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THE FRAUNHOFER-GESELLSCHAFT

"LOGISTICS MAKE THE WORLD GO ROUND – BETTER STRUCTURES AND PROCESSES THROUGH RESEARCH"

BY PROF. DR. UWE CLAUSEN

NEW DELHI, MARCH 6th

JOSEPH VON FRAUNHOFER
RESEARCHER
AND ENTREPRENEUR

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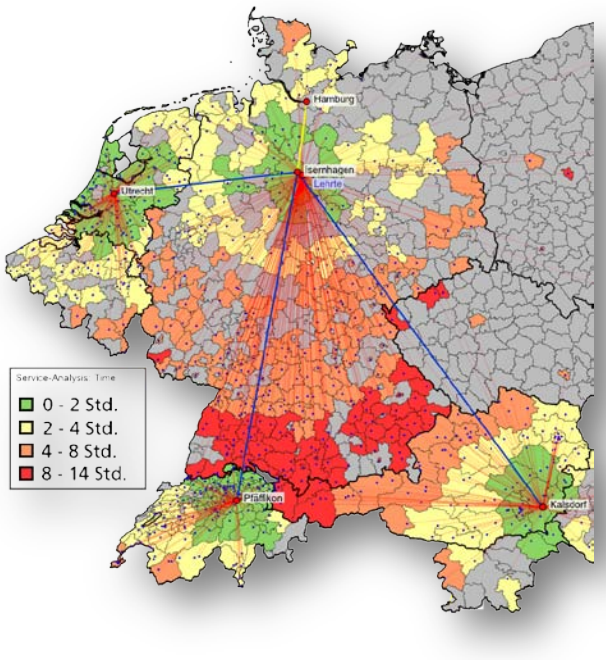
Improving logistics ..
is about structure and processes



- Analysis of distribution and consolidation strategies
  Determination of optimal stratification (modes of transport, types of storage, capacities, inventory management etc.)
- Positioning of logistics facilities:
  Optimization of # of locations and allocation of facilities
- Optimization of costumer allocations:
  Calculation of distribution areas determined by storage capacities
- Strategical and tactical route scheduling:
  Determination of solid standard runs and required vehicles
- Calculation and controlling of transport costs:
  Calculation of transport costs due to given tariffs, verification of forwarder's bills / tariffs / offers

Prof. Dr.-Ing. Uwe Clausen

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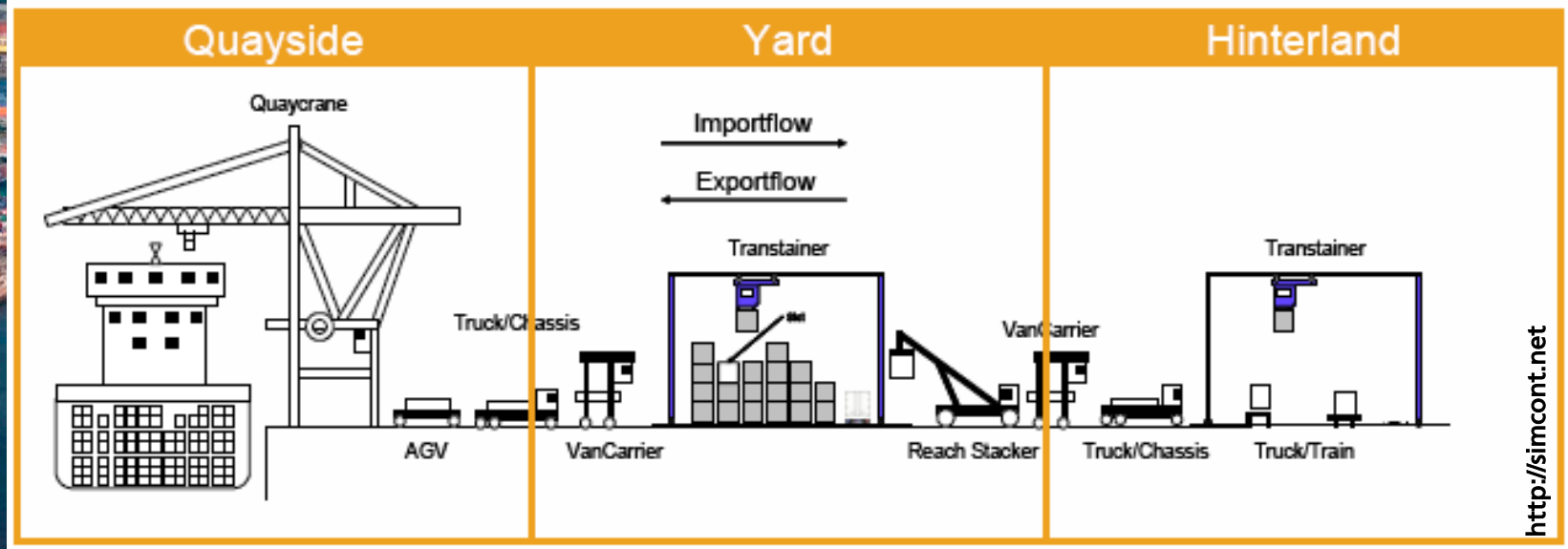
Logistics enables the world to come together

Top 20 container terminals and their throughput for 2006, 2007 and 2008

(TEUs and percentage change)

Port name	2006	2007	2008	Percentage change 2007–2006	Percentage change 2008–2007
Tianjin	5 950 000	7 103 000	8 500 000	19.38	19.67
Port Klang	6 326 294	7 118 714	7 970 000	12.53	11.96
Los Angeles	8 469 853	8 355 039	7 849 985	-1.36	-6.04
Long Beach	7 290 365	7 312 465	6 487 816	0.30	-11.28
Tanjung Pelepas	4 770 000	5 500 000	5 600 000	15.30	1.82
Bremen/Bremerhaven	4 428 203	4 892 239	5 500 709	10.48	12.44
New York/New Jersey	5 092 806	5 299 105	5 265 053	4.05	-0.64
Total top 20	208 479 500	235 823 091	247 373 540	13.12	4.90

UNCTAD (2009)



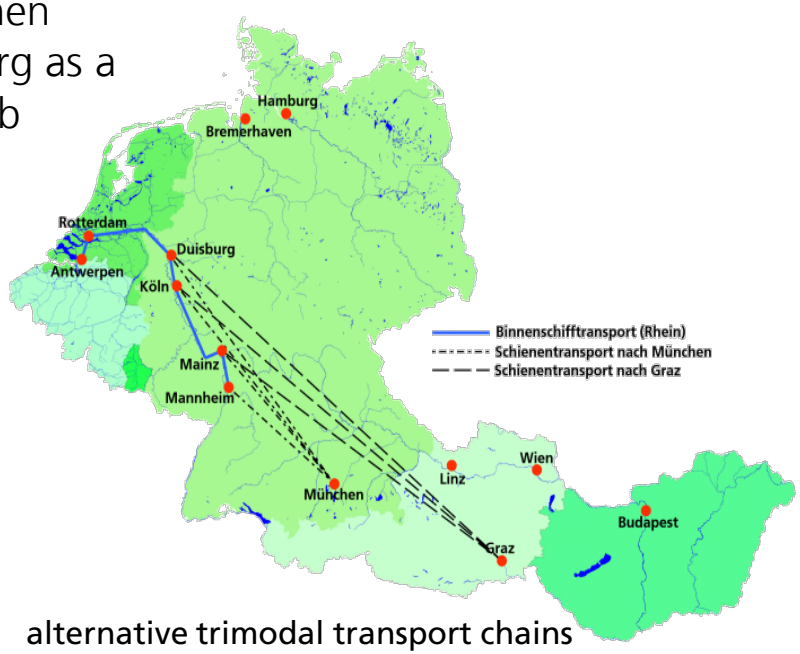
Reference - **Examination of development potentials and Logistics Strategy of Duisburg Port**

Themes which have been examinated

- Chances for development / obstacles and future demands for logistics sites and services
- Possibilities to strengthen the position of Duisburg as a sea port hinterland-hub

Approach

- Evaluation of the 3 column strategy:
  Infrastructure – logistic services – strategic cooperations
- Analyses of the situation of competition
- Analyses of options for new businesses and competitive situations
- Calculation of models to compare different Hinterland connections



alternative trimodal transport chains

Prof. Dr.-Ing. Uwe Clausen

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duisport excellence in logistics

SMART-CM:
Responding to challenges

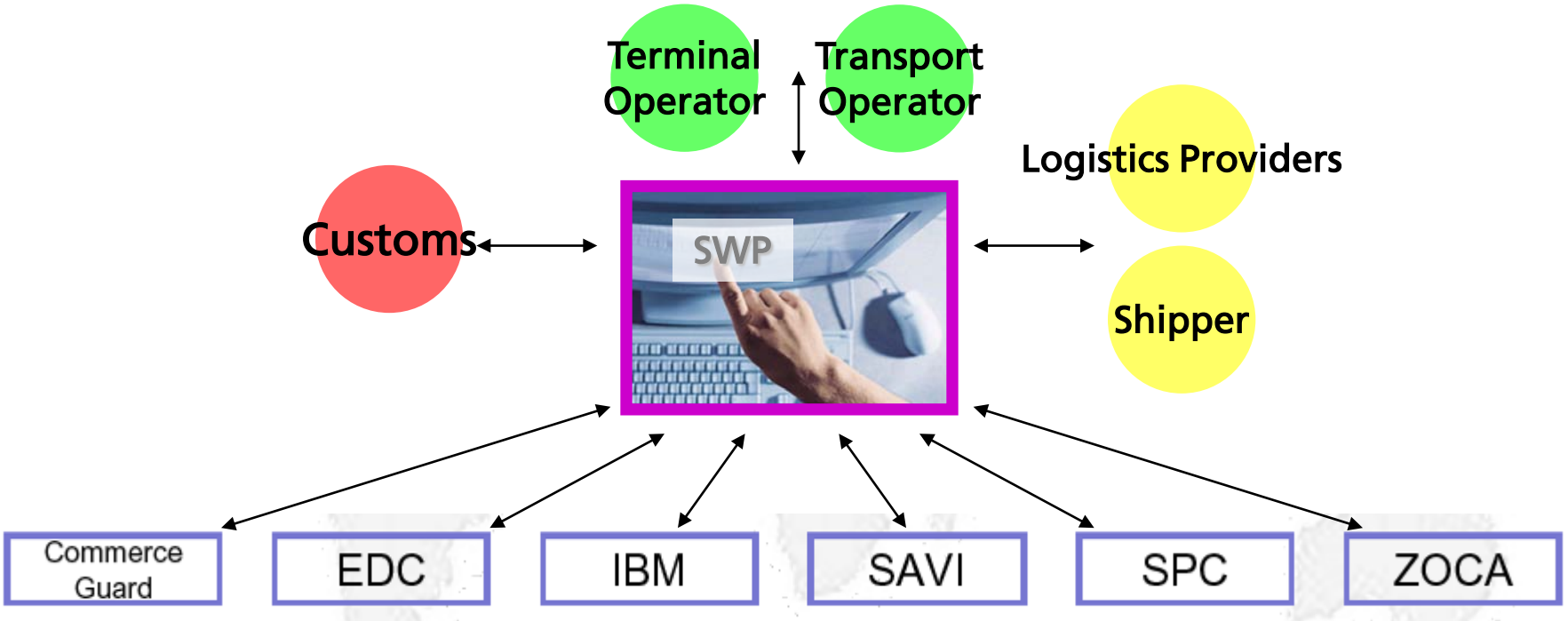
EU funded project with Fraunhofer including some of the Worlds' largest

- terminal operators,
- logistic service providers,
- shipping companies,
- technology providers and
- national customs organisations

aiming at improved security for container transport, beneficial for business and logistics responding to the challenges of the future i.e.:

- **Increase supply chain visibility**
- **Achieve faster throughput in transport corridors (green lanes)**
- **Accomplish high level chain security (continuous control)**
- **Improve productivity in chain operation**

SMART-CM approach (1/2) “Single Window” platform



Container Security Technology (CST): active RFID / satellite comms / multi-sensoric units

Fig.: Porthus

SMART-CM approach (2/2) neutral communication & service platform

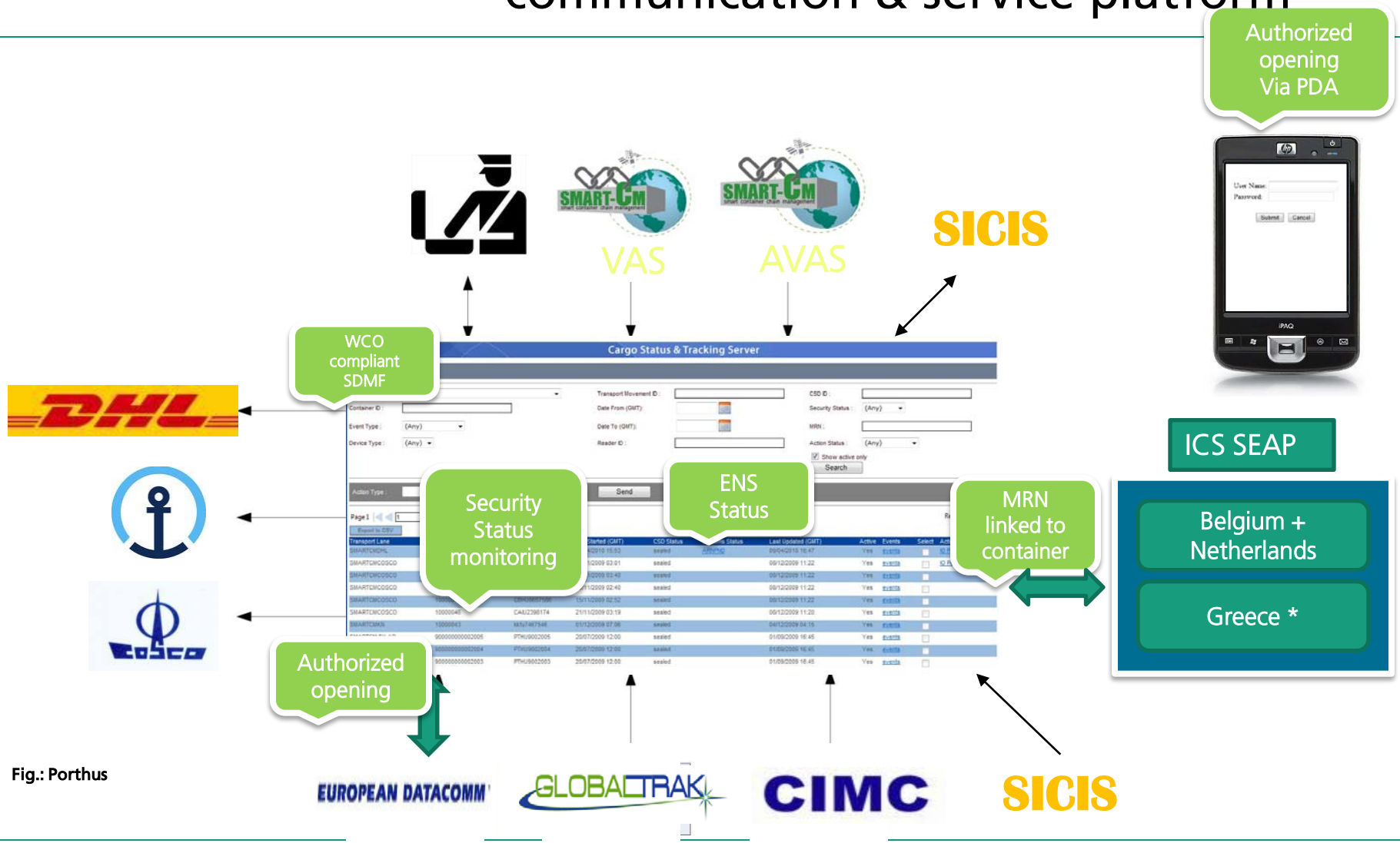


Fig.: Porthus

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Permanent, pro-active tracking & tracing / controlling

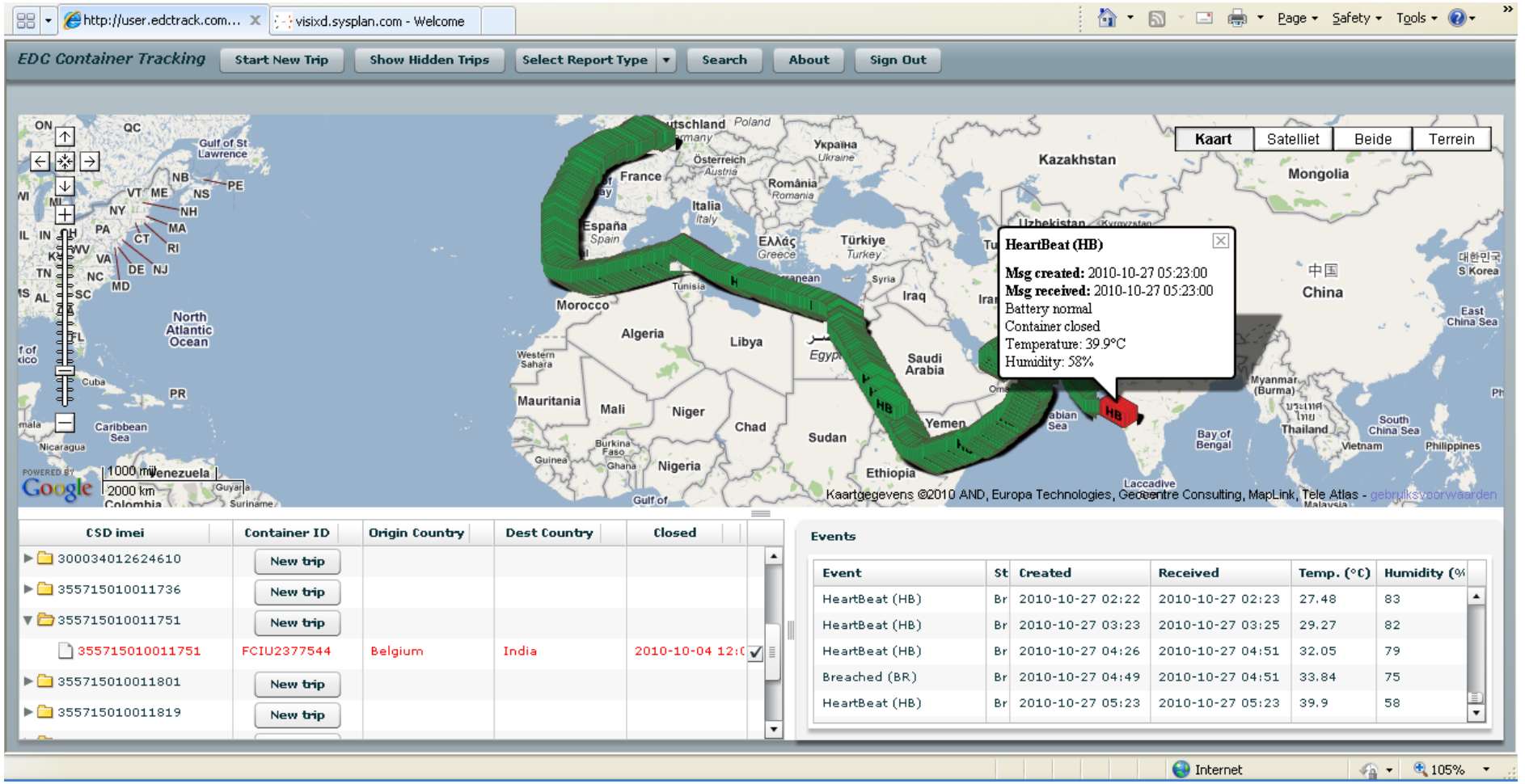


Fig.: TREDIT

EffizienzCluster LogistikRuhr – one of 15 winners of Germany´s leading-edge research competition

Bundesministerium für Bildung und Forschung

- Supporting the strategic development of leading-edge clusters in science and economy
- The Leading-Edge Cluster competition is intended to take Germany to the top of the league of technologically advanced nations.
- The high-performance clusters formed by business and science which join into strategic partnerships are set to boost Germany's innovative strengths and economic success.

» three rounds of competition: in each round, up to EUR 200 million will be made available to up to five Leading-Edge Clusters

» the funding of Leading-Edge Clusters is based on a common strategy that starts from the respective strengths of each cluster and is aimed at the definition of future development objectives

EffizienzCluster LogistikRuhr

Main Goals

Efficient management of resources

- Efficient production and transport of goods
- Efficient handling of resources and environment

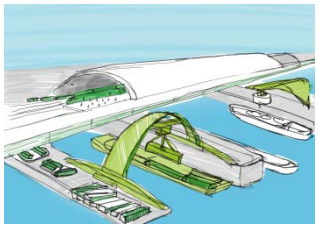
Keep individuality

- Individual supply of goods and information
- Keep individual mobility

Urban supply safety

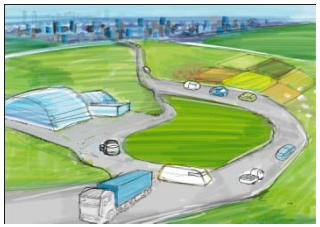
- Solid and save logistics for urban areas
- Urban logistics systems in a global context

Guiding Topics



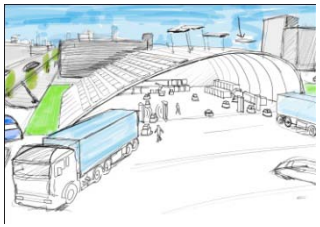
Management of goods traffic

Focus on environment

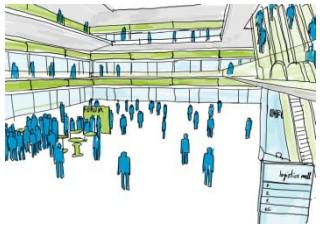


Urban supply

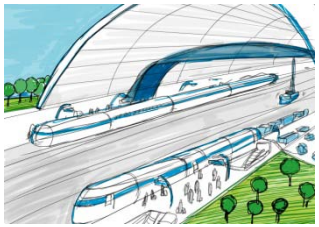
Activation of cluster potential



Mutable logistics systems



Logistics-as-a-Service



Logistic construction competence (education)

MIB - “less stress construction sites”

INVENTED IN GERMANY

SPONSORED BY THE

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Minimalinvasive Baumaßnahmen "less stress construction sites"

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sonepar deutschland

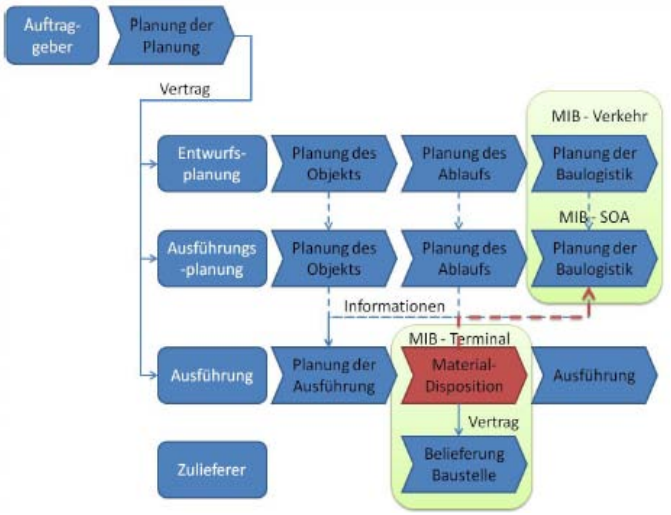
REICHEL PROJEKTMANAGEMENT

GEOsat DIE PROFIS RUND UM GPS-ANWENDUNGEN

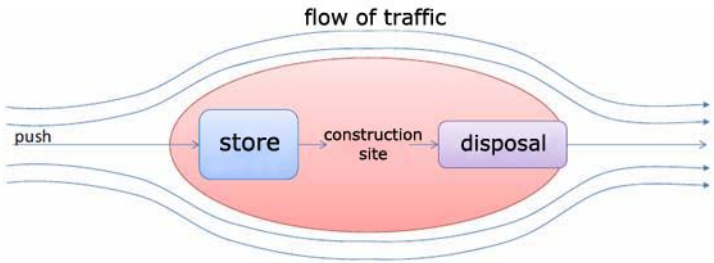
Gradwohl Konzept

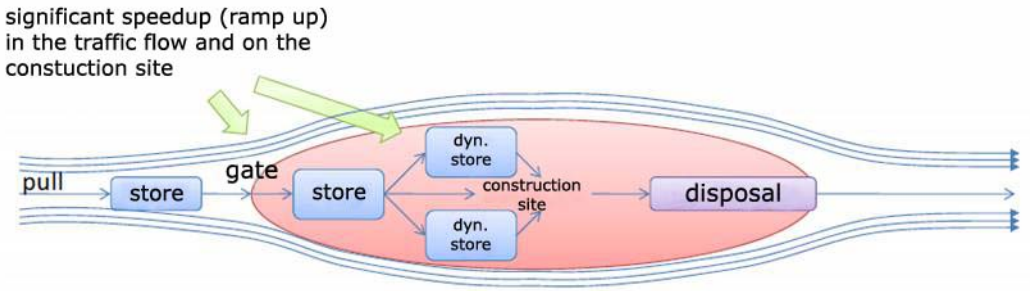
- Partners in the research project
  - Sonepar Deutschland Region West GmbH
  - REICHEL Projektmanagementgesellschaft mbH
  - GEOsat GmbH
  - Gradwohl Konzept
  - Fraunhofer IML
- Duration and budget
  - Project start: October 1st, 2010
  - Project duration: 18 months
  - Project volume of approx. 1 mio Euro

Objectives

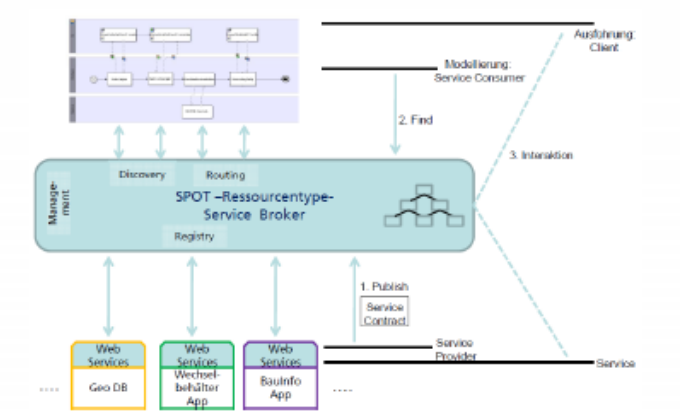


- Improving the traffic flow in the surroundings of constructional projects
  - 15 % less stress on the traffic flow by constructional projects
- Reducing the environmental impact by 10%
  - direct influence on the construction site by means of innovative tools
  - new global aims in the sense of the ecological view
- Reduction of the construction duration by 5%
  - intended by optimized supply and waste management





First Achievements



- Development of a technical concept
  - based on requirements engineering with an early integration of all project stakeholders
- Development of the organizational concept
  - transparent presentation of the system
  - display of the demands on data transfer inside and to the system
- Development of a marketing concept
  - determination of the surplus value and potential of the project
  - holistic approach is very unusual in the construction sector
- Current challenges
  - difficulty in finding a constructional project, which appears as a pilot project for the research scheme
  - established structures impede the access of a new strategy and service to the market

ELA - Efficiency in Logistics Facilities

INVENTED IN GERMANY

SPONSORED BY THE

Federal Ministry of Education and Research

EffizienzCluster LogistikRuhr

Project Partners and Framework

- **Partners**
  - ESG Elektroniksystem- und Logistik-GmbH
  - TU Dortmund, Institute of Transport Logistics (ITL)
  - DB Mobility Logistics AG
  - AMETRAS nobab GmbH
  - Logwin Solutions Deutschland GmbH
  - Kühne + Nagel (AG & Co.) KG
- **Project volume**
  - about 3.65 m. €
- **Duration**
  - June 1, 2010 – May 31, 2013

EcoSiteManager: The development of this software prototype is based on three areas of innovation:

- **unitCV**
  - Storing relevant shipment information in an electronic CV and IT-platform
- **HugO**
  - Application of Human guided optimization methods and therefore interactive software
- **X-Ray**
  - Monitoring function of all objects and resources within the system

ELA Projects and methods

Methods area of application	ELA Projects
Mathematical optimization	A User-guided planning tool to bundle rail products using decentralized delivery points
Material flow simulation	Optimal resource control in multi-user distribution centers
Forecast	Intelligent Control in area utilization and supply of contract logistics
Area utilization and operational strategies	Efficiency of sorting in light of mission properties
Resource planning	A user-guided planning tool for the management of resources on large factory sites / development EcoSiteManager
Layout- und gate allocation planning	

Multimodal Promotion

INVENTED IN GERMANY

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EffizienzCluster
LogistikRuhr

Multimodal Promotion - Project targets

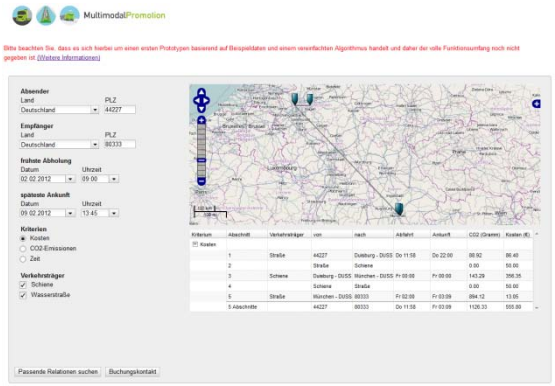
- Development of a Web 2.0 tool for the simple design of multimodal door-2-door transport chains without previous knowledge about the combined transport
- Implementation of a company-wide consolidation of transport streams, including drayage and haulage planning
- Bundling small quantities into large volumes
- Improvements of sustainability and efficiency

Trimodal D2D transport chain design

Company-wide consolidation

Evaluation of alternatives (cost, time, CO2e)

Multimodal Promotion - Platform's main functions



- Interface between operators and users
- Schedule check
  - The aim is the assignment of appropriate schedules to the transportation orders
  - Simple or detailed examination of the own transport volumes
- Timetable formation
  - The aim is to consolidate the transportation amounts and to create new transportation alternatives
  - Calculations are based on all data entered by the users
- Local traffic planning
  - The goal is the reduction of truck trips in pre-and post stages through a comprehensive customers' tours planning
  - Building of FTL by bundling the LTL

Summary

Globalization is an ongoing process providing challenges and huge opportunities for individuals and institutions.

Logistics needs long-term planning as well as short-term **flexibility,** innovative, and affordable solutions.

Logistics and mobility of the future will have to be robust and safe, ecological and economical feasable.

Thank you.

Prof. Dr.-Ing. Uwe Clausen

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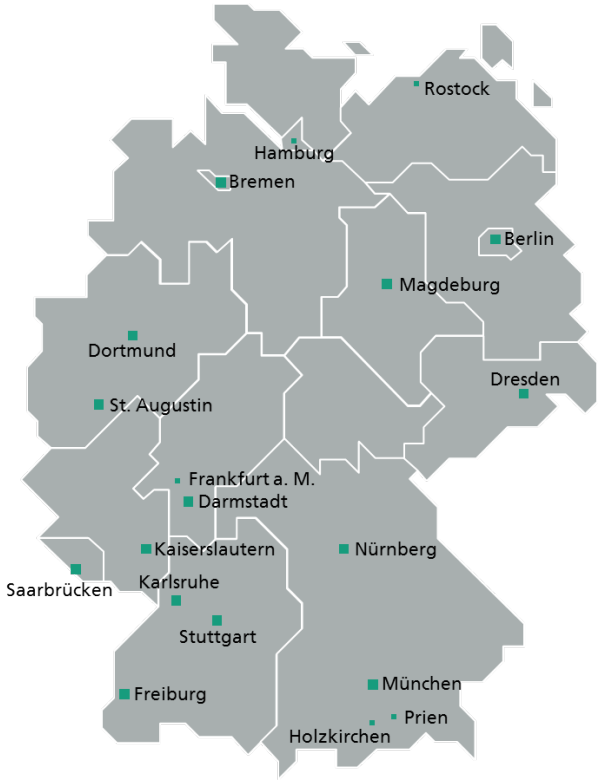
Fraunhofer IML

17 Institutes from the Fraunhofer Transport Alliance



- The Fraunhofer Transport Alliance develops adequate technical and conceptual solutions for the public and industry partners and puts transport-related research solutions into practice.
- The Fraunhofer Transport Alliance focuses and communicates existing core competencies in transport-related research and …
- … develops integrated solutions by means of co-operations between Fraunhofer-Institutes

automotive

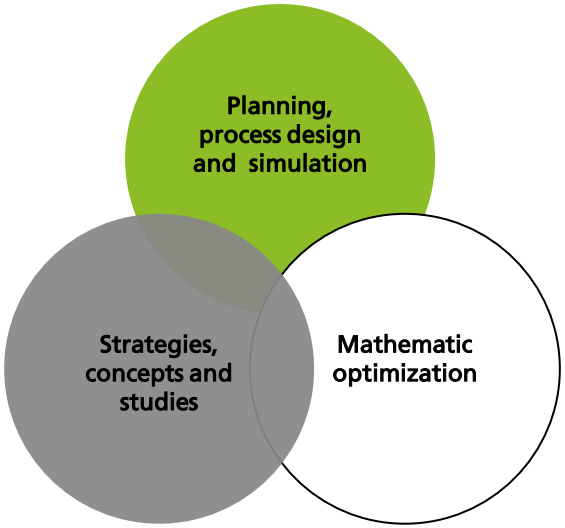
aviation

GNSS Applications

rail

waterborne

Institute of transport logistics- Interdisciplinarity as a factor of success

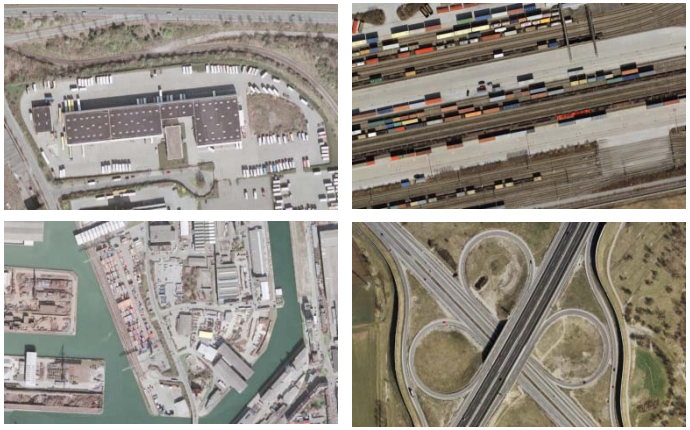


Methods

- Analyzing of data and processes, Planning
- Material flow simulation
- Empiric studies
- Development of an Operating Number System
- Mathematical Modeling
- Optimization algorithms, design of prototypes

Topics

- Logistical systems
- Transportation Planning
- Monitoring of Outsourcing
- Commercial transport



Fraunhofer IML > 200 researchers in …

SECTION MATERIAL FLOW SYSTEMS

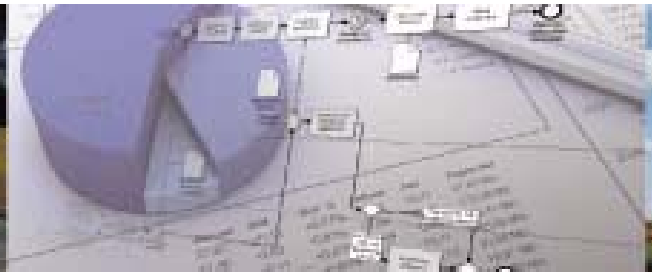
Quality Management and Organization Systems,
Intralogistics and IT Planning,
Autonomous Transport Systems,
Machines and Facilities,
Packaging and Trade Logistics,
Software Engineering

SECTION ENTERPRISE LOGISTICS

Enterprise Planning,
Supply Chain Engineering,
Production Logistics,
Maintenance Logistics,
International Enterprise Development

SECTION LOGISTICS, TRAFFIC, ENVIRONMENT

Environment and Resource Logistics,
Traffic Logistics,
Health Care Logistics,
Project Center Airport,
Project Center Traffic,
Mobility and Environment,
Center for Maritime Logistics and Services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Logistics, Traffic, Environment
Prof. Dr.-Ing. Uwe Clausen

ENVIRONMENT AND RESOURCE LOGISTICS

Dr.-Ing.
Marc Schneider

- Disposal and closed loop economy
- Environment and resources
- Building logistics

TRAFFIC LOGISTICS

Prof. Dr.
Alex Vastag

- Distribution logistics and procurement planning
- Network planning and dispatching
- Information and communication systems
- Multimodal logistics

PROJECT CENTER AIRPORT

Dr.-Ing.
Heinrich Frye

- Airfreight handling
- Baggage handling
- Ground handling Services
- Check-in control
- Air traffic security

PROJECT CENTER TRAFFIC, MOBILITY AND ENVIRONMENT

Dipl.-Ing. (FH)
Wolfgang Inninger

- Safety and logistics
- Traffic planning and simulation
- Mobility, information logistics for traffic and tourism

HEALTH CARE LOGISTICS

Dr.-Ing.
Sebastian Wibbeling

- Pharma-Logistik
- Hospital Logistics
- External Logistics in Health Care
- Pharmaceutical **Logistics**
- Home and Senior Care

CENTER FOR MARITIME LOGISTICS AND SERVICES

Prof. Dr.-Ing.
Carlos Jahn

- Sea Port planning and maritime fleet management
- Forecast, professional information and strategy
- Process- and IT-management