Robotics and Industry 4.0 - discourse, development and consequences

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18,000
Industrial robots bought in Germany 2013

Change in Human Workers and Robots Since 2009

Top Robotic Countries

- South Korea
- Japan
- Germany
- Sweden
- Italy
- Denmark
- Belgium
- USA
- Spain

Sales of Industrial Robots in the Largest Markets

One highly automated production Germany 2015

Robots * 1,000
Humans * 1,000

Orcutt 2014: Robots Rising, MIT Technology Review
Robots run 35,000h with overall costs from 100,000 to 200,000 EUR (maintenance included). With thus costs of 5 EUR per hour repetitive routine work could be substituted and the German demographic problem somewhat solved.

Interview with Director of Human Ressources Volkswagen

“Blended workforce: A labour force involving close collaboration between humans and intelligent machines in the form of augmentation. Examples include humans collaborating with robots on factory floors or augmented reality applications to assist technicians in complex repair tasks.”

“Shift towards an integrated digital and human workforce”
“Digital information and computerized manufacturing technology allows for easy, exact replication of manufacturing processes. With the explosion of digitization, literally everything can be identical. Manufacturing facilities can be relocated to emerging or developed nations as needed, allowing manufacturers to disaggregate supply chains.”

47% of the US workforce face a high risk of job loss by Big Data, Robotics, Intelligent Algorithms…

Automation always aims to substitute human labour
But it is always a societal decision not technical determinism.

After 50 years of robotics limits still are:
Coping with imponderabilities.
Flexibility and ability to adapt.
Variability of behaviour.
Tacit skills and body intelligence.
This is where humans come in

core competencies
routine tasks
creativity experience intuition

Qualitative
Use value of human labour
No commodity

Quantitative
Exchange value of human labour
Commodity

labour power
labouring capacity

= Arbeitsvermögen
(Pfeiffer 2004)

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