Standardization of Production and Development Processes – Blessing or Curse?

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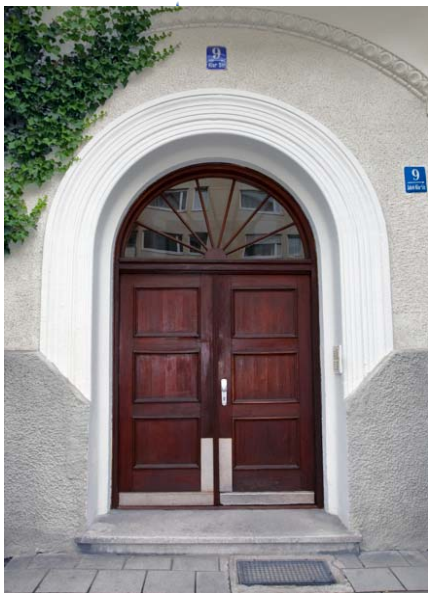

Overview

Overview

- Project Setting, Methodology and Analysis
- Selected Findings
  - CPS – Comprehensive Production Systems based on Toyota
  - StageGate Process
- Consequences of Improper Process Standardization
  - On Organizational Level
  - On Individual Level
- Conclusion and Outlook

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Project Setting, Methodology and Analysis

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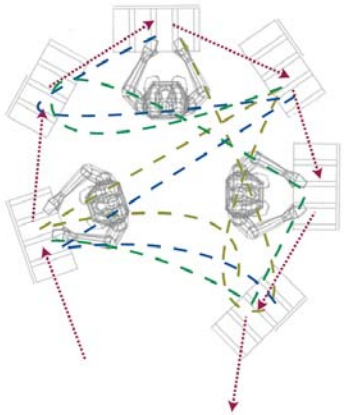
Experienced based knowledge in assembly work



- Branch focus automotive
- 60 qualitative interviews
- 5 analytical workshops
- Broad variation of Assembly and Production organization
- Common ground: CPS

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Project Partners

- The automotive sector is represented (2007/2008)
  - By 4 suppliers
  - Total employee count between 50 and 5,000
  - Between 15 and 1,000 personnel in Production and Assembly
  - 8 million to 1 billion Euros gross profit

MODINE
Continental CONTITECH
ZF Lenksysteme
Dreistern Maschinenbau GmbH

Project Objectives

- Complement technology and organization focused approaches with qualitative, work oriented aspects
- Development and test of new concepts in Production and Assembly which
  - Include employees knowledge
  - Are experience based

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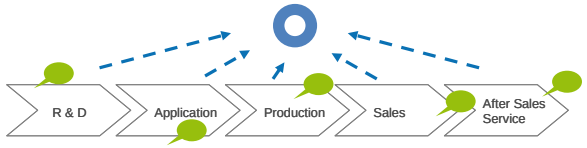
Observing Innovation



- 70 qualitative Interviews
  - guideline oriented narratives
  - visualized elements
- 10 group discussions
- 25 analytical workshops

- Common ground: StageGate

Project Partners

- Participating machinery manufacturers represent (2007/2008)
  - 18,650 employees
  - Total employee count between 300 and 8,000
  - 7.9 billion Euros gross profit
  - 4 family owned – 1 foundation

Project Objectives

- Identify activators and hindrances for innovation
- Create criterias for complementary innovation strategies on the
  - Organizational level
  - Competence level

Analytical Concept

- Industrial sociological approach (labor power / labor capacities)
- Implications
  - Subject and actor oriented
  - Focus on the concrete level of everyday work
  - Knowledge includes tacit elements

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Findings

Different but the same?

- Different branches (automotive and machinery manufacturing)
- Different focus (production and innovation)
- Different standardization strategies (CPS and StageGate)

→

- But similar intentions
  - Create predictable, robust processes
  - Enhance speed, flexibility and reproducibility while saving costs
  - Identify best way for core processes
  - Streamline comparable real activities
- And similar side effects
  - On creativity and innovativeness of the entire enterprise
  - On the actual workflow

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Implementation of Process Standardization and Side Effects

CPS – Comprehensive Production System

- Company specific production system based on TPS
  - Modular setup
  - Integration of new options with existing methods
  - methodogically coordinated
- Most prominent advantages
  - Reduction of costs e.g. by avoiding waste
  - Increase of flexibility e.g. quick machinery refit

TPS – Toyota Production System

- Implementation of TPS
  - Only partially
  - Systematic and consistent integration seldom
  - According to intentions of originators?
  - No final confirmation of promised advantages
- Effects on concrete work level
  - Reduced cycle time
  - Limited range of job assignments
  - Repetitive, separate work packages
  - Decline of well-rounded abilities, experienced based knowledge and motivation

StageGate Process

- Standardization of innovation as means to master complexity and intensified challenges
- Most prominent solution: StageGate (Cooper, Edgett)
  - Speed up R&D and innovation processes, reduce time to market
  - Parallel proceedings - integration with tradtional project management
  - Concentration on core competences
  - Quality Gates: evaluation of project, adherence to budgets or scheduling and interdepartmental decision about stop or continuance of innovation

StageGate Process

- Implementation of StageGate
  - Regular interdepartmental meetings
  - No real decision taking
  - Clear separation of innovation steps (Start of Project, Start of production, etc.)
  - Master unfamiliar business fields is specific strength of machinery manufacturers
- Effects on concrete work level
  - Early involvment of neglected departments
  - Process becomes a show, with serious real consequences
  - Overlapping processes (e.g. R&D and production) are separated

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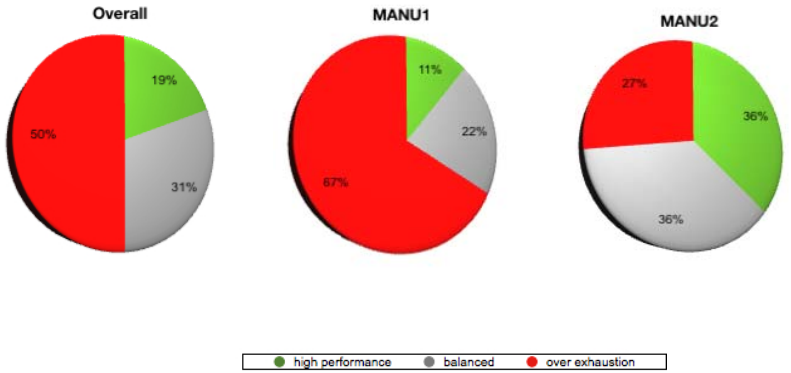
Stress and Exhaustion due to Improper Process Standardization

Stress and Over Exhaustion

SMARTE INNOVATION



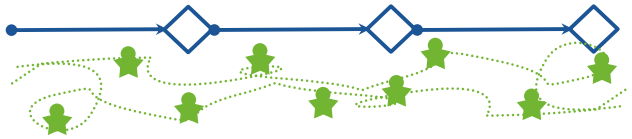
add-on jobs and extra tasks

SMARTE INNOVATION

- **Processes**: planned processes that do not run smoothly or do not correspond with de facto needs and statuses. Results: more organization tasks, work preparation, co-ordination, updating others, clarifying questions and responsibilities.
- **Documentation**: Provide, check and correct work documentation or data maintenance. (e.g. protocols of meetings, deadlines change and have to be adapted in the IT-system, version control of design work, the material listed in the IT-System does not match real stock, material has to be moved…)
- **Helping out**: “Inherited burdens” and tasks that theoretically belong to colleagues, but are still taken care of personally, because it is faster, overall more efficient, a support to others or necessary to even out mistakes.
- **Meetings**: Too many meetings that do not directly concern all participants or end without results.

Process becomes a Show

SMARTE INNOVATION



- Add-on tasks and extra jobs are burden not support
- Rigid project management and complementing IT tools
- Tendency of process knowledge and management accounting dominating technical experience (technophobia)
- Transparency is not being used (e.g. extra resources).
- Decision is made before quality meetings

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Conclusion and Outlook

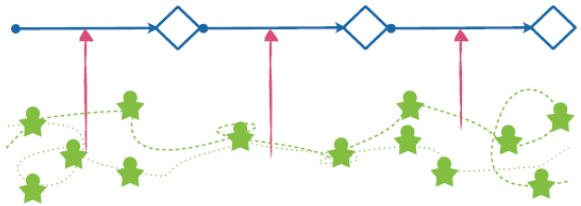
Conclusion

- Engineers and Production staff alike wish for tools and standards as support for everyday innovation work
- Implementations of production and innovation standardization do not regard specific context to the necessary extend
  - Branch specifics (mass production vs. make to order)
  - Cultural background (vocational training)
  - Company specific (technical) strengths

Conclusion

- As a consequence initial goals are contradicted
  - Less flexibility instead of increased flexibility
  - Extra burden through add-on jobs instead of release
  - Separate work packages instead of comprehensive, holistic views
- Standardization does not outweigh conflicts (speed and quality, predictability and flexibility)
- But: Involved personnel counter individually – if possible

Outlook bottom-up not top-down



- To align standardization and needs of real working processes
  - Based on branch and enterprise specific strengths
  - Including employees knowledge and experience
  - Using proven informal processes

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