World Association of Newspapers and News Publishers

Lean Production Principles

Manfred Werfel
Deputy CEO
Executive Director Competence Centre Newspaper Production
WAN-IFRA GmbH & Co. KG

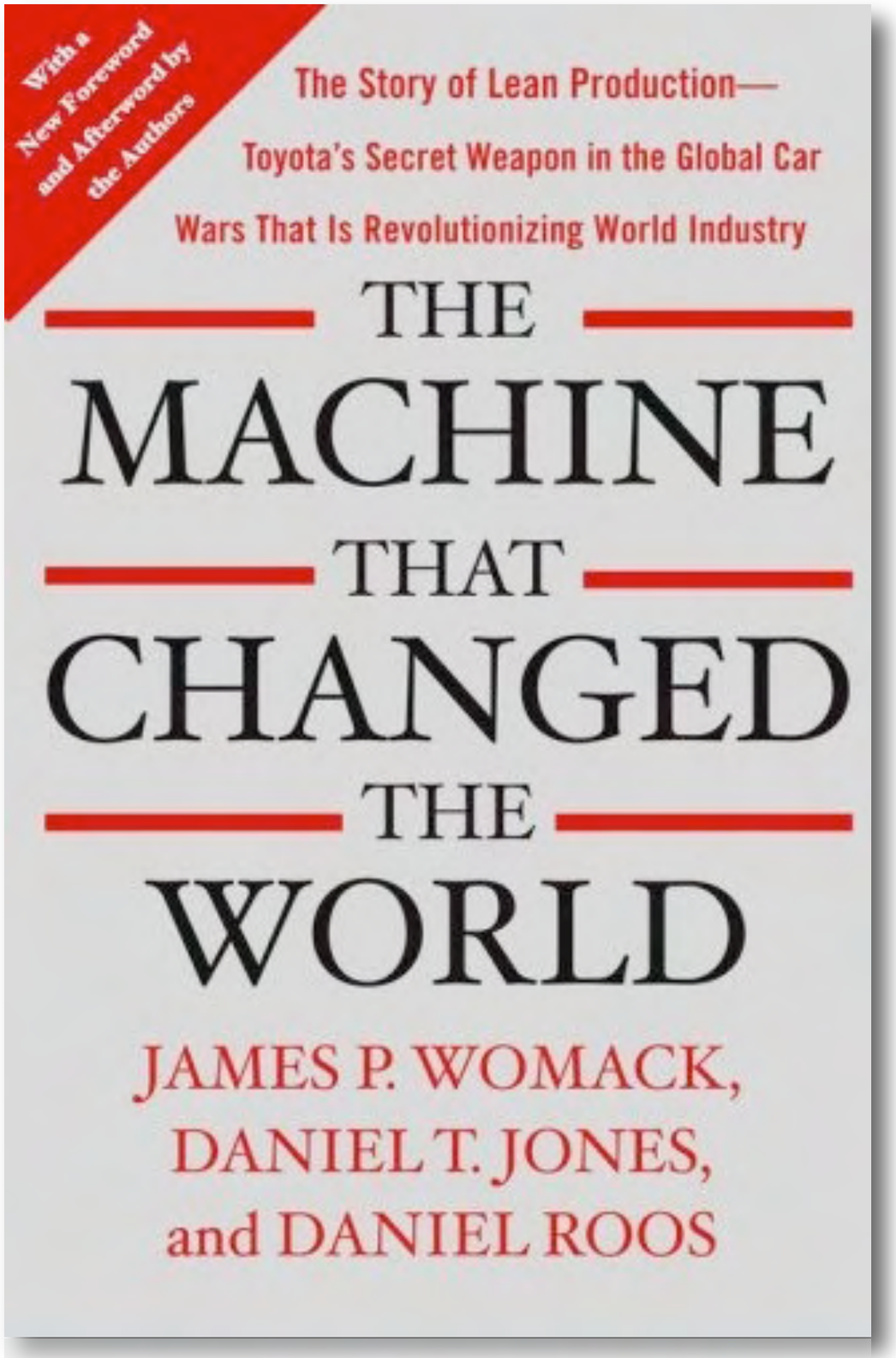
Manfred.Werfel@WAN-IFRA.org

“Japan shock” in car industry

- MIT study showed 1991 that in Japanese car industry – compared to Western standards –
  - Half as many working hours were required to manufacture a comparable motor vehicle
  - Half as many assembly errors were made
  - Half the area requirements of the plants
  - Half the development time
  - Allowing a much more flexible reaction to demand fluctuations

The MIT study

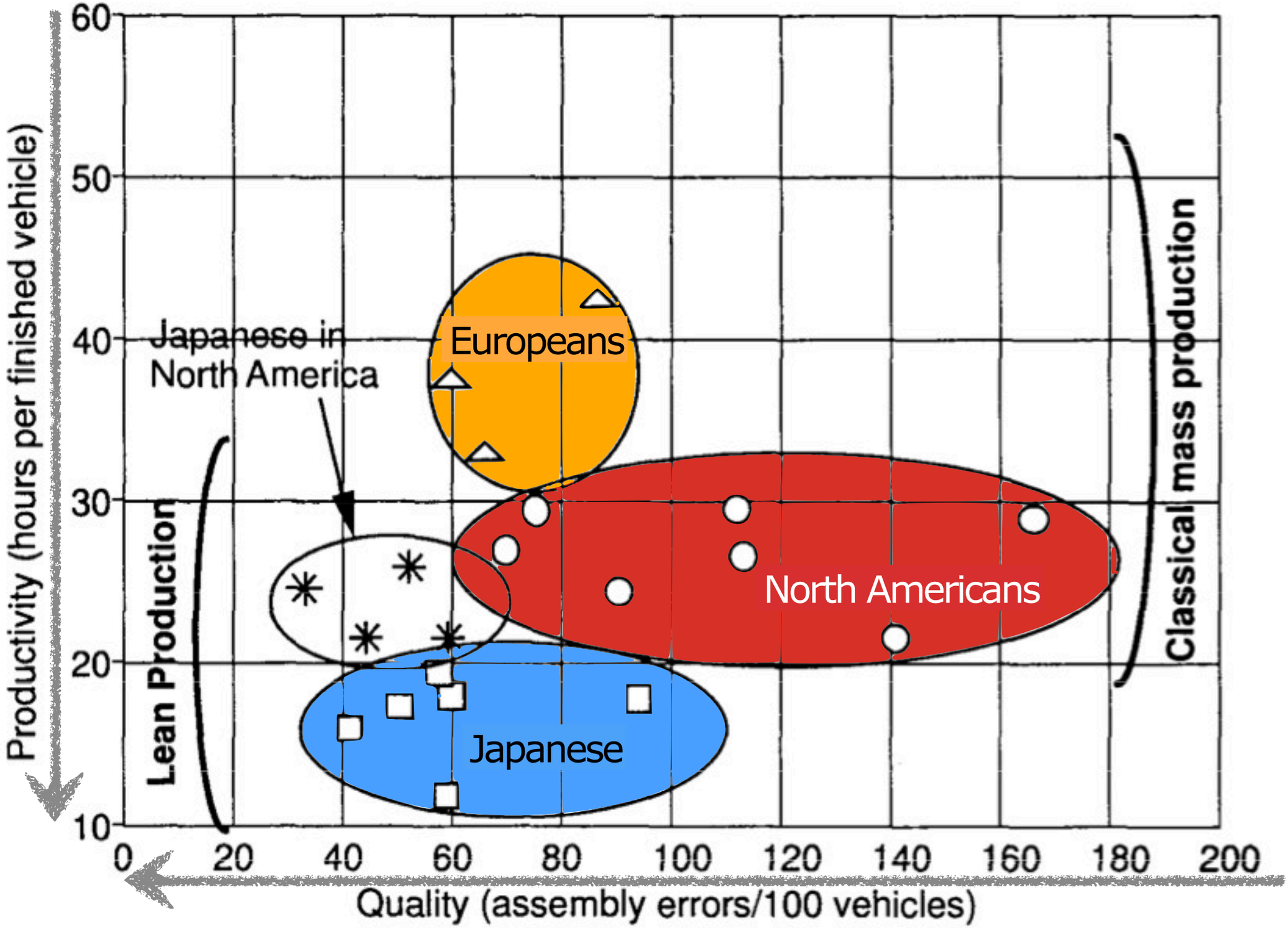
- „International Motor Vehicle Program“ (IMVP)
  - From 1985 to 1991
  - 5m US$ project
- James P. Womack
  Daniel T. Jones
  Daniel Roos



The MIT study

- 54 Experts studied production processes of the automobile industries of 15 countries with 90 plants
- 600,000 copies of the report in 11 languages were sold
- Formed the worldwide term of “Lean Production”

The productivity and finished quality of the assembly plants covered by the IMVP



Source: "The machine that changed the world"

Background

- Taichi Ohno and his team
- “Toyota System” developed in the 1950s and 1960s
- The American system of mass production was applied but needed modification
  - Ensure efficient production despite lower volumes
  - Be able to expand despite limited financial resources

Market developments

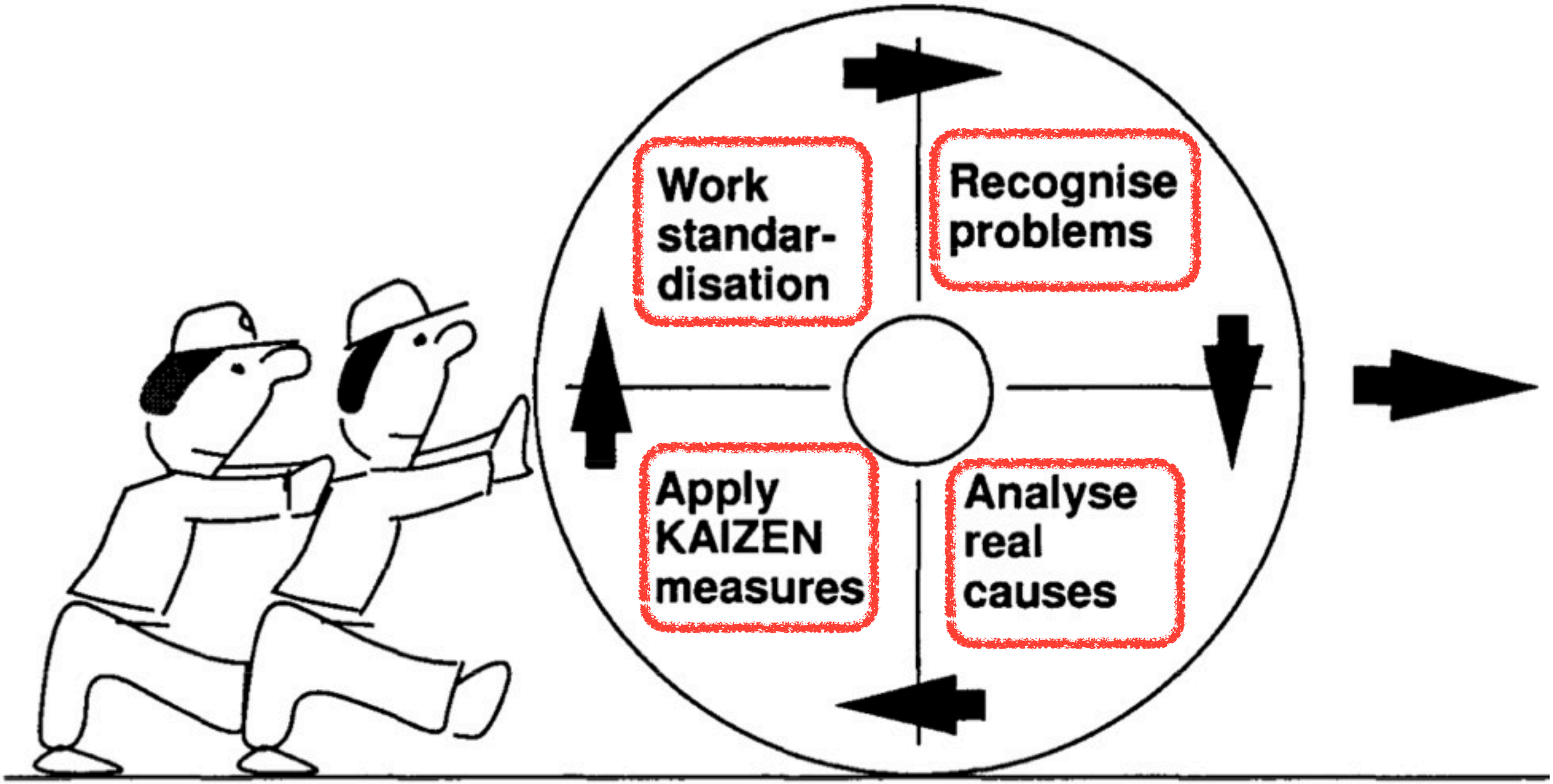
- Markets for industrialised goods started changing
- In the 1980s
  - Higher demand for customised products instead of “one fits all” concept (Ford)
  - Customer satisfaction and quality assurance became more important
- These developments required a new production philosophy as well

10 principles of Lean Production

1. Continuous Improvement Process
2. Team responsibility
3. Immediate error detection and elimination
4. Simultaneous product and process development
5. Short in-plant distances and “Just-in-Time”
6. Customer-orientation
7. Activating the sub-suppliers
8. Product flexibility despite automation
9. Improvement of means of production in small steps
10. Standardised working

1. Continuous Improvement, “Kaizen”

- Everything can be further improved
- No final objectives, only steps in the right direction
- All employees contribute continually to the improvement
- Conditions for willingness to improve
  - tolerance of errors, openness, safety
- Process-orientation instead of result-orientation
- Innovations as logical steps in the improvement chain
  - No surprising innovation leaps



Production lines in a factory

Source: KAIZEN Institute of Europe - International Management Consultants, 1990.

Kaizen fights the 7 origins of waste

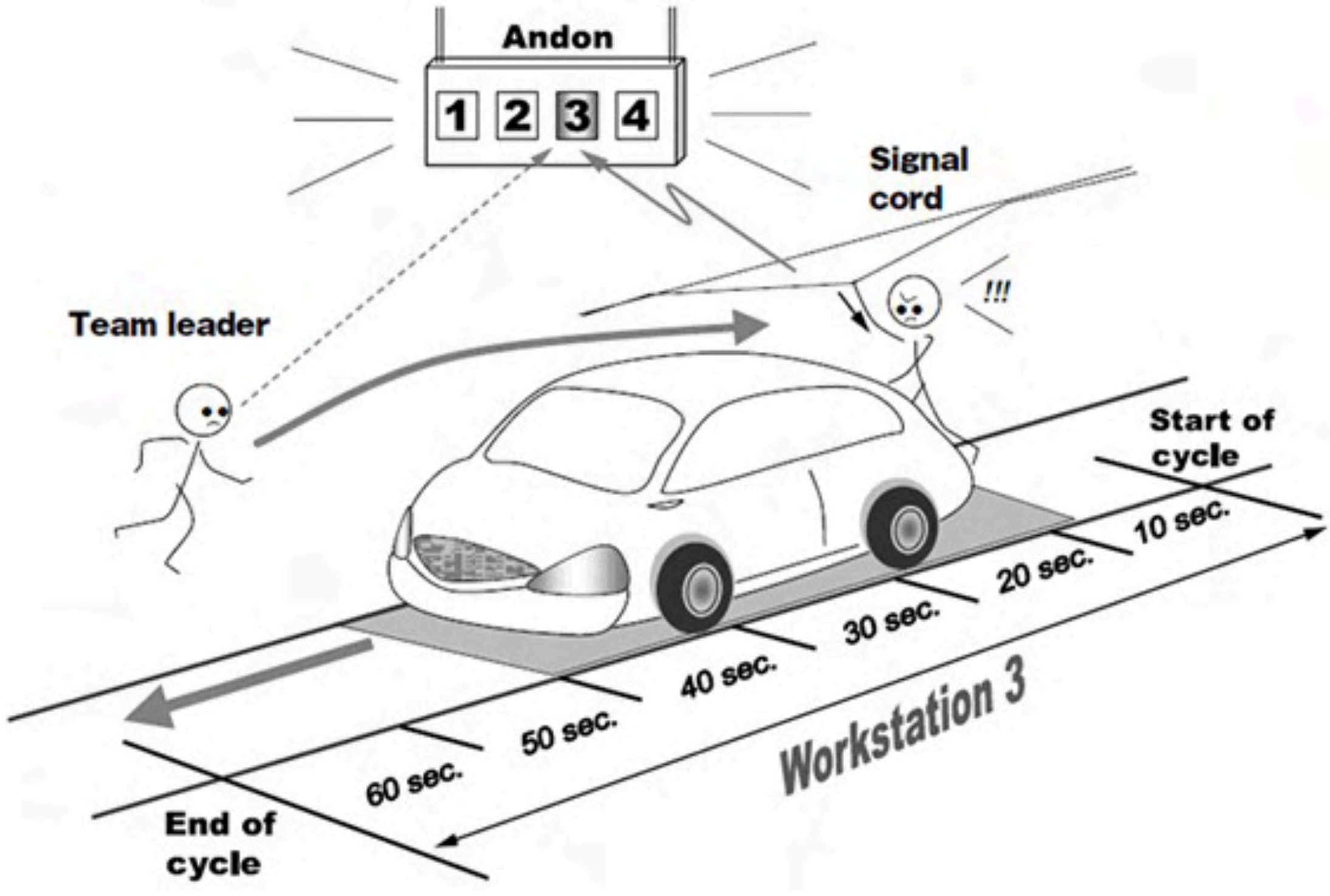
- Waste through
  - Overproduction
  - Waiting periods
  - Transport
  - In production process
  - Stocks
  - Movement
  - Errors and spoilage

2. Team responsibility

- Team takes a global view
- Teams increase performance
- Team absorbs more information
- Team is better in solving problems
- Team creates greater communication
- Team creates self-administration
- Team offers personal protection
- Team demands focussing on group benefit

3. Immediate error detection and elimination

- Taichi Ohno
  - Pull-cord installed about the assembly line
  - Anyone could stop the line in the event of an error
- The pull-cord became a unique instrument of education
- Later, yellow and red pull-cords were installed
  - Yellow = emergency signal to summon colleagues to give assistance
  - Red = stops the assembly line



Core ideas of error elimination

- Look for the origins of the error
  - Ask “why” five times
- Eliminate errors immediately
- Eliminate the error at its source – not the symptoms
- Eliminate the error where it occurs
  - Not at the customer end
    (would be most expensive)
- In mass production there are no single errors
  - Errors reproduce themselves

4. Simultaneous product and process development

- The MIT study calculated that the Japanese car manufacturers require for a new model
  - 20–30% less development time
  - 40% fewer engineers' hours
- The solution was "Simultaneous Engineering"

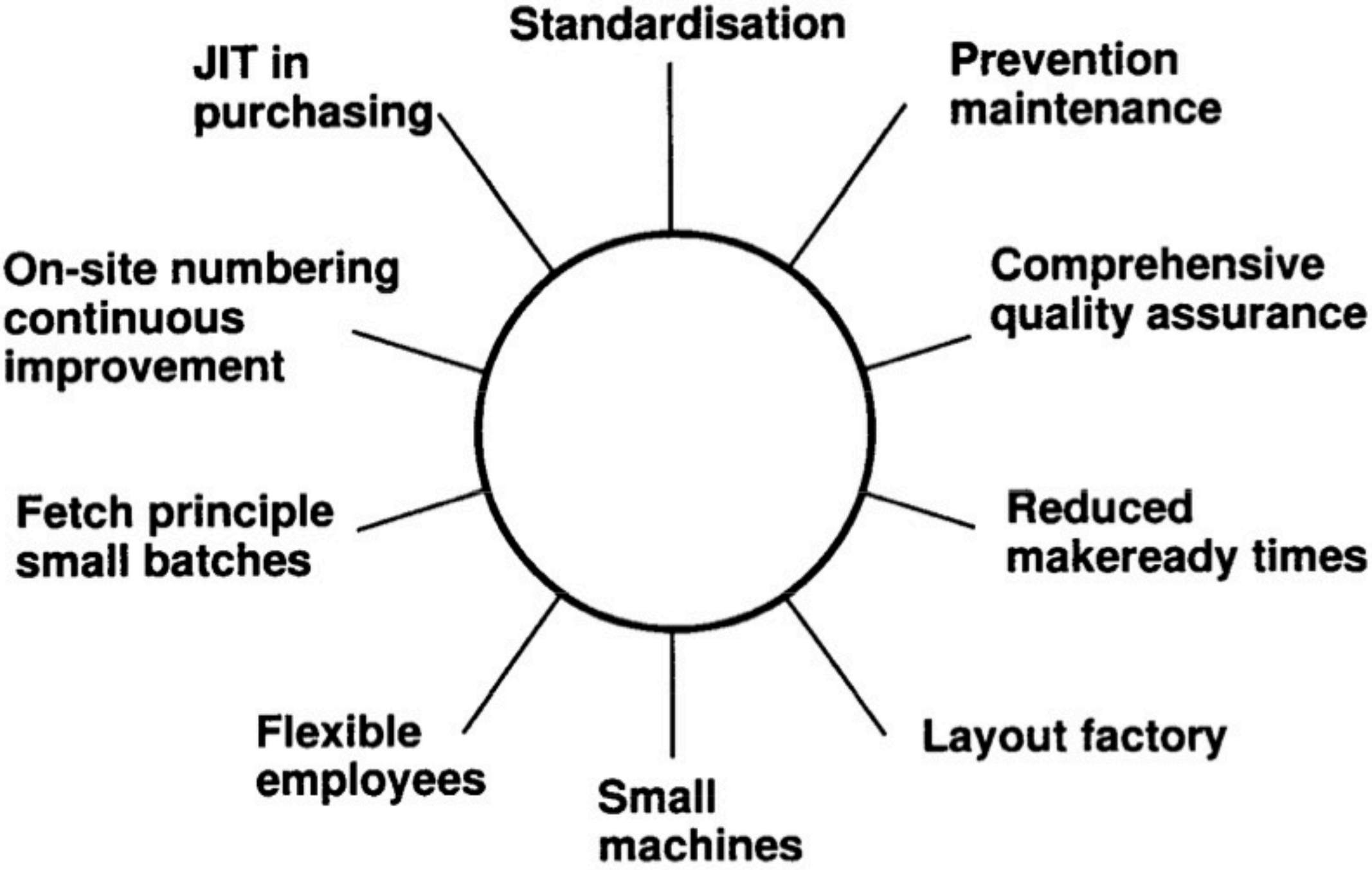
Simultaneous Engineering

- Parallel and synchronous processes
  - Multi-divisional product and process development
- Networking of information streams, also concerning still unfinished processes
- Integration of outside partners from the beginning
  - Example: suppliers of parts and materials
- Orientation of the price objectives on market conditions

5. Short distances and “Just-in-Time”

- “Just-in-Time” supply of material and semi-manufactured products
  - Reduces capital lockup
  - Requires integrated co-operation with suppliers
- “Just-in-Time” is also an in-plant practice
  - Elimination of storage space in manufacturing process
  - Process optimised building design

JIT clock



WAN-IFRA Special Report 6.15, Darmstadt 1994

6. Customer-orientation

- "Think as a customer thinks"
- Customer satisfaction as central consideration behind all quality assurance systems
- Customers do not buy materials (paper, ink) for their own sakes, but solutions to problems
- Achieve sustainable benefits for the customer
  - Performance benefits, derivative benefits

Customer-orientation

- The product becomes a person-related abstract
  - Embedded in living human networks
- The cup of coffee when visiting a dealer is a natural consequence of human relations
- The actual production takes on a service character
  - Externally and internally
- Inclusion of the customer in product planning and improvement

7. Activating the sub-suppliers

- Reduced number of suppliers
  - Vertical organisation
  - Manufacturer contacts only main supplier
  - Orders placed for entire composite systems

Graphic source: www.troxtechnik.com

Partnership with suppliers

- Framework agreements on business relations
- Joint responsibility for costs
- Agreement on annual cost reductions
- Savings from additional efforts remain with suppliers
- Design changes within framework of standard functions
- Assistance in the event of production problems
- Mutual financial participations

Effective Production

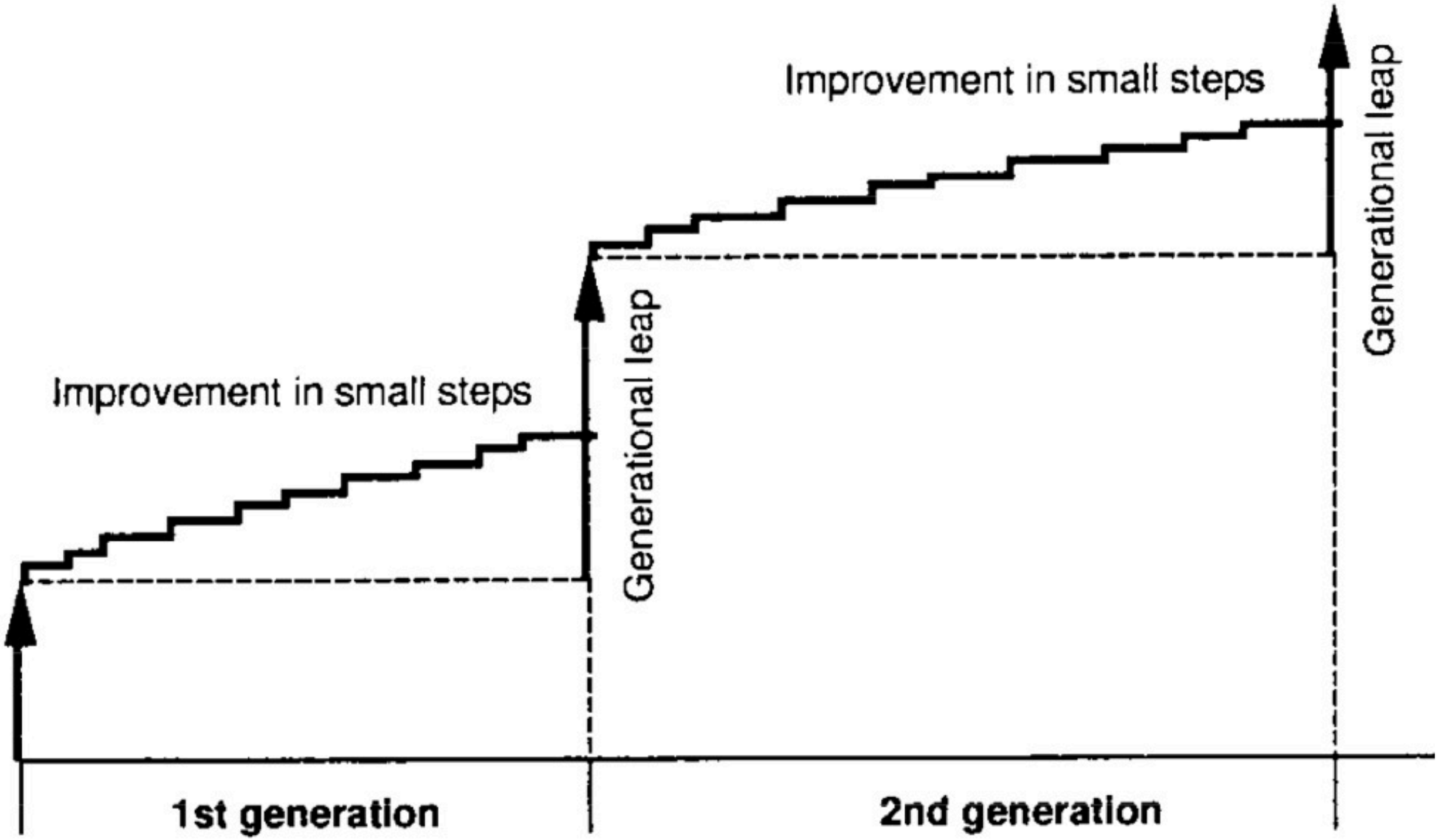
- Just-in-Time delivery to conveyor belt
- Adjusting component supply to demand fluctuations
- Categorisation of manufacturers in accordance with performance
  - Quality, delivery schedules
- Continuous Improvement Process on suppliers' side

8. Product flexibility despite automation

- Fast change-over in production
- Flexible production systems
- Producing smaller series
- Designing automatic production equipment in a way that they can manufacture individual products
- Designing automative components that are easy to service

9. Improvement of means of production in small steps

- Improving machines and systems throughout their entire operable life
- Ensure there will be no excessively large innovative leap when a new machine generation is introduced
- Fewer familiarisation problems with new machine generation


Improvement in small steps
Generational leap
Improvement in small steps
Generational leap
1st generation
2nd generation

10. Standardised working

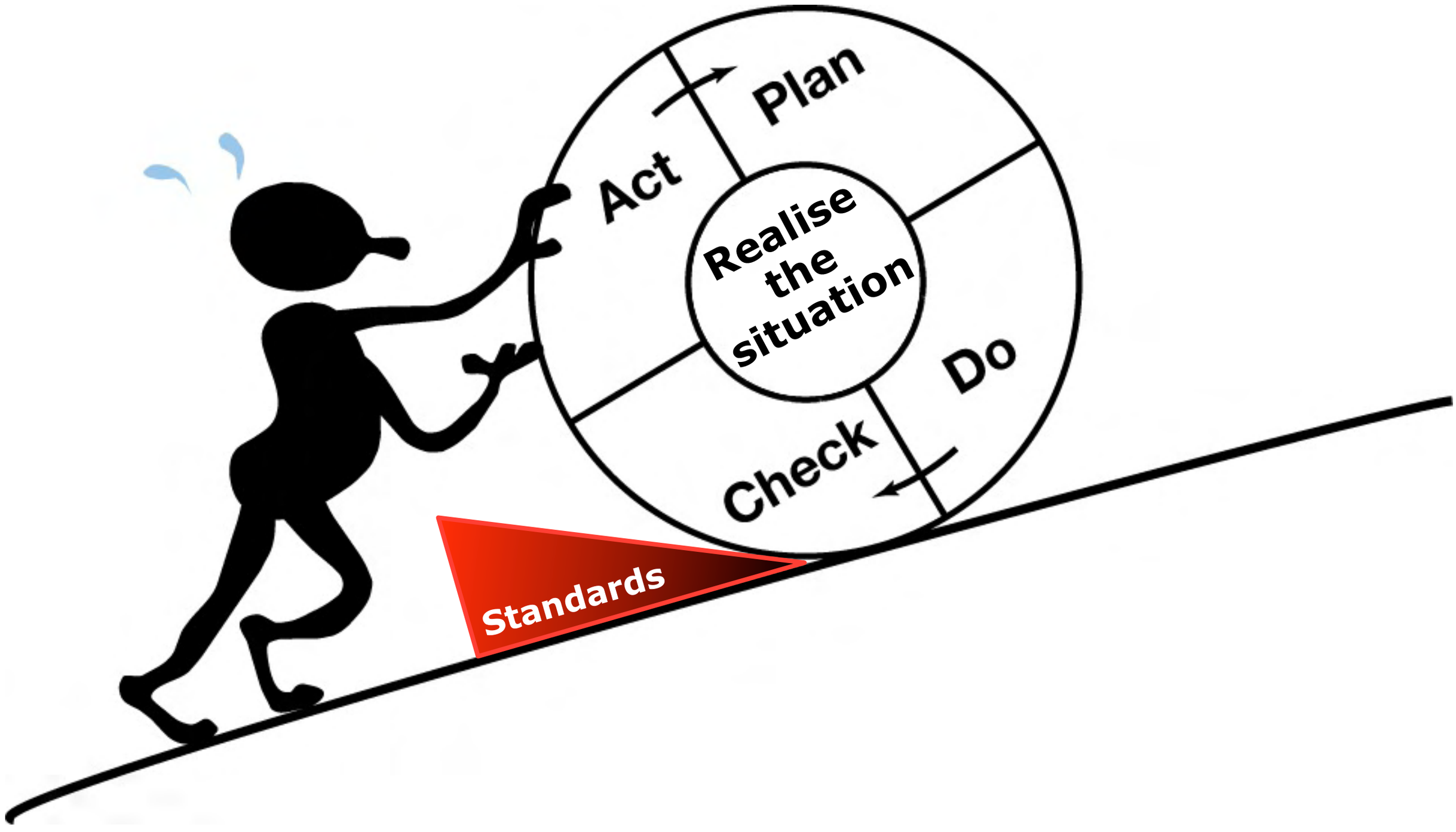
- Standardisation for all repeat processes
- The standard is the law
  - Everyone must observe it
  - Everyone can improve it
- Standards are made public
- Conceived on the top, put into effect on the bottom

Standardised working

- The best as the standard
  - Not the smallest common denominator
- Standards help achieving reliable results
- Standards ease communication
- Standards ease matching different products & processes

Standardised working

- Standards are agreements between people
- Standards are valid for a limited period
- Standards don’t live forever
- A standard is valid until a better standard is available



Lean Newspaper Production?

- Lean Production requires achieving the production target with the smallest efforts possible
- If you need to print 160,000 copies per day your press speed should be 10,000 kph in a double-shift production
- Newspaper production logics are different
  - Small production window (“prime time”)
  - Press capacity for short night-shift production
  - Plate making capacity for peak hour

Examples of Lean Production principles in newspaper printing

- Continuous Improvement Process
- Team responsibility
- Short in-plant distances and “Just-in-Time”
- Customer-orientation
- Activating the sub-suppliers
- Product flexibility despite automation
- Standardised working

Continuous improvement

- 5S at Newsprinters, UK
- Presentation of George Donaldson, Group Continuous Improvement Manager

Source: G. Donaldson, Newsprinters, 6/7 April 2011, Mainz, Germany

5S at Newsprinters, UK

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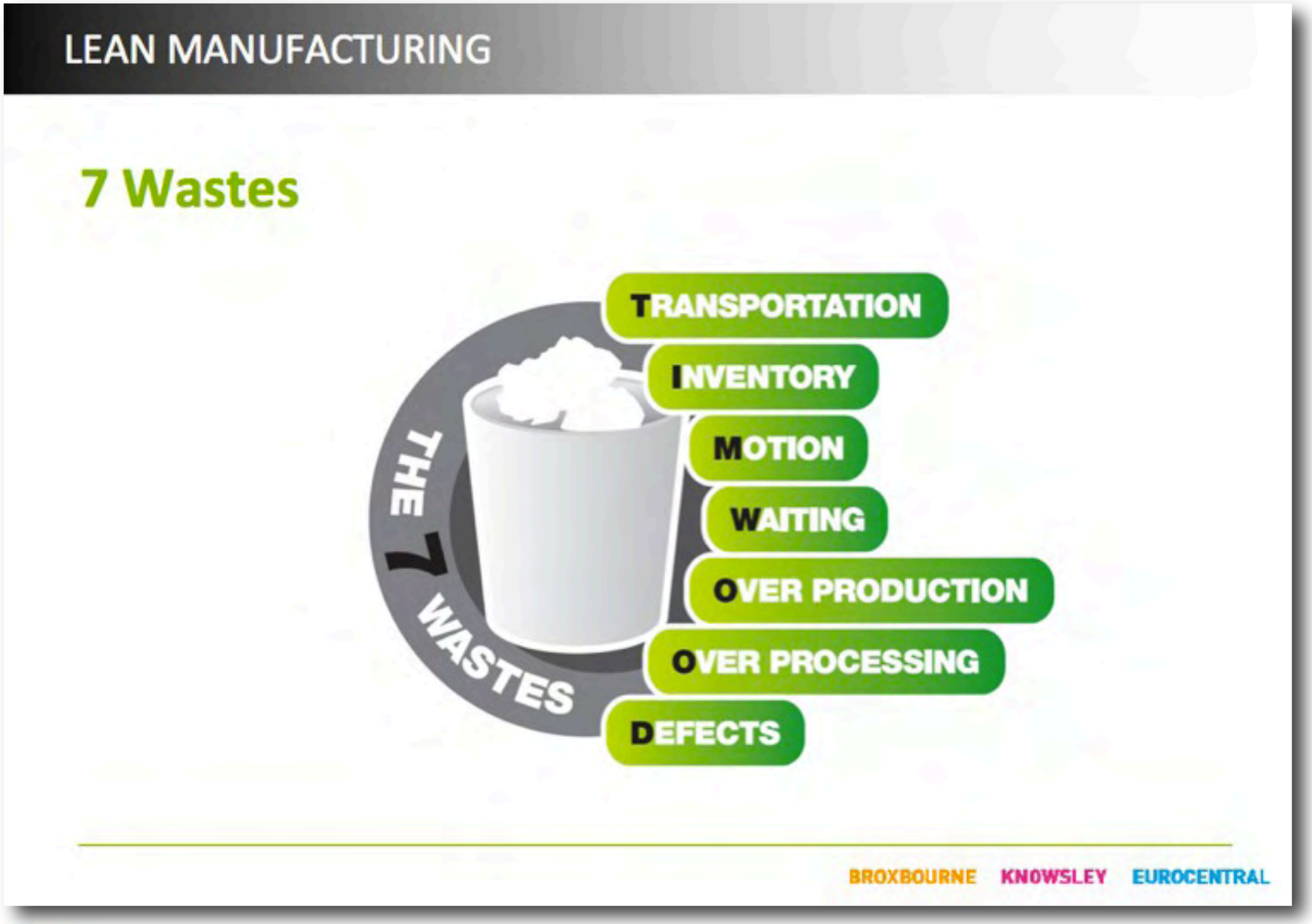


Source: G. Donaldson, Newsprinters, 6/7 April 2011, Mainz, Germany

5S at Newsprinters, UK

LEAN MANUFACTURING

SMED - History

- Developed by Shigeo Shingo at Mazda, Mitsubishi and Toyota in the 1950's and 1960's.
- Shingo called it SMED
  - Single Minute Exchange of Dies
  - Means single digit, i.e. Less than 10 minutes

- *Reduce changeover from hours to single minutes*

BROXBOURNE KNOWSLEY EUROCENTRAL

Source: G. Donaldson, Newsprinters, 6/7 April 2011, Mainz, Germany

5S at Newsprinters, UK

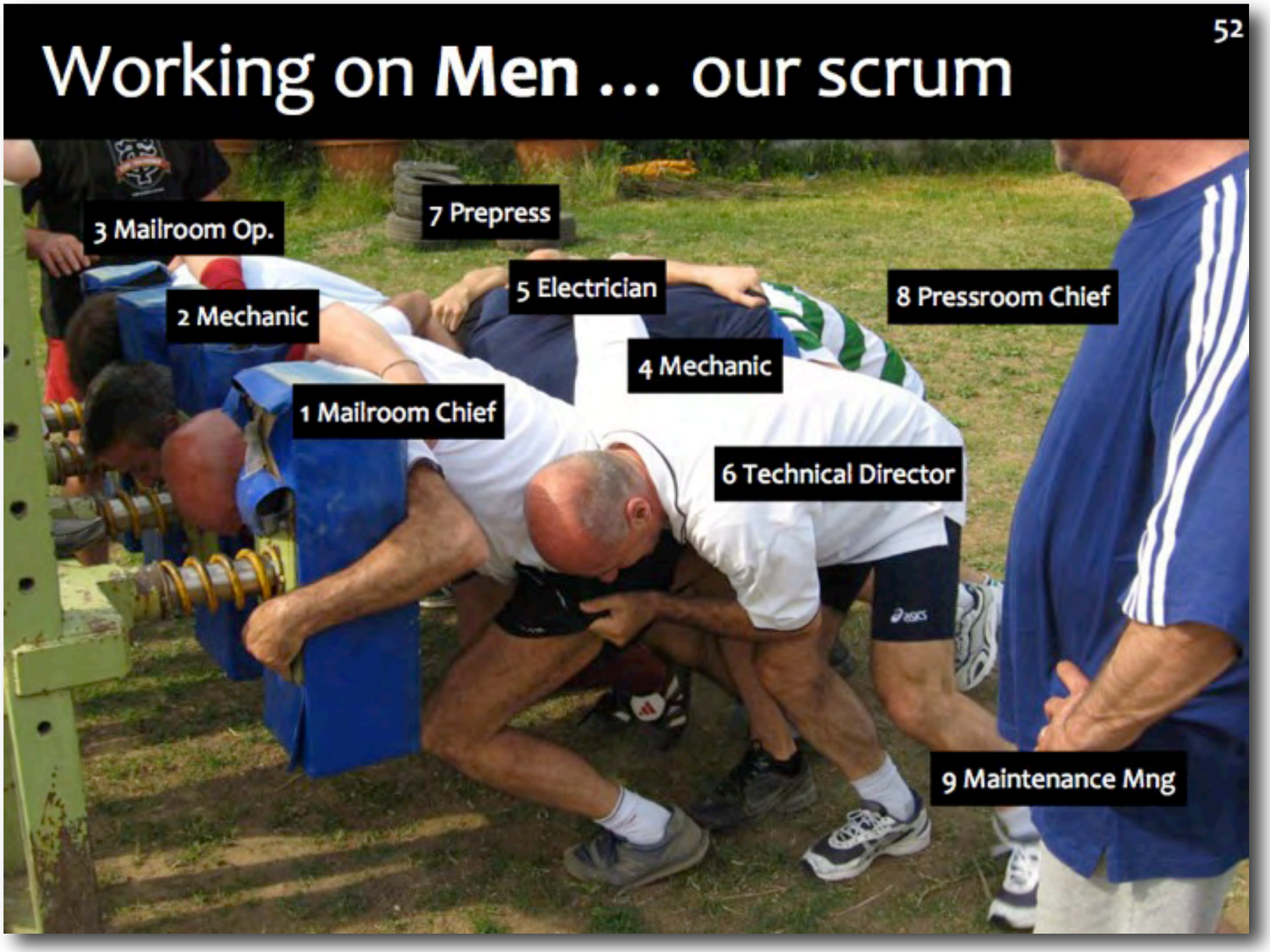
Source: G. Donaldson, Newsprinters, 6/7 April 2011, Mainz, Germany

Team responsibility

- Athesis, Verona, Italy
- Presentation of Stefano Bizarrely & Paulo Ciapetti on quality improvement

Source: S. Bigarelli, P. Ciapetti, Athesis Italy, 7 April 2011, Mainz, Germany

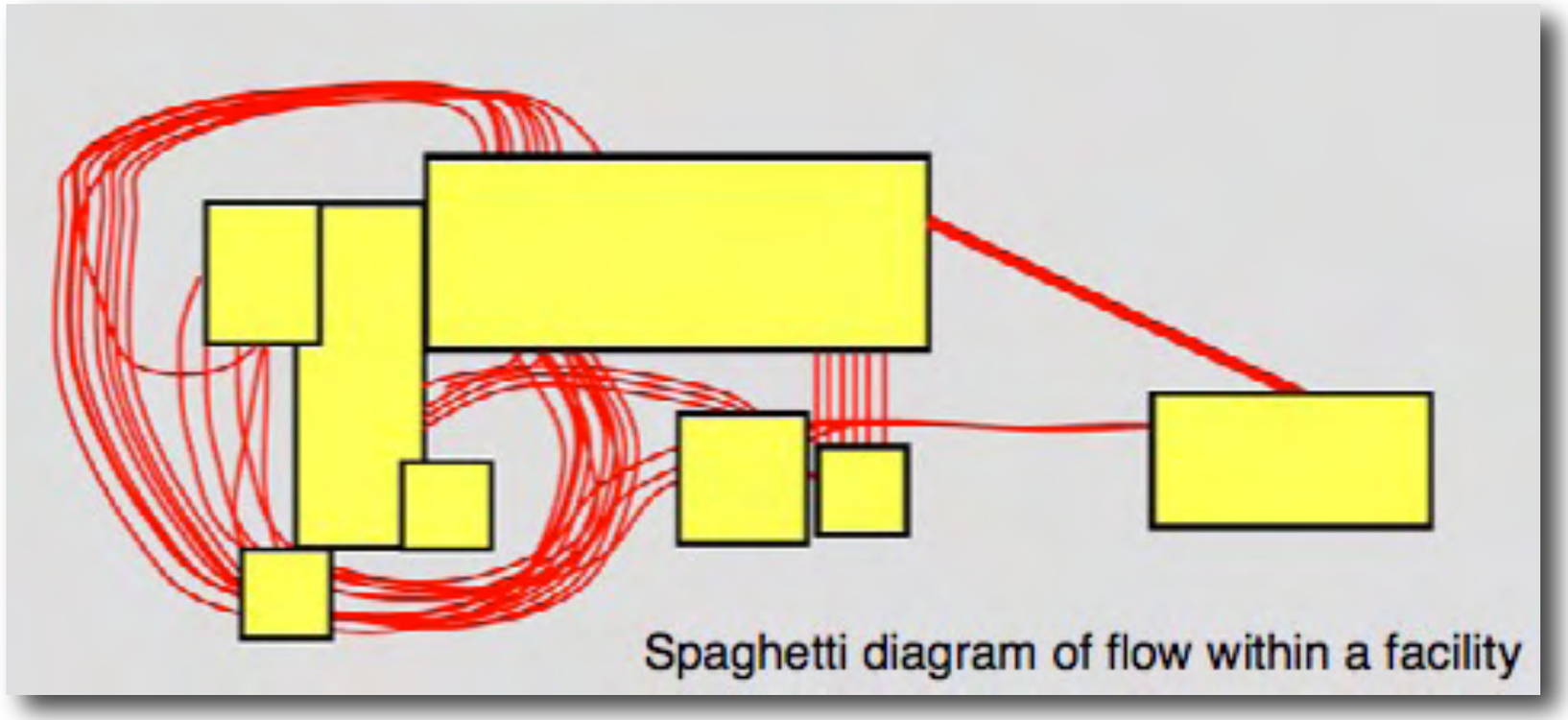
Team responsibility at Athesis



Source: S. Bigarelli, P. Ciapetti, Athesis Italy, 7 April 2011, Mainz, Germany

Short distances and “Just-in-Time”

- Roland Behringer, OZ Druck, Germany
- Commercial printer
- “Spaghetti diagram” shows the distances workers have to transport materials every day around the presses and other machines
- Reduce waste by movements



Source: R. Behringer, OZ Druck, 7 April 2011, Mainz, Germany

Customer orientation

- Marcelo Benz, Folha, Sao Paulo, Brazil
- Exceeding customer expectations with innovative forms of advertising

Source: Marcelo Benz, Folha, Sao Paulo, Brazil, 7 April 2011, Mainz, Germany

Customer orientation

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Customer orientation

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Customer orientation

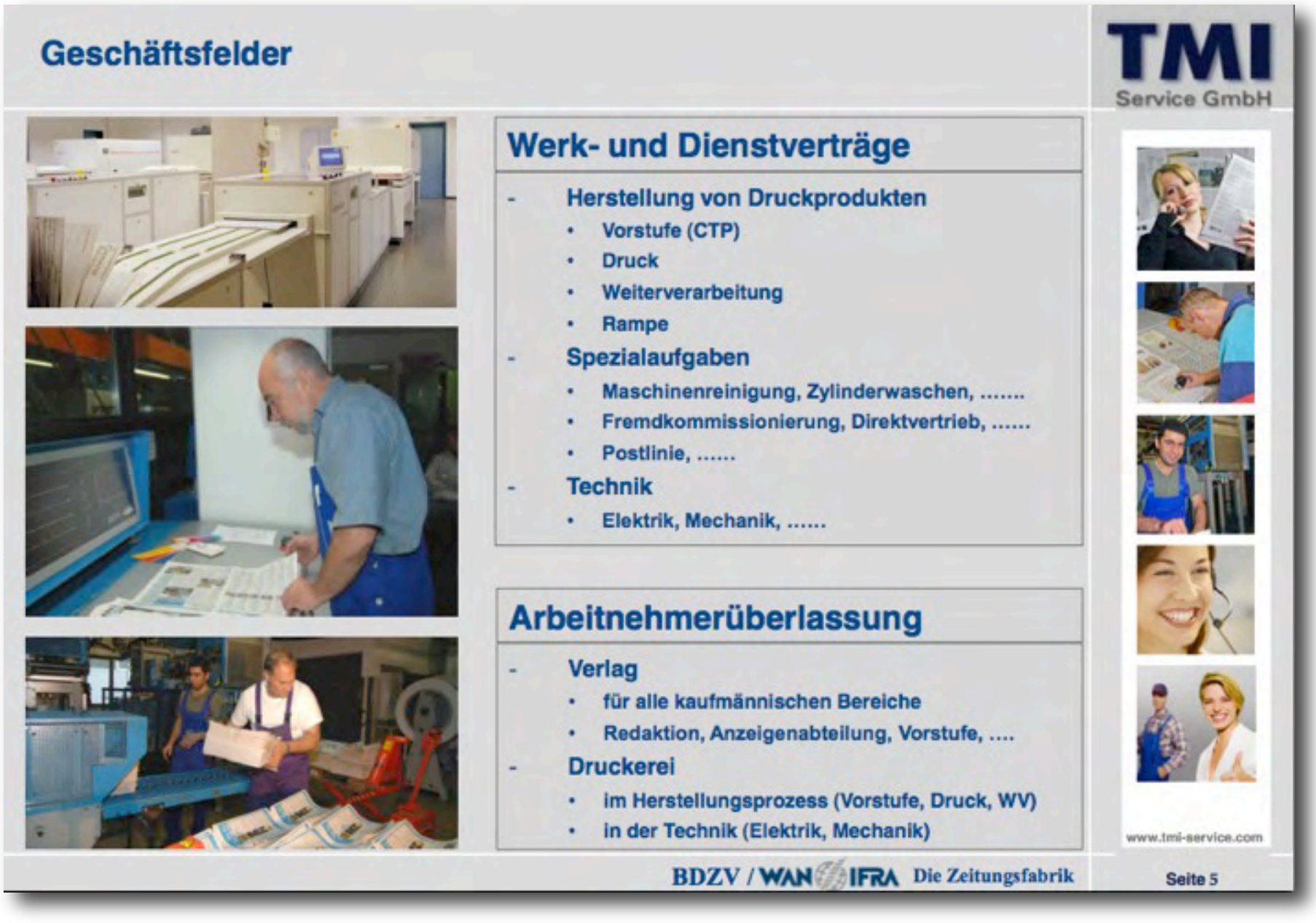
Source: Marcelo Benz, Folha, Sao Paulo, Brazil, 7 April 2011, Mainz, Germany

Activating the sub-suppliers

- Partnering with an operator company
- Heiko Schröder, TMI, Germany
- Operates mailroom equipment and newspaper presses for printers and publishers in Germany

Source: H. Schröder, TMI, Germany, 1 Dec 2010, Mainz, Germany

Activating the sub-suppliers



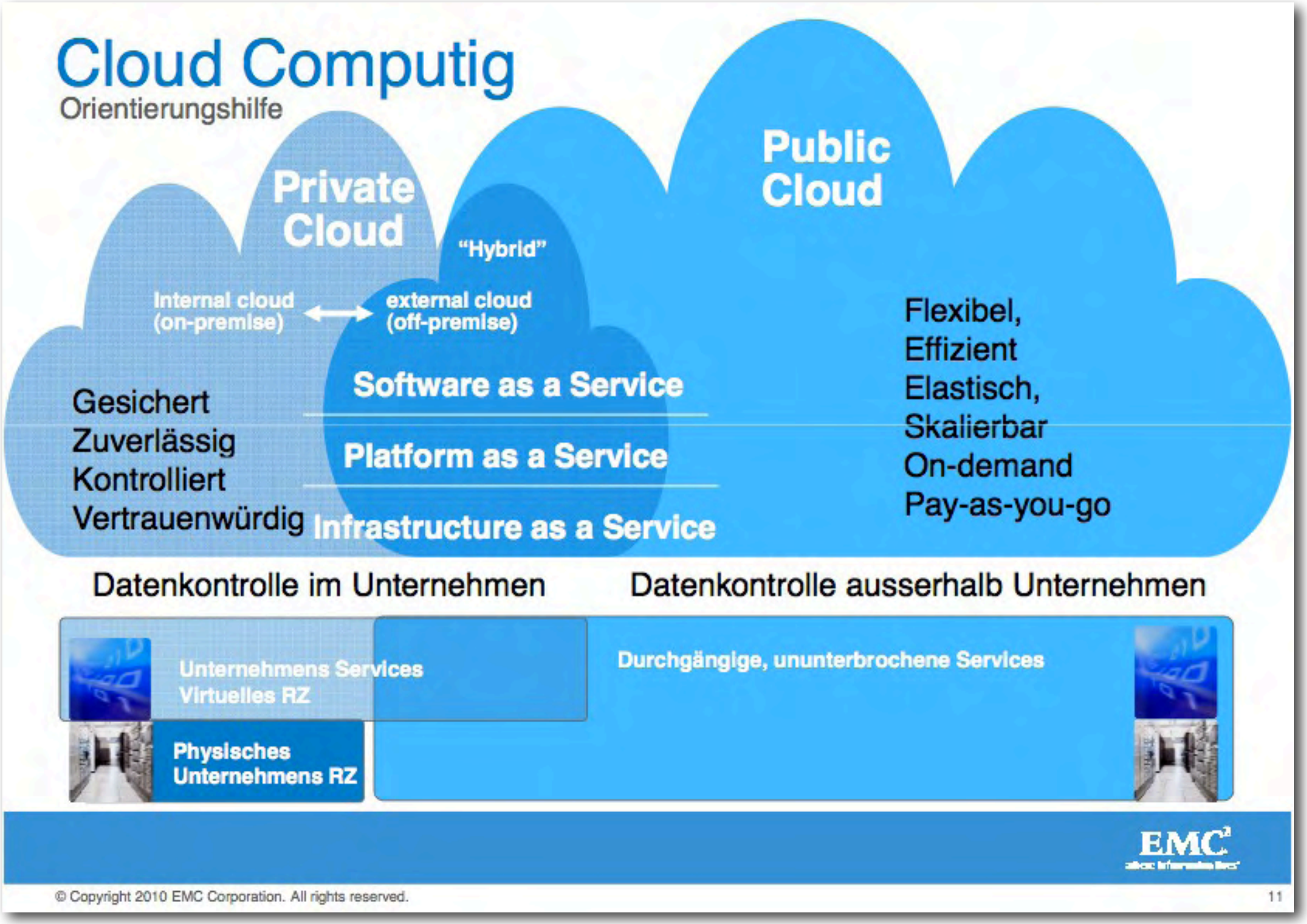
Source: H. Schröder, TMI, Germany, 1 Dec 2010, Mainz, Germany

Cloud computing

- Partnering with an IT outsourcing company
- Robin Prosch, EMC Consulting, Germany
- Scaleable IT solutions

- Without in-house IT equipment and IT personnel
- Cloud applications, cloud servers
- Data security can be managed by private colude concepts with 100% data encryption
- Hybrid solutions – mix of private cloud and public cloud

Source: R. Prosch, EMC, Germany, 1 Dec 2010, Mainz, Germany



Source: R. Prosch, EMC, Germany, 1 Dec 2010, Mainz, Germany

Product flexibility despite automation

- Matthias Ditzen-Blanke, Druckzentrum Nordsee, Bremerhaven, Germany
- Different sizes
- Different paper grades
- Different products categories
- Wider market

Product flexibility despite automation

DRUCKZENTRUM NORDSEE

Future prospects of our rotary press in the Druckzentrum Nordsee

- Market-orientation means to us:
  - Flexible width: Rhine / Berliner format
  - Different grades of paper: up to 120 gram
  - Varibale cut-off formats: Rhine / Berliner / DIN A4
  - Multivarious possibilities for finishing: trimming, stitching, MemoSticks
  - Better, more consistent print quality → 60lpc screen
  - Enhanced ecology
    - Minimum waste, less paper consumption
    - No dampening, no oil lubrication

Matthias Ditzen-Blanke, Druckzentrum Nordsee, Bremerhaven

Source: M. Ditzen-Blanke, Bremerhaven, Germany, 7 April 2011, Mainz, Germany

Product flexibility despite automation

Source: M. Ditzen-Blanke, Bremerhaven, Germany, 7 April 2011, Mainz, Germany

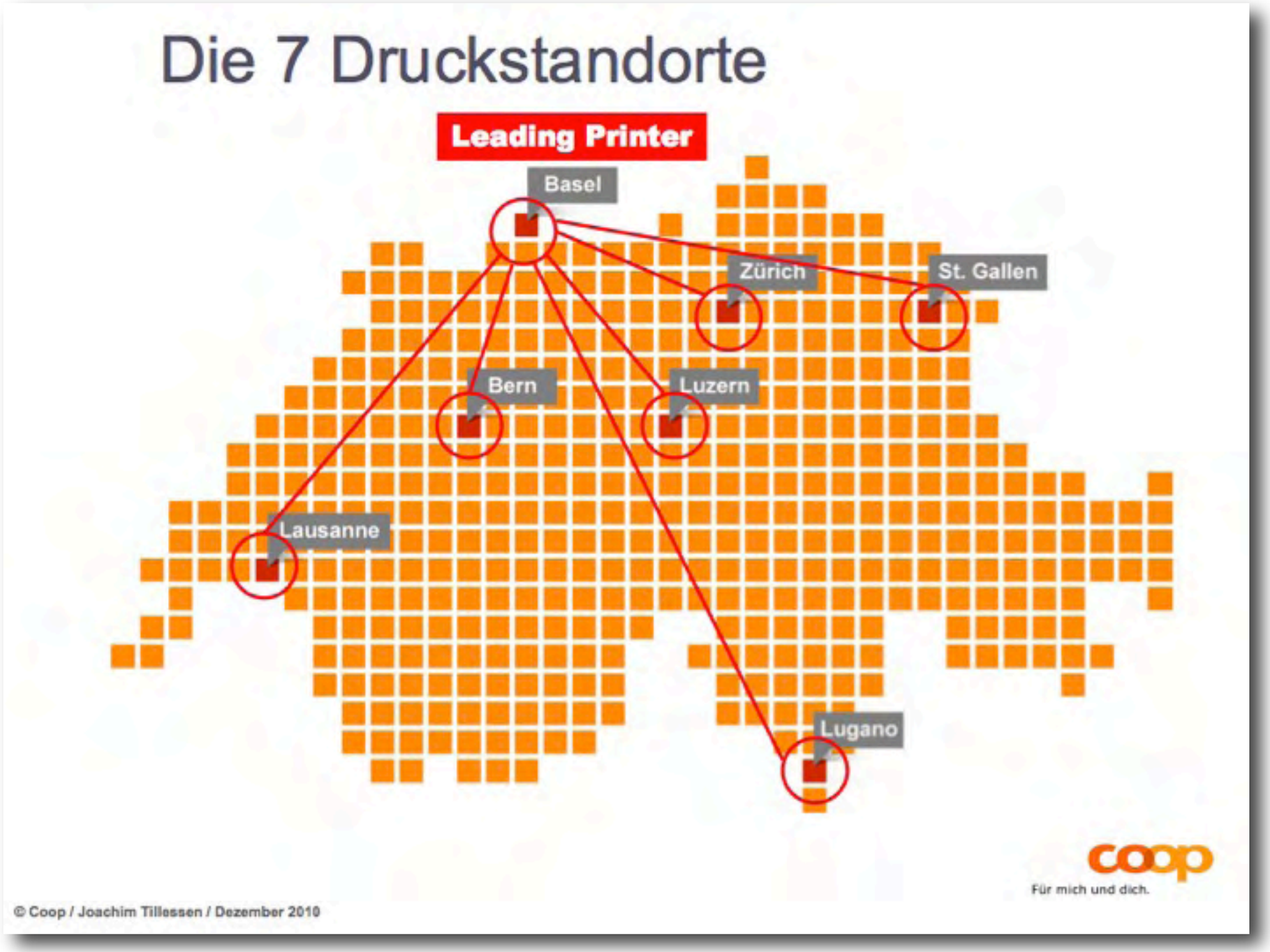
Standardised working

- Joachim Tillessen, COOP, Switzerland
- COOP issues a weekly newspaper for all Swiss households
- The have a network of print plants allover the country
- They have one “master printer” who manages the standardisation with all print plants

Standardised working, circulation 2,520,000

Source: J. Tillessen, COOP, Basel, Switzerland, 1 Dec 2010, Mainz, Germany

Standardised working, seven printers



Source: J. Tillessen, COOP, Basel, Switzerland, 1 Dec 2010, Mainz, Germany

Why standardised production?

1. Quality
2. Consistency
3. Secure production
4. Cost control
5. Associational element / trust

Source: J. Tillessen, COOP, Basel, Switzerland, 1 Dec 2010, Mainz, Germany

Lean Newspaper Production?

- Lean Production can be applied for all production processes
- Not specific for car production
- Creative adaptation delivers positive results for newspaper printers
- Improves competitiveness
- Frees capital
- Prepares for future challenges

ifra Special Report 6.15

Lean Production
in the newspaper industry

Since the MIT study on the effectiveness and quality of assembly plants in the motor vehicle industry was translated into several different languages, the terms of "lean production" and "lean management" have become worldwide catchwords. However, in many cases the true meaning of these terms is not fully understood, and they are used simply as a synonym for personnel reductions.

The aim of this Special Report is to provide a detailed description of the development of plant organisation towards lean production and the fractal plant, to highlight the important characteristics of lean production for newspaper printing, and in this way to provide our members with guidelines for the realisation of a corporate culture oriented towards effectiveness and employee motivation. The connection with the motor vehicle industry is a result of the history of the development of lean production, but is also in accordance with the exemplary function that this leading branch of industry has in many countries.

Lean production works only with people who are conscious of their responsibility and who are prepared to accept it by organising themselves accordingly. Undoubtedly, this involves a lengthy learning process for some, though the present economic crisis should help accelerate this process. Besides the potential productivity enhancement, it is aimed also to ensure that professions in the graphic arts industry remain attractive in order to be able to call upon qualified personnel also for the necessary night shift work. The failures experienced with CIM, in the sense of fully automated factories operating with unmanned shifts, have proved that it is impossible to keep an automated plant running without the involvement of a qualified specialist.

Of course, lean production is not a quick-fix remedy for the current recession. But it does represent a way to emerge from this situation in a slimmed-down and fit condition, therefore better equipped to manage future crises.

Materials (1)
Pre-Press (2)
Press (3)
Mailroom and Distribution (4)
Electronic Communication (5)
General (6)

Boris Fuchs
Research Director
Deputy Managing Director

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Deputy CEO
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