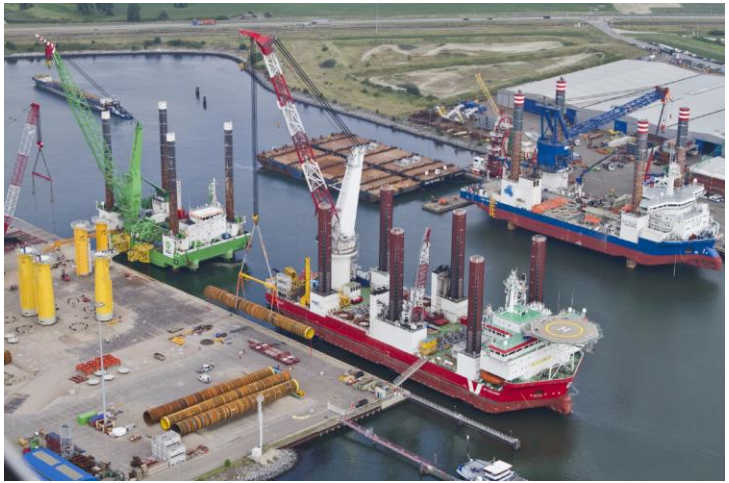
Amsterdam Metropolitan Area – High Tech

High Tech companies in the Amsterdam Metropolitan Area (AMA) includes:

intel	Western Digital	Seagate	CISCO	NetApp
Juniper NETWORKS	Microsoft	datadomain	IBM	Nikon
HUAWEI	eSys	APPLIED MATERIALS	AMD	RICOH

Energy Port Zeeland

- offshore windpark installation & offshore wind maintenance



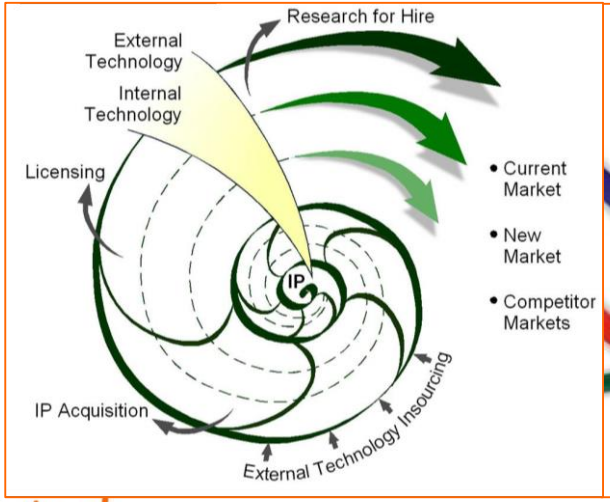
Dutch innovation in service logistics

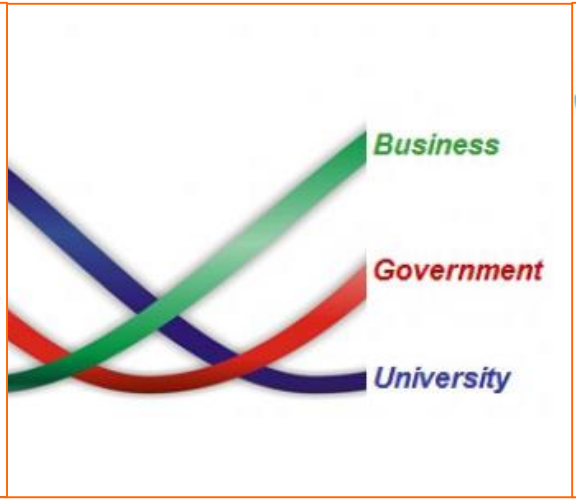
Service logistics innovation

1.
Open innovation

2.
Public private partnerships: triple helix collaboration

3.
Supply chain collaboration and coordination





Innovation roadmap Service Logistics

- The Netherlands has designated a special innovation program to Service Logistics, noting the importance and knowledge in the Netherlands, driven by the Dutch Institute for Advanced Logistics.

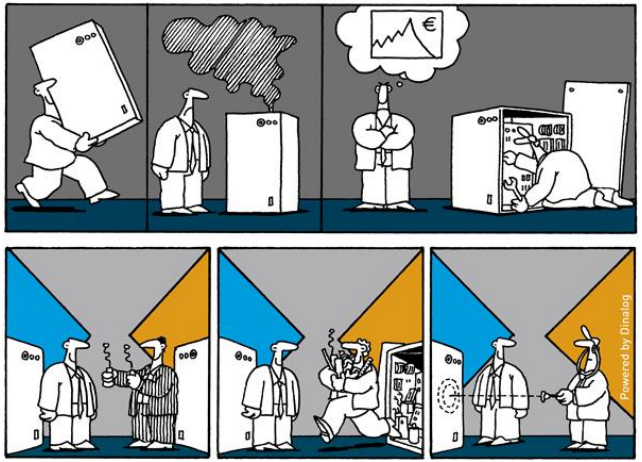
- Objectives:
  - Increased level of quality and frontrunner service business in the Netherlands
  - Increased attractiveness for foreign companies to invest in the Netherlands
  - Significant contribution to decreasing emissions and energy use by optimal use of spare parts and reuse of materials

- Parties committed to the innovation program, a.o:

Dutch innovation in service logistics
Proactive Service Logistics for Advanced Capital Goods

Innovative solutions for service control towers in order to achieve significant better system up-time whilst at the same time reducing TCO and improving competitive advantage.

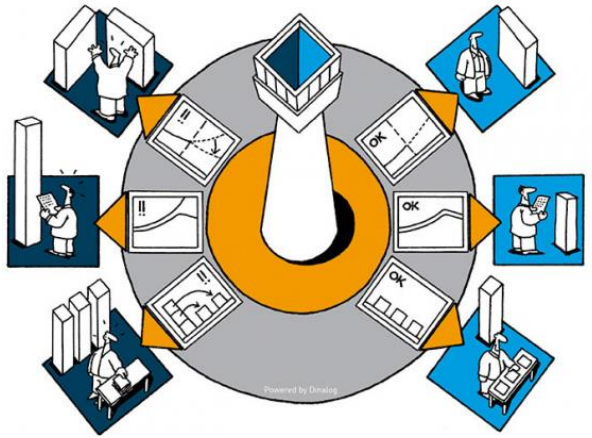
- The sharing of spare parts that are owned by different companies or that belong to different service contracts
- New concepts to deal with last-buy decisions and to facilitate the re-use of parts, modules, and systems
- New predictive maintenance concepts that make use of the possibilities of remote monitoring and diagnostics



Collaboration:
Eindhoven University of Technology, Erasmus University Rotterdam, University of Twente, Service Logistics Forum (SLF), Ceva Logistics, DAF Trucks, Fokker Services, Gordian Logistic Experts, IBM, Océ Technologies, Marel, Stork Poultry Processing, Thales, Vanderlande Industries

Dutch innovation in service logistics
Planning Services

Objective: a framework for a Spare Parts Planning Control Tower Organization;
• a Spare Parts Planning Control Tower prototype (working IT Solution);
• a working and demonstrated Spare Parts Planning Control Tower;
• a (remote) Spare Parts Planning Service concept.



Collaboration:
Gordian Logistic Experts, Eindhoven University of Technology, Netherlands Defense Academy, NedTrain, Alstom Transport, Defense Material Organization, ECT, Fujifilm

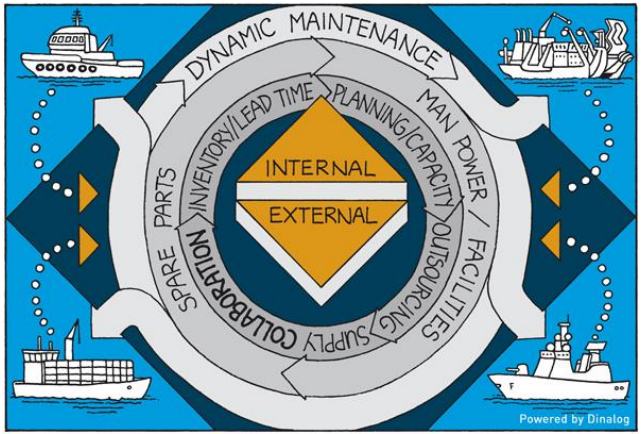
Holland. Pioneers in international business

Dutch innovation in service logistics

Integrated Maintenance and Service Logistics Concepts for Maritime Asset

In the maritime sector, service logistics support and maintenance of systems constitute a significant fraction of the exploitation costs. This project aims to increase the service logistics efficiency for these maritime assets

- Develop innovative concepts to improve the predictability of maintenance and service logistics demand,
- develop smart concepts of service logistics optimization, supply chain coordination and cooperation.



Collaboration:

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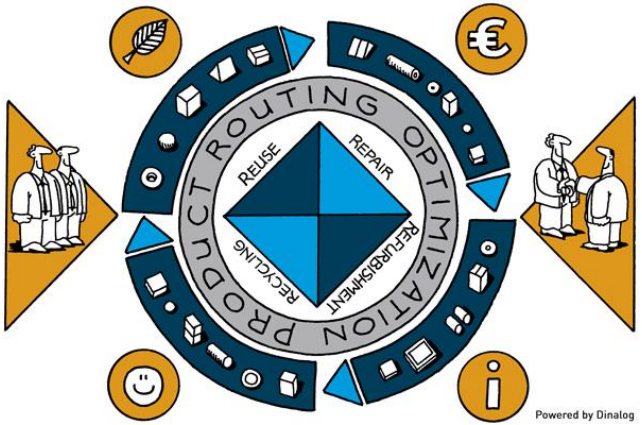
Dutch innovation in service logistics
Value creation by closing the loop

Monitored return chains ensure the retention of value of goods at the end of their lifecycle. This project examines a 4C idea for the reuse of semi-manufactured goods and raw materials in the manufacturing chain. This ensures as much of the material remains within the manufacturing flows and, in doing so, retains its value. Refuse retrieves economic value through reuse.



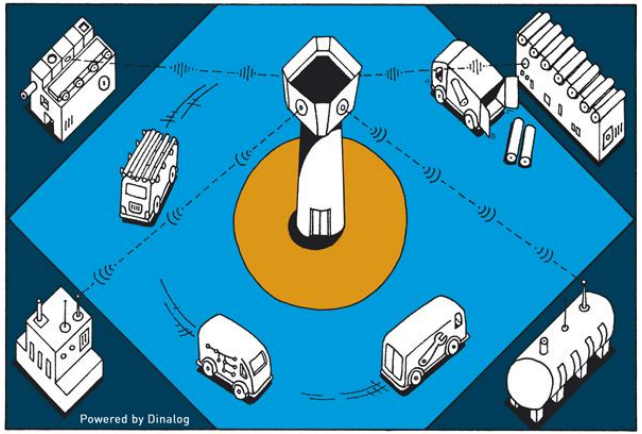
Collaboration:
12Return, Logitech, EVO, Spring Global Mail, PincVision, Rotterdam School of Management , University of Tilburg

Holland
Pioneers in international business

Dutch innovation in service logistics

Coordinated Advance Maintenance and Logistics planning for the process industries

It is essential to develop maintenance/logistics strategies that minimize cost whilst maximizing the availability and safety of assets. Many process industry companies experiment intensively with condition-based maintenance (CBM), but preventive maintenance is still the norm. The main objective of this project is to further develop a control tower approach for maintenance and logistics planning in the process industries. The innovation focusses on data pooling across disciplines and companies in the services supply chain and sharing maintenance/ logistics resources and clustering operations.



Collaboration:
University of Groningen, Eindhoven University of Technology, University of Tilburg, Gasunie, Oliviera, ORTEC, SABIC, Sitech, SPIE, Stork

Dutch Spare Part IT solutions - examples

Gordian has a flexible and modular development platform that enables them to affordably design and create professional, cost-effective and customer-specific solutions for spare parts management.

ORTEC offers solutions for high demand forecasting and inventory planning, as well as decision support such as distribution strategies, and depot and warehouse locations.

Slimstock offers sophisticated methods for forecasting irregular and slow moving items, such as spare parts, developed with scientific support from several universities.

FPC offers supply chain packaging advice as well as a control tower solution for communication for packaging instructions in the (service) supply chain.

Dutch Spare Parts Logistics Service Solutions - examples

SLS Benelux is specialist in parts logistics for service-related companies. SLS offers distribution, warehousing and control tower services allowing optimal routing of spare parts.

CEVA Logistics offers global end to end supply chain management, to reduce risk and cost for spare parts on demand, and for making fast decision-making management possible.

TNT Innight provides twenty-four-seven solutions to enable precisely timed services for nightly distribution of spare parts and other goods before the working day starts.

Rhenus Logistics draw up individual, cost-efficient and sustainable solutions that link rail, air, sea and road transport services in a sensible way for spare parts and products.

Spare parts planning train maintenance repair

Nedtrain

- Part of the NS Group and specialized in train maintenance.
- 175 years of experience in train maintenance.
- Also responsible for maintenance on Arriva, Syntus and Veolia trains.
- More than 30 strategic locations across the Netherlands.
- Responsible for timely, safe and clean traveling of 1.2 million train passengers every day.

REQUIREMENTS

- Continuous up-time of systems.
- Lower spare part stocks.
- Lower inventory costs.
- Continuous service level improvement.
- High equipment availability for direct delivery / use.
- Insight for the supplier in the current and future demand of NedTrain.

SOLUTION

- Advanced predictive inventory management models.
- Detailed add-on planning tool.
- Real-time order parameters.
- Algorithm for better forecasting delivery schemes (expected demand for the next 12 months).
- Better cooperation with suppliers.

BENEFITS

- Better understanding of demand fluctuations.
- Shorter delivery times.
- Inventory reduction of 8 million euro in one year (from 20 million to 12 million).
- Gains on both sides: NedTrain and suppliers.

Source: NedTrain / DINALOG

Spare parts for aircraft maintenance

Fokker Services

- Integrated, knowledge-based services organization
- Valuable partner for the global aerospace industry (manufacturers, owners and operators) in the continued competitive operation of their fleet.
- Capabilities include Component Availability Programs, Flight hour based Component Repairs, Engineering and Documentation Support, and Airframe Maintenance, Modifications, Conversion and Completion capabilities.

REQUIREMENTS

- Continuous up-time of systems.
- Lower spare part stocks.
- Lower inventory costs.
- Continuous service level improvement.
- Quick intervention: faster delivery from the same stock.
- Extended service market.

SOLUTION

- Advanced predictive inventory management models.
- Detailed add-on planning tool.
- Algorithm for determining which Shop Replaceable Units (SRUs) and Line Replaceable Units (LRUs) should be in stock.

BENEFITS

- Better insight in the relation between repair times and stocks.
- Information about the likelihood that specific spare parts are required (insight in necessary SRUs and LRUs in stock).

Source: Fokker Service / DINALOG

Spare parts planning poultry processing

Marel Stork Poultry Processing (MSPP)

- Market- and technology leader in poultry processing.
- Offers in-line poultry processing solutions for all process steps and all processing capacities and sells poultry processing equipment.
- Member of the Dutch Poultry Centre (DPC), the organization for leading companies in the poultry industry chain.
- Extensive global network of almost 40 sales and service locations.

REQUIREMENTS

- Continuous up-time of systems.
- Lower spare part stocks.
- Lower inventory costs.
- Continuous service level improvement.
- Quick intervention: faster delivery from the same stock.

SOLUTION

- Advanced predictive inventory management models.
- Planning tool for detailed analyses of purchases, sales and resulting stock changes.
- Relocation of current stocks (Gainesville (US) and Boxmeer (NL) reduced to one location).

BENEFITS

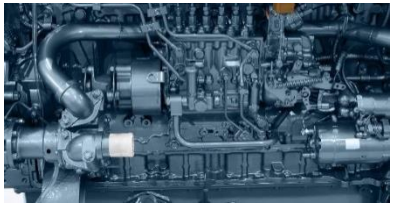
- Better insight in stock fluctuations.
- Increase of service level from 97.3% to 98,6%
- Stock decrease of 22%.

Source: Marel Stork / DINALOG

Spare parts supply automotive after sales

IZI Motive

- A Dutch SME originating from a DINALOG demonstration project.
- With an innovative approach of the core of the automotive business and its aftermarket: spare parts.
- Solutions for spare parts management, procurement, planning, inventory management and logistics.
- Control tower that connects manufacturer and garage.
- Approx. 70 affiliated garage businesses.



REQUIREMENTS

- Reduction of costs of spare parts for car repairs
- Quick response including same-day deliveries
- Reducing the number of deliveries to mechanics per day

SOLUTION

- Online supply chain control tower IZI2 Connect for car mechanics
- Developed with Slimstock and Eindhoven Technical University
- Integrated planning system
- Parts stock optimization
- Night distribution via cross-dock locations
- Supply chain orchestration of return flow, warranty and repair support

BENEFITS

- Direct ordering from independent parts suppliers
- Optimal attunement between stock, planning and orders
- Reduction of number of deliveries Cost saving of 15-20% on parts for mechanics
- 35% total supply chain cost saving
- 15% transport and warehousing cost saving potential

Source: IZI Motive / DINALOG