



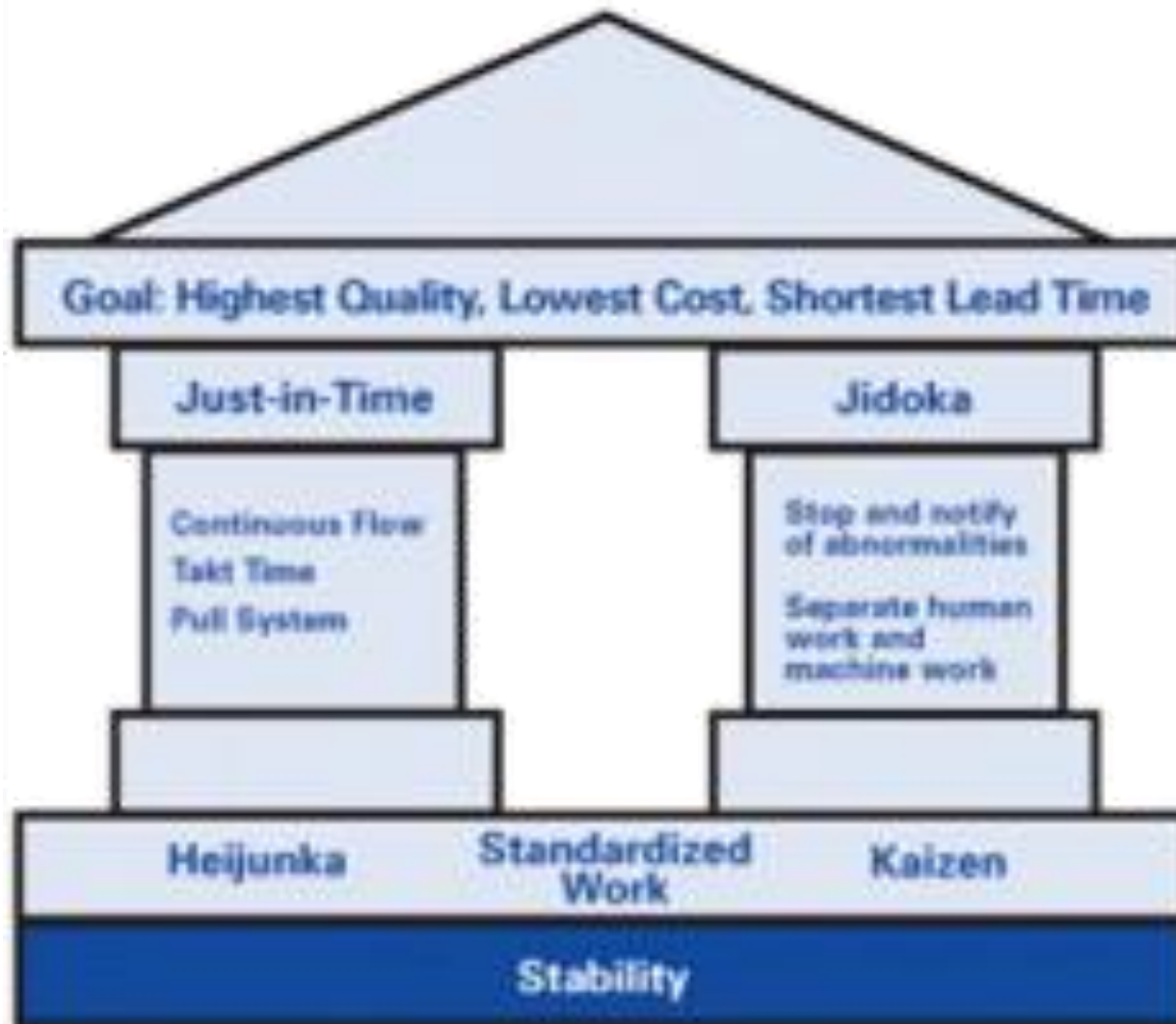
# **Lean manufacturing: introduction**

**Paolo Gaiardelli**

# The industrial context



# The lean approach: doing more with less



*(Ohno, 1988)*

# Lean Manufacturing (LM) – Part 2

The course in *Lean Manufacturing* (in English) addresses the main principles and techniques for process optimization when adopting a lean perspective. In particular, the following topics are analysed:

- The continuous improvement philosophy (Kaizen) and its effects on the employees' behaviour
- The Value Stream Mapping (VSM)
- The main manufacturing techniques and tools for Just in Time (SMED, Kanban systems)
- The main techniques and tools for quality management in manufacturing lean context (Jidoka, Poka-Yoke systems, self-quality matrix)

Finally, the module ends with an overview of Industry 4.0 implications in a lean manufacturing context.

Il corso di *Lean Manufacturing* (in inglese) si concentra sulle principali tecniche di gestione e di ottimizzazione dei processi produttivi secondo la logica della lean manufacturing. In particolare, vengono trattati i seguenti argomenti:

- La filosofia del miglioramento continuo (il Kaizen) e gli effetti sul comportamento del personale
- La mappatura del valore (il Value Stream Mapping)
- Le tecniche e gli strumenti di Just In Time (SMED, la gestione Kanban dei materiali)
- Le tecniche e gli strumenti a supporto della qualità in contesti lean (il Jidoka, i sistemi Poka-Yoke, la matrice di auto-qualità) in una produzione snella

Il corso si conclude con un'analisi delle implicazioni dell'Industria 4.0 nel contesto lean manufacturing.



**In English**

# Lean Manufacturing (LM) – Part 2

*Lean Manufacturing – LM – (English) In collaboration with prof. Daryl John Powell, NTNU*

Date	Day	Time	Topic
27-Apr-2020	Monday	09.00-13.00	LM: The lean principles & the role of soft practices in lean
01-May-2020	Friday		////
04-May-2020	Monday	09.00-13.00	LM: The Value Stream Mapping (VSM)
08-May-2020	Friday	09.00-13.00	LM: Tools for line balancing
11-May-2020	Monday	09.00-13.00	LM: Tools for line balancing
15-May-2020	Friday	09.00-13.00	LM: The kanban approach
18-May-2020	Monday	09.00-13.00	LM: The kanban approach
21-May-2020	Thursday	09.00-13.00	LM: Seminar - Prof. Powell
22-May-2020	Friday	09.00-13.00	LM: Seminar - Prof. Powell
25-May-2020	Monday	09.00-13.00	LM: Seminar - Prof. Powell
26-May-2020	Tuesday	09.00-13.00	LM: Seminar - Prof. Powell
29-May-2020	Friday	09.00-13.00	LM: The SMED
01-Jun-2020	Monday	09.00-13.00	LM: The Jidoka
05-Jun-2020	Friday	09.00-13.00	LM: Lean & industry 4.0
08-Jun-2020	Monday	09.00-13.00	LM: Refresh second part
12-Jun-2020	Friday	09.00-13.00	LM: Exam part 1 or part 2 or both (upon request of the student)
12-Jun-2020	Friday	14.00-18.00	LM: Industrial tour

**Start: 27/04/2020**

**End: 08/06/2020**

**Pre-exam: 12/06/2020**





# Lean Manufacturing Seminar

## Prof. Daryl J. Powell

### Day 1

Lean as leadership, learning, long term.  
*Discussion and quiz (Kahoot.com)*

### Day 2

The traditional view of Lean: JIT & Jidoka  
*VSM competition*

### Day 3

Lean programs & Operational Excellence  
*Best practice analysis and «Pig game»*

### Day 4

The future of lean thinking  
*Article review team exercises*