

**Big Data Analytics:
Just More or Conceptually Different?**

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Agenda

- Freedom of a Keynote
- Context: 'Big' Data
- Technology Issues
- Impacts of Big Data Analytics
 - Management
 - Business & Society
 - Research
- Further Food for Thought
- Discussion and Takeaways

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Context: 'Big' Data

- No clear agreement on terminology or concepts (e.g., Chen et al. '12)
- Sources and types:
Familiar sources, Internet of things, internal operations (employees etc., customer/user behavior)
 - Clickstream / page views / web transactions
 - Web links / blog references / Facebook
 - Google / Yahoo searches
 - eMail messages
 - Cell phone / GPS/ location data
 - ERP / CRM / SCM / stock market transactions
 - RFID, bar code scanner data
 - Real-time machinery diagnostics
 - Twitter feeds
 - Wearables / Sensors
 - etc.

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- 3+1Vs : Volume, velocity, variety, [... and veracity]

Volume

- Terabytes
- Records
- Transactions
- Tables, files

Velocity

- Batch
- Near time
- Real time
- Streams

Variety

- Structured
- Unstructured
- Semistructured
- All above

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Technology Issues

Big Data Analytics
Allowing for new ways in which companies do business

IF

New Business Models Ideas

Suitable Technology
[Sensors, Algorithms, Platform, Networks]

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Impacts of Big Data Analytics

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

See also
'The Production of Knowledge'
William Starbuck 2006

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Big Data Analytics Leading to a Management Revolution*

***Overturning existing power structure**

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

(today ...: group talk & HiPPO decision)

Big Data
M2M, Apps, recommending systems
(≠ people taking long time to rate / analyze)

⇒ Changing Decision Making

"Data-driven decision making"
Brynjolfsson et al. '11

"Predicting the present"
Choi, Varian '12

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Humans with Two Types of Thought

Good with right experience

Fast

Slow

Good if simple

Process

Fast Parallel Automatic Associative

Slow Serial Controlled Rule-based

'Social Physics'
Pentland '14

Content

Conceptual Representations Past, Present, Future

After: Kahneman '11

Big Data as Mental Prosthesis

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Impacts of Big Data Analytics

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Big Data Analytics: Toward New Business Models & Societal Changes

Endless examples – almost analog to the 'not so new' IS/IT debates

Trucks / cars with built-in sensors

Wine chemistry predictions ++

Sports of all sorts and kinds

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Big Data Impacting Business & Society

- Empowering individuals & organizations / Offering competitive advantage e.g., 'Watson'
- Efficiency e.g., 'Winology'
- Price Decrease, Consumer Surplus
- Transparency ⇔ Privacy ⇔ Security
- Job Loss > Job Creation ? ...

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Big Data Impacting Business & Society

- Job Loss > Job Creation ? e.g., MOOCs

"Sometimes, [...], the professional outlook [...] prevent[s] the very people who have the most at stake - the professionals themselves - from understanding major changes to the structure of their profession. [...] It is easier to understand that you face competition than obsolescence."

Shirky '08, p. 58

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Big Data Analytics and Employment

Employment

e.g., Autor / Dorn '09

"Bath Tub"

High Skill Level Low

BUT

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

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

Push education

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Big Data Analytics and Employment

Going deeper into Role of technology (in the era of Big Data Analytics)

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

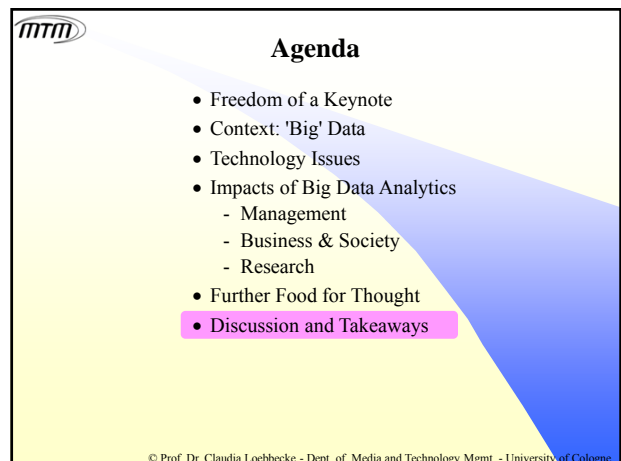
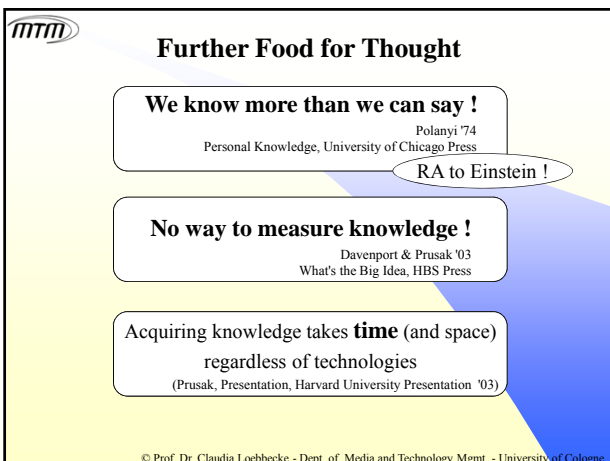
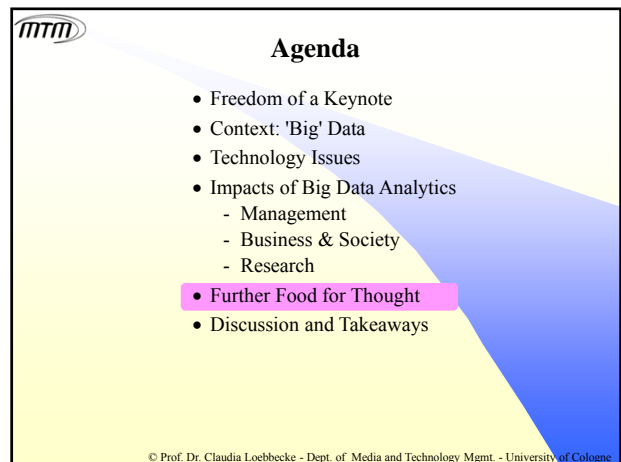
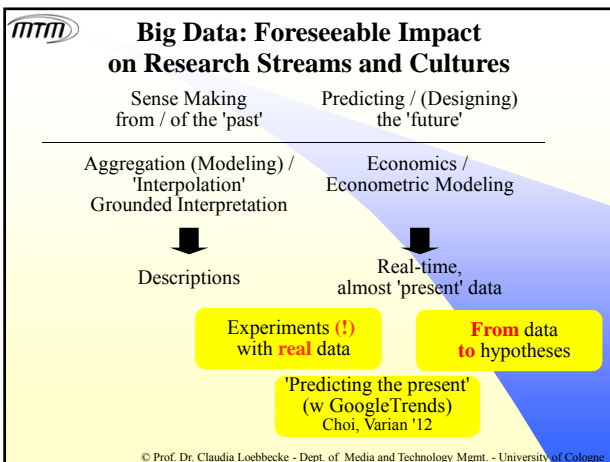
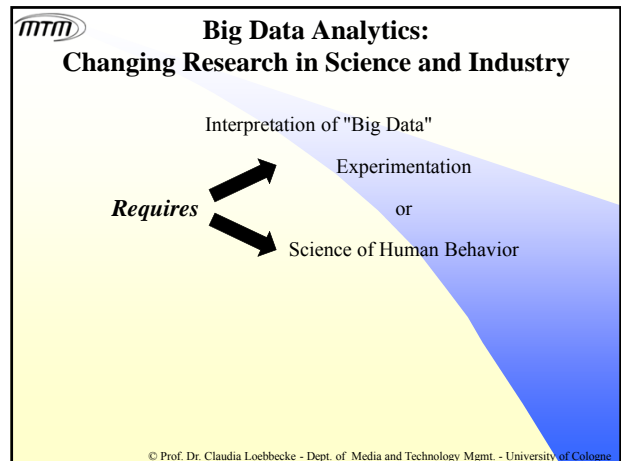
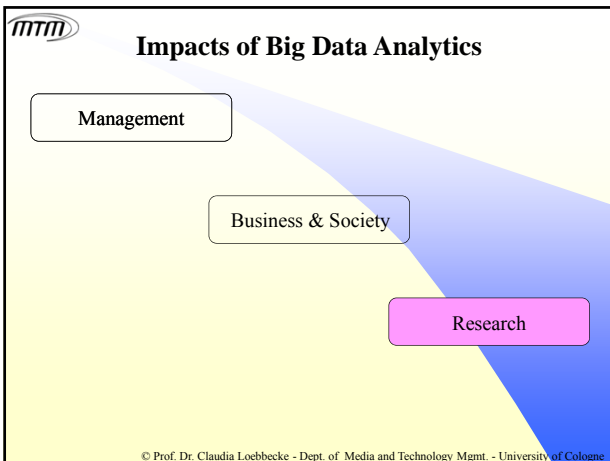
Boundaries not always obvious ! (e.g., chess, jeopardy, driving, ...)

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

Employment

High Skill Level L

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Discussion and Takeaways

Big Data Analytics:
Just More or Conceptually Different?

- ⇒ Leading to management revolution
- ⇒ Substituting (instead of supporting) highly skilled, cognitive jobs
- ⇒ Revamping the concept of 'research'

Once truly implemented:
 Conceptually different

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.... Questions, Comments, Complaints ?

Thanks for your attention !

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