

---

***Presentation:***

# **Challenges and approaches to start-up scenarios in the automotive industry**

**Prof. Dr.-Ing. habil. Dieter Specht**

**Chair of Production Management**

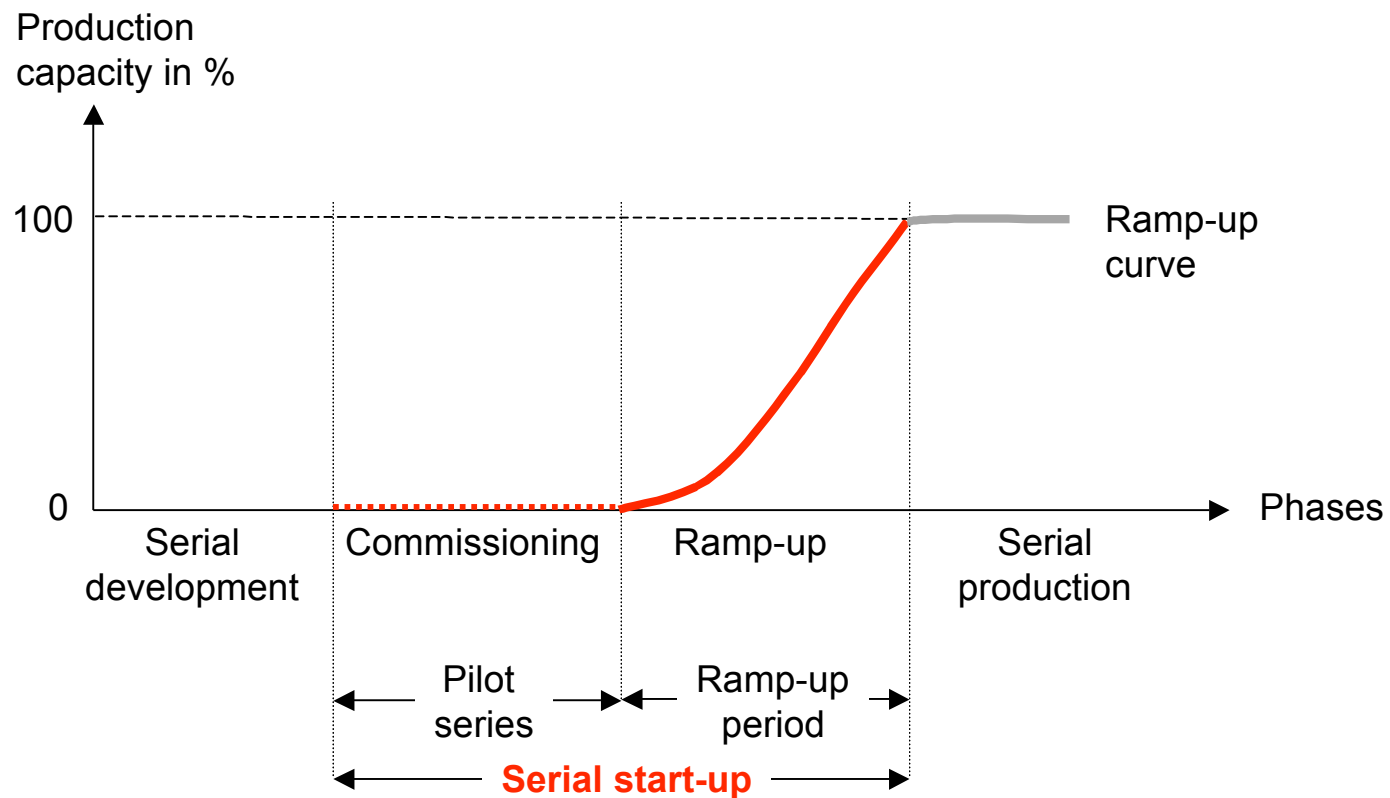
**Institute of Product Research**

**Brandenburg University of Technology Cottbus**

# ***Serial start-ups represent the link between product development and full-scale production.***

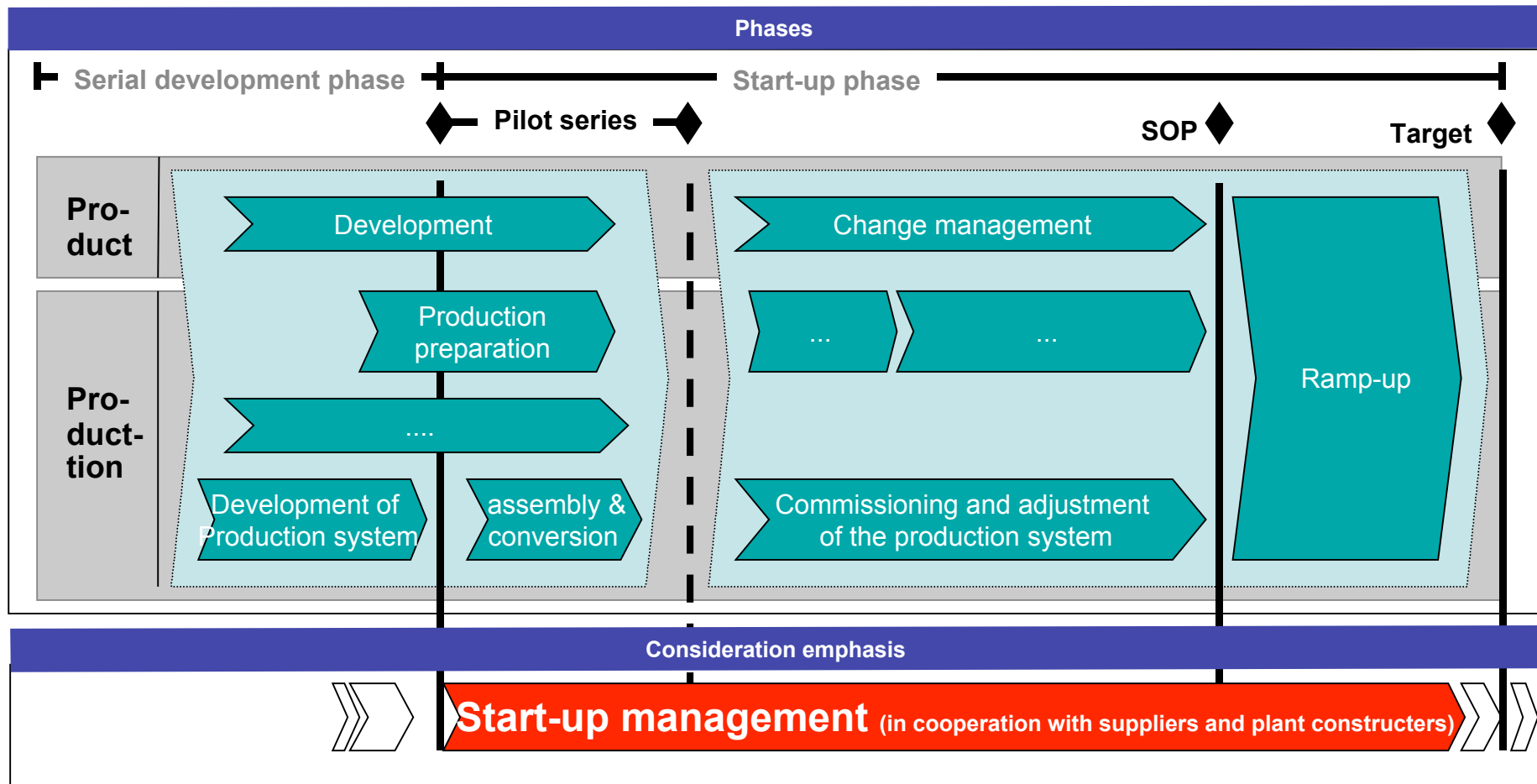
Definition of serial start-up

The serial start-up defines the timeframe in which the total production is brought up to the determined target number of units per day, including the pilot series phase as well as the start of production, and the subsequent ramp-up period.



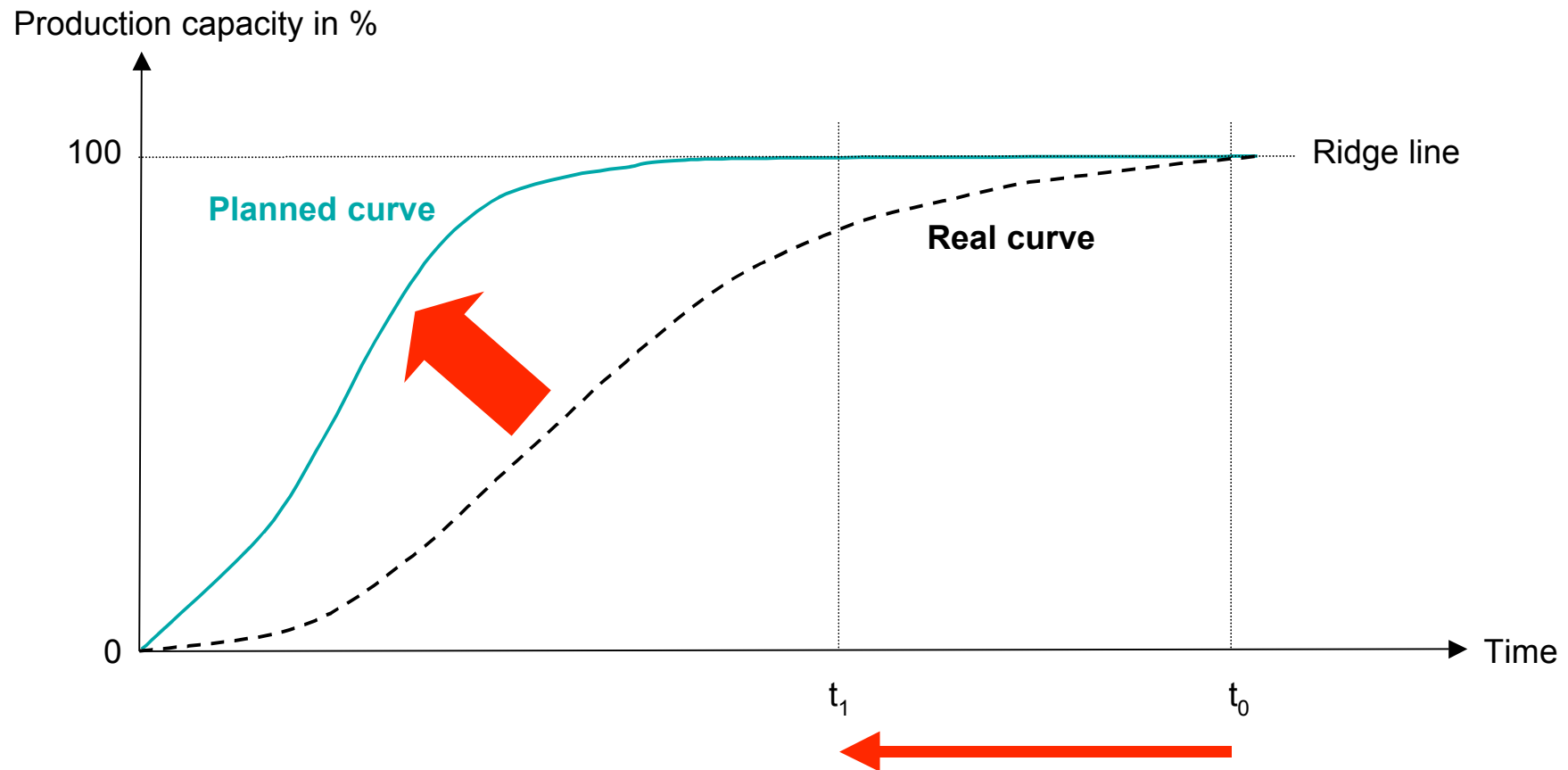
# The start-up management of a serial product contains all activities and measures regarding the planning, control and enforcement of the start-up process based on the associated production systems.

Start-up management in the process of product genesis



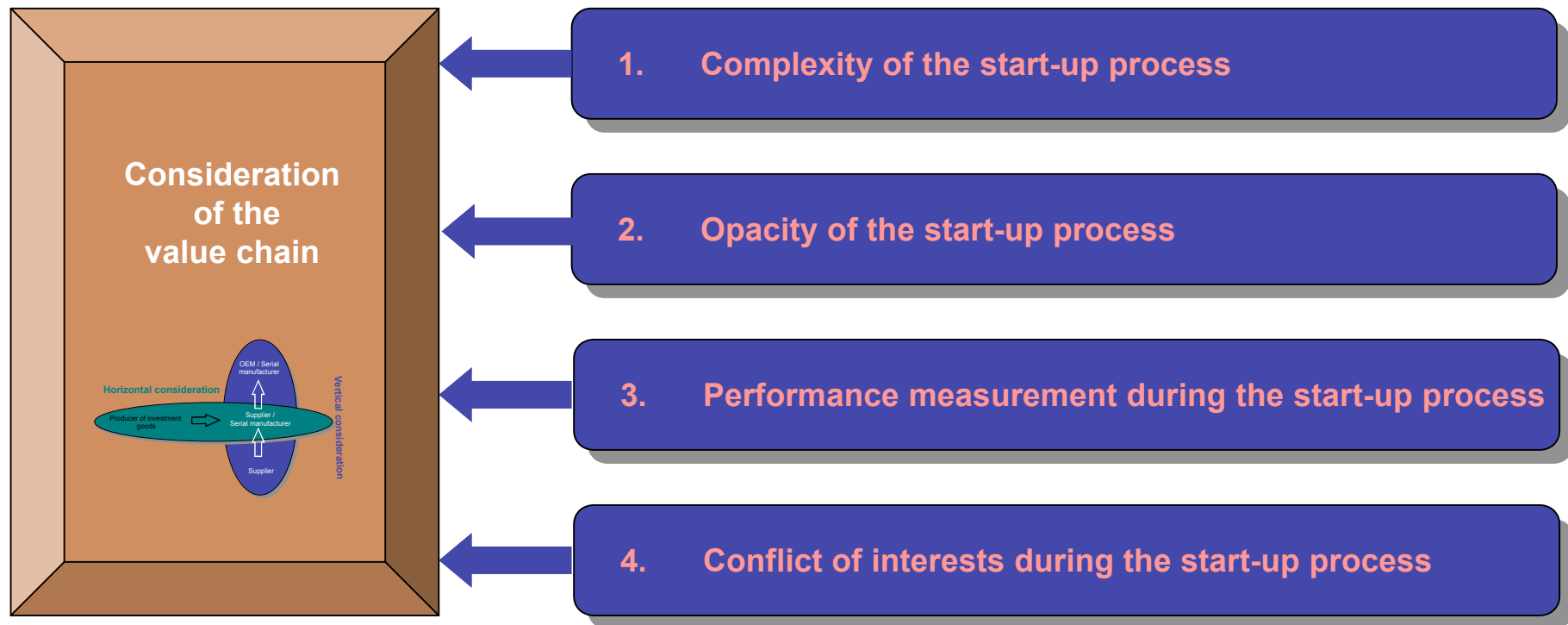
# By reducing the start-up time, the planned target number of units per day can be achieved faster

Reduction of start-up time



# ***Prerequisite for the reduction and control of the start-up process is the mastery of the problem areas.***

Challenges within the start-up process



# ***The horizontal as well as the vertical consideration of the start-up process is specified by elementary and organisational aspects.***

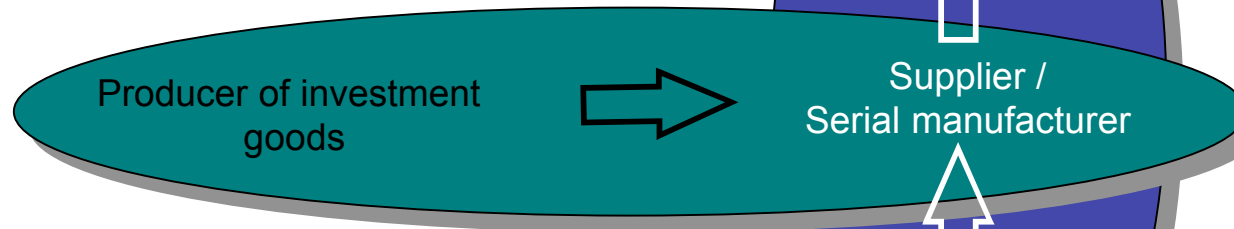
Horizontal and vertical consideration of the start-up process

## **Horizontal consideration of the start-up process**

### Elementary:

- Fast control of all processes
- Adaptation of the material flows and capacities of both the production and logistics system

### **Horizontal consideration**



### Organisational:

Control of how a process's degree of maturity develops as well as control of the efficiency of capacity- and technology-driven start-up processes

## **Vertical consideration of the start-up process**

### Elementary:

- Fast implementation of customer requirements
- Inter-company coordination of operational functions
- Control of the complexity within the value chain

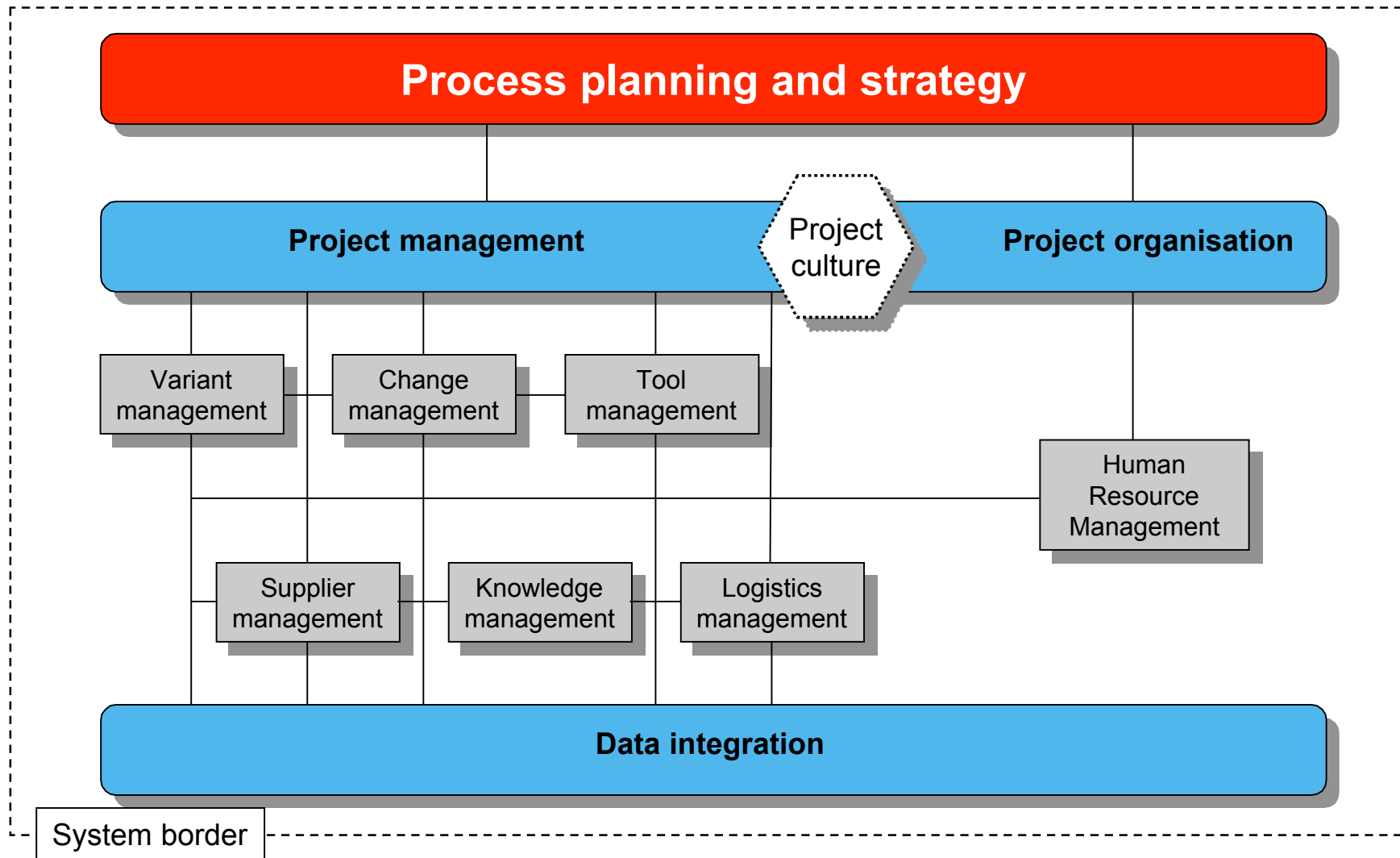
**Vertical consideration**

### Organisational:

Control of inter-company processes and thus of the efficiency of product- and technology-driven start-up processes

***In the scope of a logistic-based start-up management, a number of tools and methods is suggested, in order to optimise start-ups in the automotive industry.***

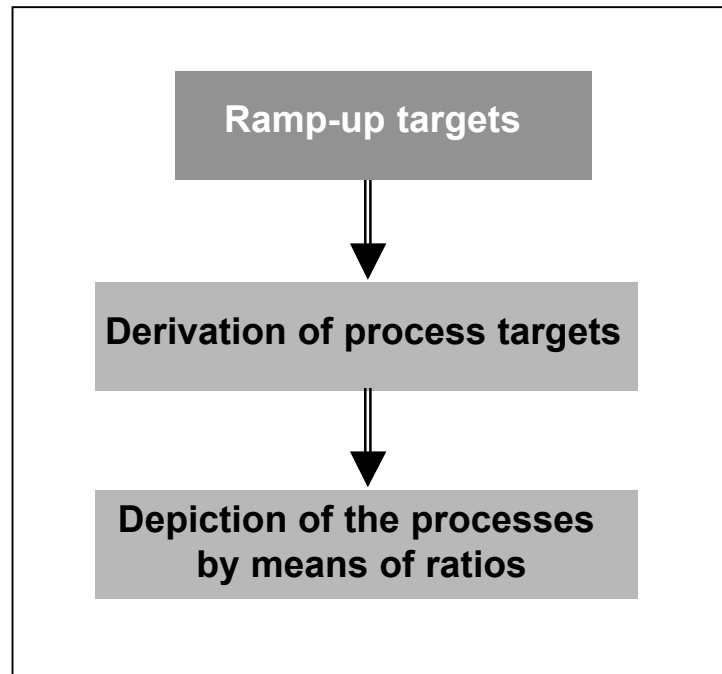
Modules of a logistic-based start-up management (I)



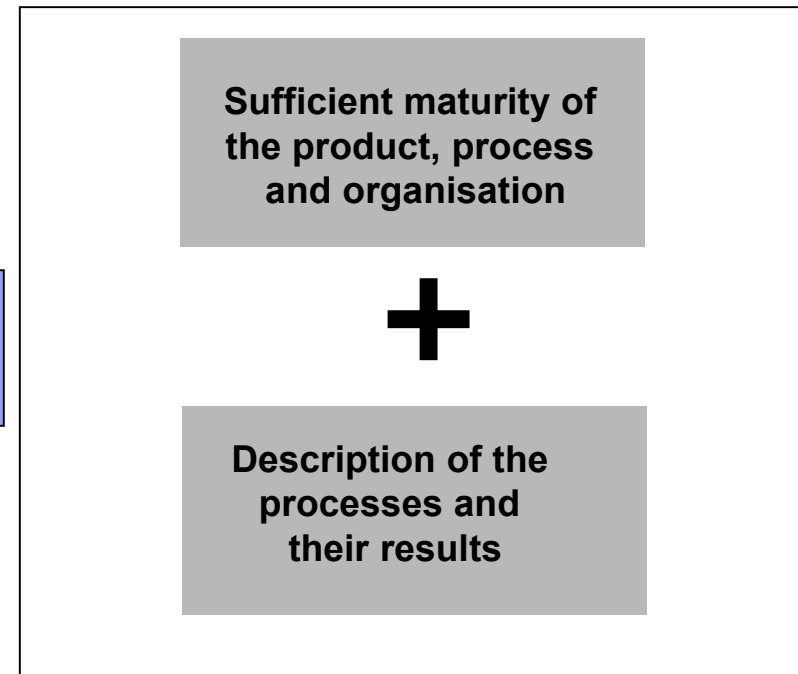
***The target-based process management is to ensure the mastery of all processes that are required until the target number of units per day is achieved.***

Target-based process management (I)

### (1) Fundamental procedure



### (2) Fundamental prerequisites

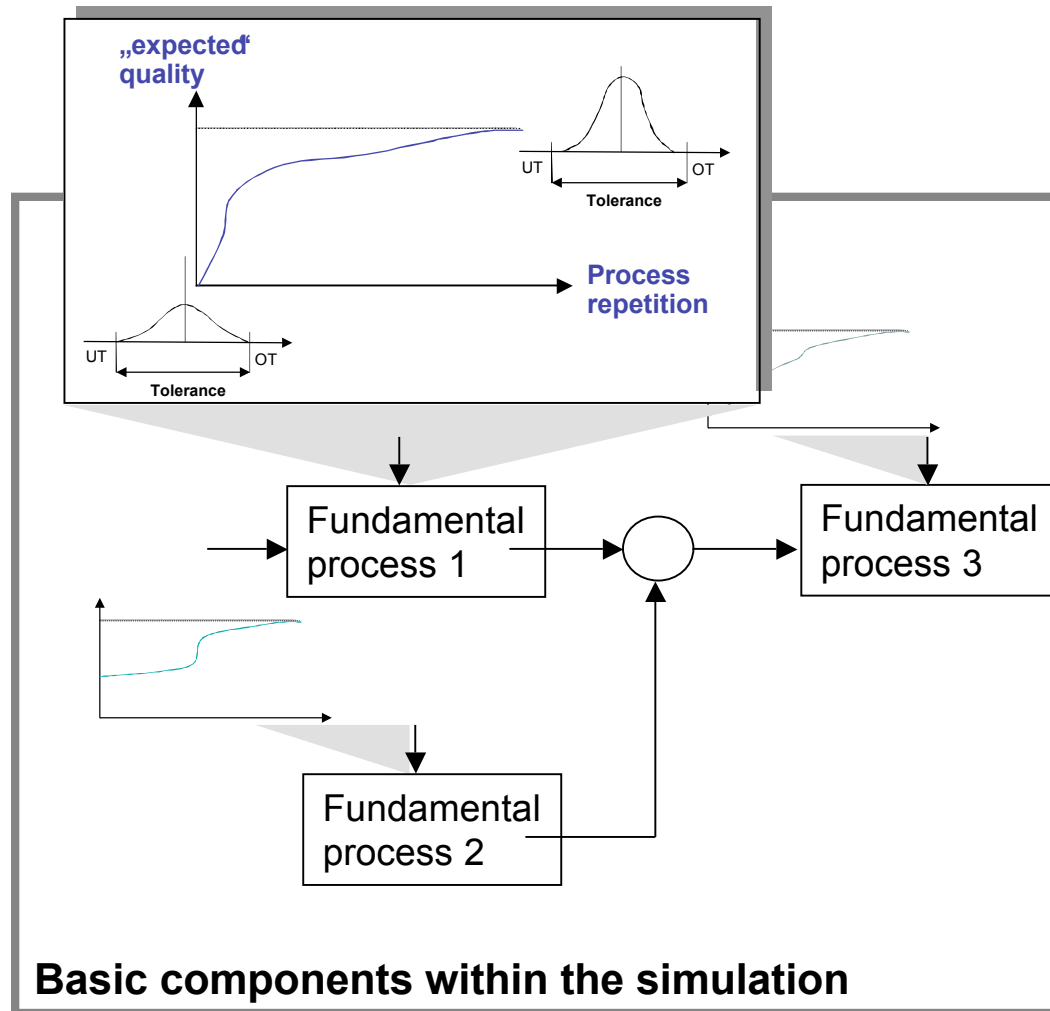


**Essential characteristic of the target-based process management is the continuous gathering of process ratios and the comparison of these ratios to the determined targets.**



# Simulations facilitate both an early warning system of disadvantageous developments and an optimisation of the production system.

Planning and process related simulations of the production system (I)



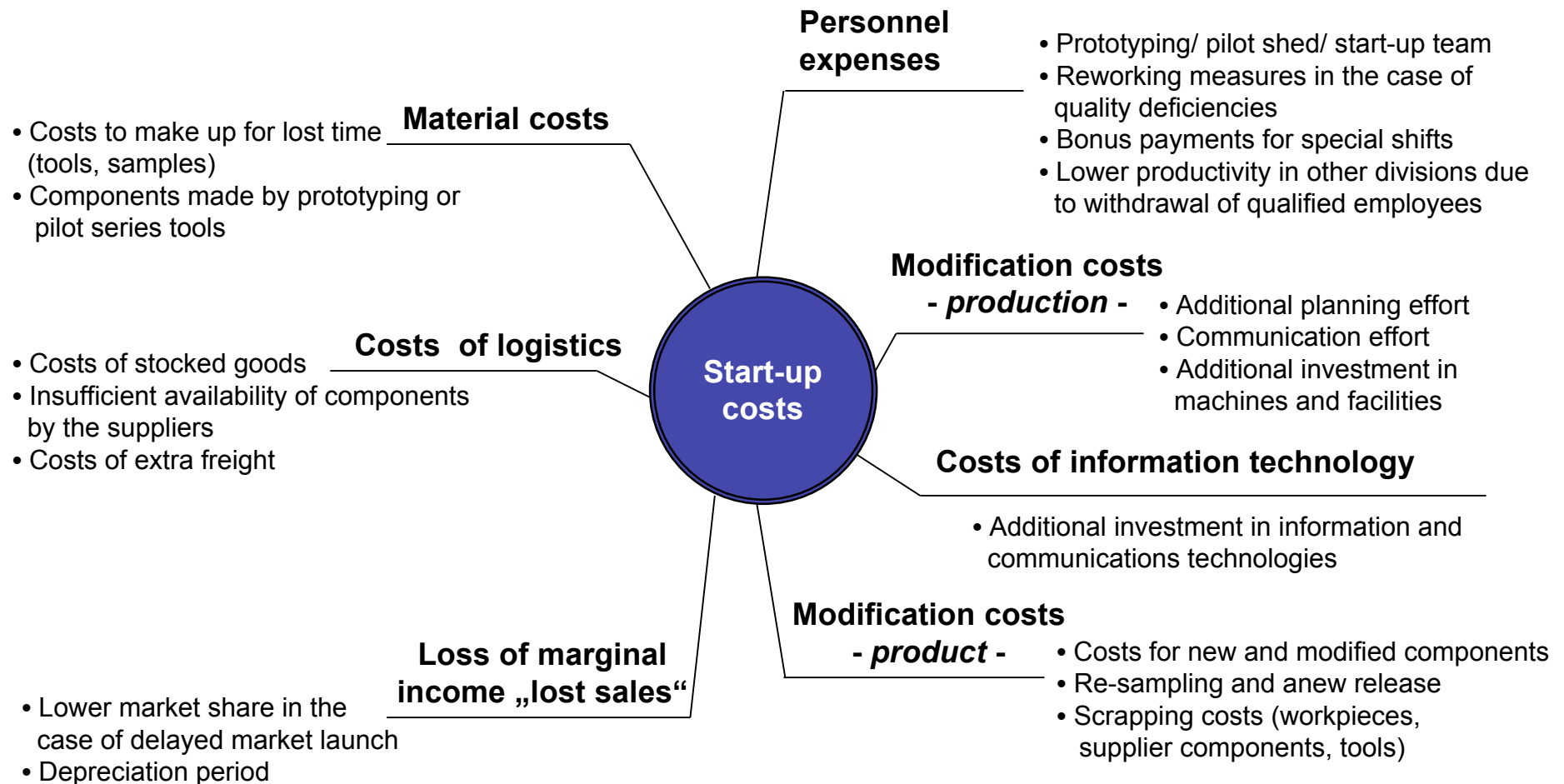
Developments of the performed process-related quality capability form the basis of quality simulations

The fundamental procedure is based on the breakdown of the considered production process in predetermined modules.

With the knowledge of the influencing factors (man, machine, process, material, and environment), which effect the performed quality of the fundamental processes, the effectiveness of the fundamental process with respect to the fulfilment of quality requirements can be determined.

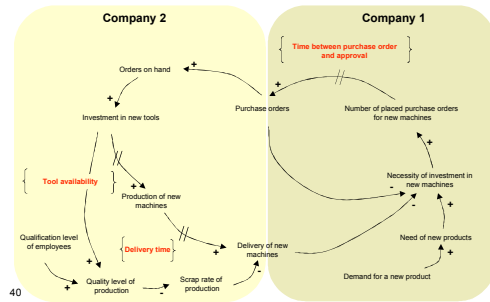
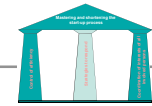
# For the optimisation of the start-up process, a closer consideration of start-up costs is required.

Saving potentials within the start-up process



**The effects of disruptive factors on the start-up system are investigated in the following step. Based on this investigation, improvement measures and strategies to react respectively can be developed.**

Examples for disruptive factors



**Disruptive factors**

The cause of disruption originates from the system start-up

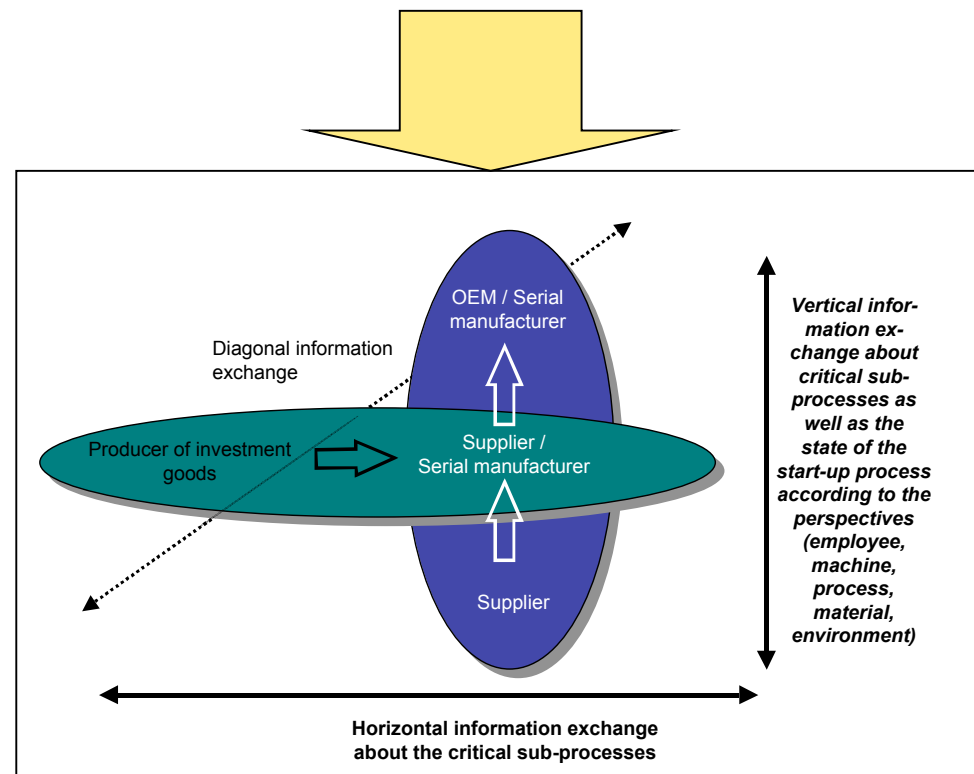
The cause of disruption originates from preliminary or temporally parallel processes

internal	external
<ul style="list-style-type: none"> <li>- lacking process maturity of new production facilities</li> <li>- compatibility of the sub-systems of the production machinery</li> <li>- no series conditions for supplier components and tools during the first production start-ups</li> <li>- incomplete data base within the start-up phase</li> <li>- quality control involves difficulties due to product modifications and technical problems</li> </ul>	<ul style="list-style-type: none"> <li>- unplanned product modifications</li> <li>- incorrect software</li> <li>- bad delivery performance, as supplier components may possibly be in the start-up phase, as well</li> <li>- many start-up projects at same time</li> <li>- problems to integrate the production machinery into the plant's or company's infrastructure</li> </ul>

# Only by an integrated, inter-company spanned cooperation, the mastery of the start-up process is possible.

Conclusion (I)

The realisation of start-up targets as well as the effective exposure to challenges of the start-up process requires the consideration of the entire value chain. Isolated solutions do not consider the manifold interdependencies within the value chain.



- Fleischer, J./ Spath, D./ Lanza, G. (2003): Qualitätssimulation im Serienanlauf: Vorbestimmte Qualitätsfähigkeitskurven von Elementarprozessen. In: *wt Werkstattstechnik-online*, 93, (1/2): 50-54.
- Klinkner, R./ Risse, J. (2002): Auf den Anlauf kommt es an. In: *Logistik Heute*, 2002, (3): 38-39.
- Kuhn, A./ Wiendahl, H.-P./ Eversheim, W./ Schuh, G. (2002): Fast ramp-up: Schneller Produktionsanlauf von Serienprodukten. 1. ed., Dortmund, 2002.
- Laick, T./ Warnecke, G. (2002): Produktionshochlauf neuer Prozesse in der Produktion. In: *ZWF*, 97, (1-2): 43-46.
- Risse, J. (2002): Time-to-Market-Management in der Automobilindustrie: Ein Gestaltungsrahmen für ein logistikorientiertes Anlaufmanagement. Dissertation Technische Universität Berlin, Berlin, 2002.
- Wiendahl, H.-P./ Hegenscheidt, M./ Winkler, H. (2002): Anlaufrobuste Produktionssysteme. In: *wt Werkstattstechnik online*, 92, (11-12): 650-655.
- Wiesinger, G./ Housein, G. (2002): Schneller Produktionsanlauf von Serienprodukten: Wettbewerbsvorteile durch ein anforderungsgerechtes Anlaufmanagement. In: *wt Werkstattstechnik online*, 92, (10): 505-508.