

Data Analytics and Artificial Intelligence (AI) in Business, Society, and Academia: Opportunities and Risks beyond the Technological Hype

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Data Analytics and AI

Not all 'Digital', IT, Robots, or Data Analytics is AI

but:

all AI needs Data (Analytics)

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Data Analytics and AI

AI: Technologies systematically "use" also **unstructured data**

based on algorithms and big data
machines 'can'

- understand
- interpret
- learn
- interact

Turing Test (Alan Turing 1950)

IBM's Watson

Daily produced new data
250.000 Libraries of Congress
90 years of HD Video


AI something with machines & "cognitive"

Mostly (employees/customers)

- Clickstream
- Facebook
- Cell phone
- RFID, beacons
- Real-time
- Wearable
- Cars etc.
- Nature (winds, clouds, animals, plants)

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Long before 'ChatGPT': AI Can Get Tricky!




“ (Malicious) cyber actors may use **synthetic content** to create highly believable messages or engage in sophisticated **social engineering attacks**”

FBI Alert '20

Schick '21

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AI – Towards the End of Reality ?!



Salvador Dali, †1989
Deepfake 2021

Almost impossible to distinguish between authentic versus synthetic information!

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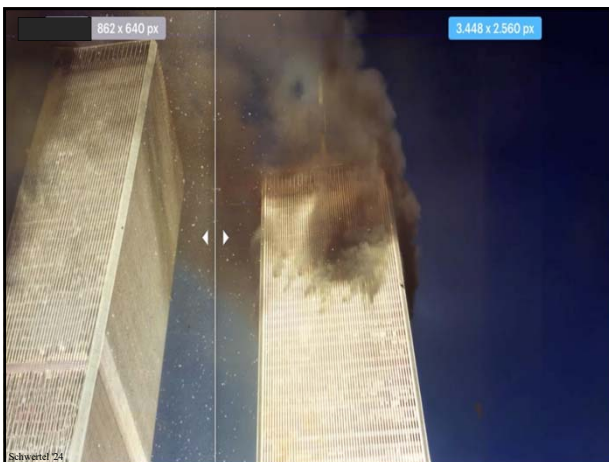
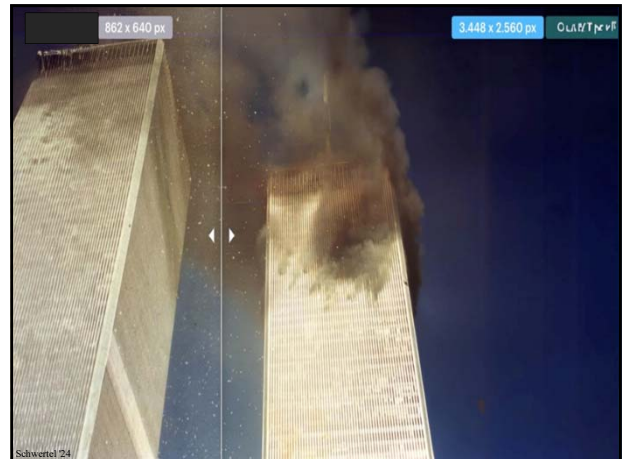
GenAI - New Kid on the Block

- Calculating probabilities for next ...
- Trained with huge (!) data sets
- Dialog-oriented user interface (chatbot)

Chat GPT Text generation - Generative Pre-trained Transformer (language model)

midJourney Image generation (text-to-image)

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Pretty new! *Pretty new!*

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Sora Video generation (text-to-video)

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With SORA - Prompting for New Video

"A movie trailer featuring the adventures of the 30 year old space man wearing a red wool knitted motorcycle helmet, blue sky, salt desert, cinematic style, shot on 35mm film, vivid colors."

OpenAI '24

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With SORA* - Movie Clips

* 02/'24 version

<p>"30 year old man in a gray suit"</p>	<p>"Woman"</p>
<p>"60 year old with white beard"</p>	<p>"Metal industrial robot"</p>

Source: OpenAI '24

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Truly disruptive ... *? Still ?*

Likely **LOWER** quality, but **huge 'market' potential**
 ⇒ turning markets (and academia) upside down

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Humans or Humanity at a Turning Point ?



Schwertel '24

If so, what knowledge or skills to teach / will make the difference ???

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AI and Academia – Some Things Do Not Change –

We know more than we can say !
 Polanyi '74
 Personal Knowledge, University of Chicago Press
 RA to Einstein !

Acquiring knowledge takes **time**
 regardless of technologies
 (Prusak, Presentation, Harvard University Presentation '03)

... and will not change!

Data and (so-called) AI are here to stay!

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AI (and Data Analytics) Leading to a Management Revolution

... overturning existing power structure

HiPPO
 Highest Paid Person's Opinion
 McAfee, Brynjolfsson '12

AI / Big Data
 Apps, Recommending Systems

⇒ **Changing Decision Making**

"Data-driven decision making"
 Brynjolfsson, McAfee '14

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AI (and Data Analytics) Changing Jobs

Role of Technology (in the era of Big Data & AI)

Task	routine	non-routine (ex)
manual		truck driving household
cognitive		medical diagnosis content creation managing others

Boundaries not always obvious !
 (e.g., chess, jeopardy, driving, ...)

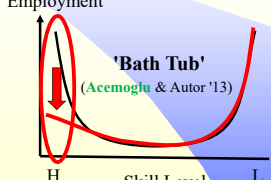
Acemoglu & Autor '13, Autor & Dorn '09, Brynjolfsson, McAfee '14

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AI (and Data Analytics) Changing Jobs

Machines increasingly completing cognitive tasks / **decision making**

Employment



'Bath Tub'
 (Acemoglu & Autor '13)

Daron Acemoglu - Nobel Laureate '24 -

Autor & Dorn '09, Brynjolfsson, McAfee '14

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Data Analytics and AI Innovating Business, Society, and Education

- Empowering individuals & organizations ✓
- Efficiency ✓ & **Destroying economic rent**
- Transparency ⇔ Privacy ⇔ Security ?
- Job Loss ⇔ Job Creation ?

... we see and foresee "it" everywhere, **but not in our own profession !**
It is easier to accept that you face competition than to accept that you to face obsolescence.
 Shirky '08, p. 58

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Future with AI

Risks, yes!
 But also **immense possibilities!**

- Openness / Acceptance
- Willingness to learn
- Critical observation

The biggest risk of AI is not the technology, but the missed opportunity to use it to our advantage.

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Discussion and Takeaways

- Artificial Intelligence and 'Data Analytics' are here to stay – in society and in academia
- Challenging the concept of reality
- Supporting and substituting highly skilled, cognitive jobs
- Revamping society, business models, and education ...





↻ No sector should underestimate the momentum !

BUT ... no Transformation of Society and Academia without (Your) Human Brains !

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So, ...

Let's agree with famous French singer Edith Piaf

... and appreciate AI as a fresh 'Wind of Change'!

then we can – all – lead from a position of strength !

Thanks for your attention (and contribution 😊) !


Questions, Comments, Complaints ?

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Food for Thought

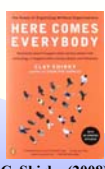
A. Pentland (2014) **Social Physics**



R. Kurzweil (2012) **How to Create a Mind**



C. Shirky (2008) **Here Comes Everybody**



Loebbecke, C., Picot, A. (2015) Reflections on Societal and Business Model Transformation arising from Digitization and Big Data Analytics: A Research Agenda, *Journal of Strategic Information Systems (JSIS)*, 24(3), 149-157.

Markus, M., Loebbecke, C. (2013) Commoditized Digital Processes and Business Community Platforms: New Opportunities and Challenges for Digital Business Strategies, *Management Information Systems Quarterly (MISQ)*, 37(2), 649-653.

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Literature

Acemoglu, D., Autor, D. (2013) Skills, Tasks and Technologies: Implications for Employment and Earnings. In: Card, D., Ashenfelter, O. (Eds.), *Handbook of Labor Economics*, Vol. 4B. Elsevier, Amsterdam, 1043-1171.

Autor, D., Dorn, D. (2009) This Job Is "Getting Old": Measuring Changes in Job Opportunities Using Occupational Age Structure. *American Economic Review*, 99(2), 45-51.

Brynjolfsson, E., McAfee, A. (2014) *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, W. W. Norton, New York, NY, US.

Kurzweil, R. (2012) *How to Create a Mind*, Penguin Group, New York, NY, US.

Loebbecke, C., Picot, A. (2015) Reflections on Societal and Business Model Transformation arising from Digitization and Big Data Analytics: A Research Agenda, *Journal of Strategic Information Systems (JSIS)*, 24(3), 149-157.

Markus, M., Loebbecke, C. (2013) Commoditized Digital Processes and Business Community Platforms: New Opportunities and Challenges for Digital Business Strategies, *Management Information Systems Quarterly (MISQ)*, 37(2), 649-653.

McAfee, A., Brynjolfsson, E. (2012) *Big Data: The Management Revolution*, Harvard Business Review, 90, 60-68.

Pentland, A. (2014) *Social Physics: How Good Ideas Spread – The Lessons from a New Science*, Penguin Press, New York, NY, US.

Schick, N. (2021) *DeepFakes: The Coming Infocalypse*, International Telecommunications Society (ITS), Online Presentation.

Shirky, C. (2008) *Here Comes Everybody: The Power of Organizing without Organizations*, Penguin Press, New York, NY, US.

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