# Production, maintenance, and quality development

2016-03-29

Antti Salonen

# Agenda 2016-03-29

**Role call**

**Course info**

-The course curriculum

**Course plan**

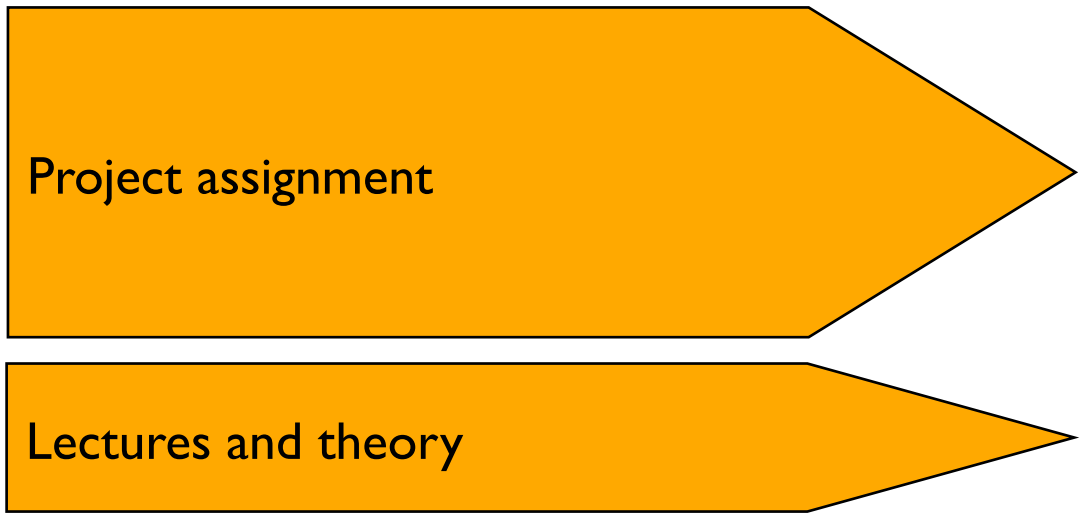
-Schedules and lectures

**Introduction to the project assignment**

-Projects assignment and groups

-Pulse meetings

# Course objective




Understanding
and
application

# Course objective

## Objective

The objective of the course is to provide the students with a general understanding of production-, maintenance-, and quality development within industrial environments.
Conduct a pre-study to analyze a part of a production system in search for improvements

## Learning Outcomes

The student should, after graduating from the course be able to;

-apply modern methods and tools for conducting rationalization projects within a production process

-ability to manage an improvement project within industry

-analyze and estimate problems within the production process and developed corrective actions and improvement plans.

-conduct machine- and process capability calculations

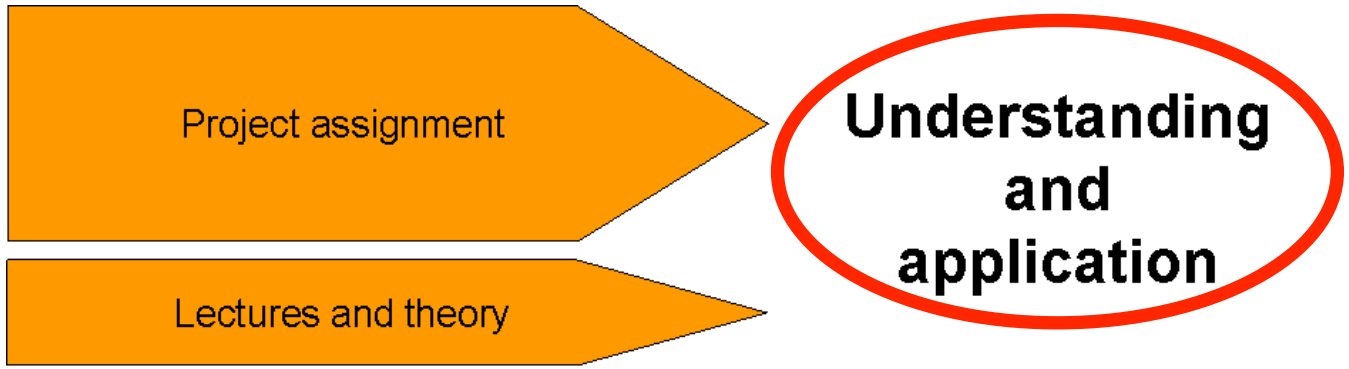
-apply performance indicators for evaluation and development of maintenance

# From the Course plan

**Examination**
Project 4,5 hp
Written exam 3 hp

**Grades**
3, 4 or 5 or grade A-B-C etc

# Project assignment



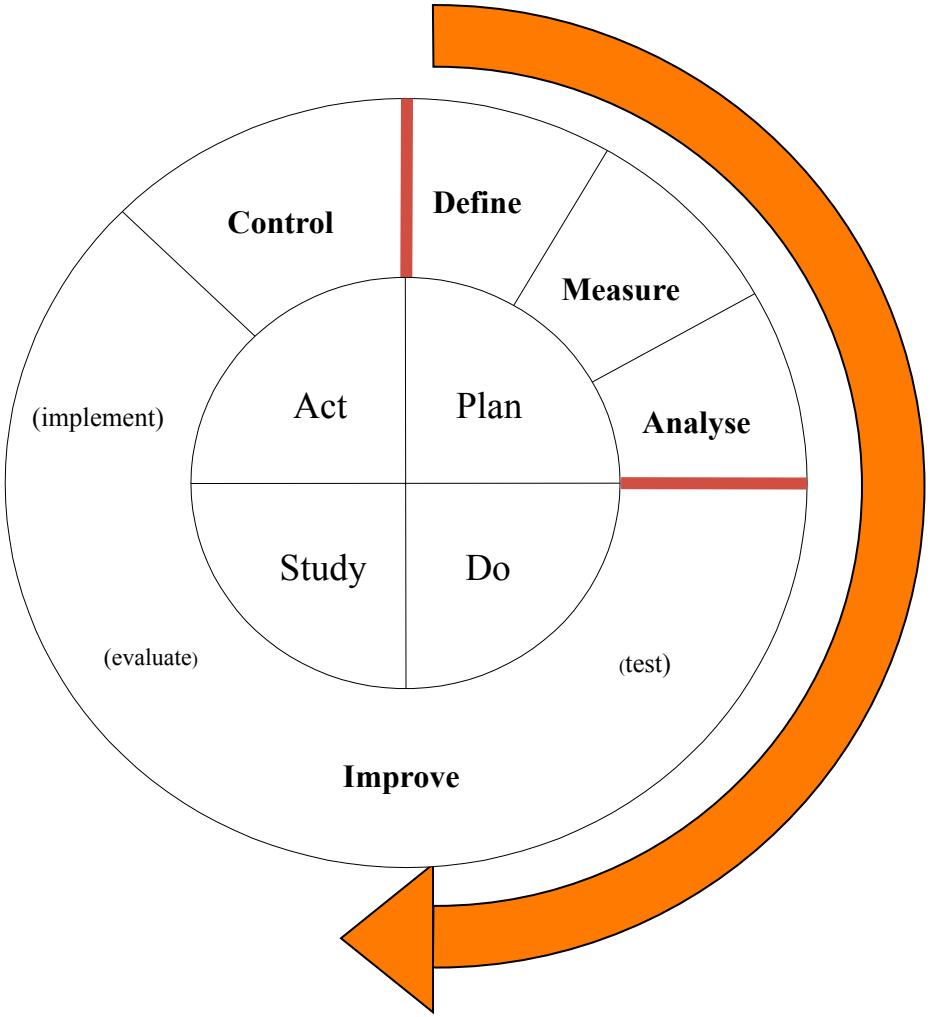

Apply methods and tools for improvements in a ”real” industrial project

⇒ A prestudy to analyze a part of a production system in search for improvements

⇒A smaller improvement project

# DMAIC for improvements

The Six Sigma DMAIC method is about “solving a problem with an unknown solution."



# Examination

**PROJECT:**
Grades based on project work, theory and solutions and the company benefit in the study.

**WRITTEN EXAM:**
A smaller written exam, based on the theories, presented at the lectures and the associated research papers.
Grades: 3-5 (Swedish), E-A (ECTS)

This year the exam will be even more (but not only) based on the research papers discussed in the course!

# Course evaluation 2015

**Overall grade: 4.2 (scale, 1-5)**

**Pros:**

- The industrial projects
- The guest lectures

**Cons:**

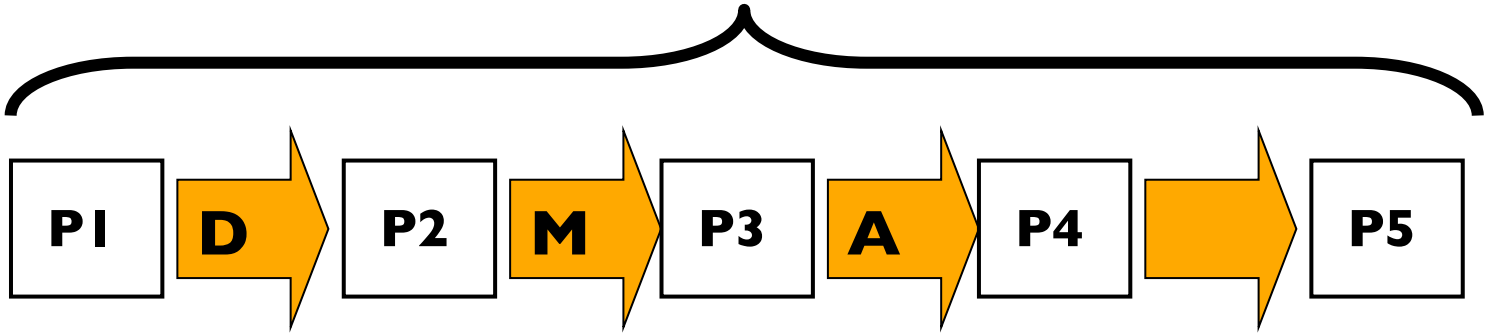
- The course content was too familiar from previous courses
- The course was a bit “low level” for an advanced course

**Changes 2016:**

- Increased use of scientific research papers in the lectures
- More exam questions based on the scientific literature

# Lecture 1: 2016-03-29

- Groups
- Companies
- Projects start-up

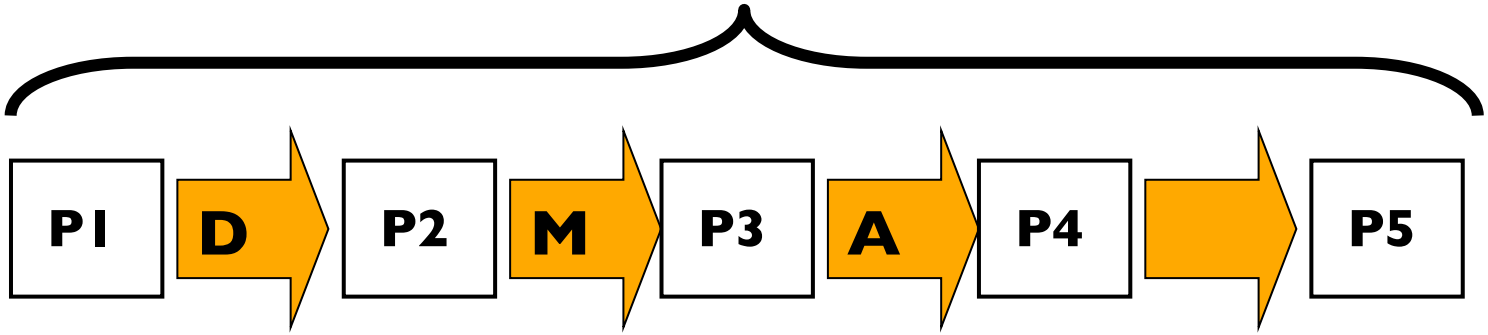


# Lecture 2: 2016-04-05

**Industrial process development**

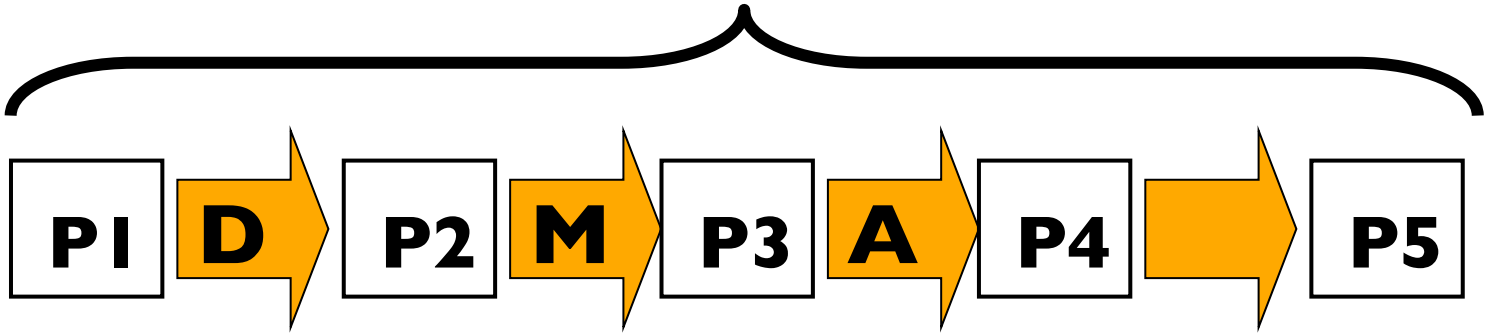
- **Lecture: Process mapping**
- **Seminar: Chen, et.al. 2010**

  - Responsible teacher: Antti



# Pulse meeting 1: 2016-04-08

## P1: Pre-study plan and deliveries

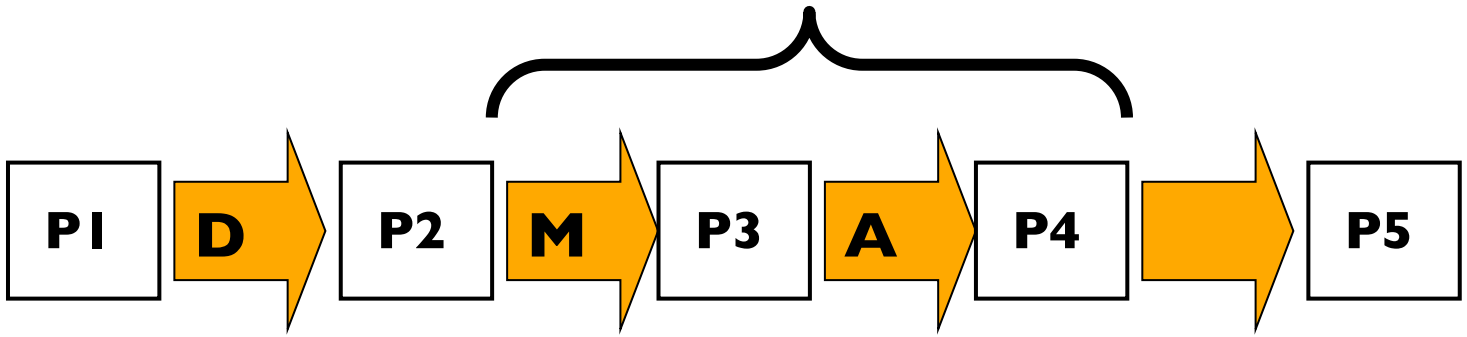


# Lecture 3: 2016-04-12

**Quality development**

- **Lecture: Quality development**
- **Seminar: Stålberg & Fundin, 2016**

  - Responsible teacher: Antti

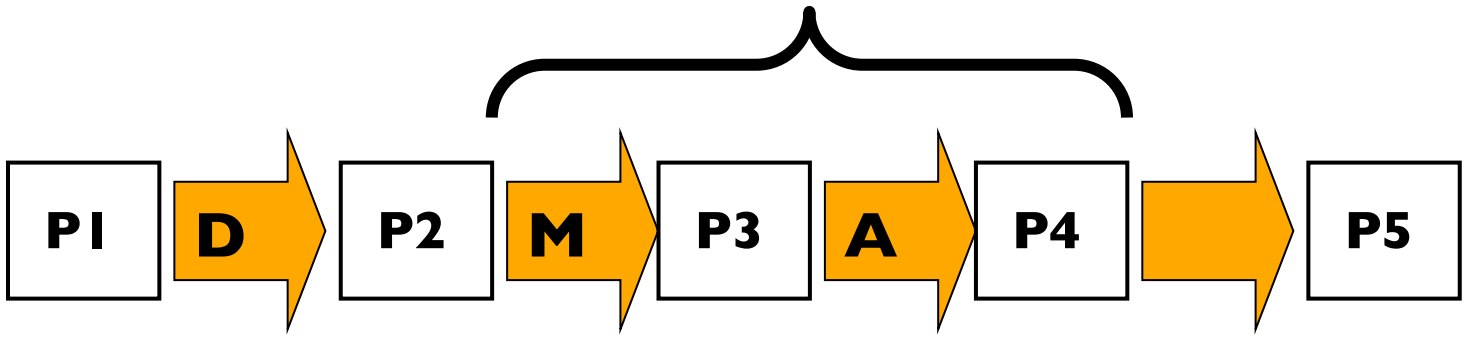


# Lecture 4: 2016-04-15

**Measuring loss**

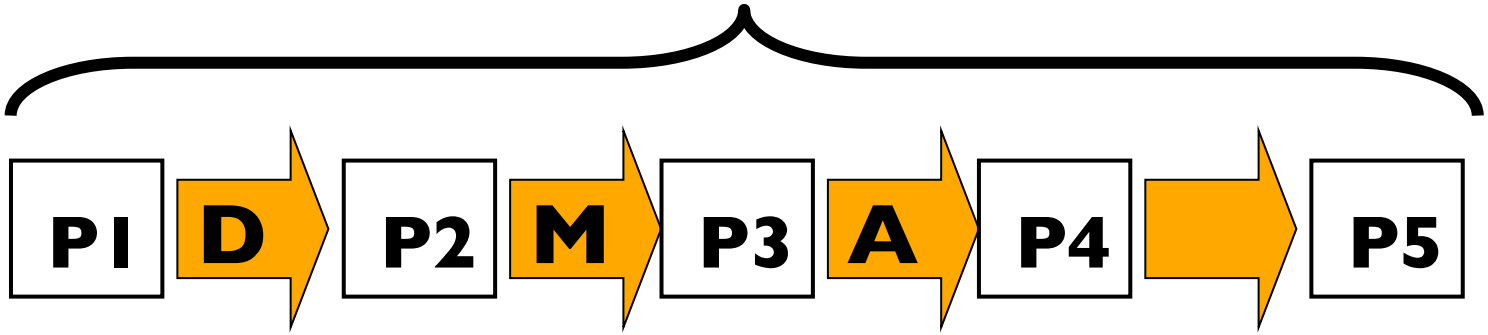
- **Lecture: Quantification of loss**
- **Seminar: Wisner & Fawcett, 1991**

  - Responsible teacher: Antti



# Pulse meeting 2: 2016-04-19

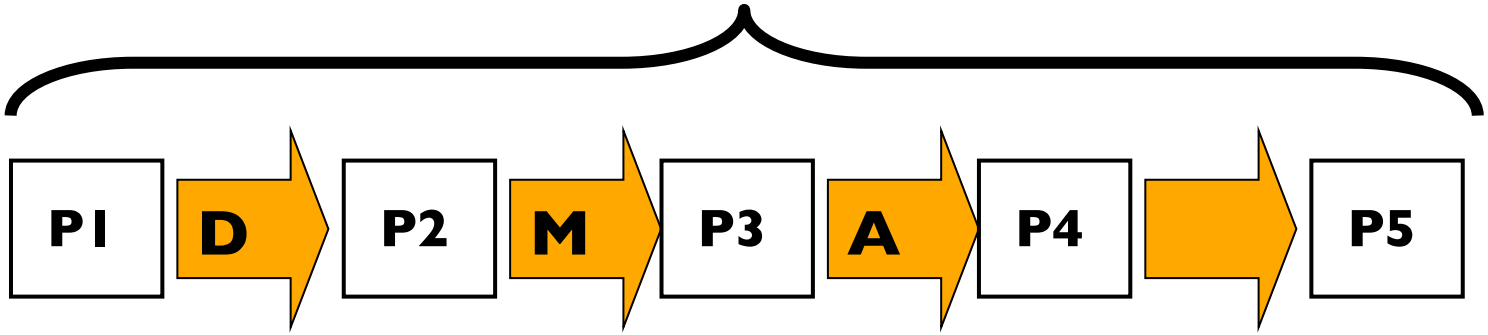
## P2: Process definition



# Lecture 5: 2016-04-22

**Production system development**

Guest lecturers: Jessica Bruch, Mdh
Erik Flores, Mdh/Volvo CE

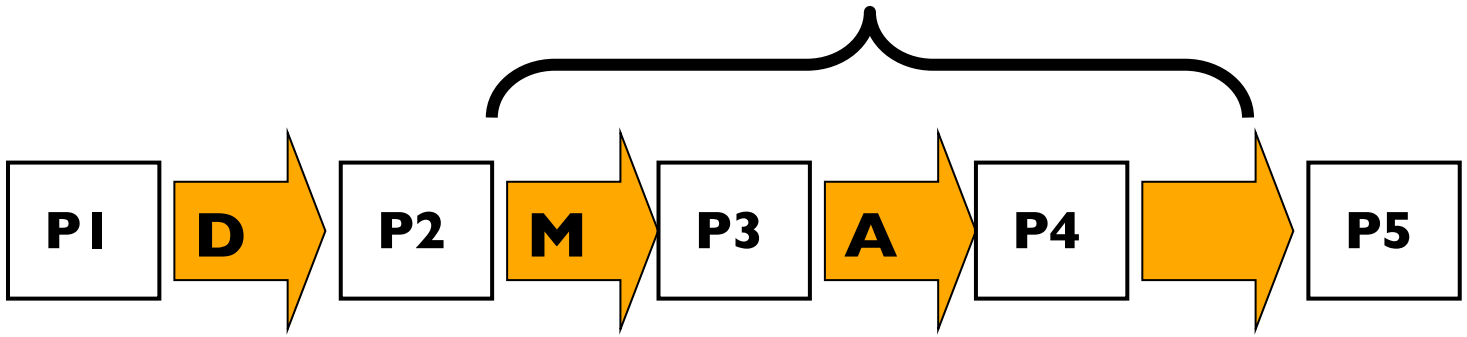


# Lecture 6: 2016-05-03

**Change management**

- **Lecture: TBA**
- **Seminar: Prel. Bengtsson & Osterman, 2014**

  - Guest lecturer: Christer Osterman, Scania

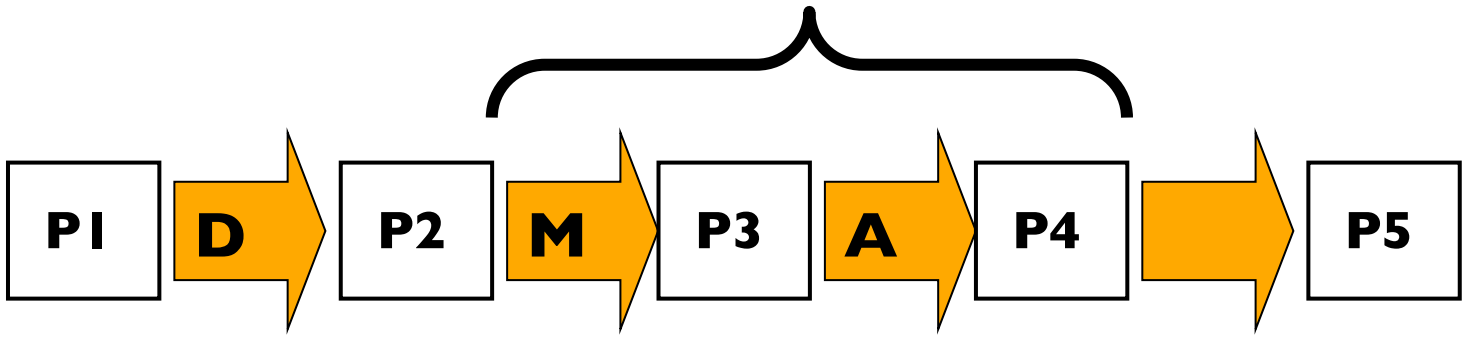


# Lecture 7: 2016-05-10

**Maintenance development**

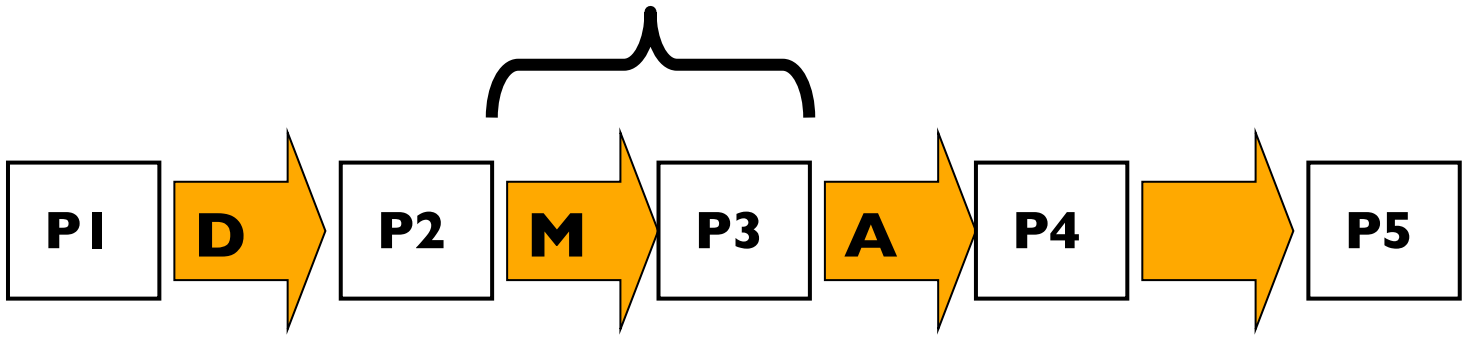
- **Lecture: Reducing maintenance related waste**
- **Seminar: Prel. Bengtsson & Salonen, 2016**

  - Guest lecturer: Marcus Bengtsson, Volvo CE



# Pulse meeting 3: 2016-05-13

## P3, Actual status

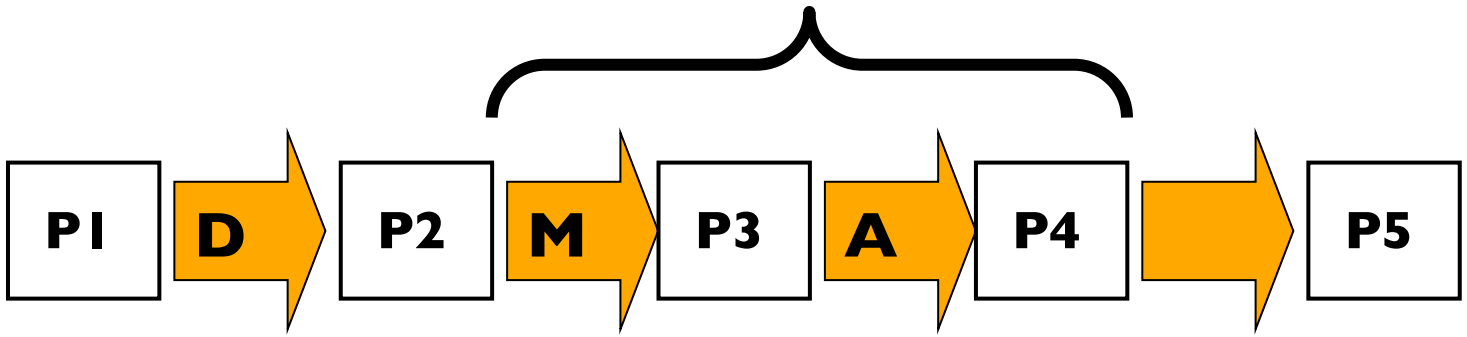


# Lecture 8: 2016-05-17

**Root Cause Analysis**

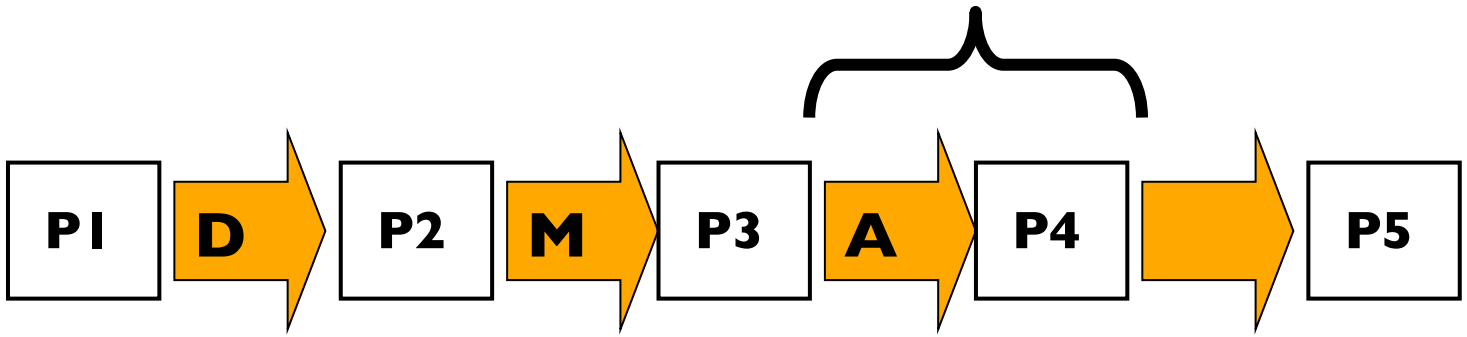
- **Lecture: Tools for RCA**
- **Seminar: MacDuffie, 1997**

  - Responsible teacher: Antti



# Pulse meeting 4: 2016-05-20

## P4: Root Cause Analysis

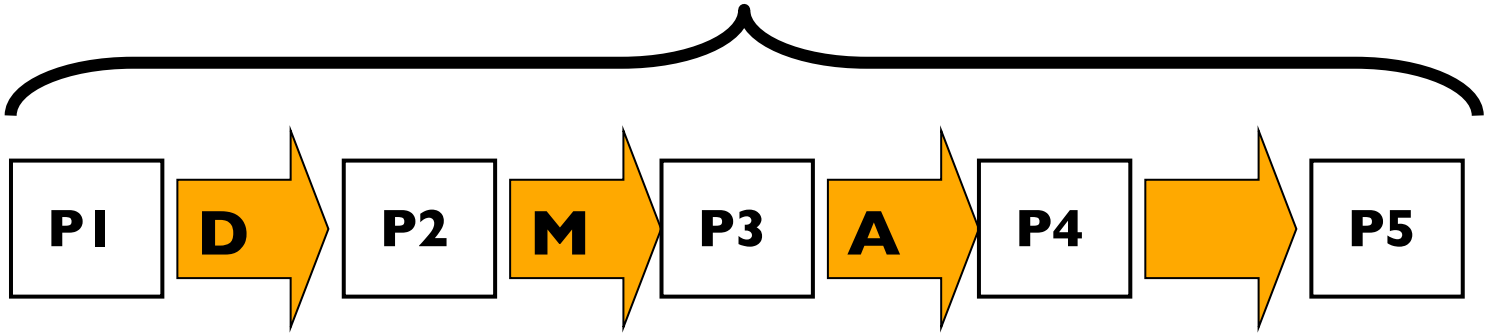


# Lecture 9: 2016-05-24

**Investment calculations**

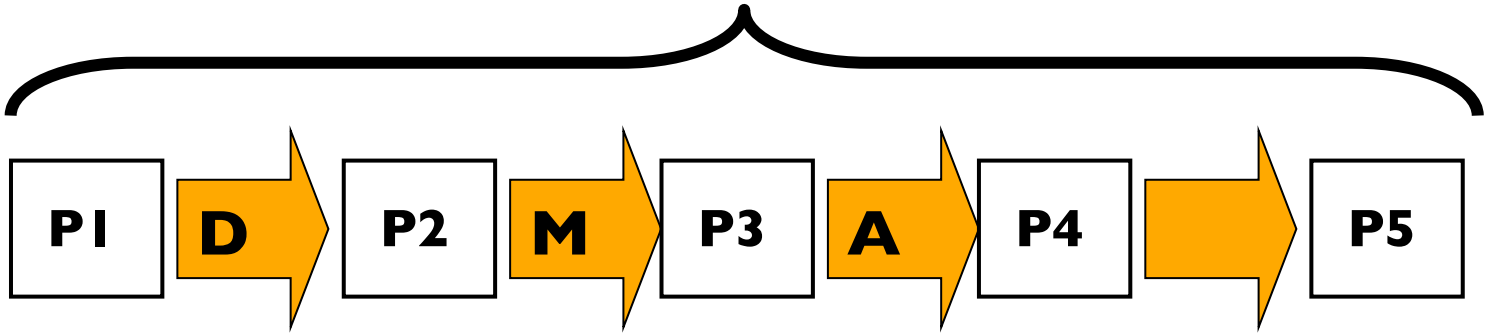
- **Lecture: Calculation models**
- **Seminar: TBA**

  - Responsible teacher: Antti



# Project presentations: 2016-05-27

- **P5: Final Project presentations**
  Suggestions for improvement
  Final presentation about 15 min/group
  (Mandatory)



# The projects

**Applied industrial projects**

- Groups of 4-5 students
- Minimum 1 Swedish speaking student/group
- Real industrial problems
- Car costs outside of Eskilstuna and Västerås will be paid

# The projects 2016

**ICA, Västerås**

- Work efficiency at voice controlled storage

**A-betong, Hallstahammar**

- Increase productivity

**Gnutti Carlo, Kungsör**

- To be defined

**Scania, Södertälje**

- Mapping of material flow and sources of contamination

**Westermo, Stora Sundby**

- Pre-study of possibilities of later customer order point

**Alfa-Laval, Eskilstuna**

- Pre-study of advanced technology for quality assurance

**Husmuttern, Eskilstuna**

- Several projects to be defined

# Pulse meetings

**Groups evaluate each other**

- Evaluation on pre-defined criteria

**Groups coach each other**

- Staff coaching only if necessary

**Document**

- Use Pulse protocol to visualize the project status

# Criteria for evaluation

DELIVERABLES

COOPERATION WITHIN THE GROUP

RELATION WITH THE COMPANY

PROJECT REPORT

# Comunication

**Course material:**
**http://zoomin.idt.mdh.se/course/PPU404/**

**Contact me:**
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Phone: 016-15 36 06

# Next lecture: 2016-04-05

- **Industrial process development**

**As preparation, please read:**

Chen, J., Li, Y. & Shady, B., (2010), "From value stream mapping toward a lean/sigma continuous improvement proves: an industrial case study", International Journal of Production Research, Vol. 48, No 4 , pp. 1069-1086