


Societal and Business Model Transformation Arising from Digitization, Big Data Analytics, and Artificial Intelligence (AI)

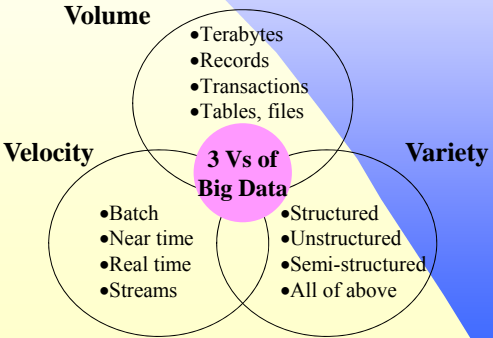
Prof. Dr. Claudia Loebbecke, M.B.A.
Department of Media and Technology Management
University of Cologne, Germany
www.mtm.uni-koeln.de
claudia.loebbecke<at>uni-koeln.de

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne



Digitization and Big (?) Data

- No clear agreement on terminology or concepts (e.g., Chen et al. '12)
- Many sources and types:
Familiar sources, Internet of Things (IoT), internal operations (employees etc.) customer/user behavior
- Lots of Vs : Volume, Velocity, Variety, [Veracity, and ...]



Volume

- Terabytes
- Records
- Transactions
- Tables, files

Velocity


- Batch
- Near time
- Real time
- Streams

Variety

- Structured
- Unstructured
- Semi-structured
- All of above

3 Vs of Big Data

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne



AI & Big Data Analytics

AI: Technologies to systematically "use" also unstructured data

based on algorithms and big data

machines "can"

- understand
- interpret
- learn
- interact

Mostly
 (employees/customers)


- Clickstream
- Facebook
- Cell phone
- RFID co
- Real-time
- Wearables / Sensors
- Cars etc.
- Nature (winds, clouds, animals, plants)

Daily produced new data
250,000 TB

AI
something with
machines
&
"cognitive"

IBM's Watson
 (Alan Turing 1950)

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne




"... in other words ..."

Not all "Digital", IT, Robots, or Big Data Analytics is **AI**

but all AI needs Digitization & Big Data Analytics

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne



Impacts of Digitization, Big Data Analytics and AI


Management /
Decision Making

Business & Society

Research

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

The slide features a background with a diagonal gradient from yellow to blue. Three rounded rectangular boxes are arranged in a descending staircase pattern from top-left to bottom-right. The top box is pink and contains the text 'Management / Decision Making'. The middle box is white with a black border and contains 'Business & Society'. The bottom box is white with a black border and contains 'Research'. The MTM logo is in the top-left corner, and the copyright notice is at the bottom.



**With enough data,
the numbers speak for themselves**
Chris Anderson, Wired


See also
'The Production of Knowledge'
William Starbuck '06

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

The slide features a background with a diagonal gradient from yellow to blue. A large white rounded rectangular box is centered in the upper half, containing a quote in bold black text and the attribution 'Chris Anderson, Wired'. Below this, the text 'See also' is followed by another quote in black text and the attribution 'William Starbuck '06'. The MTM logo is in the top-left corner, and the copyright notice is at the bottom.

mtm **Leading to a Management *Revolution***

... overturning existing power structure

	HiPPO Highest Paid Person's Opinion*
---	---

(today: group talk & HiPPO decision)

➔ **Changing Decision Making**

"Data-driven decision making"

➔ Changing value of domain knowledge

* McAfee, A., Brynjolfsson, E. (2012).

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

mtm **Impacts of Digitization, Big Data Analytics and AI**

Management / Decision Making

Business & Society

Research

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

mtm

Innovating Business & Changing Society

Thousands of examples and opportunities for **Transforming** Business & Society (i.e., from existing to something different)
[... almost analog to the "not so new" IS/IT debates]


Built-in sensors in vehicles

Sports of all sorts and kinds

Built-in sensors in smartphones & wearables

Wine chemistry predictions ++

New Business Models Ideas



Suitable Technology [Sensors, Algorithms, Platforms, **Networks**]

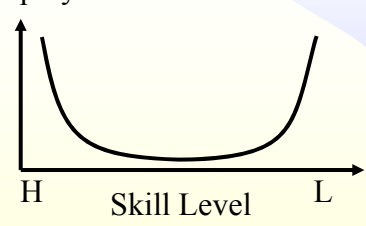
© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

mtm

Challenging Employment (1)

Impact of Technology

Employment



H Skill Level L


Push Education

B
U
T

Task	routine	(ex) non-routine
manual	✓	-truck driving -household
cognitive	✓	-medical diagnosis -legal writing -managing others

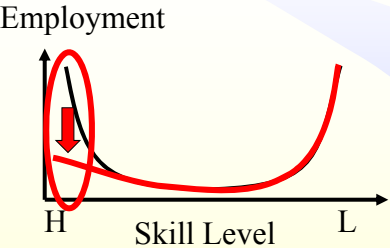
Boundaries not always obvious!
(e.g., chess, driving, game "Go" ...)

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne



Challenging Employment (2)

Employment




Skill Level

"Machines" increasingly completing cognitive tasks / decision making: pattern recognition, complex communication, ...

(Brynjolfsson, McAfee '14; Pentland '14 - and even Kurzweil '12)

Push Education ?!

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne



Innovating Business & Changing Society

- Empowering individuals & organizations, offering *competitive* advantage ✓
- Efficiency ✓ & Destroying economic rent ⚡
- Transparency ⇔ Privacy ⇔ Security ?
- Job Loss ⇔ Job Creation

... in university


- MOOCs
- admin. processes
- cross-institutional research excellence

P.S.: ... we see it everywhere *but* in our own profession

"It is easier to understand that you face competition than obsolescence."

Shirky '08, p. 58

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne



Impacts of Digitization, Big Data Analytics and AI


Management /
Decision Making

Business & Society

Research

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

The slide features a background with a diagonal gradient from yellow to blue. Three rounded rectangular boxes are arranged diagonally from top-left to bottom-right, containing the text 'Management / Decision Making', 'Business & Society', and 'Research'. The 'Research' box is highlighted in pink.



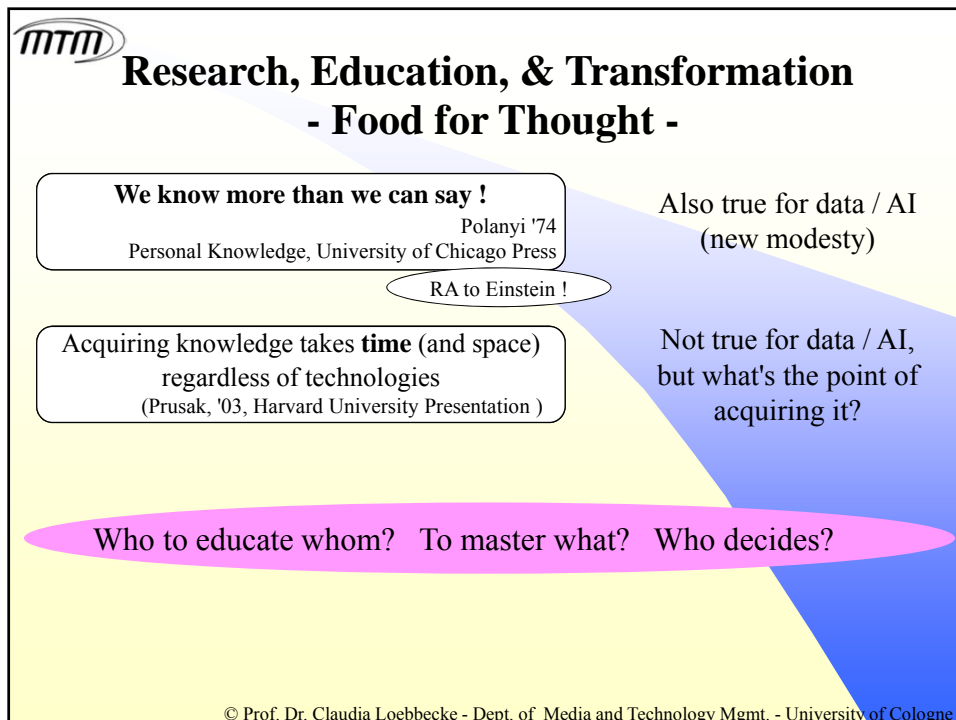
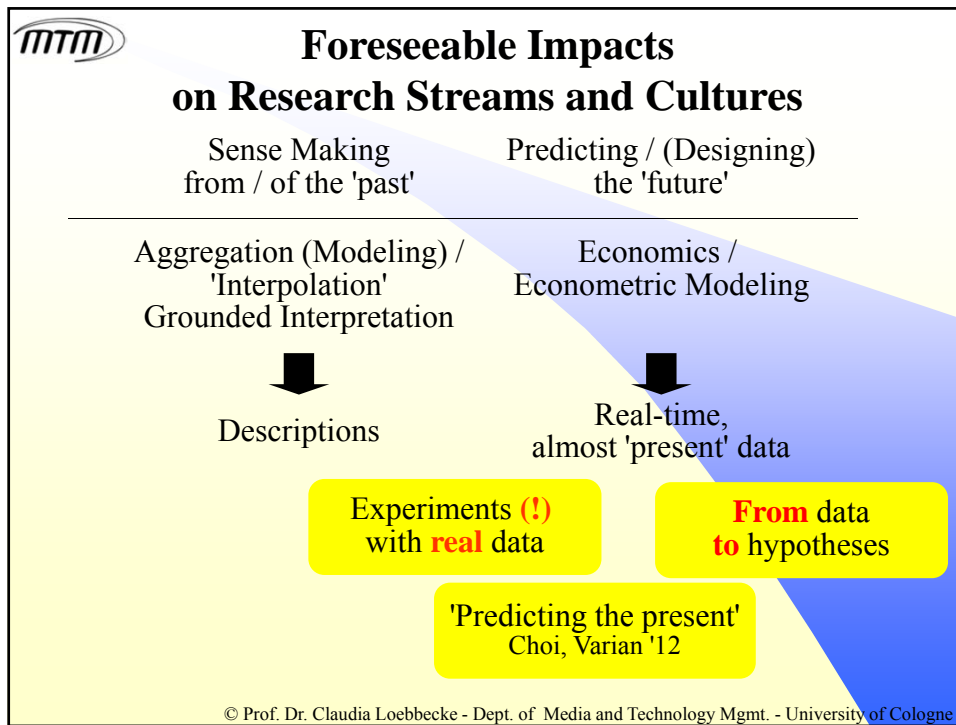
Again ...

**With enough data,
the numbers speak for themselves**
Chris Anderson, Wired

See also
'The Production of Knowledge'
William Starbuck 2006

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

The slide features a background with a diagonal gradient from yellow to blue. The word 'Again ...' is written in a pink, stylized font in the upper right. A rounded rectangular box in the center contains the quote 'With enough data, the numbers speak for themselves' by Chris Anderson from Wired. Below it, the text 'See also' is followed by the title 'The Production of Knowledge' by William Starbuck from 2006.



mtm

Discussion and Takeaways

- AI and Big Data are here to stay - "love them or hate them" !
- Revamping concepts of management and research
- Transforming business and society
thereby supporting *and* substituting highly skilled, cognitive jobs
 - ➡ No sector should underestimate the momentum !

BUT ALSO

No digitization, Big Data Analytics and AI
without human brains !

So, let's be aware, let's be realistic, and then ...
let's **lead from a position of strength** !

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne

mtm

Suggested Readings

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.

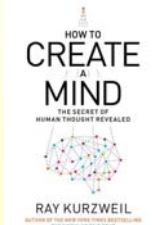
A. Pentland (2014)
Social Physics



E. Brynjolfsson, A. McAfee (2014)
The Second Machine Age



R. Kurzweil (2012)
How to Create a Mind



C. Shirky (2008)
Here Comes Everybody



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.

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne




.... Questions, Comments, Complaints ?

Thank you for your kind attention !

✉ claudia.loebbecke@uni-koeln.de

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne



Readings / References

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.

Brynjolfsson, E., McAfee, A. (2014) *The Second Machine Age*, W.W. Norton & Co., New York, NY, US.

Brynjolfsson, E., Hitt, L., Kim, H. (2011) Strength in Numbers: How does data-driven decision-making affect firm performance?, International Conference on Information Systems (ICIS), Shanghai, China.

Chen, H., Chiang, R., Storey, V. (2012) Business Intelligence and Analytics: From Big Data to Big Impact, *Management Information Systems Quarterly (MISQ)*, 36(4), 1165-1188.

Choi, H., Varian, H. (2012) Predicting the Present with Google Trends, *Economic Record*, 88(S1), 2-9.

Kahneman, D. (2011) *Thinking, fast and slow*, Penguin Group, New York, NY, US.

Kurzweil, R. (2012) *How to Create a Mind. The Secret of Human Thought Revealed*, Viking Adult, New York, US.

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*, The Penguin Press, US.

Shirky, C. (2008) *Here comes everybody: how change happens when people come together*, Penguin Books, London, UK.

Starbuck, W. (2006) *The production of knowledge*, Oxford University Press, New York, NY, US.

© Prof. Dr. Claudia Loebbecke - Dept. of Media and Technology Mgmt. - University of Cologne