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

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)
  3+1Vs: Volume, velocity, variety, […] and veracity
  - Volume: Terabytes, records, transactions, files
  - Velocity: Batch, near time, real time, streams
  - Variety: Structured, semi-structured, unstructured, all above

Further Food for Thought

- 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.
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

Management
Business & Society
Research

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

See also 'The Production of Knowledge'
William Starbuck 2006

Big Data Analytics
Leading to a Management Revolution*

*Overturning existing power structure

HiPPO
Highest Paid Person's Opinion

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

Changing Decision Making
"Data-driven decision making"
"Predicting the present"

Humans with Two Types of Thought

Good with right experience
Fast Parallel Automatic Associative Conceptual Representations Past, Present, Future After: Kahneman '11

Good if simple
Slow Serial Controlled Rule-based

Big Data as Mental Prosthesis

‘Social Physics’ Pentland '14
Impacts of Big Data Analytics

Business & Society

Management

Research

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

Big Data Impacting Business & Society

- Empowering individuals & organizations / Offering competitive advantage
- Efficiency
- Price Decrease, Consumer Surplus
- Transparency ⇔ Privacy ⇔ Security
- Job Loss > Job Creation ? …

Big Data Impacting Business & Society

- Job Loss > Job Creation ?

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

Big Data Analytics and Employment

Skill Level

Employment

Machines increasingly completing cognitive tasks / decision making:
- pattern recognition, complex communication, …

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

Big Data Analytics and Employment

Machines increasingly completing cognitive tasks / decision making:
- (ex) manual
- non-routine

Task

Employment

High Skill Level

Push education

But

Low Skill Level

Bath Tub

Skill Level

Employment

Machines increasingly completing cognitive tasks / decision making:

(ex)

Routine

Non-routine

Boundaries not always obvious!

(e.g., chess, jeopardy, driving, …)

(cognitive)

Employment

High Skill Level

Manual

Routine

medical diagnosis

Managing others

Legal writing

Household

Routine

Medical diagnosis

Manage household

Medical diagnosis

Legal writing

Managing others

Non-routine

Medical diagnosis

Manage household

Medical diagnosis

Legal writing

Managing others

Employment

High Skill Level

Manual

Routine

medical diagnosis

Managing others

Legal writing

Household

Routine
Impacts of Big Data Analytics

- Management
- Business & Society
- Research

Big Data Analytics:
Changing Research in Science and Industry

Interpretation of “Big Data”

Requires

Experimentation
or
Science of Human Behavior

Big Data: Foreseeable Impact on Research Streams and Cultures

Sense Making from / of the 'past'
Predicting / (Designing) the 'future'

Aggregation (Modeling) / 'Interpolation'
Grounded Interpretation

Descriptions

<table>
<thead>
<tr>
<th>Aggregation (Modeling) / 'Interpolation'</th>
<th>Economics / Econometric Modeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-time, almost 'present' data</td>
<td>From data to hypotheses</td>
</tr>
<tr>
<td>Experiments (?) with real data</td>
<td>&quot;Predicting the present&quot; (w GoogleTrends) Choi, Varian '12</td>
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</tbody>
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Further Food for Thought

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

No way to measure knowledge!
What's the Big Idea, HBS Press

Acquiring knowledge takes time (and space) regardless of technologies

Further Food for Thought

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Discussion and Takeaways
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 …

References / Readings