

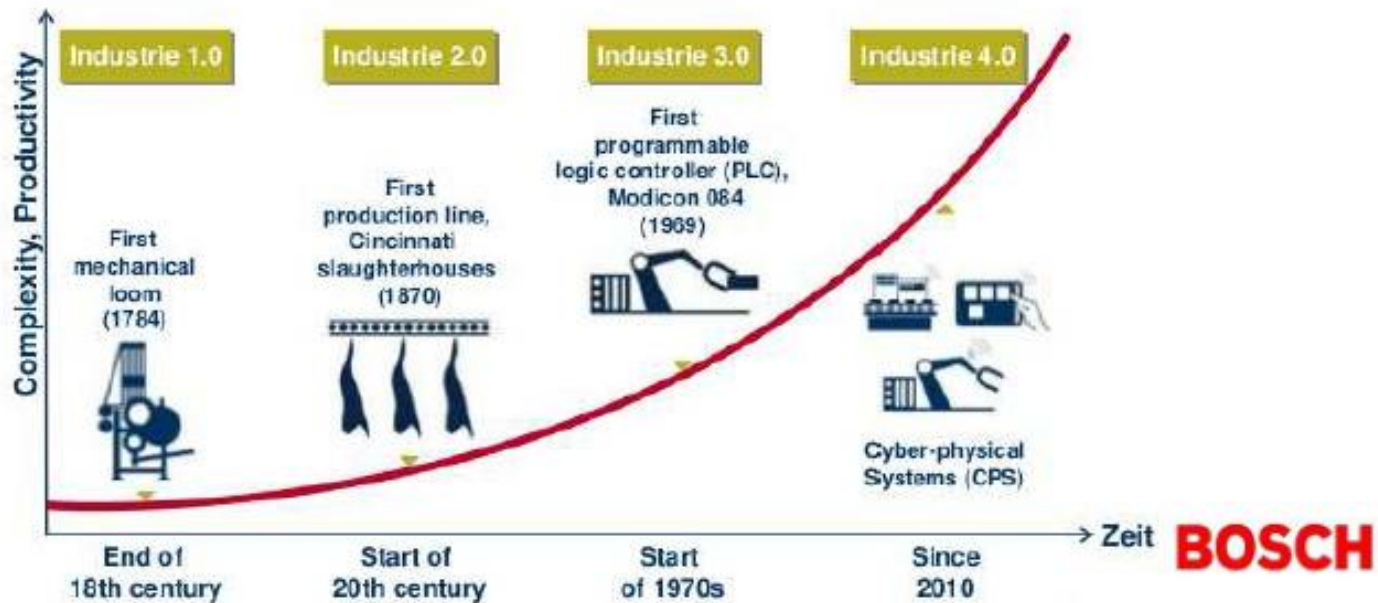
**ROBOT**

*..... i nostri surrogati ?*



# Industry 4.0

- Robots as key components in the manufacturing of Industry 4.0
- Integration of machinery, warehousing systems and production facilities as Cyber-Physical systems
- Flexibility, cost effectiveness and productivity in smart factories



## 2) ROBOTICA 1

**OGGI IN ITALIA VI SONO 50.000 ROBOT  
IL MERCATO E' DI 5.000 /anno  
NEL 2020 SARANNO 70.000  
GRAN PARTE "TRADIZIONALI"  
MA GIA' OGGI VI SONO ROBOT PENSATI PER**

- LAVORI LEGGERI
- CO-OPERAZIONE CON UOMO
- FORTE SENSORIALIZZAZIONE
- DESTREZZA

**POSSIAMO DIRE 65.000 TRADIZIONALI E 5.000 INNOVATIVI PARI >> 10%**

**VEDIAMOLI**



*Henri Salvador*

22 aprile 2015

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## Collaborative robotics

- Humans and robots collaborating at the same task
- Increase productivity
- Particularly interesting for SMEs
- Assist the aging workforce



Source: KUKA





## Service robots for professional use

### Medical systems

- Diagnostic systems
- Robot assisted surgery or therapy
- Rehabilitation systems



Source: Cyberdyne



Source: AlterG

### Field robots

- Milking robots
- Farming and livestock breeding systems



Source: Lely

### Logistic systems

- AGVs
- Both for industrial and non-industrial sectors



Source: Blubotics

# Collaborative operations

❖ Safety-rated monitored stop



Source: ABB

❖ Hand-guiding



Source: ABB



Source: ABB



Source: KUKA

❖ Speed and separation monitoring



Source: ABB

❖ Power and force limiting by inherent design or control



Source: ABB



Source: KUKA



Source: Universal Robot

## Easy-to-use robots

- New programming interfaces
- Decrease of the deployment time
- High potential for SMEs



Source: Universal Robots



## Mobile robot manipulators

- Unlimited workspace
- Support human-robot interaction
- Support flexible manufacturing



Source: KUKA



## Service robots for personal/domestic use

### Main categories

- Vacuum and floor cleaning
- Lawn-mowing robots
- Entertainment and leisure robots



Source: Thymio



Source: Vorwerk

*... ecco da chi potremmo correre il rischio di essere sostituiti !!!*



## Service robotics



Source: Aldebaran