



FESTO

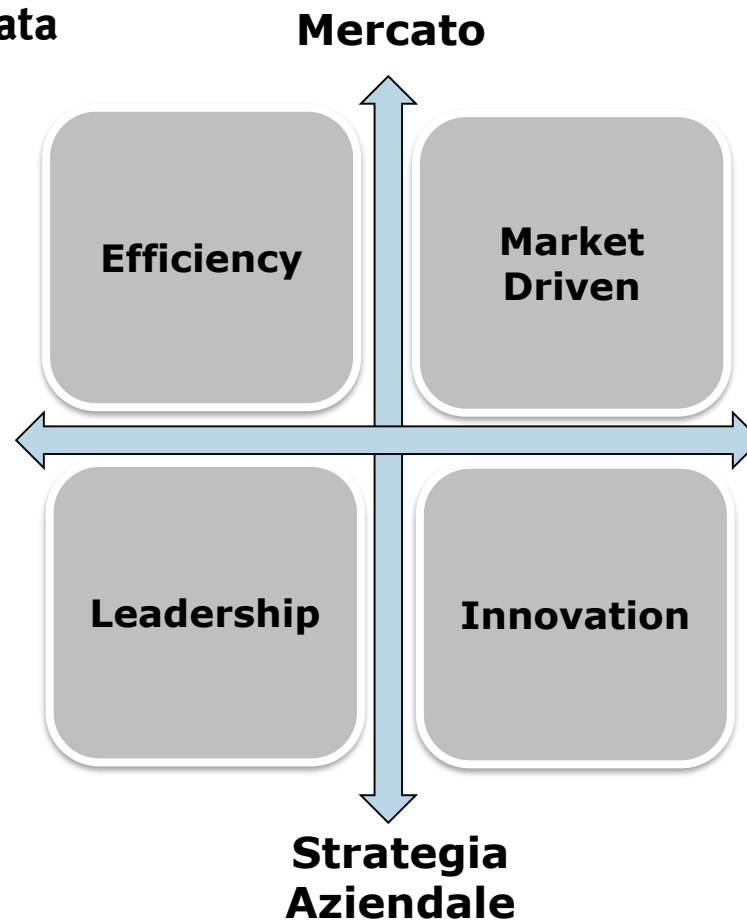
→ WE ARE THE ENGINEERS
OF PRODUCTIVITY.

Alessandro Ferioli

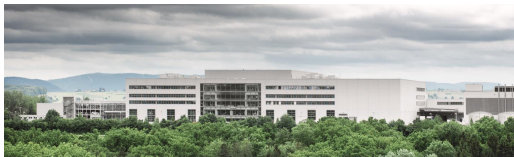
Industrie 4.0 Project Leader
Festo Automation

Festo

Una strategia 4.0 integrata



Processo



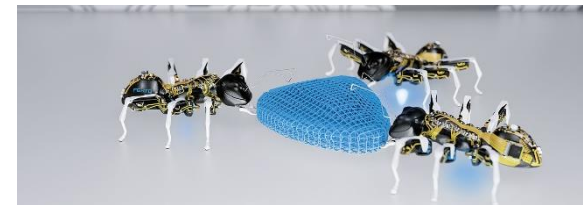
Persone



Prodotto

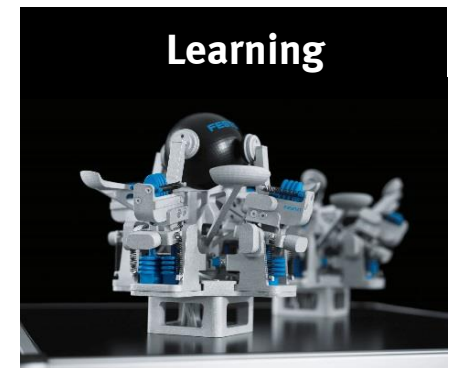
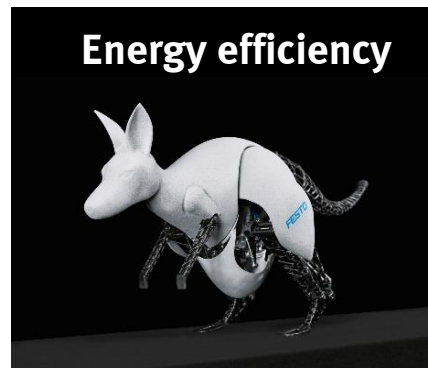
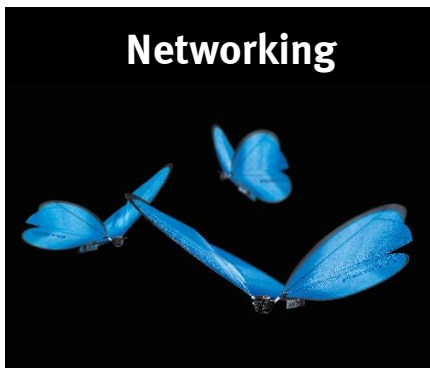
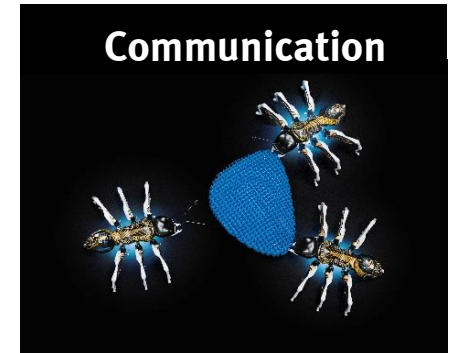
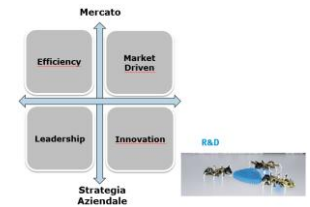


R&D



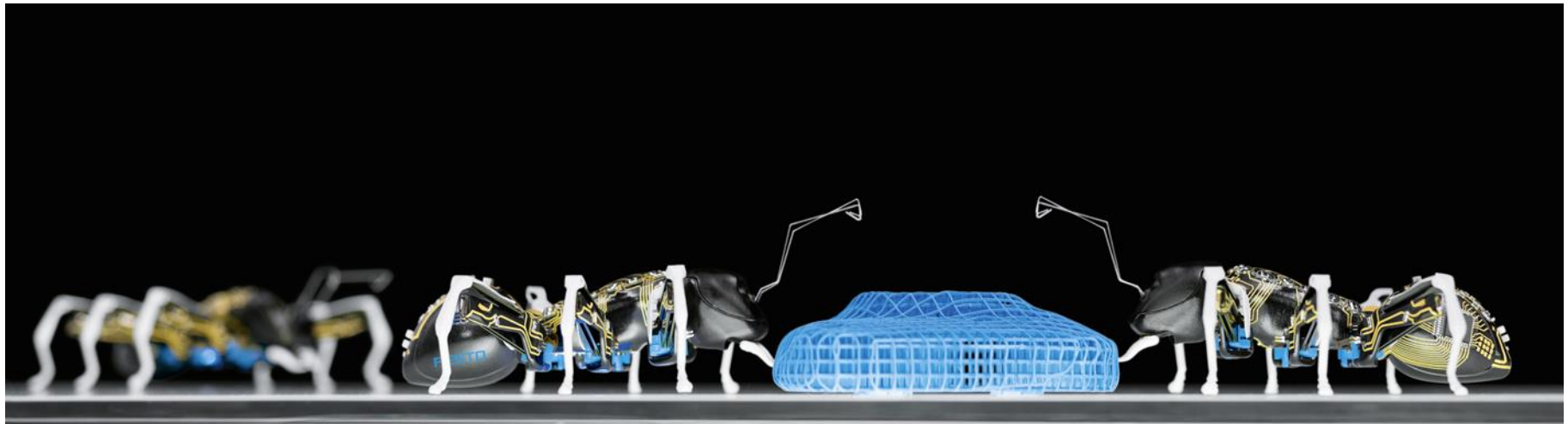
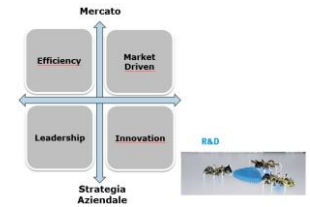
Ispirazione per automazione di fabbrica e di processo

Imparare dalla natura per la produzione del futuro



Sistemi autonomi integrati per l'esecuzione di operazioni complesse

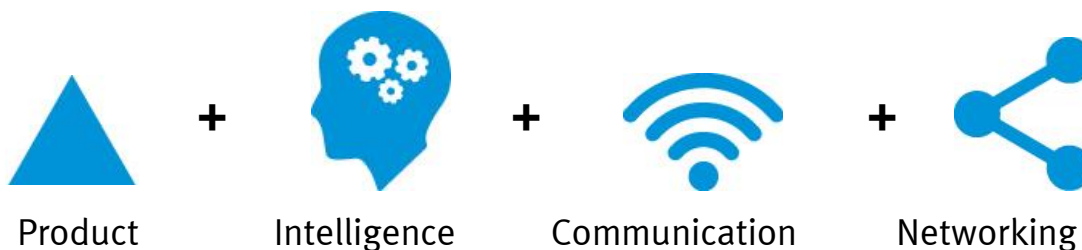
BionicANTs



- Algoritmi di controllo per la cooperazione tra sistemi indipendenti all'interno di un network
- Microsistemi altamente tecnologici
- Sistemi multi-agent con intelligenza distribuite
- Comunicazione Wireless, sistemi di visione e floor sensor

Futuro e innovazione

Il prodotto integra intelligenza e capacità di comunicazione



Value added services

- Analysis
- Condition monitoring
- Cloud services

Business models

- Pay per user
- Predictive maintenance
- Customer support

Prodotti 4.0 – Festo Motion Terminal

Benefits of standard pneumatics:

- Plug and play technology for easy operation
- Very attractive prices
- Flexible when handling overloads
- High performance
- Insensitive to contamination

Digital pneumatics

Benefits of electric automation:

- Flexibility for complex tasks
- Variable positioning and speed profiles
- Highly accurate
- Low power consumption



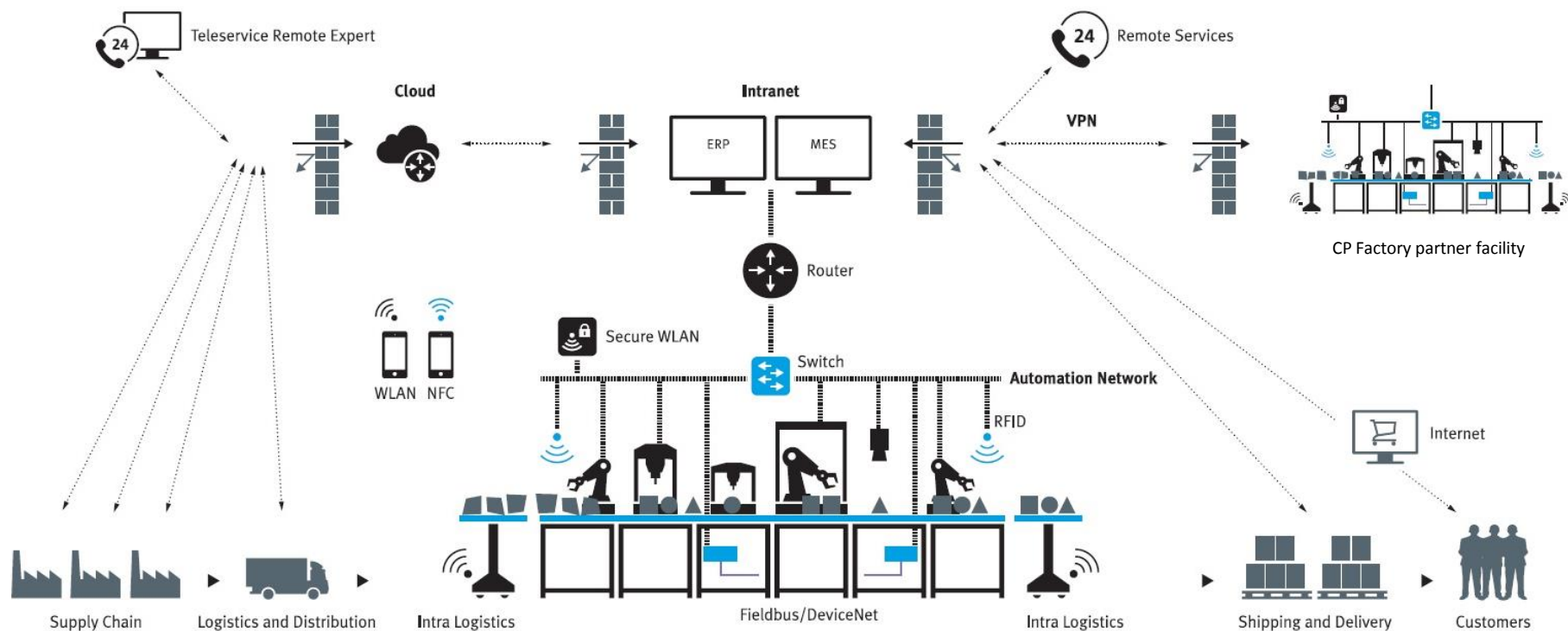
sps ipc drives
ITALIA

Tecnologie per l'Automazione Elettrica
Sistemi e Componenti
Fiera e Congresso
Parma, 23-25 maggio 2017



La fabbrica del futuro

Sistemi di produzione per una fabbrica interconnessa, adattiva, flessibile



Processi 4.0 - Scharnhausen Technology Plant



Competitività Globale



Riferimento per produzione valvole, unità di valvole, elettronica



Automazione intelligente con prodotti Festo



Collaborazione on-site dei reparti (Eng – Prod – IT)



Lean production / management



Efficienza energetica



Qualificazione personale/ learning factory

Rendiamo sostenibile il futuro: Smart Factory 4.0

Automatizzato e flessibile

Flusso produttivo flessibile

Ottimizzazione energetica

Learning “taken for granted!”



Riduzione costi, lotto adeguato alla domanda



Flusso di info e materiali continuamente ottimizzato



Edifici in Energy Network e efficienza in produzione



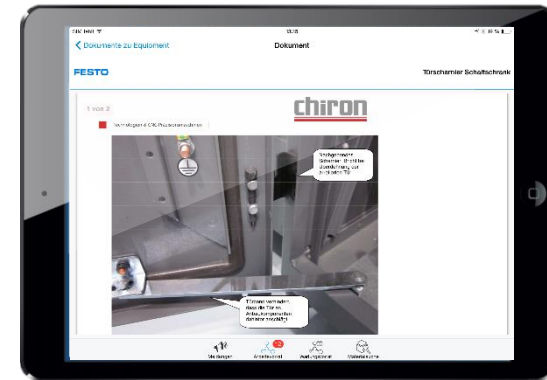
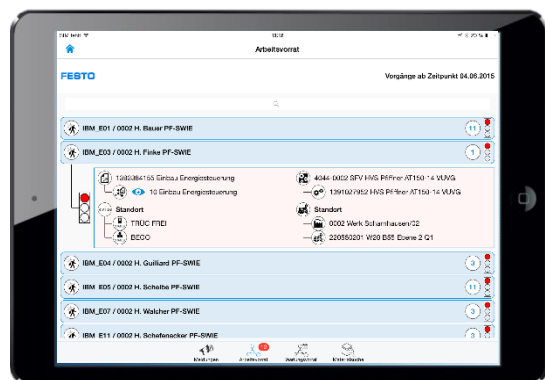
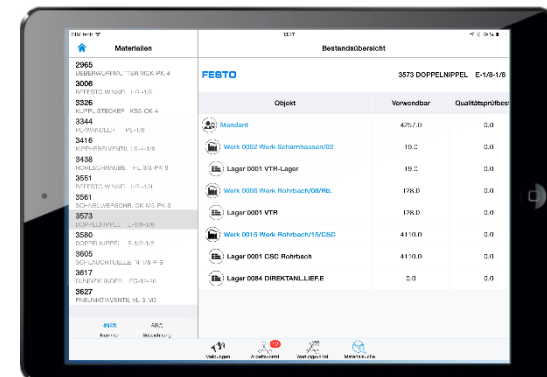
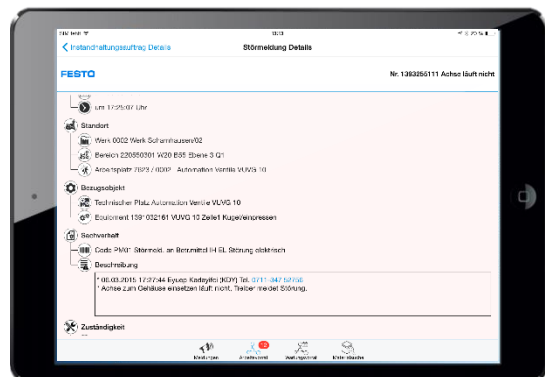
Continuo training on the job e Learning centre in loco

Macchina modulare e intelligenza decentralizzata



- Lotto economico da 10 a 10.000 Pz
- Produzione ottimizzata sulla domanda
- Flusso materiali ottimizzato
- Comando decentralizzato
- Interfacce standardizzate
- Produzione mix prodotto

Mobile Maintenance – higher OEE and higher profitability



0 %

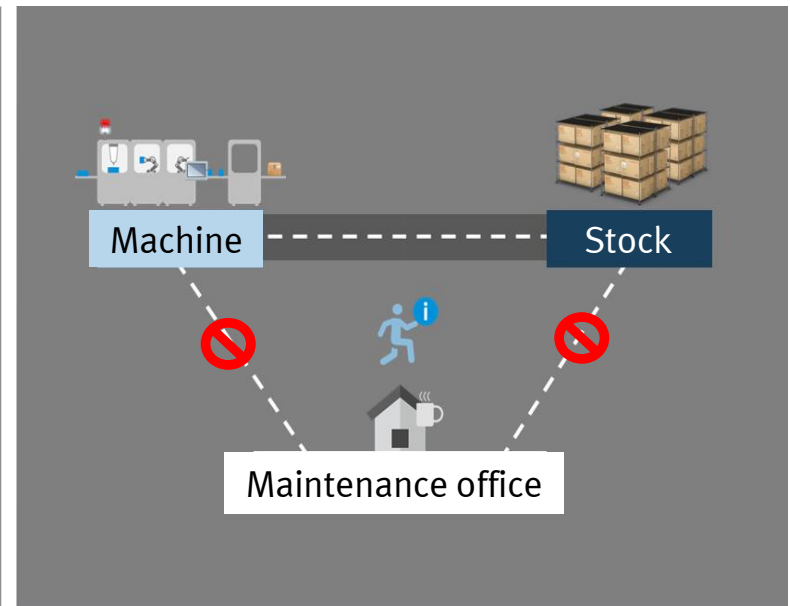
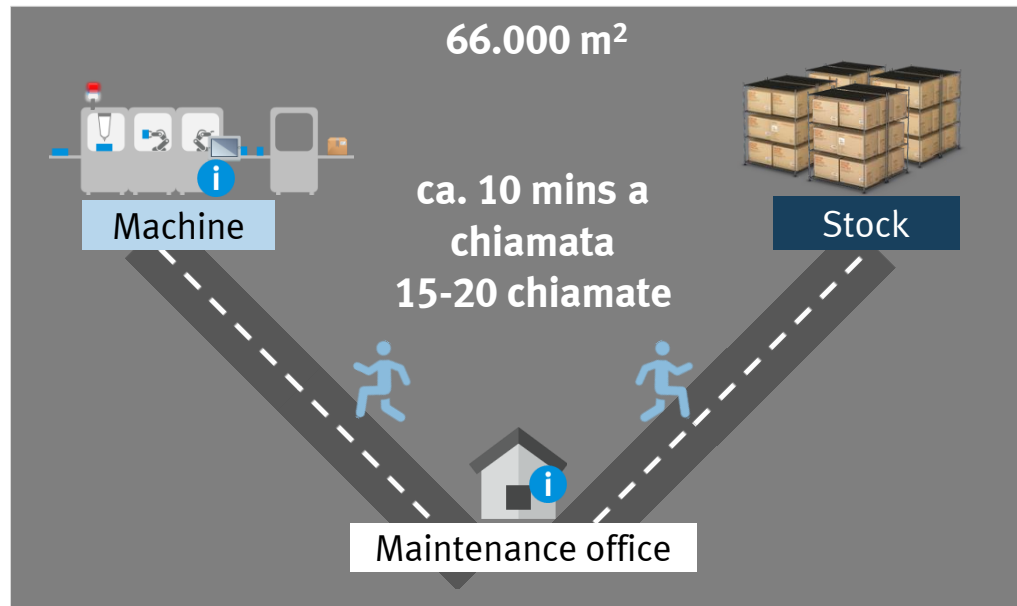
25 %

50 %

75 %

Industrie 4.0

Mobile Maintenance



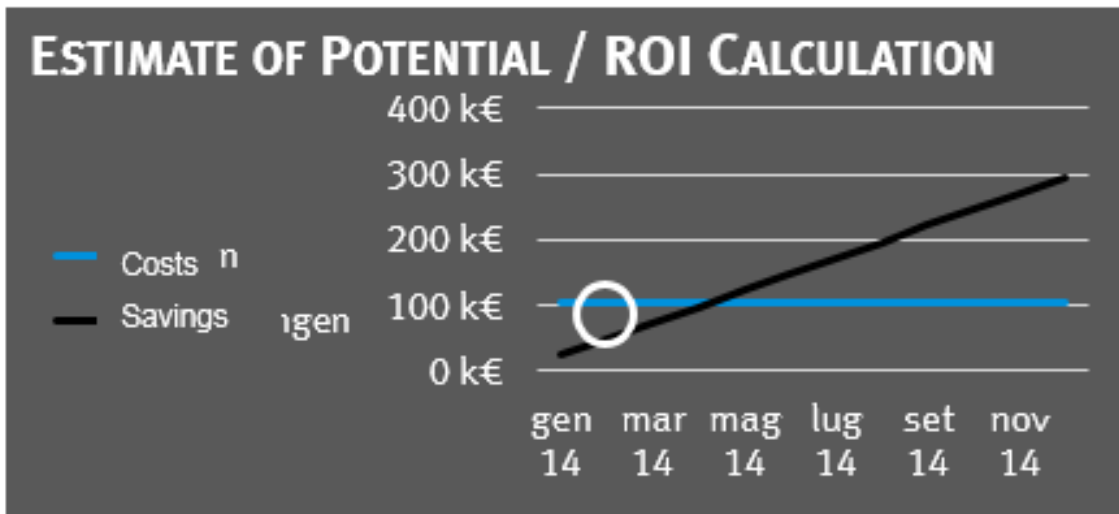
WEAKNESSES

- Limited information on site
- Many places, long distance walks
- Reporting, Feedback, Status complicated at maintenance office, no work-flow

OPTIMISATIONS

- Directe paths m-m
- Documents mobil available
- Real time information
- Time & travel savings

Mobile Maintenance



SUMMARY

- ROI of 4,3 months
- about 190.000 € saving in Scharnhausen and Rohrbach in the first year
- High worker's acceptance of the solution
- Further positive effect: Machine linkage leads to higher availability of production

BUSINESS CASE

- 10 Mins Time saving per notification resp. maintenance
- Year 2014: about 19.000 incidents, 2.000 maintenances
- Leads to time saving of about 3.500 hours for person (two man years) & machine
- According to labor costs & machine hour rates this results in a saving of

+ 295.000 € *

* Without positive effects of machine linkage

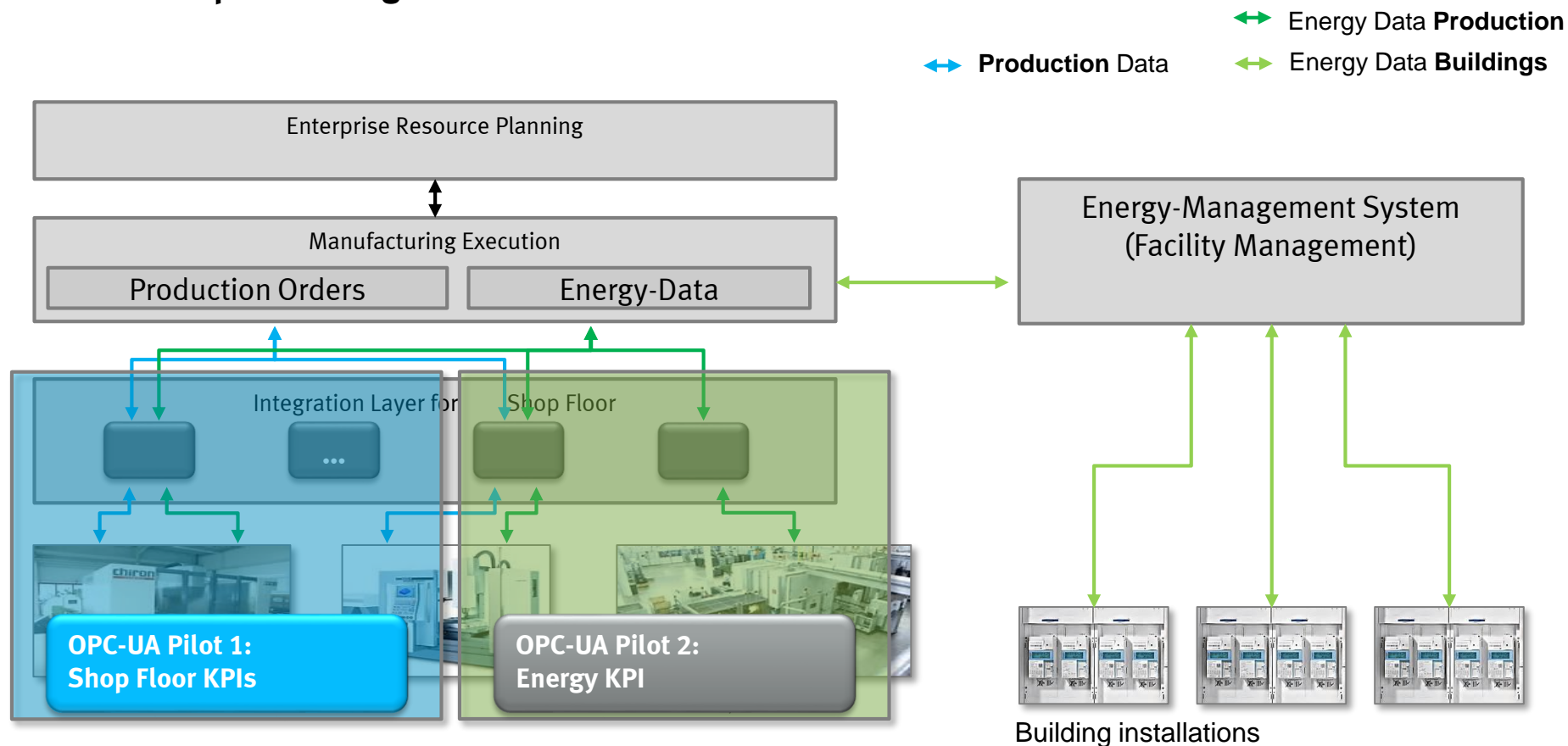
- iPads: 46 devices, total 23.400 €
- Cases: 3.500 €
- Licenses: 79.000 €
- Total Invest:

**+ ca. 190.000 €
p. a.**

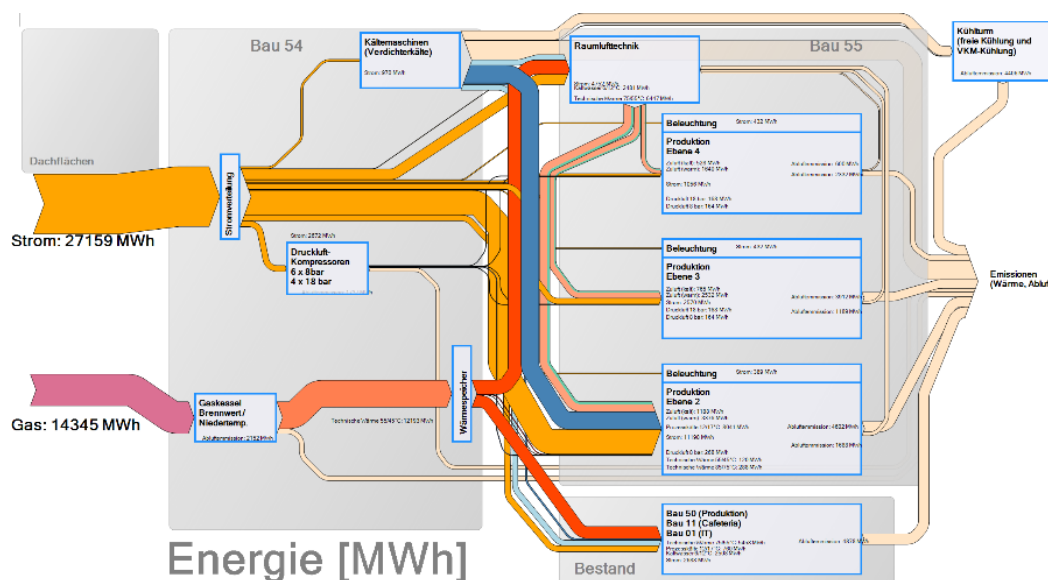
- 105.900 €

Infrastruttura dati per KPI di produzione e KPI energetici

Gestione dei picchi energetici



Strategia energetica



1. Bottle-neck optimized work flow

(a chain is only as strong as its weakest part)

- adjust machine performance according to bottle neck situation
- Avoid buffer stocks, one-piece-flow
- Reduce waste of energy

2. Energy Peak management

- Avoid energy peaks
- start critical machines at different times
- reduces energy (electricity) bill by 1/3

3. Utilise available energy sources better

- pre-heat galvanic baths are by “waste” energy of other machines/compressors
- optimize these sequences in general, and daily depending on work-load

Risultati Ottenuti 2016/2017

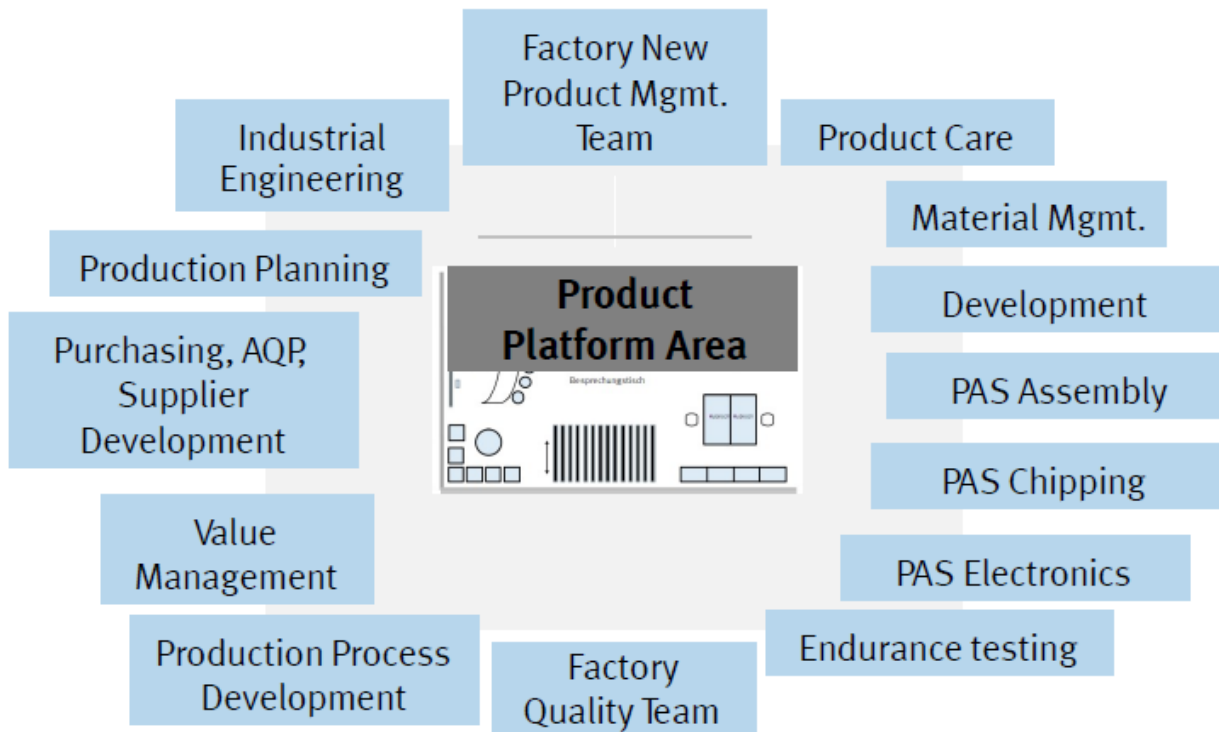
1 GW
less energy

100.000 €
venting and
light intensity

80.000 €
lower pressure

Platform space concept

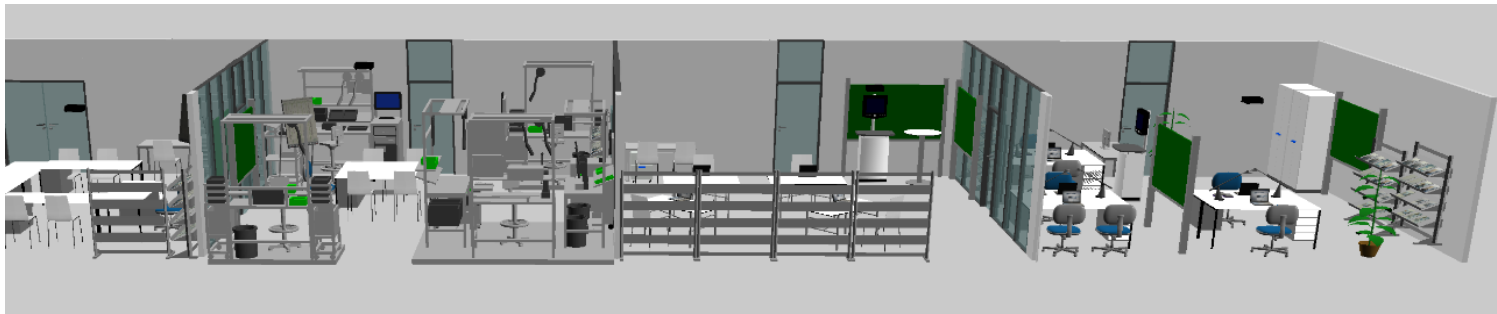
Favorire l'interazione e la collaborazione tra le funzioni



PAS [PSP] = Production Start-up Phase
AQP = Advance Quality Planning



La nostra Learning Factory



220 m²

Room 1 Chip removal

CNC-programming

Deburring

SPC-measuring

Seminar area

Room 2 Assembly

Valve assembly

Testing

FVP

Quality

Room 3 Technology, Processes, Products

Automation

Energy efficiency

Elektronics

Product training

Room 4 Media-Center PC-Station

Office

Trainings-
equipment

PC-Stations

**Attività
operative
selezionate**



**Training
Package
dedicati**

Cyber Physical Factory per la formazione

Virtual emulation:
this will enable automatic
start-up and reconfiguration.

Plug and produce components:
facilitate the exchange of
defective production units and the
reuse of individual units for new

"I am finished."

"I continue on to station 2."

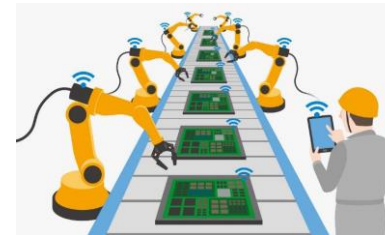
Condition Monitoring:
the filter reports a
contamination level of
95%



Players 4.0 - Benefits



Acceptance for change



IL 4.0 nell'industria
Modul 1

Sperimentare e approfondire
Modul 2

Come posso contribuire?
Modul 3

