SMARTLOG

Tilfører norsk industri høy internasjonal kompetanse om verdikjedestyring og produksjonslogistikk

NTNU
Norwegian University of Science and Technology

Researchgroup Lean / World Class performance

Smart & Lean

How can smart and lean improve operations in manufacturing

LEAN 4.0

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Agenda

- Who Am I?
- What is (in short):
  - Lean
  - Smart
- So what is Lean & Smart (for Manufacturing)?

Who am I?

- Menno Herkes

- Researcher HAN university of applied sciences.

- Previous over 10 years working experience

Focus:

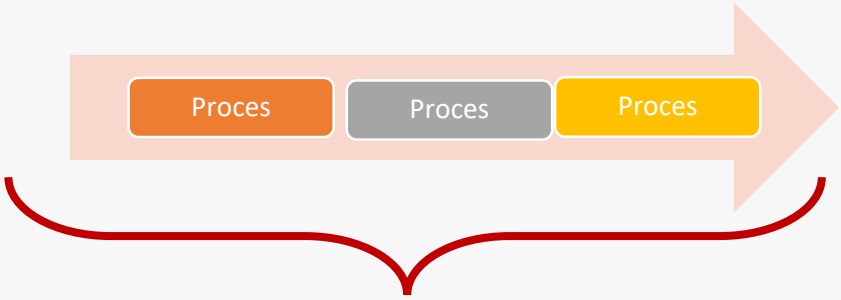
Human centred technology & Proces development

Smart & Lean

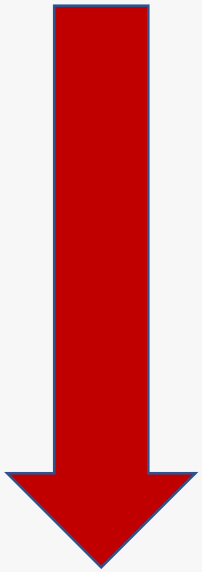
How can you :

Improve Quality & Efficiency

Reduce Throughput time & Cost



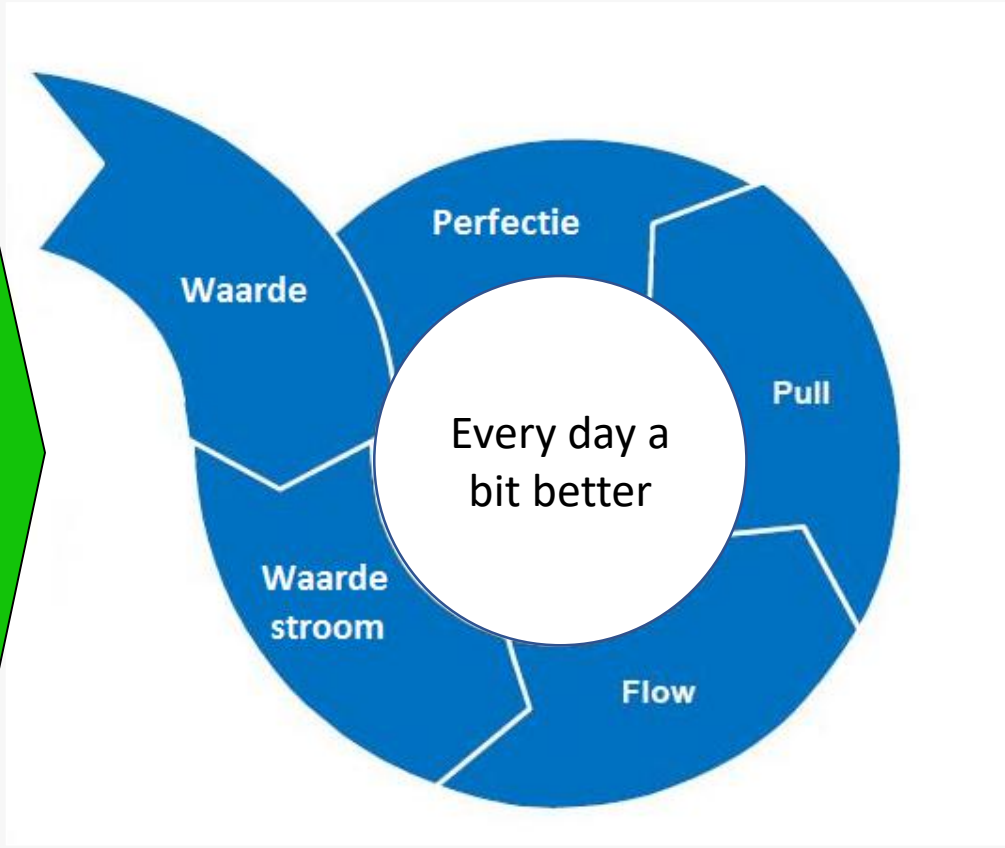
TIME



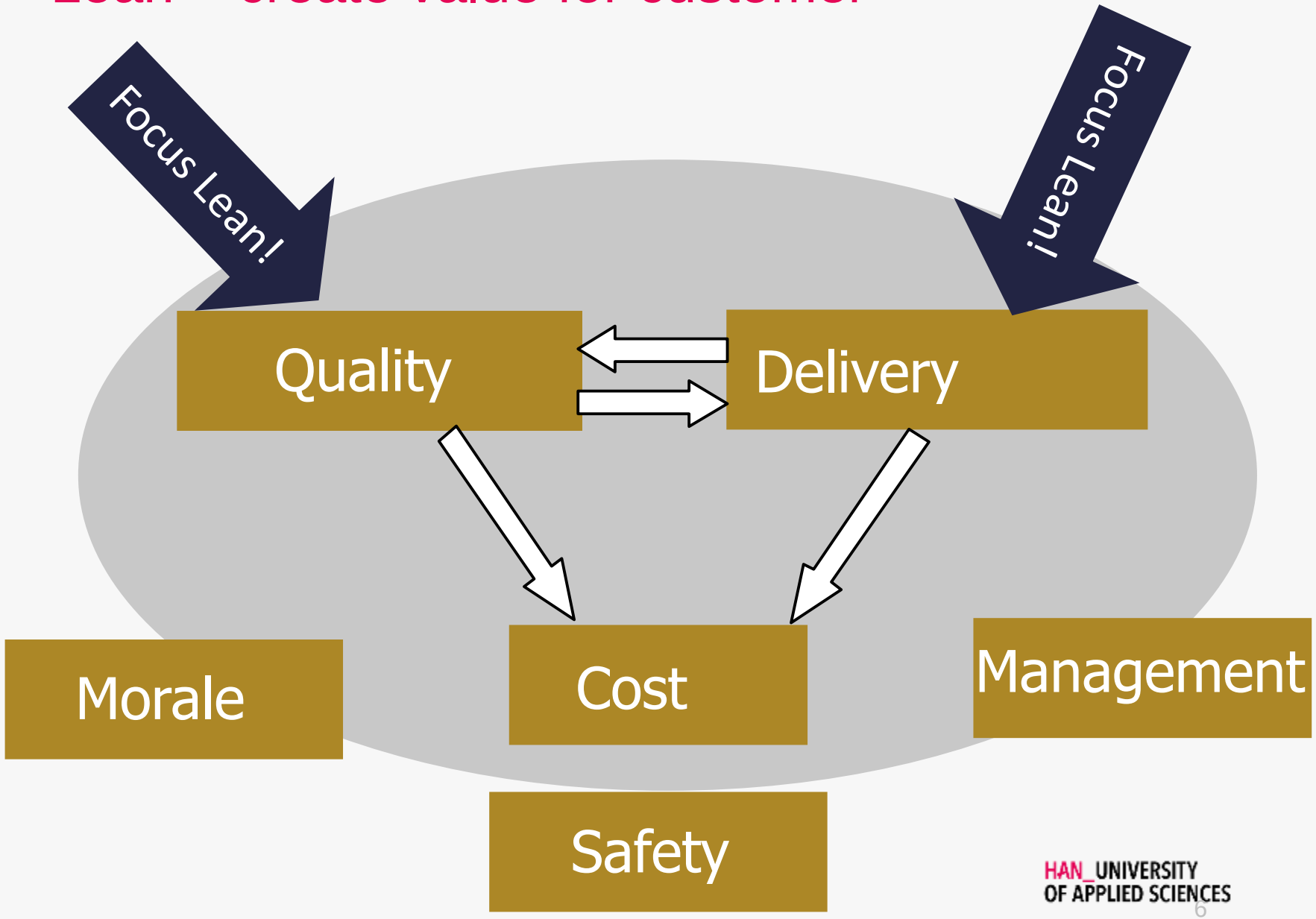
NOK / €

Lean in short

Value	What is value for you customers (and their customers?
Value stream	How do we make thes value ? The proces
Flow	Reduce waste
Pull (&Takt)	Only produce what you need to produce.
Perfection	Next time will be better ! (and better and better and better and better)



Lean = create value for customer



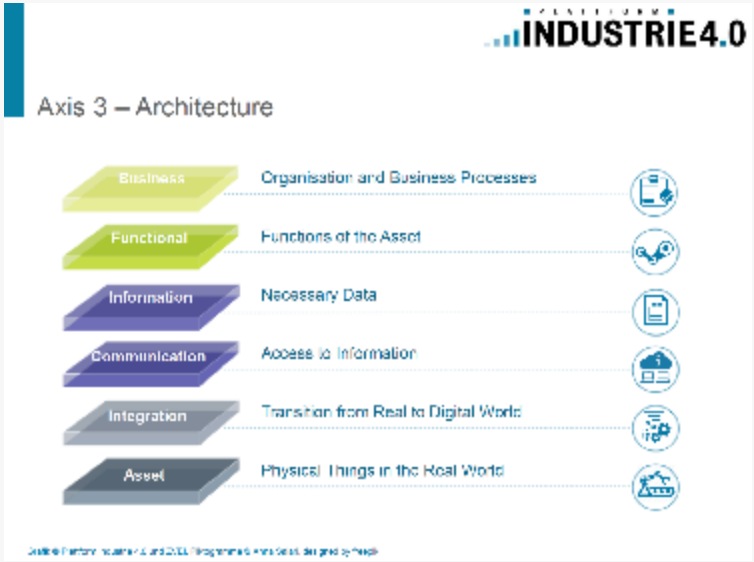
High variety – low volume

Diversification of **customer demand:**

Makes production companies to perform:

- Faster …
- With more variance…
- In lower quantities…

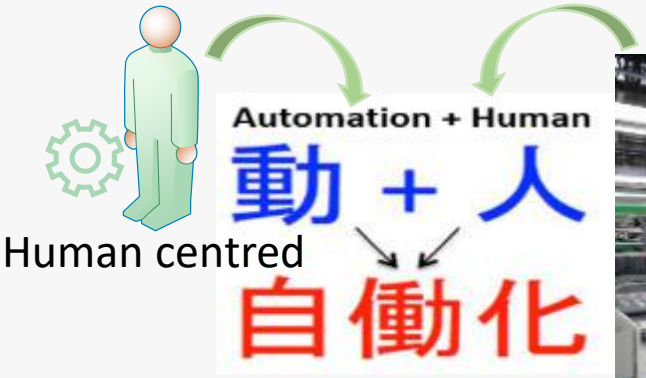
Smart in short



Cyber Physical systems

Fit or un-Fit?

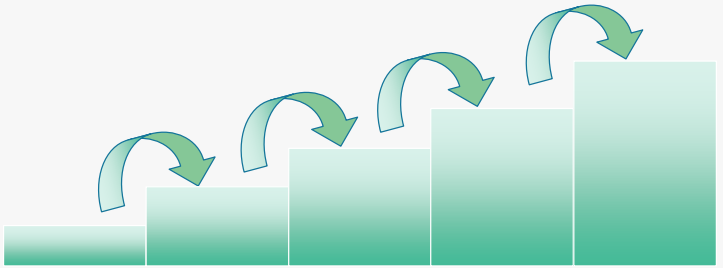
LEAN:



Human centred

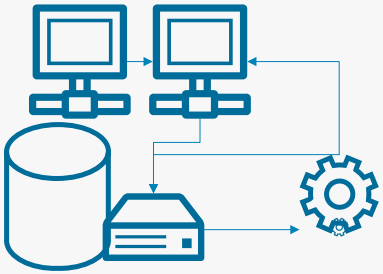
Jidoka
(*autonomation*)

(low) Technology support



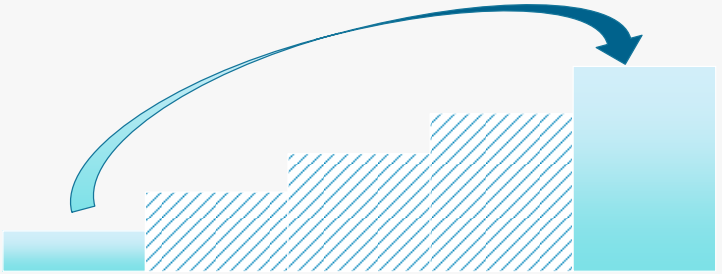
Small step improvement

SMART:



Data driven,

High Technology,



Disruptive change

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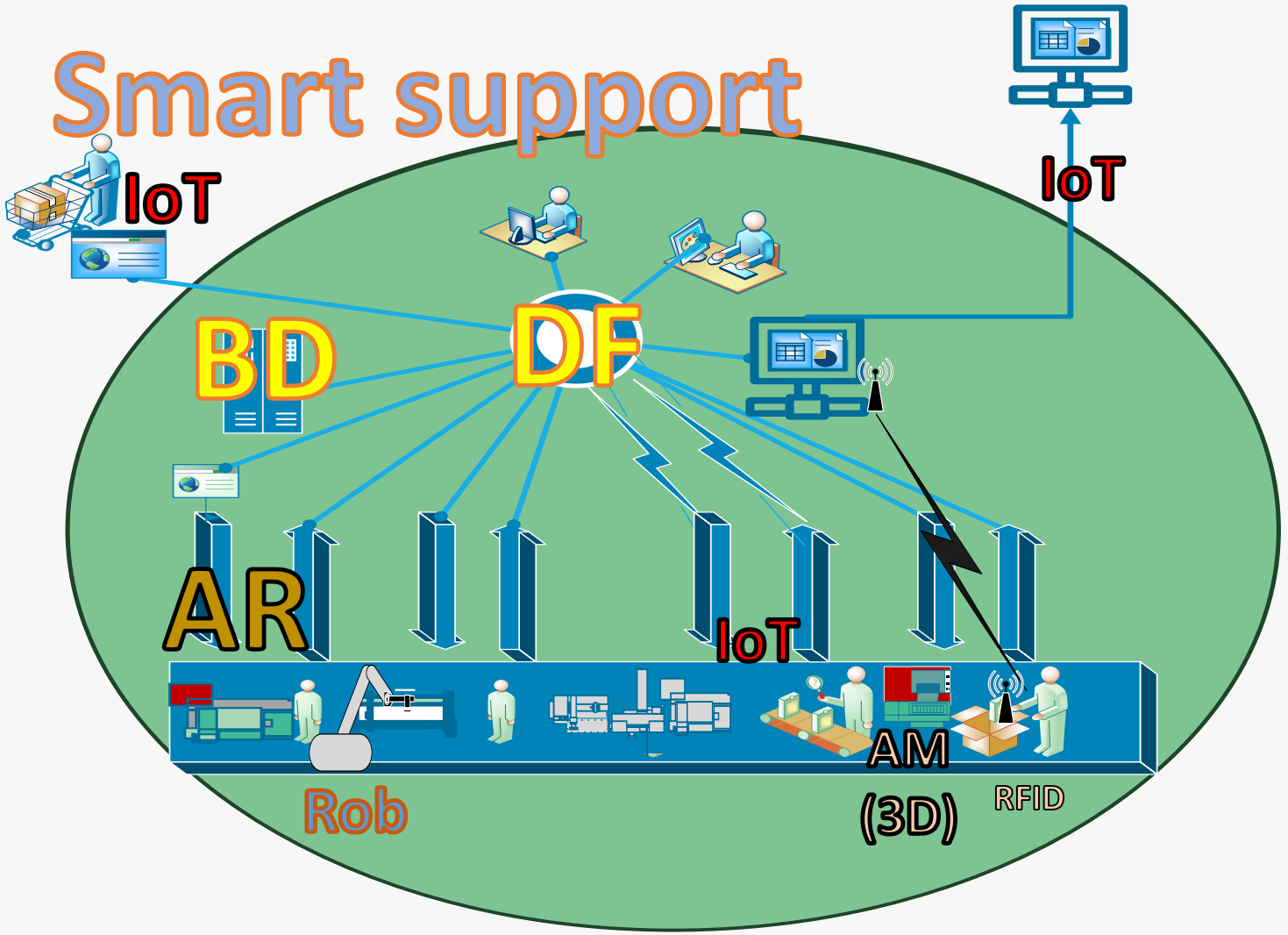
Smart support



Lean Production ->

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Step 1

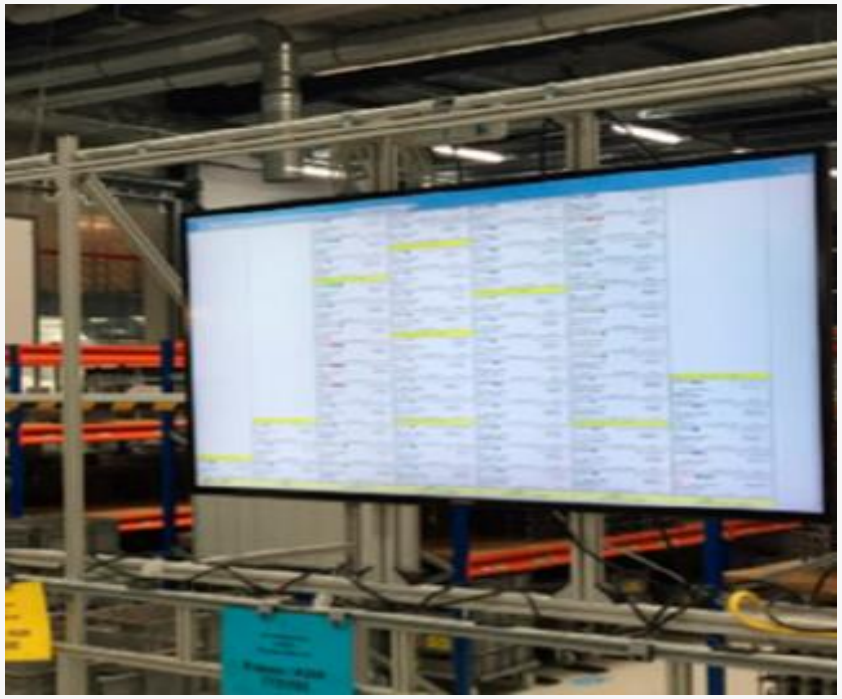
Step 2

Step 3

Does it have to be extreme??

Or direct in LEAN support……..

iBin



Digital Heijunka-Board

ANDON
Smart Watch

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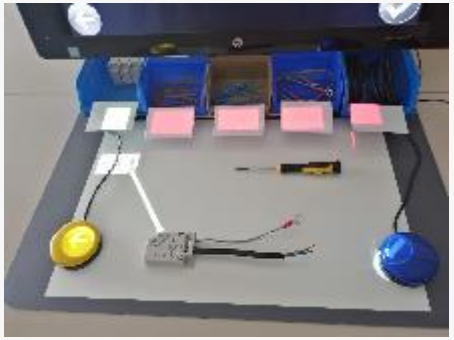
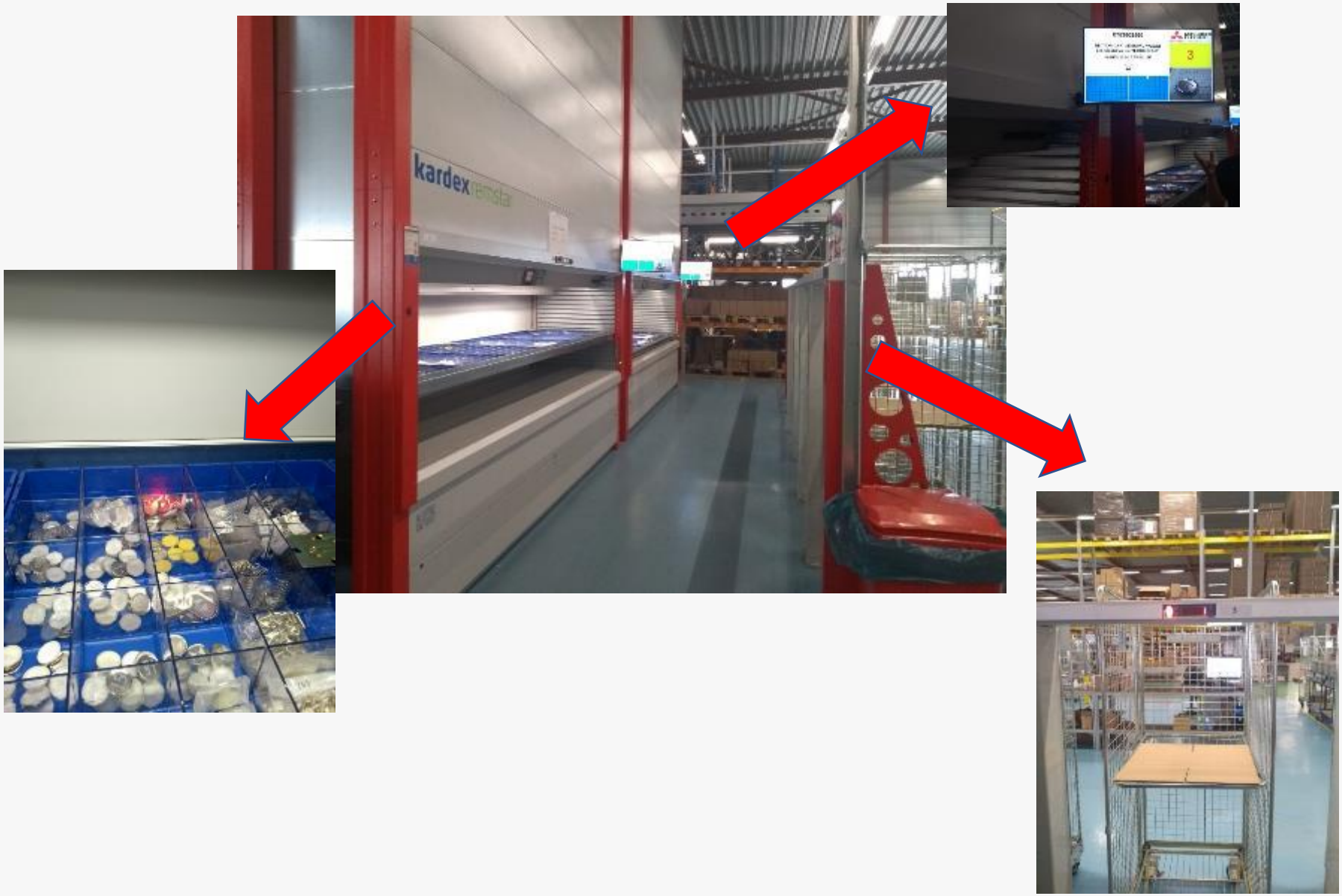
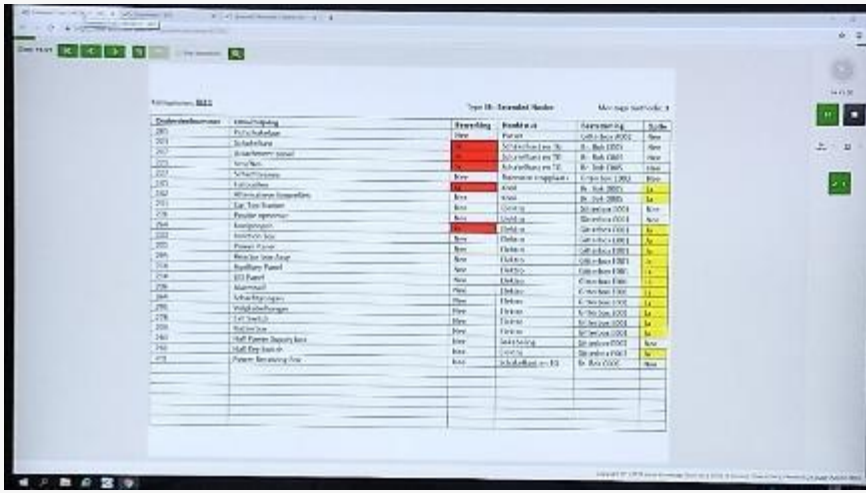
It can be simple too….



Start of smart in order picking



Start of smart assembly



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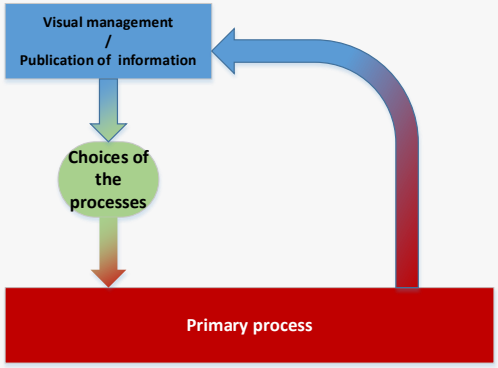
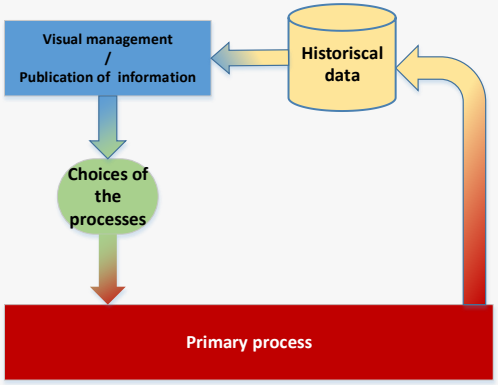
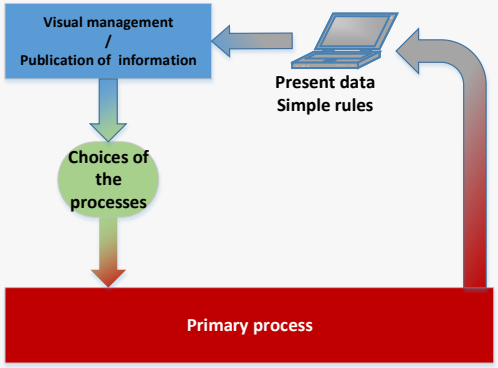
Phases of development

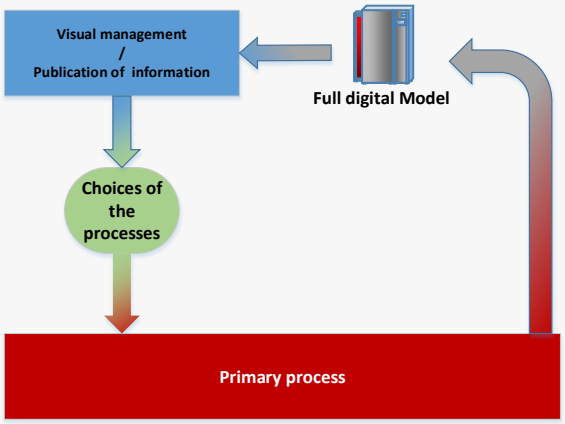




Situation 2:
Historical data to VM



Situation 3:
Info based on simple rules to VM



Situation 4: full digital model to VM

Towards the Digital Factory:
Different options

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Automation is good, so long as you know exactly where to put the machine.

Eliyahu Goldratt

The first rule of any technology used in a business is that **automation applied to an efficient operation will magnify the efficiency**.

The second is that **automation applied to an inefficient operation will magnify the inefficiency.**

Bill Gates

Questions?

Thank you for your attention

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