

# WORK 4.0: MEGATRENDS DIGITAL WORK OF THE FUTURE – 25 THESES

Results of a project carried out by Shareground  
and St. Gallen University

August 2015

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# THE DAWN OF A NEW ERA

Digitalization is having a dramatic effect on the way we work.

Machines are replacing humans.

Customers cooperate with computers.

Companies are being dissolved.

Employees refuse to accept hierarchies.

HR needs to act.



**THE "WORK 4.0" STUDY HAS QUESTIONED EXPERTS  
WORLDWIDE ABOUT MEGATRENDS IN DIGITAL WORK**



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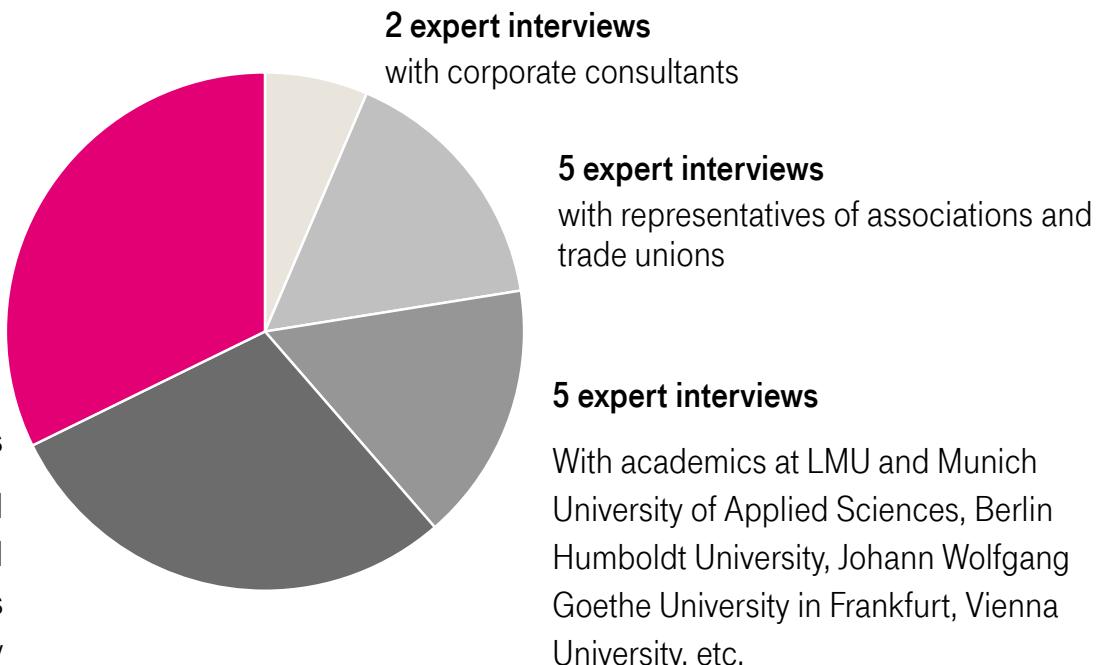
# OUR APPROACH

Academics at St. Gallen University and a Shareground team have conducted 60 expert interviews (of which 31 were detailed, structured interviews), on the basis of which 5 megatrends for Work 4.0 were formulated.

## 31 structured interviews

10 expert interviews  
with top managers in the  
telecommunications and ICT sectors

9 expert interviews  
at MIT, the Berkman Center of Harvard  
University, Berkeley and Stanford  
universities, as well as with employees  
in Silicon Valley

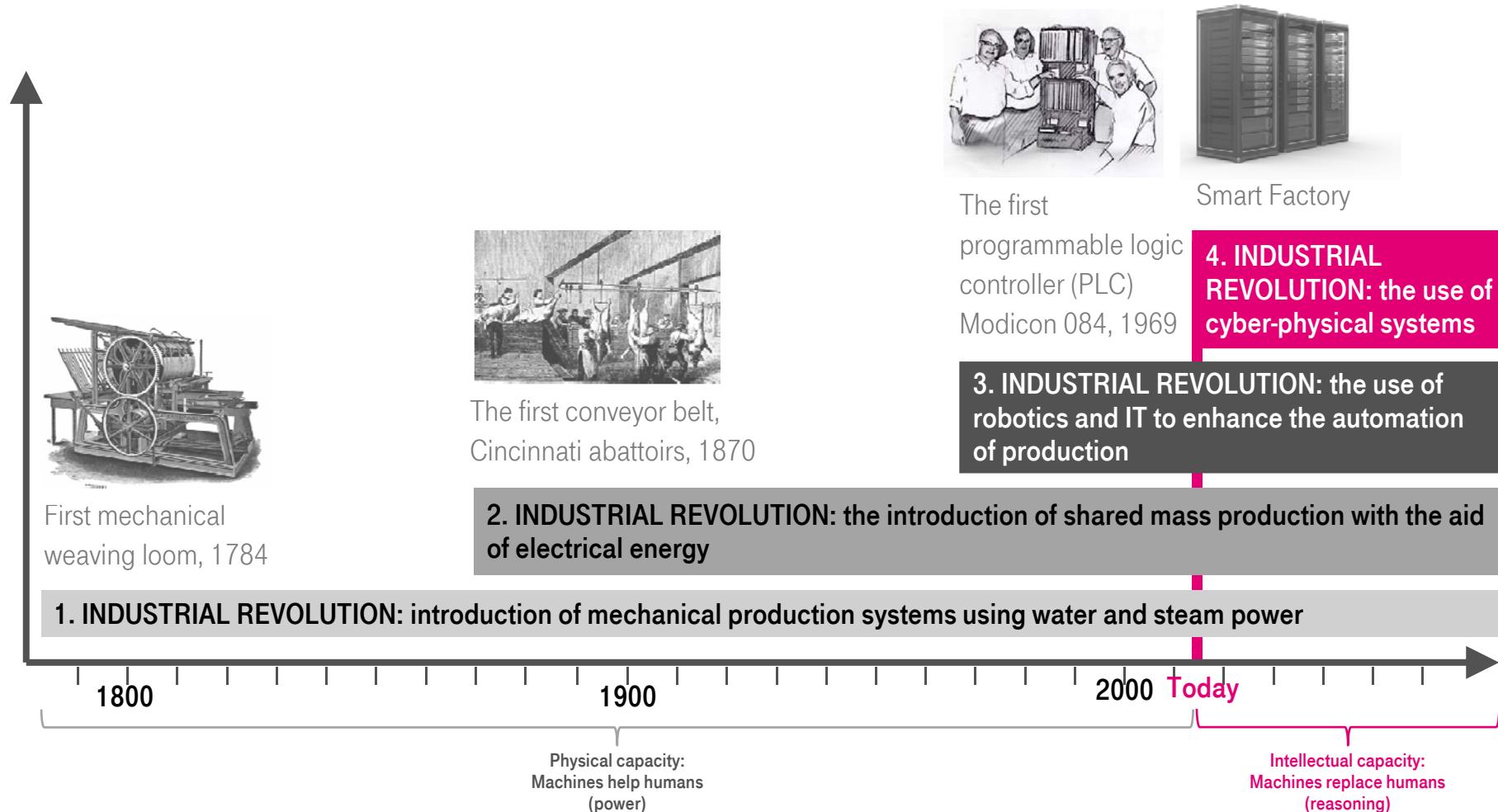


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# **INTRODUCTION**

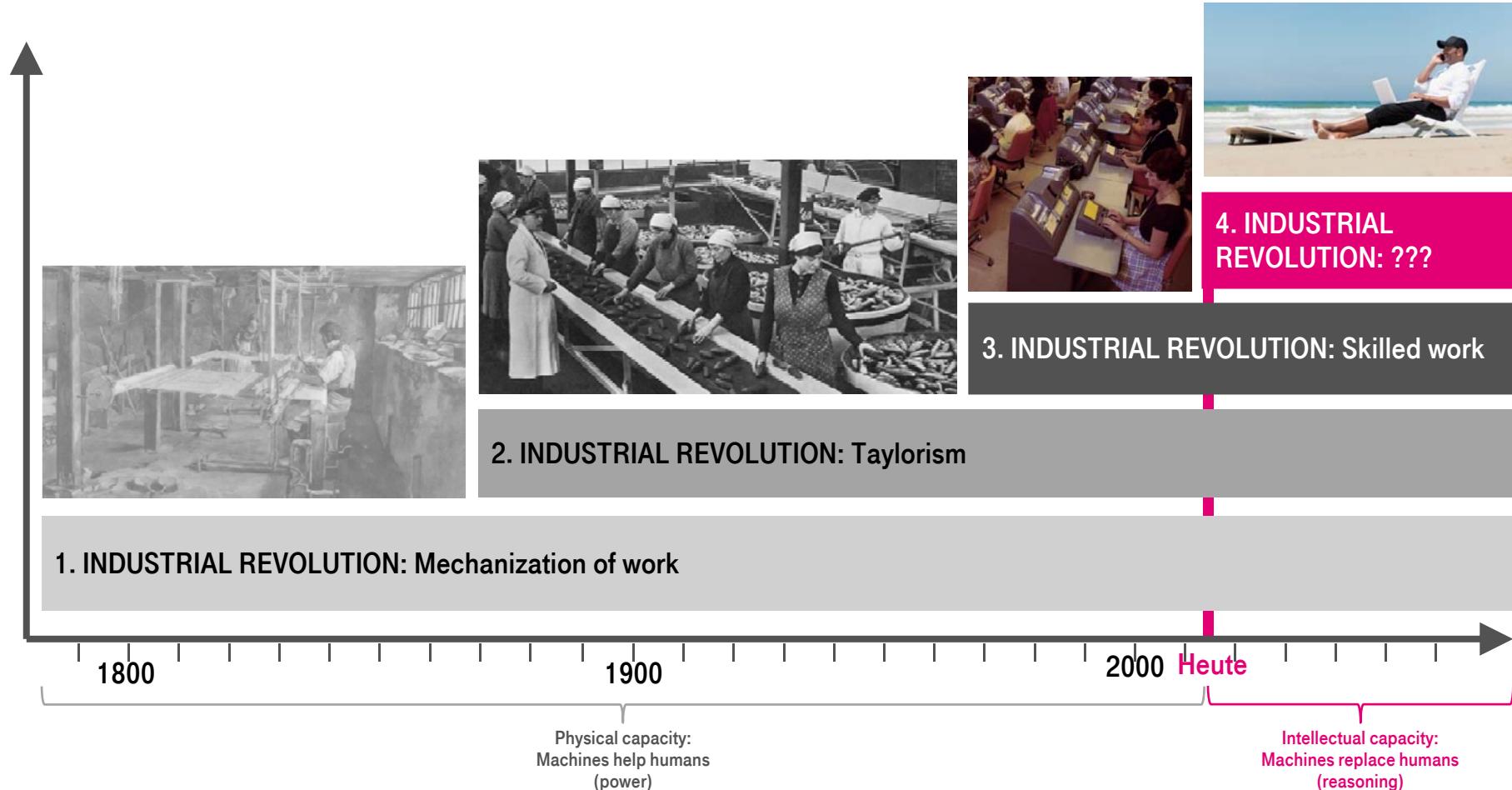
## FROM THE 1. TO THE 4. INDUSTRIAL REVOLUTIONS

# REVOLUTION INSTEAD OF EVOLUTION: INDUSTRY 4.0 AS A QUANTUM LEAP



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# SUBSTITUTION INSTEAD OF SUBSIDIES: WORK 4.0



# DRIVERS OF CHANGE 1: MACHINES ARE LEARNING TO THINK

## 1. Self-reliant interaction with the physical world

- Development of fine and gross motor skills of robots
- Identification of environment and assured spatial navigation



... Kiva industrial robot



... Atlas, Baxter industrial robots

## 2. Development of ability to comprehend and use speech

- Voice recognition
- Processing of natural language
- Active use of language (both written and spoken)



... voice recognition (e.g. Siri, Microsoft Cortana)



... Forbes Earnings Preview: GameStop  
... automated journalism  
... Wall Street is optimistic about GameStop (GME), which is listed to  
... gain its fourth consecutive win on "Jeopardy," March 19, 2014. Analysis  
... from Narrative Science shows that the market's optimism is justified.

... Robot journalism (e.g. Narrative Science, Automated Insights )

## 3. Ability to solve problems

- Answering unstructured questions
- Rule-based analysis
- Pattern recognition and classification



... self-steering car (Google Car)



... Artificial intelligence IBM Watson (pictured playing 'Jeopardy')

# DRIVERS OF CHANGE 2: INTELLIGENT MACHINES BECOME OMNIPRESENT

17 billion connected devices in 2014  
(MIT Technology Review)



... also 2,4 verbundene Geräte pro Person

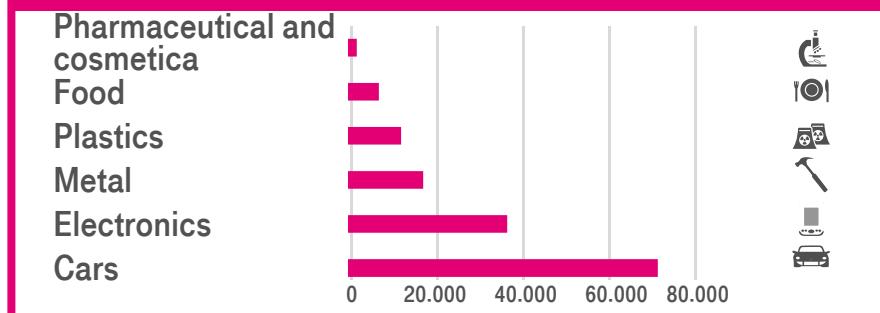
Data volume per minute in 2014  
(Data never sleeps 2.0)

- E-mails sent: 204,000,000
- Google inquiries: 4,000,000
- Information shared via Facebook: 2,460,000
- Photos shared via WhatsApp: 347,222
- Tweets via Twitter: 277,000
- App downloads: 48,000

Industrial robots sold in 2013  
(International Federation of Robotics)

China		37.000
Japan		26.000
North America		24.000
Korea		21.000
Germany		18.000

Worldwide sale of industrial robots by sector in 2013 (International Federation of Robotics)



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# **ARBEIT 4.0 -**

## **25 THESES**

# **THE DISINTEGRATION OF THE ORGANIZATION**



## 1. FLUID INSTEAD OF RIGID

The modern work environment is characterized by networks. Standardized back-end processes are shared between companies without this being visible to the customers or employees. This creates jobs without a clear organizational allocation and products without a clear origin.



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## 2. PEER-TO-PEER INSTEAD OF HIERARCHY

Highly specialized professionals communicate worldwide in special interest communities. Loyalty is no longer based on organizational affiliation, but is only driven by professional expertise. Once these ties have been cut, this kind of organization becomes impossible. Trade unions are already becoming aware of this: dedication to common interests is a selective process today.



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### 3. ASSIGNING INSTEAD OF EMPLOYING

To provide specific services, companies rely less on a workforce permanently attached to the company. The global transparency of skills and the availability of highly qualified staff results in "hiring on demand". The employment relationship becomes a work assignment.



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## 4. SAP INSTEAD OF MCKINSEY

Organizations are increasingly structured on the basis of organograms. Complex IT systems specify standardized processes and organizational forms. It is cheaper to adapt the organization to the software than to individualize the software. Software standardization makes organizational forms more homogeneous.



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## 5. OPEN INSTEAD OF CLOSED

Accelerated demand for transparency and the necessity of co-creation with customers (open innovation) leads to the opening up of previously closed corporate structures. Transitions between inside and outside become fluid, proprietary knowledge, such as patents, lose their value. The ability to scale rapidly and transparently becomes the best way forward. Thus the crowd becomes a part of the value-added chain.



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## 6. PROSUMERS INSTEAD OF PROFESSIONAL PRODUCERS

Companies increasingly rely on customers instead of employees. Many (digitalizable) services are provided without charge by enthusiastic volunteers. Prosumerism blurs the boundaries between producers and consumers. Voluntary digital work replaces professional employment.



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# **WORK IN THE DIGITAL NETWORK ECONOMY**

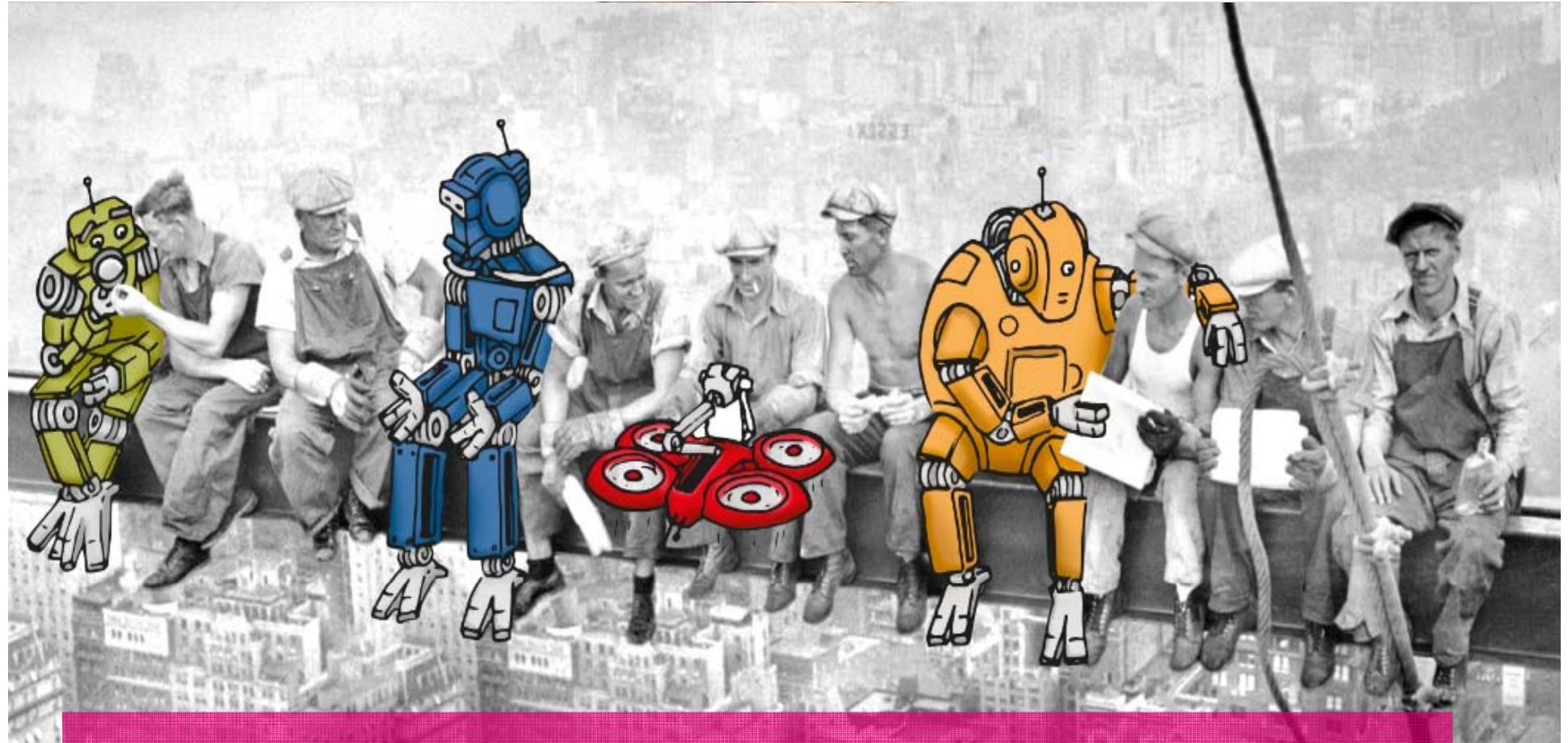


## 7. FROM EXECUTION TO MONITORING

The role of humans in the production process is changing; they are becoming machine supervisors rather than active providers of labor. Routine processes and physically strenuous activities are now automatically carried out by machines. Humans only monitor and intervene in emergencies.



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## 8. MACHINES AS COLLEAGUES, COOPERATION PARTNERS AND MONITORS

New forms of interaction between man and machine are coming to the fore. Many variants will co-exist in the future. From people who control machines to machines as colleagues to a merger between man and machine or even a complete take-over by machines.



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## 9. CLOUD- AND CROWD-WORKING AS A TRANSITIONAL PHENOMENON

Digital services are divided into ever smaller parts and delegated to "virtual laborers". Big data analyses allow value contributions to be accurately allocated to the various workers. Cloud/click workers provide their services as piecework. Many of these activities are expected to become fully digitalized in the near future.



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## 10. THE DATA READERS

Big data has resulted in sufficient data being available for all areas of life. The ability to combine and interpret these in a meaningful way is one of the key capabilities of digital work and cannot be supplanted. However, working with big data differs from traditional data analysis in that hypotheses are no longer required ("end of theory").



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## 11. WORK WITHOUT LIMITS

Highly qualified specialists work on projects, providing services around the world. Qualifications are globally transparent and comparable. The geographical location of the service provider no longer plays a role. For the first time, work is now as mobile as capital.



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## 12. NO LONGER A DIVISION BETWEEN WORK AND PRIVATE LIFE

Traditional workplaces and working hours are becoming a thing of the past. For workers, this results in the potential to individually organize their work, for example to better combine work and family, but also creates new stress factors ("always on").



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### **13. NON-LINEAR THINKING AS A HUMAN DOMAIN**

The automation of work is finite as there are certain creative activities that, as far as is foreseeable at present, cannot be undertaken by machines. These are mainly specific niche activities. Entrepreneurial skills, creativity and the control of machines are regarded as skills that are difficult to replace.



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## 14. REINFORCING PERSONAL SERVICES

In high wage countries, activities involving direct human interactions are more highly valued. The proportion of these jobs is growing. Standardizable and anonymous processes, on the other hand, especially in the ICT field, become subject to offshoring and further efficiency pressure.



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## 15. SELF-MANAGEMENT AS A CORE QUALIFICATION

The flexible and demand-oriented allocation of orders to labor brokers results in the dissolution of traditional employment relationships and processes. Work time is made up of micro-slices of work times spent on various tasks, which the employee combines according to necessity and ability.



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## 16. THE COALESCENCE OF CREATIVE AND PRODUCTIVE WORK

It is becoming increasingly common for the providers of creative or intellectual services to be expected to implement them in concrete form. 3D printers and other tools favor this trend.



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Nick D'Aloisio,  
19-year old  
App Developer &  
Internet Entrepreneur

## 17. WE CHILD PRODIGIES

The ever-increasing importance of IT allows the "nerds" to find their way into the upper echelons of the corporate world. The musical child prodigies of former times have become the precocious app developers and data experts of today. This generation will make a substantial contribution towards disruptive change within corporate cultures. It is not formal qualifications but only technical skills that will determine employability in future.



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## 18. DIGITAL INCLUSION

Remote working, the anonymity of crowd- and click-working employment conditions and the flexibilization of working hours will also bring social groups not available for traditional employment relationships onto the labor market. As has been observed in Berlin, for example, this applies to both start-ups and to click-workers in emerging economies.



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# CHALLENGES FOR BOTH THE ORGANIZATION AND ITS LEADERS



## 19. THE CHALLENGE OF A "LATTE MACCHIATO" WORKPLACE

The workplace of people in flexible employment relationships is extending into the public space. Physical offices are temporary anchor points for human interaction, which are mainly used for networking. Work takes place everywhere - except at a worker's own desk.



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## 20. BREAD AND CIRCUSES

It is when carrying out standardized activities that workers yearn for distractions and rewards. Gamification and the intuitive operation of IT interfaces are becoming increasingly important, turning the work environment into a virtual playing field. Employers are required to integrate gaming design principles into standardized IT applications.



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## 21. JOB-HOPPING AND CHERRY-PICKING AS HR CHALLENGES

The ties between the employer and employee are loosening. Flexible forms of work and cooperation lead to employees always having one foot in the labor market. This makes systematic staff development more difficult. At the same time, expectations and demands with regard to directly usable qualifications are increasing.



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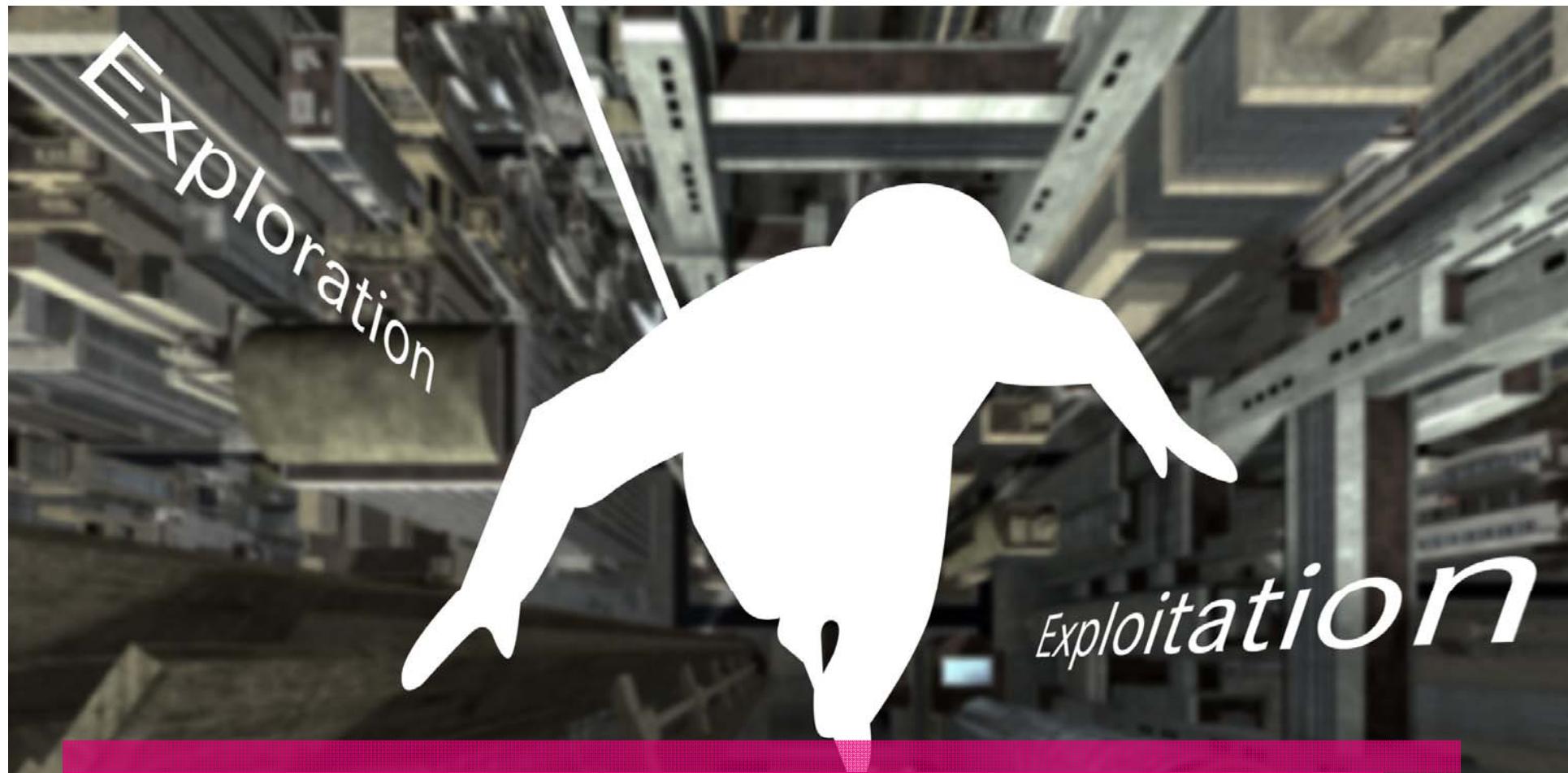


## 22. HANDS-OFF MANAGEMENT

The demise of geographically located workplaces is associated with a change from a presence to a results culture. Managers must learn that they will need to motivate rather than control workers. The skill is to establish personal ties even through impersonal technical channels and to maintain them.



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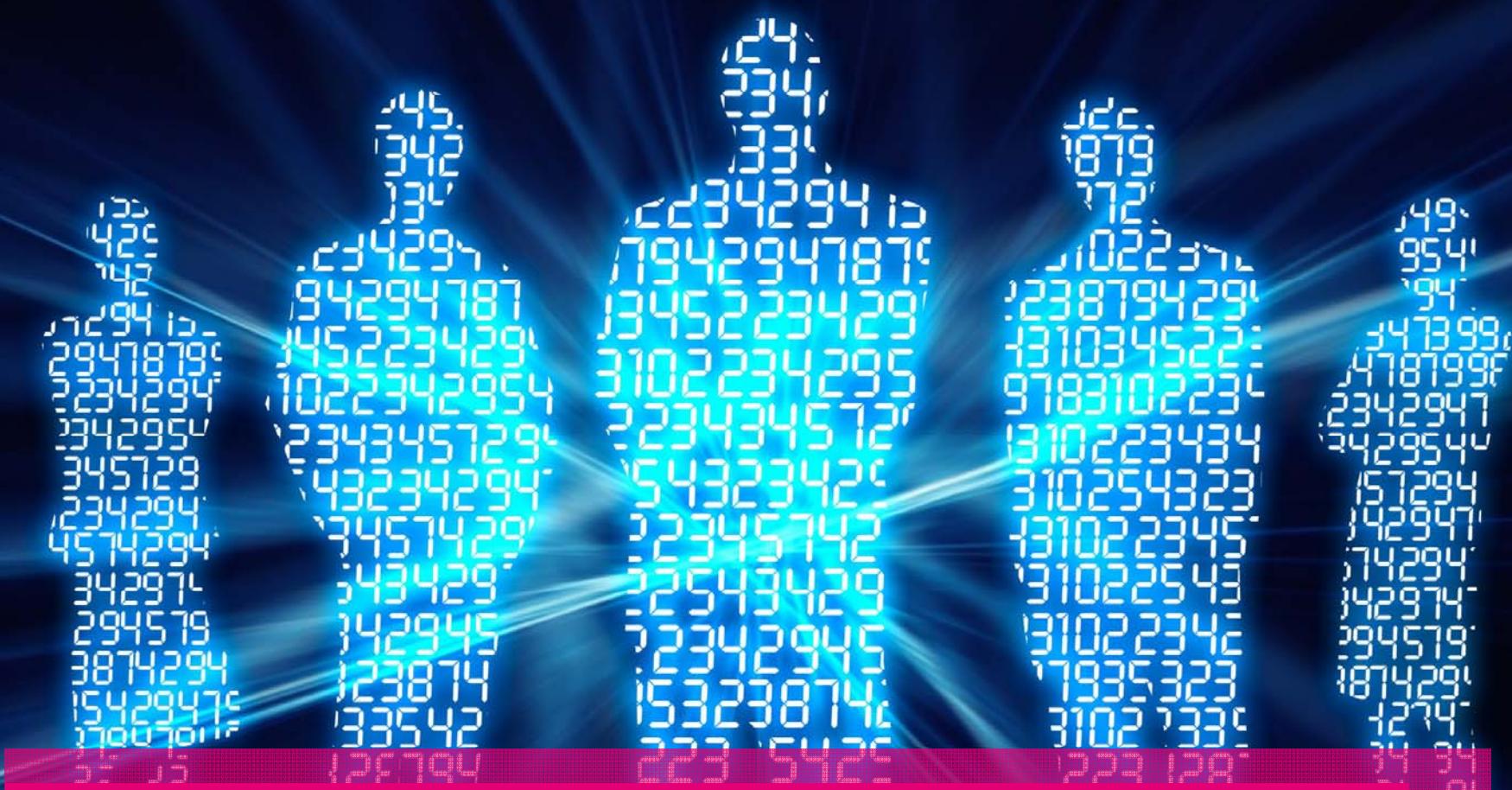


## 23. EXPLORE VS. EXPLOIT

The increasing pace of innovation requires the constant replacement of innovative business areas and the transformation of the existing business models (explore). At the same time, the core business that is still profitable must be pursued as efficiently as possible (exploit). Management thus becomes "two-handed" and operates both in the present and in the future.



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## 24. MATCHING BY MOUSE CLICK

Digital workers are quantified in the form of individual data packages – their skills, experience and capacities. This facilitates the allocation of matching tasks. However, disruptive factors in the data profile can also prevent such matching. Staff selection becomes less intuitive, but also less dependent on cultural matches.



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## 25. GOOD DATA, BAD DATA

Sensors characterize the digital "workplace". Environmental characteristics, processes, work results and the workers are all recorded on an ongoing basis to provide both the employer and the employee with information about the quality of work and potential improvements. Practical benefits must be weighed up against ethical considerations.



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# **CONCLUSIONS FOR HR OF THE FUTURE**

# CONCLUSIONS FOR HUMAN RESOURCES MANAGEMENT 1: TODAY'S REQUIREMENTS



## INNOVATION CULTURE

It is necessary to meet the demand for participation, professionalize knowledge management, use open innovation and encourage entrepreneurship



## FUTURE WORK

Autonomy of place, working hours and time off, a results-based culture, not a presence culture



## MANAGEMENT

Reinforcement of networking and dialog skills, change from control to encouragement



## LABOR POLICY

Autonomy of time and place must be combined with "autonomy of content". Face-to-face encounters and breaks from the digital must be made possible



## ORGANIZATION

Flat network structures, integration of social media. The creation of platforms and communities within and outside the organization



## SKILLS

Focus on creativity, non-linear thinking and entrepreneurship, combined with clear-cut ICT skills

# CONCLUSIONS FOR HUMAN RESOURCES MANAGEMENT 2: FUTURE DESIGNS

