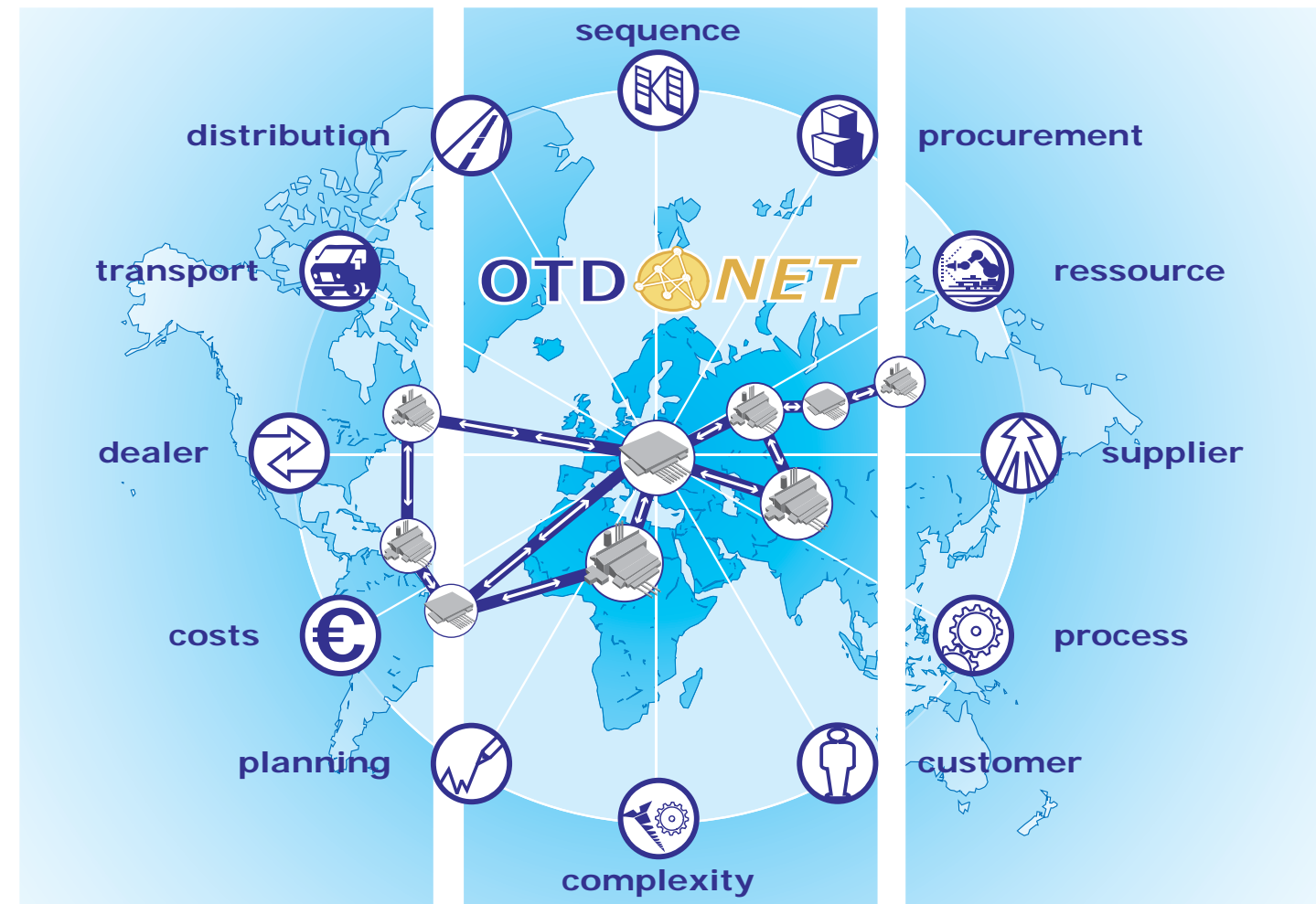




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Simulation Aided Network Design

Designing, planning and analysing
 value added networks



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Supply Chain Design

Service



The most effective lever to reduce the costs of ongoing transactions, to make optimal use of all resources and to improve the customer service lies in the design stage of a supply chain.

The tasks of supply chain design are:

- Configuration of the logistic network with the determination of the value added levels, the number and locations of sites as well as the transport relations
- Design and dimensioning of processes and resources, that means the determination of warehouse, production and transport capacities
- Development of the order execution process in the network, that means the definition of planning and communication processes
- Assessment of design alternatives with regard to costs and service levels (flexibility, delivery time, delivery reliability, ect.)

Challenges for the requirement and capacity management through a shift in global sourcing and added value:

- Long order lead times and decreasing process quality (Prozessgüte) with versatile modules increase the risk for missing parts. The sensitivity of the network needs to be considered in the design

Additional demands on the procurement planning due to insecurity in global logistics networks of the supply chain:

- Stochastic influences on the logistic side need to be taken into consideration in the design and planning phase in order to guarantee the security of supply for the daily operations

New demands on information processes on the information processes due to Build-to-Order strategies:

- Stocks are replaced by the availability of information. The analysis of information processes is essential for the identification of critical network paths.

Numerous new challenges for the SCD arise from current development trends:



Expertise

The Fraunhofer IML offers extensive support in designing and planning value added networks

The Fraunhofer-Institute for Material Flow and Logistics (IML) can draw on more than 25 years of experience in model-based design and planning of logistic and production systems in distributed value added networks as well as the respective information and business processes.

A specific simulation tool for the analysis of large logistics networks which meets the high demands of the network simulation was developed by the Fraunhofer IML.

The know-how of the Fraunhofer IML in network design and planning is based on successful industrial projects and on various applied research and development projects.

Experienced and skilled staff participates actively in projects with their result-oriented operating principles. A study that solves an individual problem or the assistance in a planning team are two possible options for a cooperation.

The complexity of network design offers various potential areas for services of Simulation-Aided Network Design (SAND):

Network design for a product start-up:

Especially the start-up of new products is a challenge for network design. The production start-ups of manufacturers and suppliers need to be coordinated. SAND creates transparency and allows for the planning of necessary capacities on the basis of rising production volumes in the start-up phase and therefore secures planning of investment steps (Investitionsstufe) for capacity extension

Designing distribution and transport processes:

In global networks distribution and transport processes pose a specific challenge due to long delivery times. By taking into consideration alternative bottleneck strategies and stochastic influences SAND makes the design of stable and failsafe processes possible. An operating point at optimal costs also taking into consideration stocks and special transports can already be determined during the design phase.

Risk analysis in global networks:

Sustaining the security of supply is the ultimate ambition of network design. The application of SAND allows for precise assessment of supply risks and the identification of critical network paths. Distributed capacities, information processes, transport processes and stocks are made holistically assessable in their interdependencies.

Design of order processing processes:

The design of order processing processes and the respective communication processes is of high significance in global networks. Long replacement times lead to a production on the basis of different forecast and order statuses. The occurring deviations need to be compensated by suitable processes. SAND makes the specification of these processes possible. When does information need to be available? Which order preparation times are necessary? Which planning frequencies make an efficient coordination in the network possible? These are just some examples for questions that can be answered in the network design with the help of SAND.

Assessment of sourcing alternatives:

The decision for a sourcing-shift is often based on the purchase price. SAND allows for access to the entire procurement costs including the identification of possible supply risks and the effects of e.g. part change/ partial alteration (Teiländerungen) in the start-up phase or in the Serienlauf. Purchase prices, transport costs taking into consideration the actual transport utilization, customs, insurance costs, capital commitment of stocks and during transport are ascertainable as well as e.g. scrapping costs of obsolete parts when a part change/ partial alteration (Teiländerung) takes place.

Identification of cost drivers during the network design

SAND offers access to the cost drivers in the network. The essential additional value of the dynamic approach is the identification of cost drivers that result from the interplay of the networks players.

