



Manufacturing in Germany – A Renaissance

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COMPETITIVE MANUFACTURING IN GERMANY BY SUSTAINABLE MANAGEMENT OF PRODUCTIVITY

- + Introduction
 - + Example
 - + General Remarks
- + Current Studies on Manufacturing in Germany
- + Summary: Criteria for Competitive Manufacturing in Germany
- + Tools for Competitive Manufacturing in Germany
- + Outlook



EXAMPLE: COMPREHENSIVE AND SUSTAINABLE PRODUCTIVITY MANAGEMENT



- Increasing flexibility of working hours
- Optimum use of bargaining agreements
- Motivation and activation of employees

- Increasing productivity of administrative processes
- Increasing productivity of manufacturing processes by top notch video technology
- Formation of internal productivity consultants

- Integrated optimization over areas and locations (interfaces)
- Location in Asia for customer proximity (however only non IP-critical products)

- Best Practice Transfer
- Know-how Transfer
- Integration into Production System and Continuous Improvement Process
- EBIT Margin approaches 10%



GENERAL REMARKS

- + Costs are not the only driver of success
- + In manufacturing relocations at least three factors are underestimated regularly:
 - + Complexity and logistical consequences of the arising interfaces drive cost and reduce flexibility and quality
 - + Separation from development and other corporate functions in Germany reduces the speed of innovation
 - + The commencing business travel typically quickly exceeds all expectations, drives costs and negatively impacts employee motivation
- + Sustained management of the productivity potential makes two digit EBIT margin figures possible also for Germany as a manufacturing location



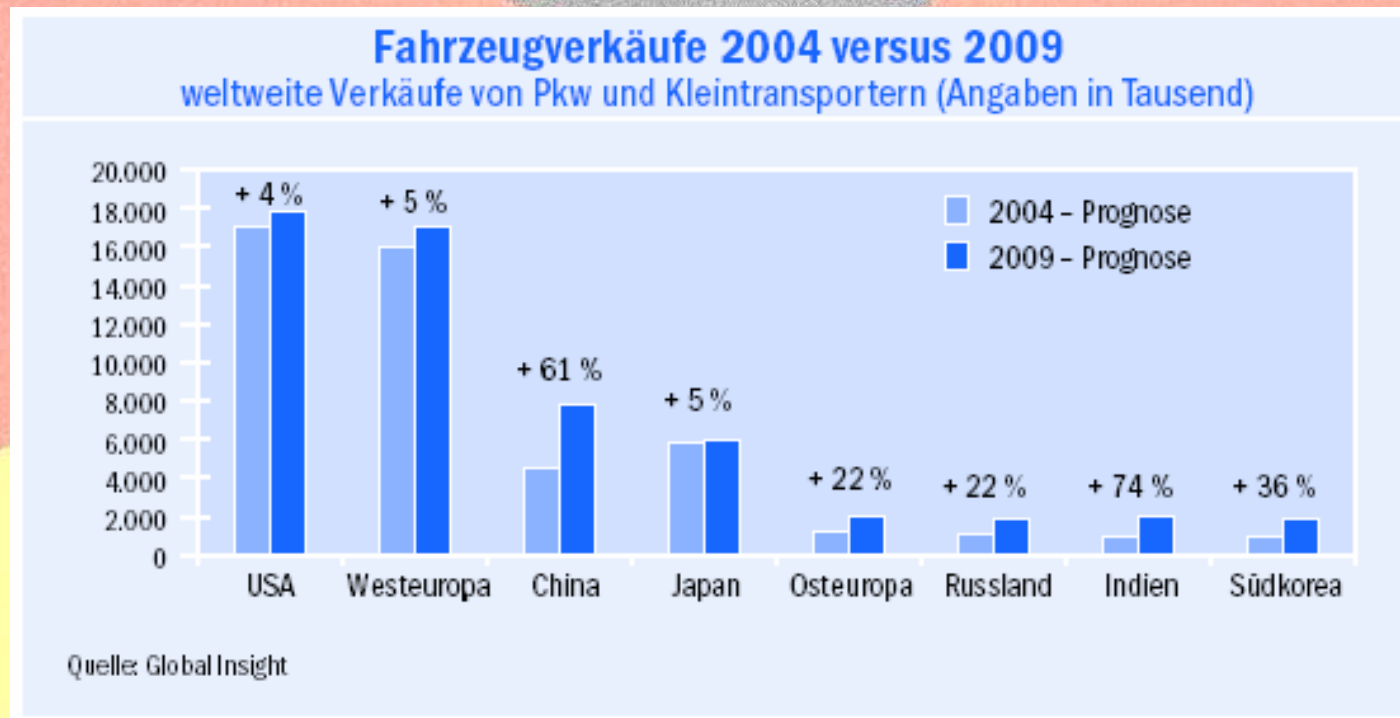
GERMANY AS A MANUFACTURING LOCATION – REPORTS ERNST & YOUNG

- + Peter Fuß, Partner: „There is a renaissance of Germany as a Manufacturing Locations “
- + Survey in the German Automotive Industry:
 - + 73% Germany is internationally an attractive location
 - + 4% Germany is no attractive location anymore
- + However: 22% of suppliers plan investments in Eastern Europe, 15% in Asia
 - + Driver: Proximity to market and customers
- + Strengths of Germany
 - + 92% R&D
 - + 84% Employee Qualification
 - + 80% Infrastructure



GERMANY AS A MANUFACTURING LOCATION – REPORTS ERNST & YOUNG (II)

+ Proximity to markets as driver for relocation



Source and © Ernst & Young



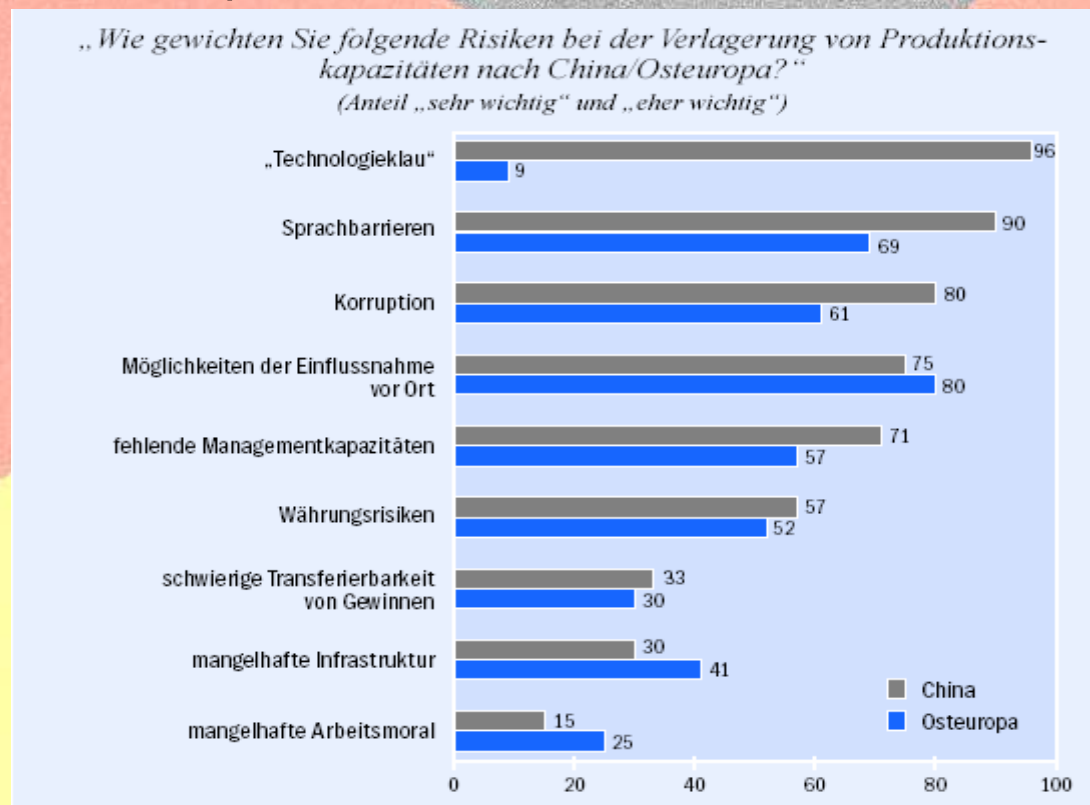
GERMANY AS A MANUFACTURING LOCATION – REPORTS ERNST & YOUNG (III)

- + Key disadvantage of Germany: High labour cost (93%)
- + However significant progress in increasing labour flexibility – only for 23% still a major problem due to
 - + More flexible working times
 - + Increase of weekly working hours
 - + Work on Saturdays
 - + Introduction of temp contracts for workers
 - + Bargaining of wage increases against job guarantees
- + Main pressure still on parts production and final assembly – all productivity potentials need to be realized



GERMANY AS A MANUFACTURING LOCATION – REPORTS ERNST & YOUNG (IV)

+ Perception of Risks

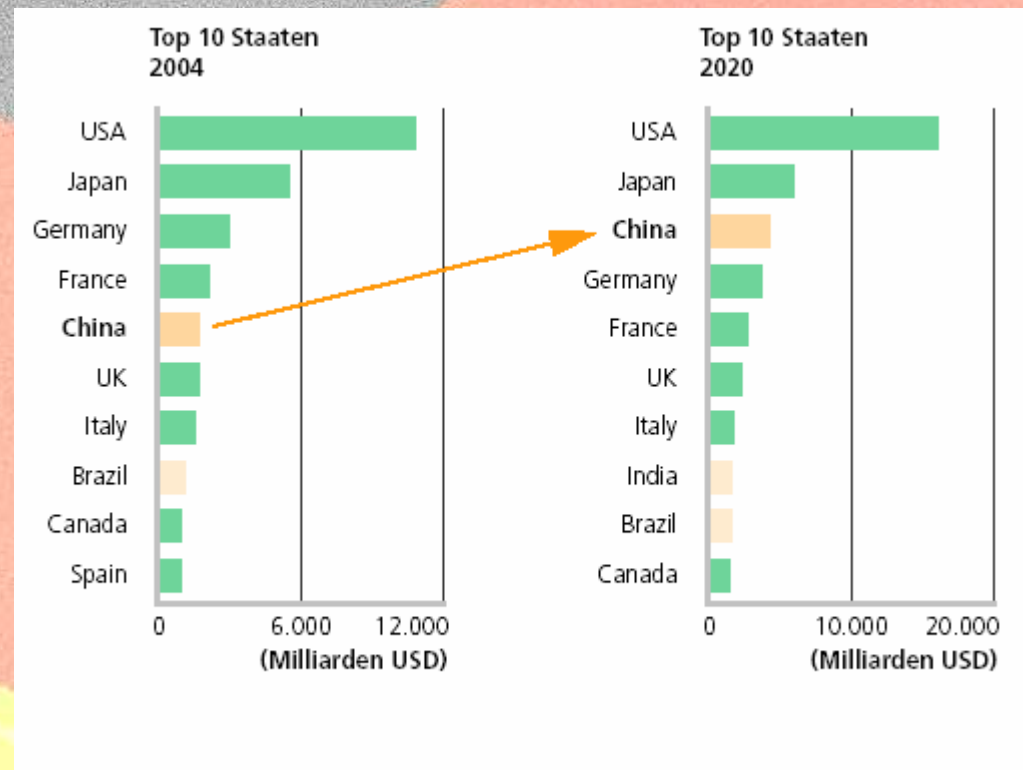


Source and © Ernst & Young



GERMANY AS A MANUFACTURING LOCATION – REPORTS MERCER CONSULTING

- + Peter Baumgartner, Managing Director: „German companies overrate China“
 - + „Prospects are seen to bright, risks are ignored“
 - + „Vigilance instead of Euphoria“



Source and © Mercer Consulting

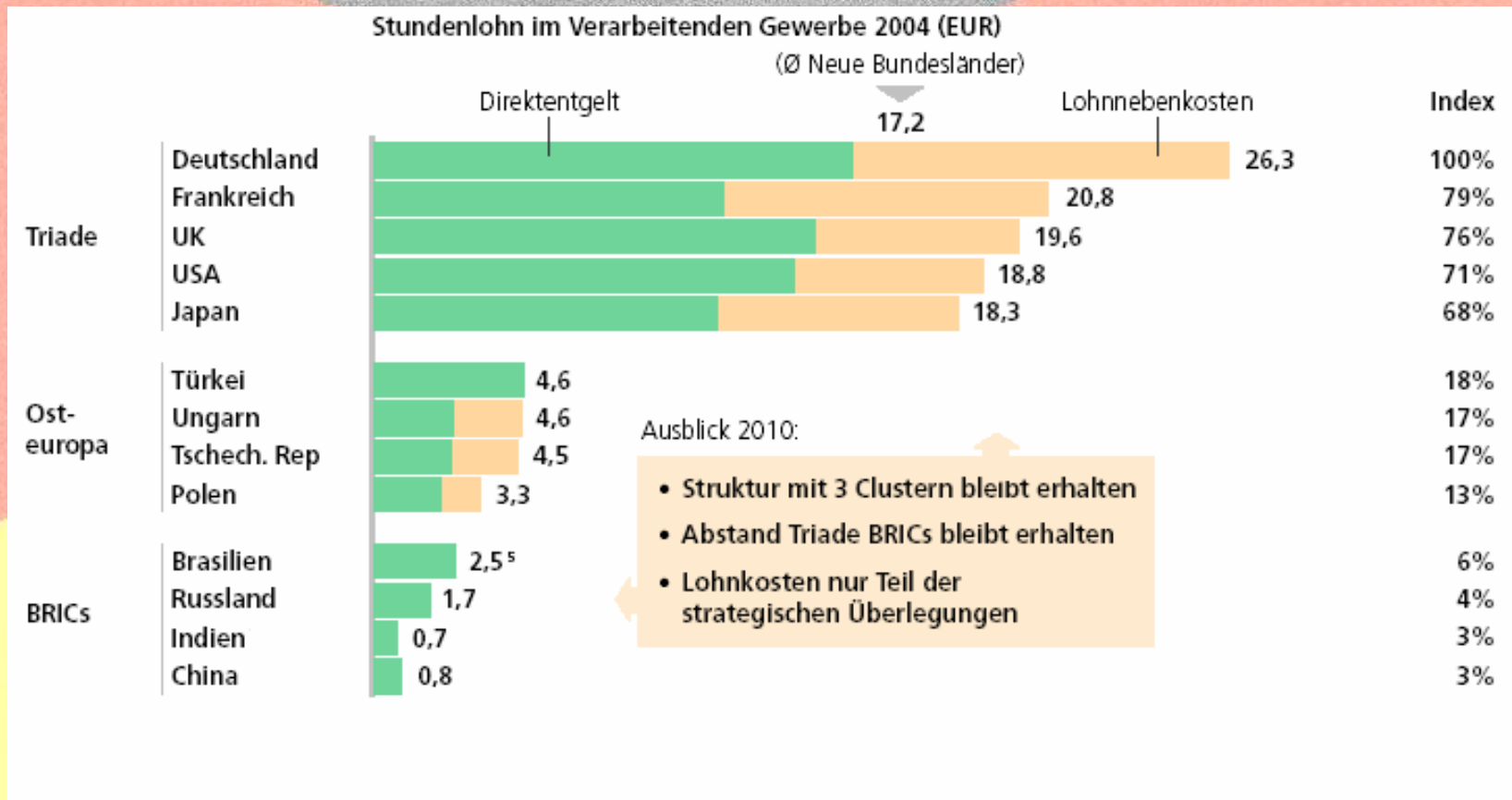


GERMANY AS A MANUFACTURING LOCATION – REPORTS MERCER CONSULTING (II)

- + Labour Cost are important, however only one aspect of all costs at a manufacturing location
- + Create transparency in all cost aspects, specifically including:
 - + Logistics
 - + Quality
- + „A complete analysis in many cases indicates strategically better solutions than the supposedly advantageous manufacturing relocation.“



GERMANY AS A MANUFACTURING LOCATION – REPORTS MERCER CONSULTING (III)





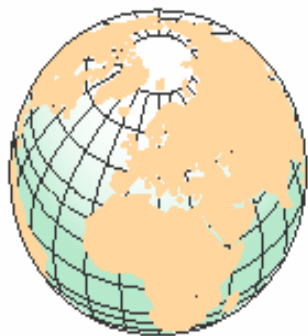
GERMANY AS A MANUFACTURING LOCATION – REPORTS OTHER QUOTES

- + „It is definitely possible to manufacture in a profitable way in Germany “ (AT Kearney / „Best Plant“ Competition)
- + „Commitment to Germany as a Manufacturing Location in spite of the difficult circumstances as a basis for successful entrepreneurs“ (Ludwig Erhard Award / German Business Excellence Award)
- + „Underrated Asset: Employees“ (Expert Circle Small and Midcaps, SZ/HVB)
- + „Germany as a Manufacturing Locations makes significant progress in 2005“ (innovations report)
- + „Return of the repentant “ (manager-magazin)
- + „The desert lives“ (Handelsblatt)



GERMANY AS A MANUFACTURING LOCATION – REPORTS MERCER CONSULTING (IV)

Fünf Dimensionen der Globalisierung



Faktor 1: Kosten

- Lohnkosten
- Rahmenbedingungen
- Flexibilität

Faktor 2: Wachstum

- Neue Wachstumsmärkte
- Neue Kundenanforderungen
- Überwindung von Handelsbarrieren

Faktor 3: Wettbewerb

- Neue Wettbewerber
- Angriff auf das Premiumsegment
- Neue Wettbewerbsstrukturen

Faktor 4: Innovationsfähigkeit

- Globale Wissens- und Technologiennetze
- Globaler Talentwettbewerb
- Angriffe auf »geistiges Eigentum«

Faktor 5: Risiken

- Verfügbarkeit und Preise von Rohstoffen
- Währungsschwankungen
- Terrorismus

Source and © Mercer Consulting

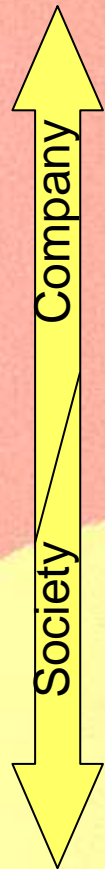
08.02.2007

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13



SUMMARY: FACTORS FOR COMPETITIVE MANUFACTURING IN GERMANY



Operational Factors

- + Productivity
- + Quality
- + Customer Satisfaction
- + Supplier Management

Strategic Factors

- + Innovation Capabilities
- + Technology Leadership
- + Customer Intimacy
- + Market Development

Society

- + Location Cost
- + Quality of schools and availability of young engineers
- + Mobility
- + Infrastructure



MANAGING COMPETITIVE MANUFACTURING OVERVIEW

- + Operating Factors
 - + Can be influenced to 100% by the company
 - + Potentials can be derived from surveys and experience
 - + Focus of this presentation
- + Strategic factors
 - + Classical strengths of the German Mittelstand (SME)
 - + Should not be jeopardized by creating geographical interfaces
- + Societal factors
 - + Area of influence for associations
 - + Positive developments are visible as well as negative, like the “Pisa Survey” or the decline in engineering students

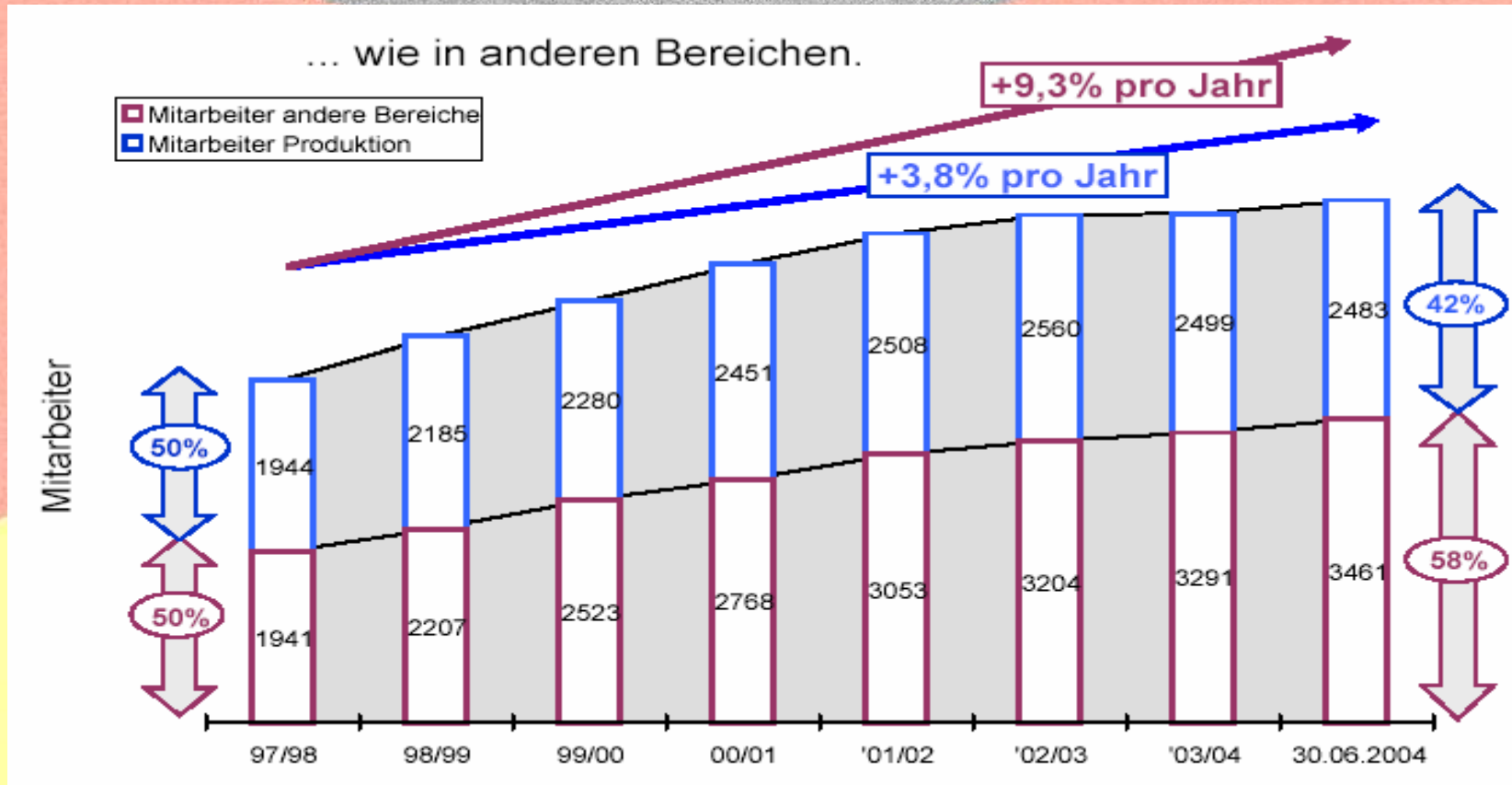


MANAGING COMPETITIVE MANUFACTURING INCREASE PRODUCTIVITY: LABOUR COST

- + New labour time models
 - + Extension of weekly working hours
 - + Working hours accounts
 - + Saturday work without surcharge
 - + Temp contracts to mitigate peak demands
- + Flexibility in bargaining agreement
 - + Company individual regulations
- + Employee participation in company gains



MANAGING COMPETITIVE MANUFACTURING PRODUCTIVITY INCREASE: ADMINISTRATIVE PROCESSES



Source: TRUMPF
08.02.2007



MANAGING COMPETITIVE MANUFACTURING PRODUCTIVITY INCREASE: ADMINISTRATIVE PROCESSES (II)

- + According to InGENICS survey 2005:
 - + Productivity increase in manufacturing 1990 – 2005: 100%
 - + Productivity increase in administration: Usually not present
 - + Potential: up to 24% of total cost
- + Tools for optimization:
 - + Value / process chain analysis
 - + Typical results: 30% improvements*

* Quelle: PQ+

08.02.2007

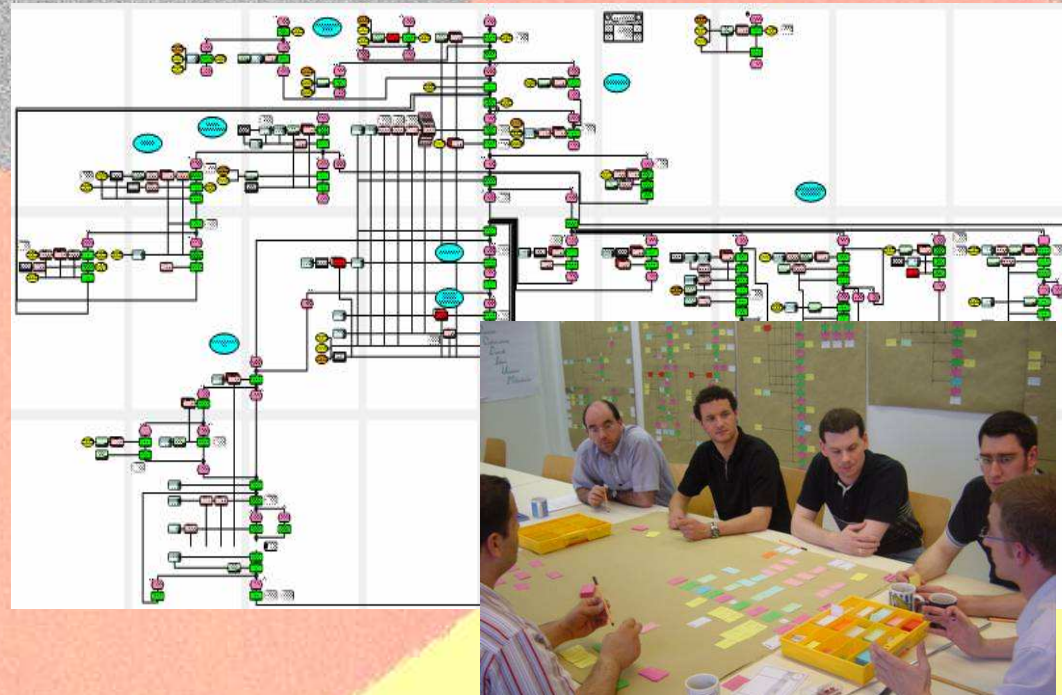
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18



MANAGING COMPETITIVE MANUFACTURING PRODUCTIVITY INCREASE: ADMINISTRATIVE PROCESSES (III)

- + Value / process chain analysis
- + Visualization of actual and to-be processes using cards
- + Employees and managers concerned are actively involved in the workshops
- + To-be processes will be documented in a software system



Quelle: PQ+



MANAGING COMPETITIVE MANUFACTURING PRODUCTIVITY INCREASE: MANUFACTURING PROCESSES

- + Increasing productivity of manufacturing processes using video based process analysis
- + Integrated optimization by
 - + Direct input of digital video frames into the analysis software (instead of paper, pencil and stopwatch)
 - + Integrated evaluation and assessment in one application
 - + Balancing of the manufacturing line
 - + Automatically generating new manufacturing plan
- + Typical productivity increase 20%*
- + Results over all projects 15% – 45%*
- + Additional potential through application in planning and Design for Manufacturing / Design for Assembly

* Source: PQ+



MANAGING COMPETITIVE MANUFACTURING PRODUCTIVITY INCREASE: MANUFACTURING PROCESSES (II)

File Edit Method Tools Reports Window Help
New Open Save Print Copy Paste Undo Redo Zoom In Zoom Out Time Unit Decimal Places

Operation
Anzahl: 1 Start: 116 Stopp: 203
Objekt: Isolierband Art. Nr.: 024-34-456
Hilfsmittel: [KEINE] Art. Nr.: [KEINE]
Aktivität: Holen
A: 1 B: 1 C: 0 D: 0
KA: 0 Stoppuhr: 0 Sekunden
Stoppuhrzeit für Bewegungen: 0
Schritt: 0 Beugung: 0
Steckung: 0 Drehung: 0
Anweisungen: Holen Isolierband
Anmerkungen:

Operation - Gesamtzeit
+ 2 - Holen Isolierband [Isolierband]
Gesamtzeit: 182,9 Sek. 29,8 %
Verluste (Rot+Orange): 87,5 Sek. 18,1 %
davon Warten (Orange): 33,1 Sek.
Unt-leistg. (Gelb): 88,7 Sek. 48,5 %
Produktivität (Grün): 21,7 Sek. 3,7 %
davon Unergonomie: 11,8 %

Backofenwerk Ostfildern
Heißluftofen [Z 21-54]
Station 1
1 - [1-01] Montage des Innenofens
2 - [1-02] Montage der Heizelemente
3 - [1-03] Vernieten von Innenofen und Abschlußrahmen
4 - [1-04] Montage des Heizstabes
5 - [1-05] Montage der Klammer
6 - [1-06] Montieren des Außenblechs
7 - [1-07] Weiterleiten des vormontierten Ofen
1 - Innenofen mit Transportbandaufnahme dreh [Innenofen]
2 - Ausrichten der inneren Heizelemente [Inneres Heizelement]
3 - Drehen (Rotieren) des Ofen [Innenofen]
4 - Weiterschieben des Ofen auf Transportband [Innenofen]
Station 2
1 - Vorbereiten des Isoliermaterials
1 - Holen Isolierband [Isolierband]
2 - Holen Isolierband [Isolierband]
3 - Holen Isoliermaterial [Isoliermaterial]

AvX - [Balancing (C:\...Beispiele Vorbereitung\velux.avx)]
File Edit Balancing Tools Reports Window Help
New Open Save Print Copy Paste Undo Redo Zoom In Zoom Out Time Unit Decimal Places

Herde-Linie
Herdemontage [01]
Station 1
1 - [1-01] Montage des Innenofens [Abschlußrahmen]
1 - Holen Abschlußrahmen [Abschlußrahmen]
2 - Plazieren Abschlußrahmen [Abschlußrahmen]
3 - Handieren Rahmenaufnahme
4 - Holen Innenofen [Innenofen]
5 - Montieren Innenofen [Innenofen]
2 - [1-02] Montage der Heizelemente
1 - Holen von 2 Heizelementen [Inneres Heizele]
2 - Plazieren des ersten Heizelements [Inneres Heizele]
3 - Montieren von 2 Heizelementen [Inneres Heizele]
4 - Holen von 4 Schrauben 8x 60 [Schraube 8x 6
5 - Holen Drehmomentknarre [Schraub
6 - Plazieren Schraube 8x 60 in Drehmomentkn [Schraub
7 - Plazieren Schraube 8x 60 mit Drehmomentkn [Schraub
8 - Plazieren Schraube 8x 60 in Drehmomentkn [Schraub
9 - Fixieren Schraube 8x 60 mit Drehmomentkn [Schraub
10 - Plazieren Schraube 8x 60 in Drehmomentkn [Schraub
11 - Fixieren Schraube 8x 60 mit Drehmomentkn [Schraub
12 - Plazieren Schraube 8x 60 in Drehmomentkn [Schraub
13 - Fixieren Schraube 8x 60 mit Drehmomentkn [Schraub
14 - Zurucklegen der Drehmomentknarre
3 - [1-03] Vernieten von Innenofen und Abschlußrahmen
4 - [1-04] Montage des Heizstabes
5 - [1-05] Montage der Klammer
6 - [1-06] Montieren des Außenblechs
7 - [1-07] Weiterleiten des vormontierten Ofen

Produkte
Name: Herdemontage
Art. Nr.: 01
Anmerkungen:
Taktzeit: 140 Sek.
Eff. grad (%): 80

Arbeitsstationen dieses Produkt
Station 1, Station 2, Station 3, Station 4, Station 5, Station 6, Station 7, Station 8, Station 9, Station 12, Station 13, Station 14, Station 15

Source: PQ+

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21



MANAGING COMPETITIVE MANUFACTURING QUALITY AND CUSTOMER SATISFACTION

- + Satisfaction through customer oriented quality management
 - + Rapid cycle time and efficient handling of customer complaints
 - + Leverage customer complaints for product and system improvements
 - + Integrated data storage, including customer complaints, field data, manufacturing data and other information as a basis for new product development
- + Utilization of integrated methodologies
 - + Design FMEA
 - + Design for Assembly
 - + Design for Manufacturing



MANAGING COMPETITIVE MANUFACTURING SUPPLIER MANAGEMENT

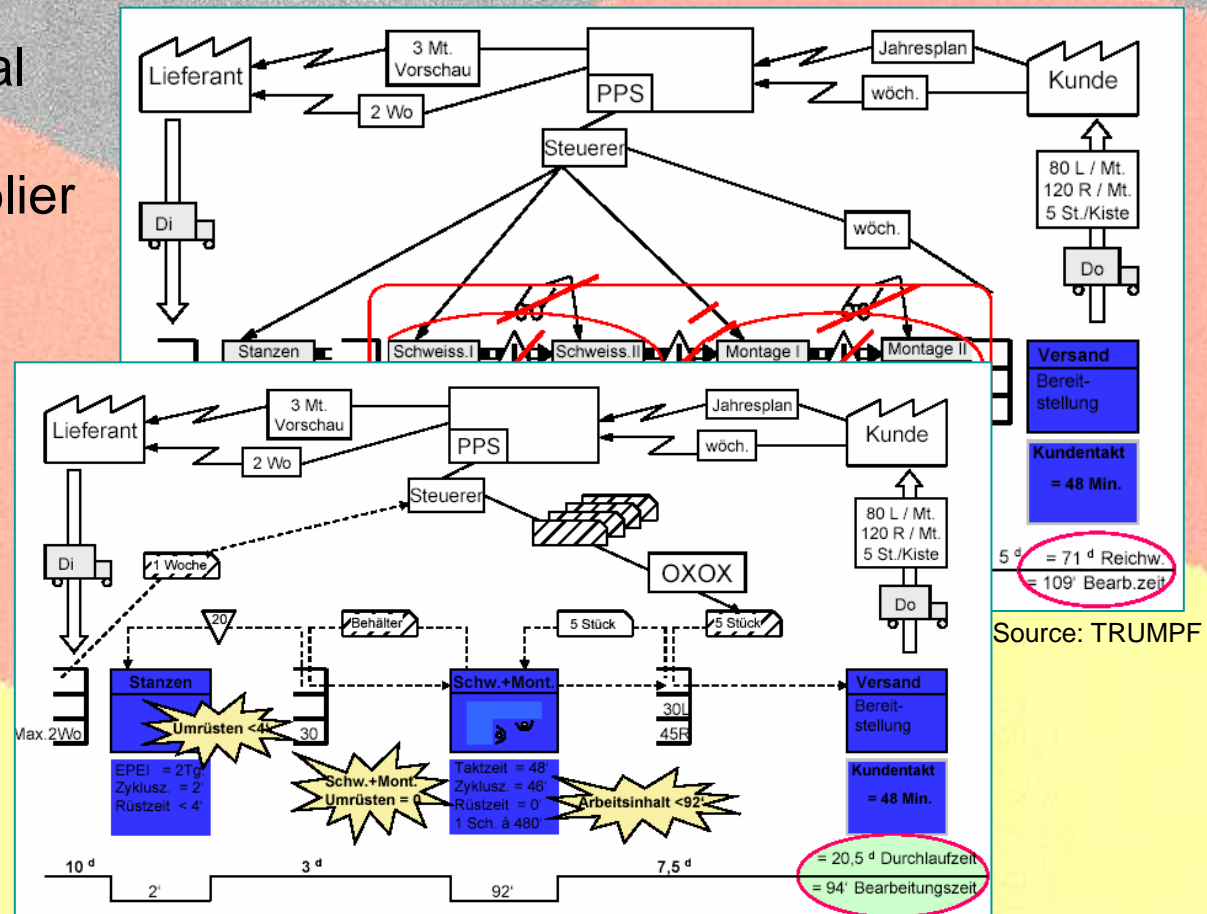
- + Up to 80% of total cost defined in supply chain
- + Active management of the supplier base yields
 - + Cost reduction by productivity management
 - + Minimization of indirect cost through active quality management
 - + Preventative cost optimization through integration into development process
- + Optimized management of the supply chain
 - + Logistics optimization through JIT, Kanban and other concepts
 - + Value Stream Mapping
- + Development of supply base through Supplier Excellence Programs for strategic suppliers



MANAGING COMPETITIVE MANUFACTURING

SUPPLIER MANAGEMENT: VALUE STREAM MAPPING

- + Capturing material and information stream from supplier to customer
- + Targeted optimization
- + Average results around 20% improvement*



Source: TRUMPF

* Source: PQ+
08.02.2007



MANAGING COMPETITIVE MANUFACTURING SUPPLIER MANAGEMENT: SUPPLIER EXCELLENCE

- + Integrated approach to achieve top level quality and productivity status, coined in the automotive industry
- + Visual project management through
 - + Project phase model
 - + KPIs
 - + War Room
- + Clear project controlling through
 - + Active involvement of top management
 - + Steering committees and project teams
 - + Integration of customers and suppliers
 - + Dedicated staff for the effort
- + Direct implementation of quick wins



PERSPECTIVE: GERMANY AS A MANUFACTURING LOCATION A RACE WITHOUT A FINISH LINE

- + German companies can compete in the global competition based on manufacturing in Germany
- + Prerequisites are
 - + Consistent and integrated management of all productivity potentials
 - + In the own company
 - + At the suppliers
 - + With the customers
 - + Leveraging Innovation and Motivation of all employees through positive leadership



PERSPECTIVE: GERMANY AS A MANUFACTURING LOCATION A RACE WITHOUT A FINISH LINE (II)

- + Societal conditions and framework needs continuous improvement in parallel, to support competitiveness of the location
- + „Sachen Machen“ initiative of the VDI, German Association of Engineers:
„The only way to remain competitive in a global economy is continuous innovation. The leading position in particular demands constant development to keep the distance from the fast followers. For that means we need the best. Therefore it is important to communicate the attractiveness of the engineering career.“
(Horst Siedle, Managing Director & Shareholder Siedle & Söhne)



ANNEX

- + Bibliography
- + Presenters



BIBLIOGRAPHY

- + Ernst & Young 2005: Automotive Location Germany in Jeopardy?
- + Mercer Management Consulting 2006: Globalisation strategies for industrial engineering companies
- + InGENICS 2005: Increasing efficiency in administration 2005
- + Bernhard Stalder, TRUMPF: „SYNCHRO, the TRUMPF Production System“, Presentation for the „Plant of the Year 2006“ contest



PRESENTER
DR. UWE BÜCHNER



+ 1946 + Married, 3 children + Ph.D. in Physics + 25 years of Senior and Executive Management Daimler Benz AG, Mercedes Benz AG, and DaimlerChrysler AG at the plants in Hamburg and Bremen, and in the HQ in Stuttgart in + Material and Process Engineering + Quality Management + Organizational and HR Development + Transformation Management + Holistic Corporate Development + 2 years board member of hspAG consulting firm + Since 2003, established independent consultant + Dr. Uwe Büchner Unternehmensberatung + Partner of PQ Unternehmensberatung GmbH + Partner of Solme Deutschland GmbH + Visiting Professor TU Berlin, Institute for Quality

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