



POLITECNICO
MILANO 1863

LEAN PRINCIPLES

Alberto PORTIOLI STAUDACHER
Dipartimento Ing. Gestionale
Politecnico di Milano
Dep. Management, Economics and Industrial Engineering
alberto.portioli@polimi.it

This material and what the Professors say in class are intended for didactical use only and cannot be used outside such context, nor to imply professors' specific beliefs or opinion

What is Lean Management?

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Types of activities

- Value activities (those the customer is happy to pay for)
- NO value activities (customer is not happy to pay for them), but they are unavoidable in the short-term
- NO value activities, and avoidable in the short-term

Value adding or not value adding?

Sample activities for a Machine tools producer

- Insert a ball bearing on its shaft
- Test a product before sending it to the customer
- Clamp raw material to the fixture of a vertical workstation
- Bring the electric motors from the warehouse to the place where the machine tool is assembled
- Urge the supplier for an overdue order
- Plan internal and external personnels' activities for the next week

The 7 Wastes

1. Transportation (of no value for the customer)
2. Inventory
3. Movement
4. Waiting
5. Overproduction
6. Overprocessing
7. Defects

*Waiting is the easiest to generate and the hardest to correct,
because time does not pile up on the floor like material wastes*
Henry Ford (1926)

Lean Management IS:

- Increase Sales
- Increase Quality
- Increase Safety
- Boost Morale
- Innovate
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Understanding the philosophy



Textile Industry
Company as the Human Body

Understanding the philosophy

- We achieve **brilliant** results from people with **average** capacity that operate and improve **brilliant processes**.
- Our competitors achieve **average** results from **brilliant people** that work on **flawed processes**.
- When they meet some problem, they try to hire **more brilliant people**
- We will beat them

Toyota

Lean principles

1. Identify **Value**
2. Map the Value Stream
3. Create **Flow**
4. Establish **PULL**
5. Seek **Perfection**

1. Identify Value

The Value is defined by the Customer:
All that the customer is willing to pay

(All that gives value to the customer is **Value**)

One of the major changes of the last 30 years:
The shift to an external point of view. Outside in

1. Identify value 2/2

From

$$\text{Cost} + \text{mark-up} \Rightarrow \text{Price}$$

To

$$\text{Price} - \text{mark-up} \Rightarrow \text{Cost}$$

(Value)

2. Map the value stream

The Value Stream is the set of activities that are made on the inputs to give to the customer a product/service.

There are 3 main flows:

- Development and introduction of new products/services
- Managing informations from customer's order to delivery
- **Manage product/service realization from the inputs elements to the final output**

Look at the system from the flow point of view, with the flow perspective, not the resources' perspective

What stops the flow?

Anything that stops the flow is a problem.
Identify what stops the flow and remove it

Establish PULL

Forecasts are always wrong

Many of the systems we develop are too complex to be completely controlled (FMS, MRP, ecc.)

Instead of trying to make a better forecast,
we should focus on having a faster response

Seek perfection

- When quality is sufficient?
- When cost is low enough?
- When wastes are low enough?

If perfection is the aim,
we focus on the journey and not on the destination

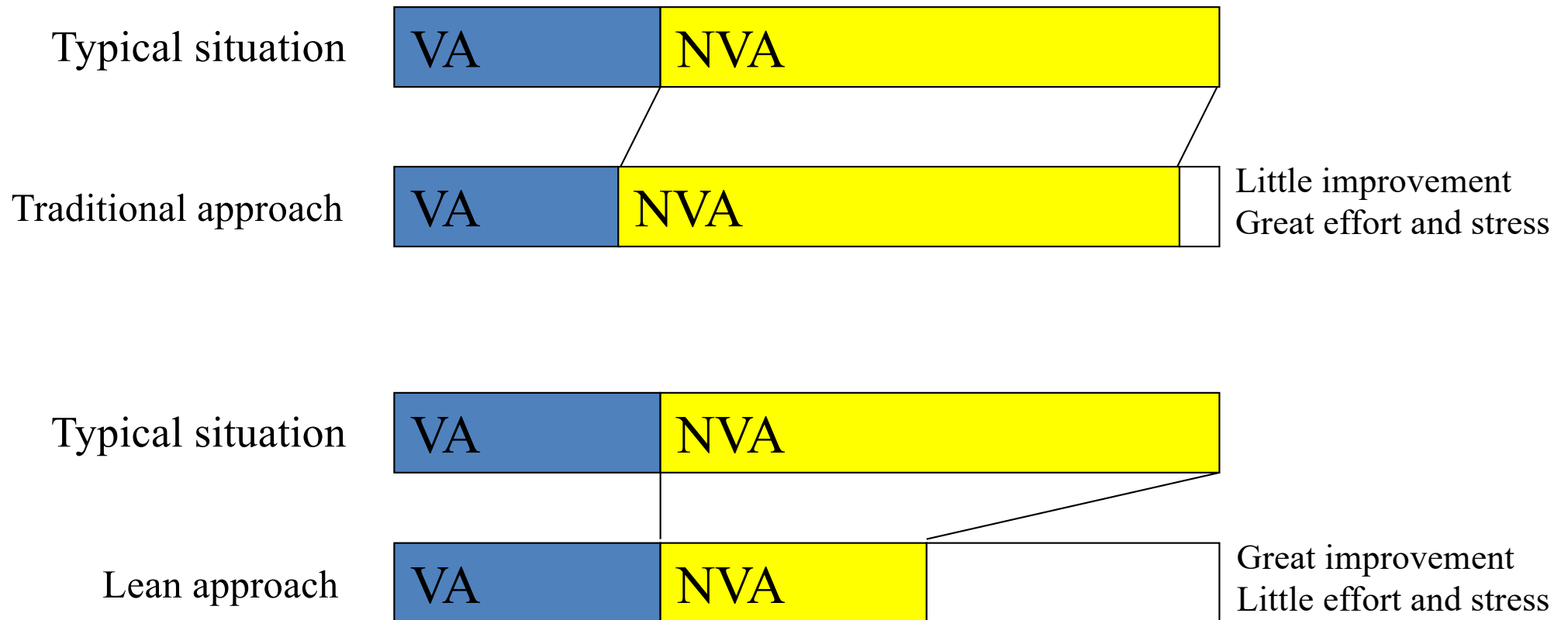
Possible results

- 50% improvement of work productivity in the whole system
- 90% cut of production lead time
- 90% reduction of stocks
- Halved process defects and wastes
- Halved accidents
- Halved Time to Market

All with a very limited capital investment

How is it possible?

As in football, you make a faster action not running more but advancing the ball faster.



Do not work more. Work **better**



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