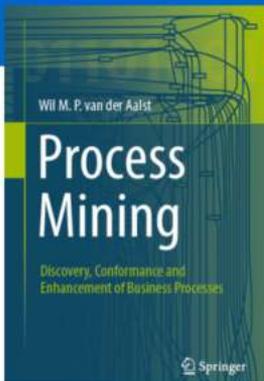


Towards a Process Scientist



prof.dr.ir. Wil van der Aalst
www.processmining.org



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Technische Universiteit
Eindhoven
University of Technology

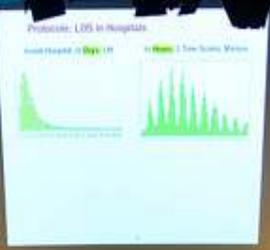
Where innovation starts



DSC/e

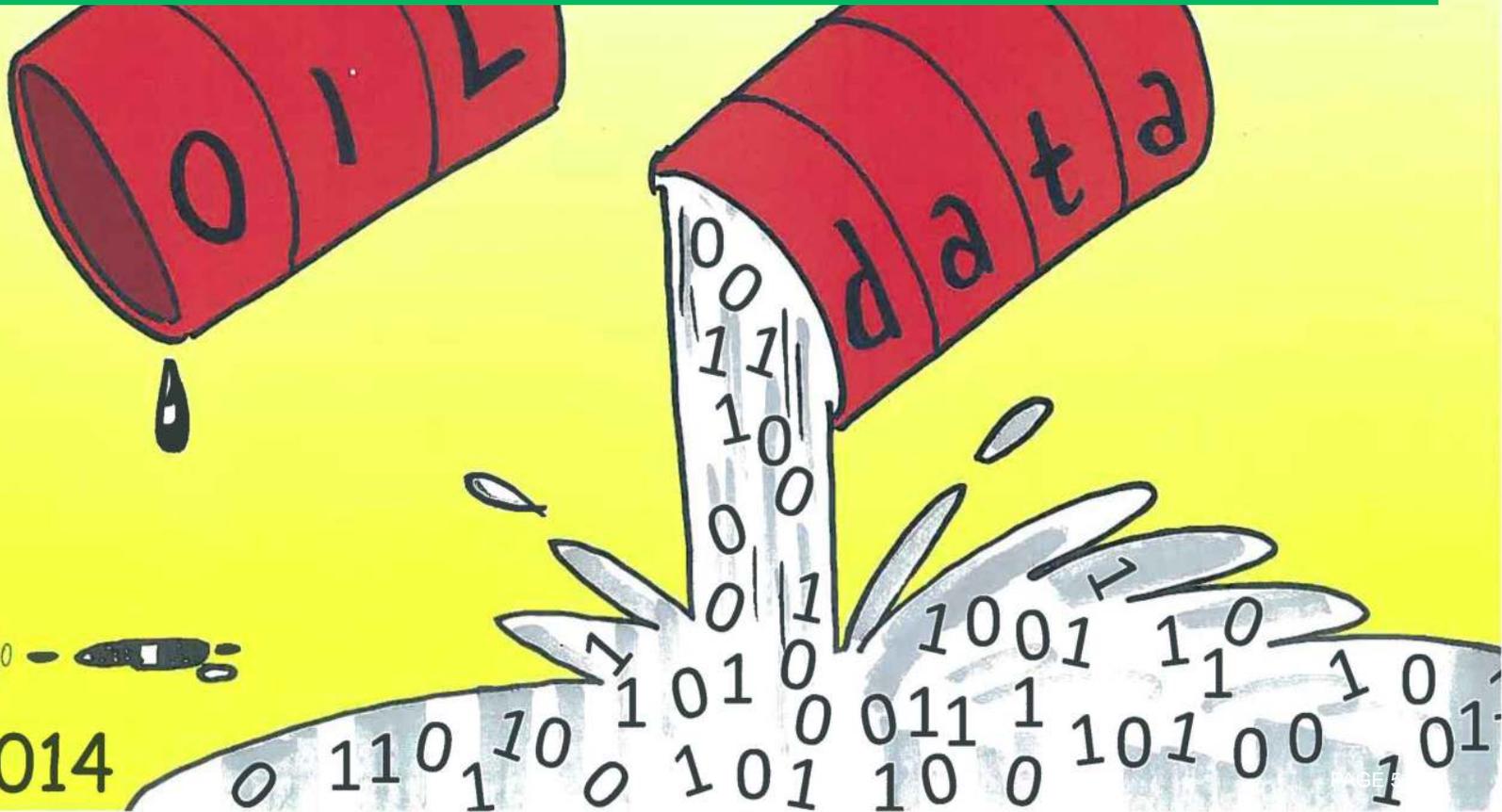


<http://www.tue.nl/dsce/>



21st Century

In the last 10 minutes we generated more data than from prehistoric times until 2003!



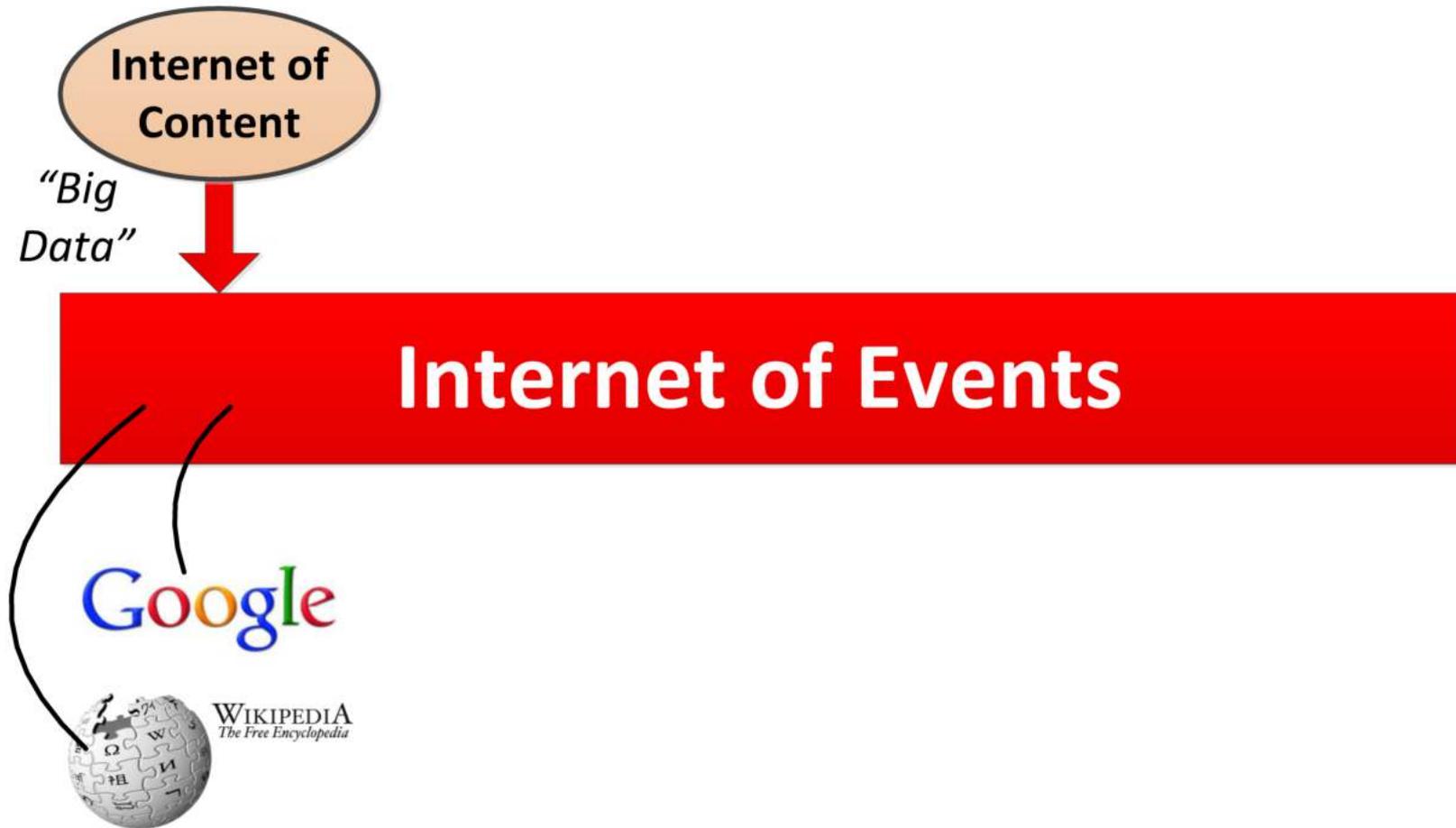
Internet of Events

4 sources of event data

Internet of Events

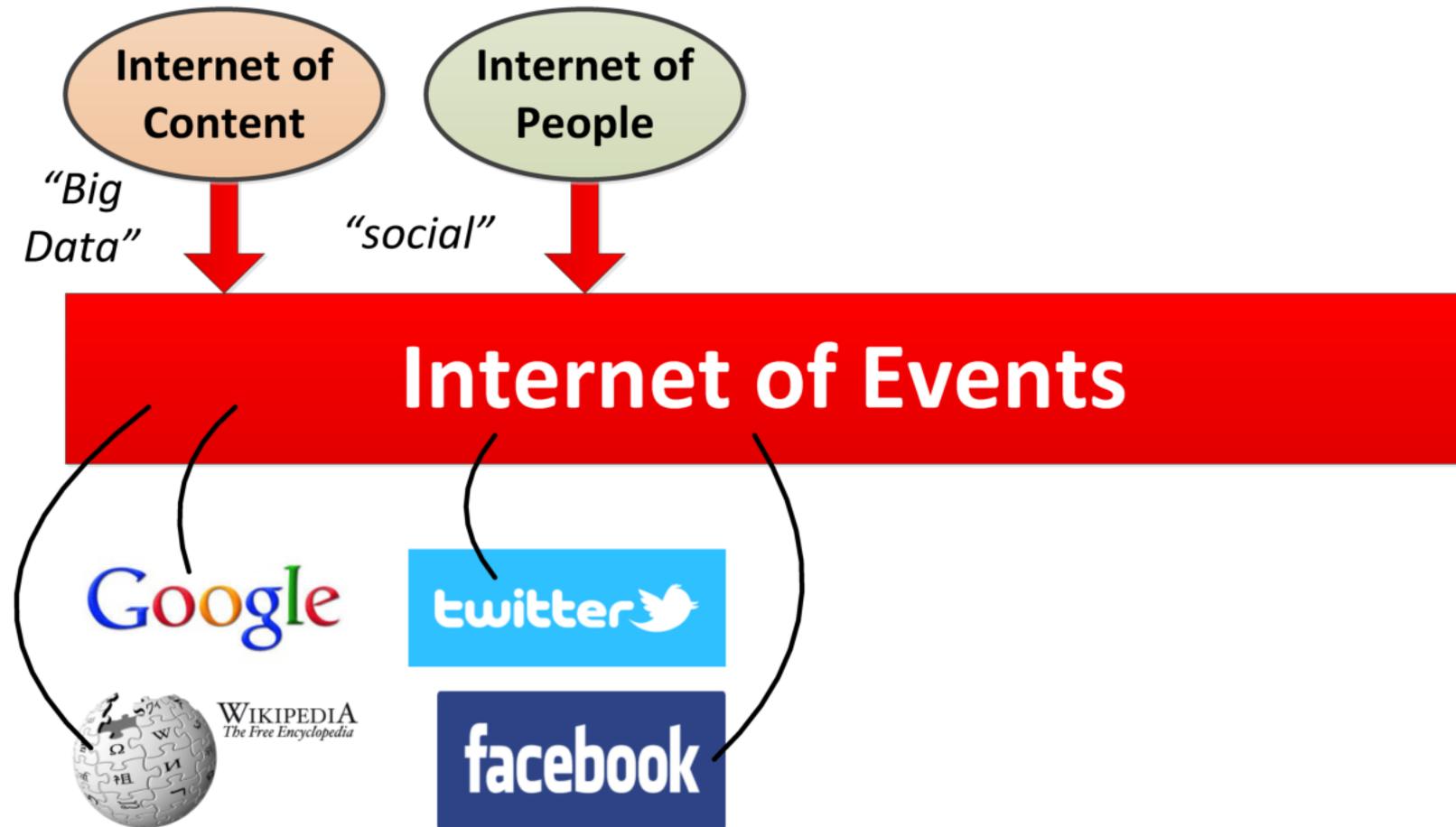
Internet of Events

4 sources of event data



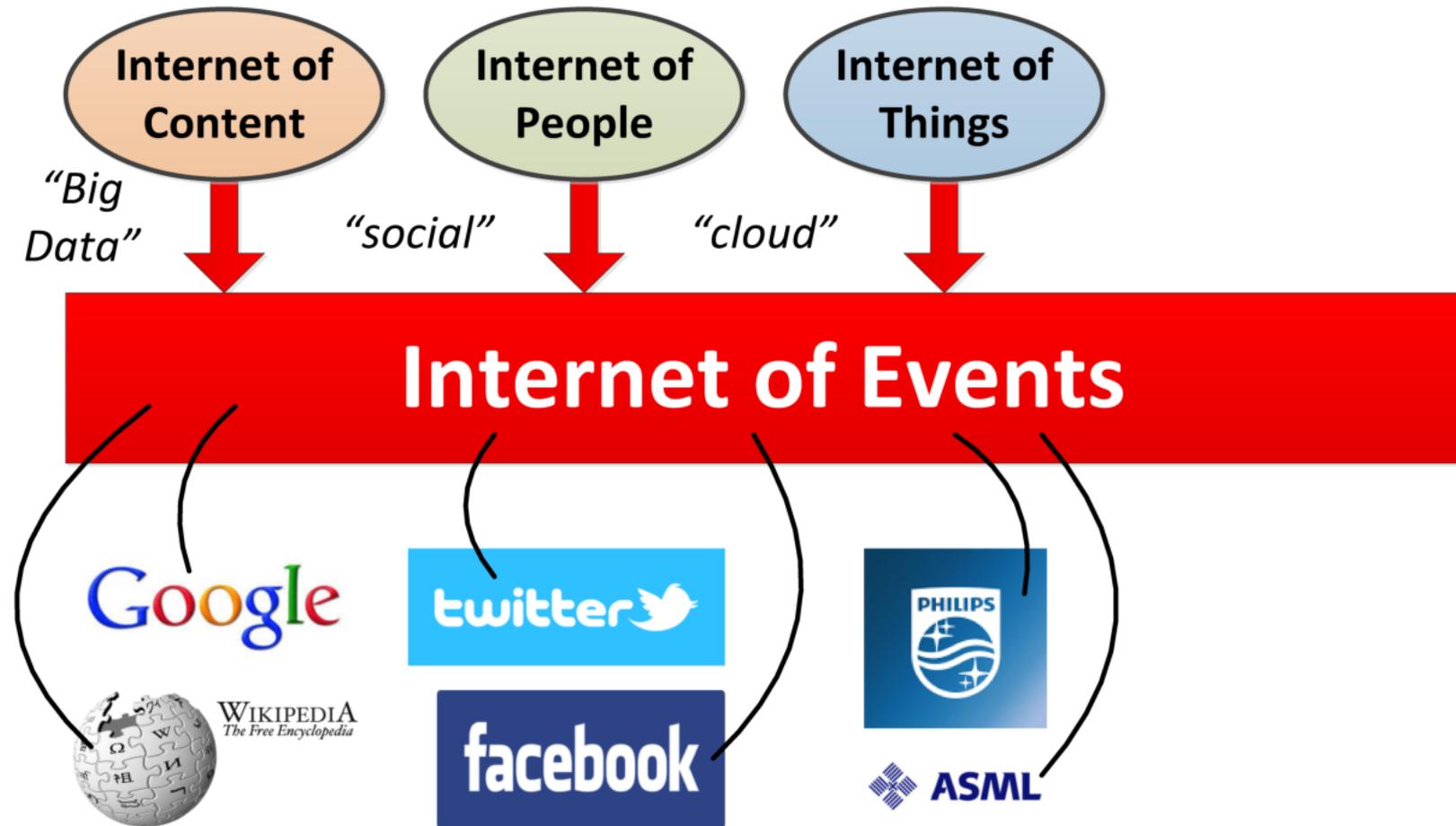
Internet of Events

4 sources of event data



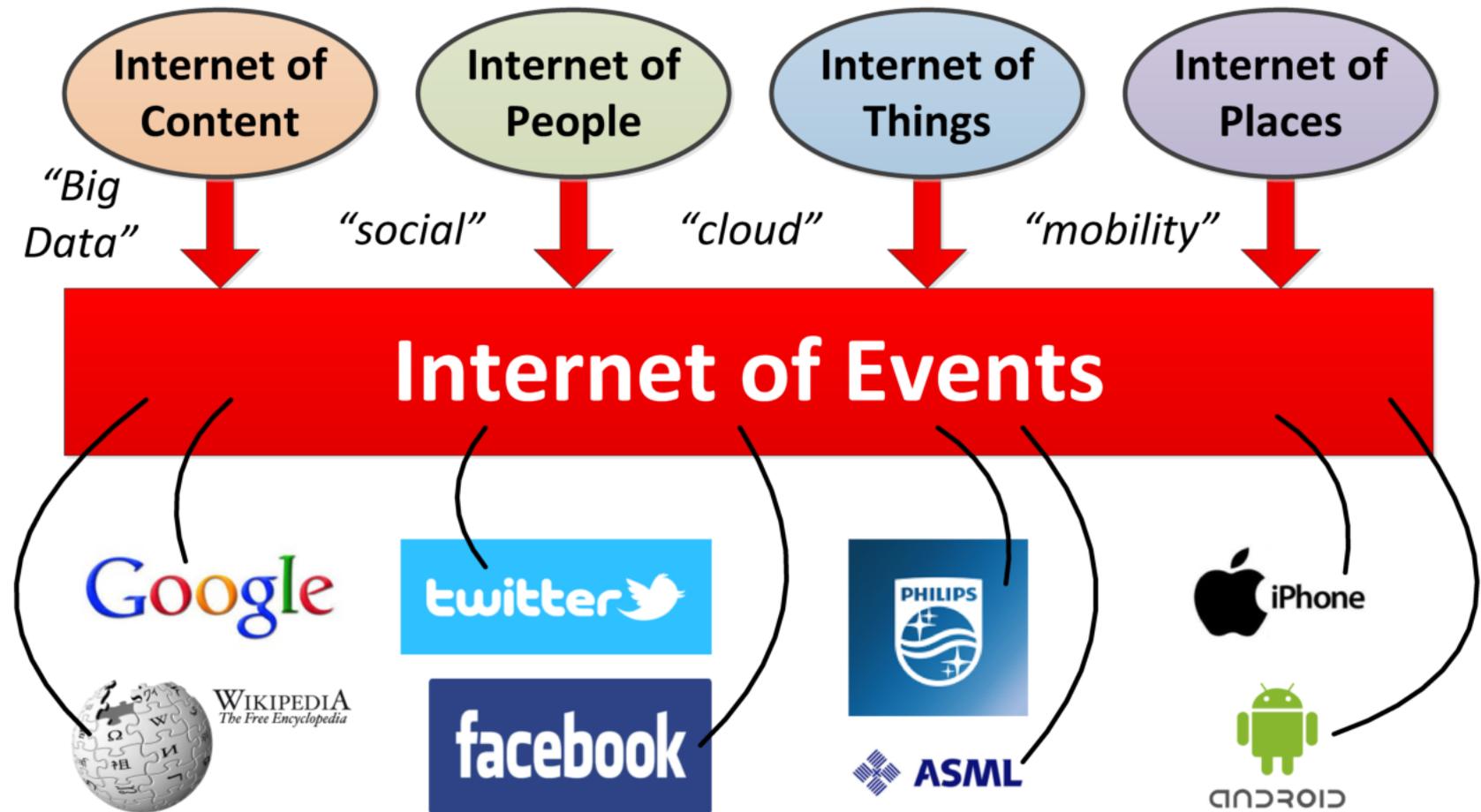
Internet of Events

4 sources of event data



Internet of Events

4 sources of event data



The four V's of Big Data



Data does not have to be "Big" to be challenging!



Need for data scientists!

- Data science aims to collect, analyze, and interpret data from a variety of sources (social interaction, business processes, cyber-physical systems).
- To turn data into actionable information, a comprehensive understanding of the context of the data and the ability to mine and visualize large amounts of data are essential.

generic data science
question 1/4



**What
happened?**

generic data science
question 2/4



**Why did it
happen?**

generic data science
question 3/4



**What will
happen?**

generic data science
question 4/4



**What is the
best that can
happen?**

Why do patients have to wait so long?

Do doctors follow the guidelines?

Can we predict waiting times?

How much staff is needed tomorrow?

How can we reduce costs?



A man in a dark suit and light pink shirt stands with his arms crossed in a hospital room. Behind him is a large, white X-ray machine. The room is lit with a warm, yellow light. The man is looking off to the side with a thoughtful expression. Several speech bubbles containing questions are overlaid on the image.

How are X-ray machines really used?

Can we predict that the machine will break down next week?

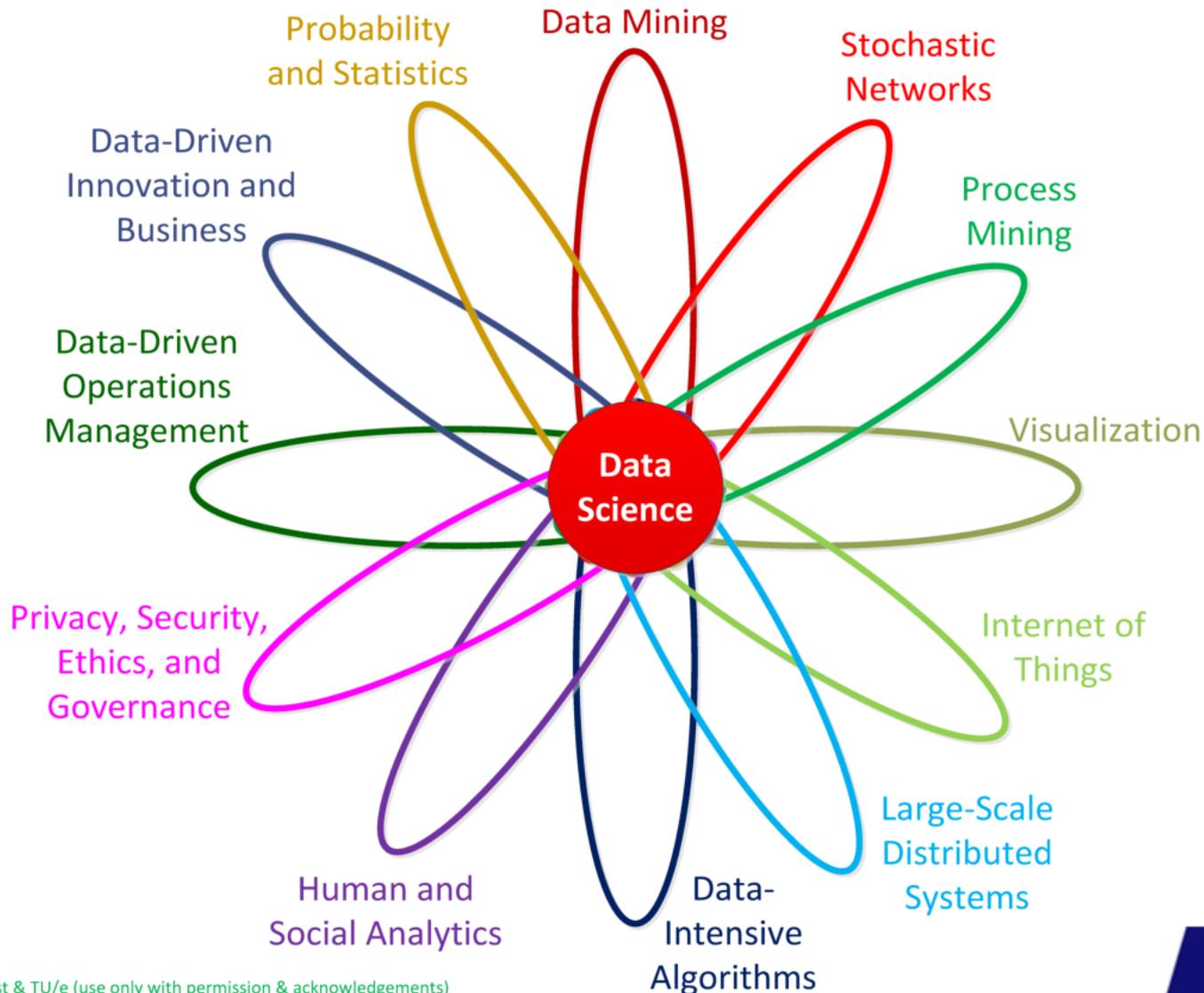
Why and when do X-ray machines malfunction?

Which components should be replaced?

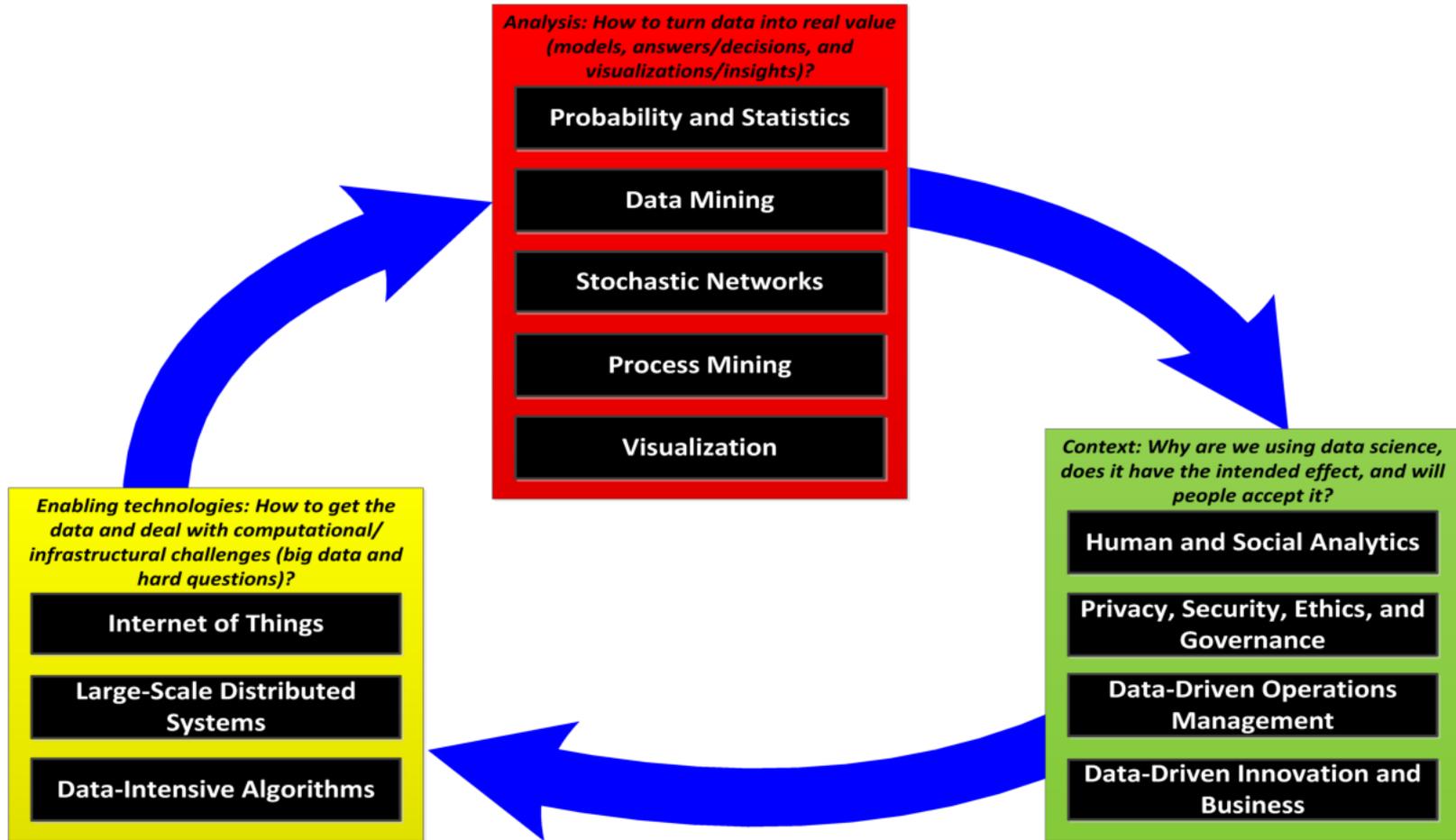
Which parts need to be improved?

**from the organizational level
to the hardware/software level**

Data science skills needed to answer such questions



Other view on DSC/e disciplines



research programs

**[RP1] Process Analytics:
Improving Service While Cutting Costs**

**[RP2] Customer Journey:
Connecting the Dots**

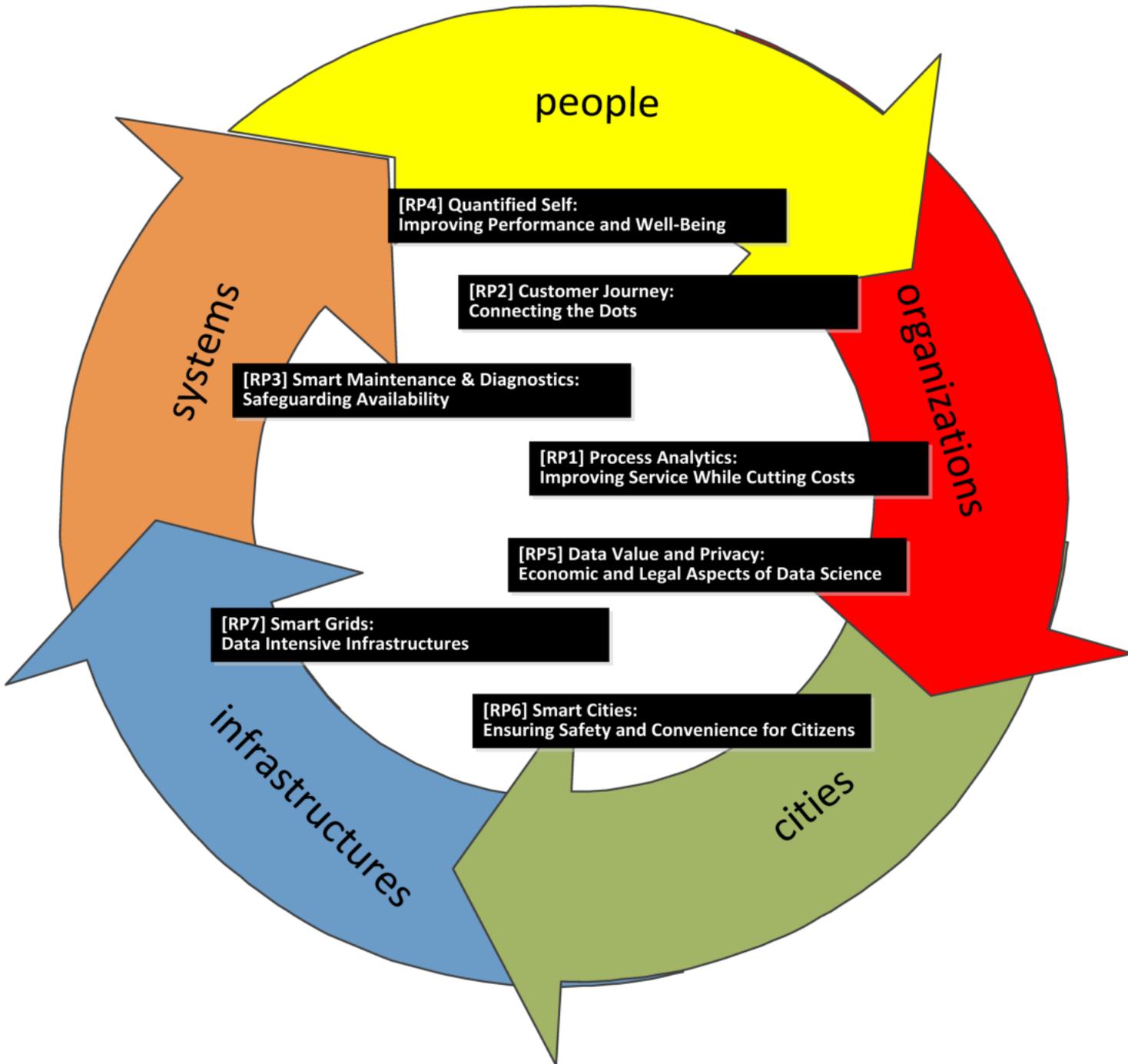
**[RP3] Smart Maintenance & Diagnostics:
Safeguarding Availability**

**[RP4] Quantified Self:
Improving Performance and Well-Being**

**[RP5] Data Value and Privacy:
Economic and Legal Aspects of Data Science**

**[RP6] Smart Cities:
Ensuring Safety and Convenience for Citizens**

**[RP7] Smart Grids:
Data Intensive Infrastructures**



people

[RP4] Quantified Self:
Improving Performance and Well-Being

[RP2] Customer Journey:
Connecting the Dots

[RP3] Smart Maintenance & Diagnostics:
Safeguarding Availability

[RP1] Process Analytics:
Improving Service While Cutting Costs

[RP5] Data Value and Privacy:
Economic and Legal Aspects of Data Science

[RP7] Smart Grids:
Data Intensive Infrastructures

[RP6] Smart Cities:
Ensuring Safety and Convenience for Citizens

systems

organizations

infrastructures

cities



DSC/e

Data Science Center at TU/e

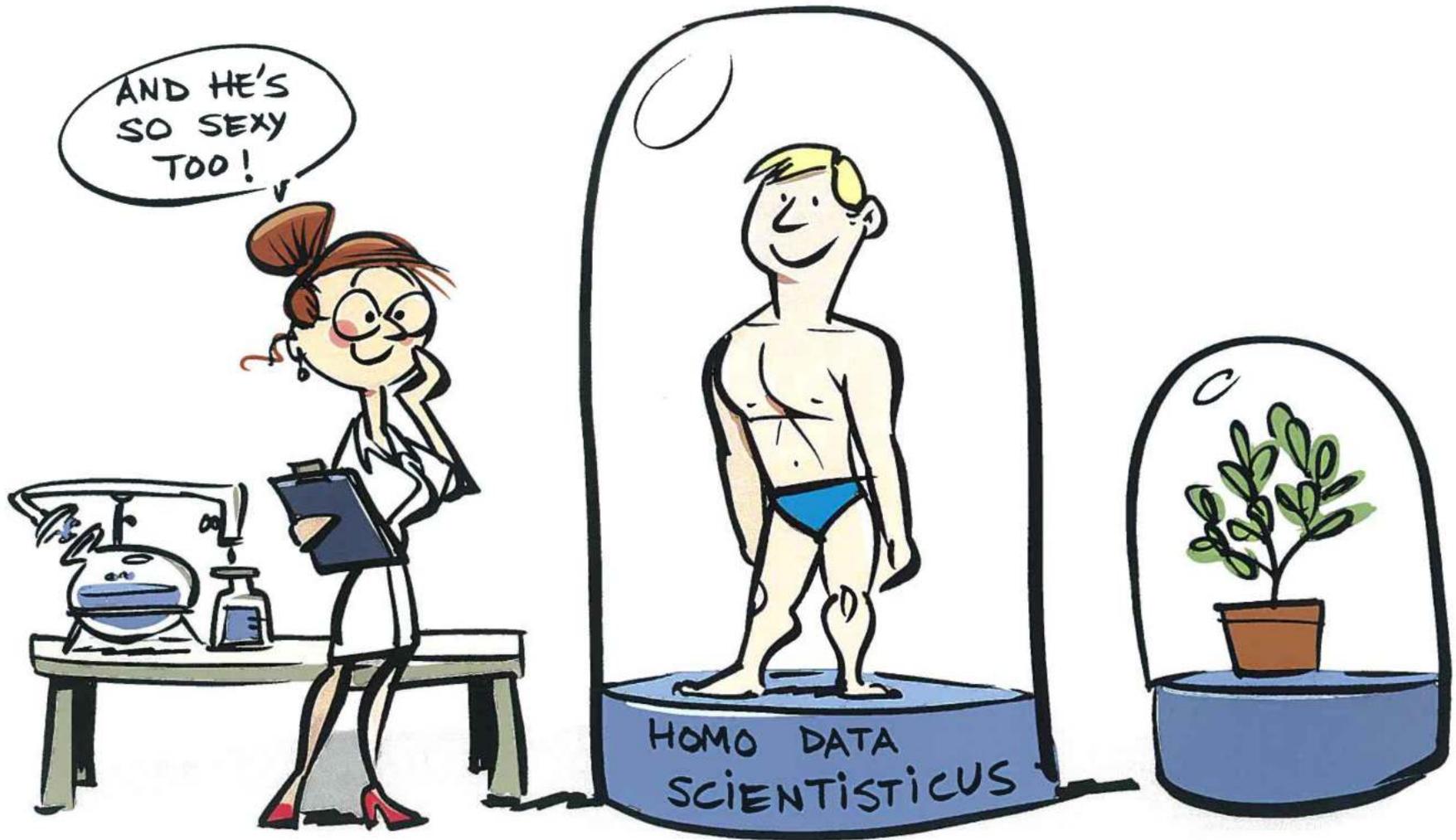
TU/e
Data Science Center Eindhoven

DATA SCIENTIST IS A NEW BREED...

ASK ME'S SO NEW YEA!

HOMO DATA SCIENTIFICUS

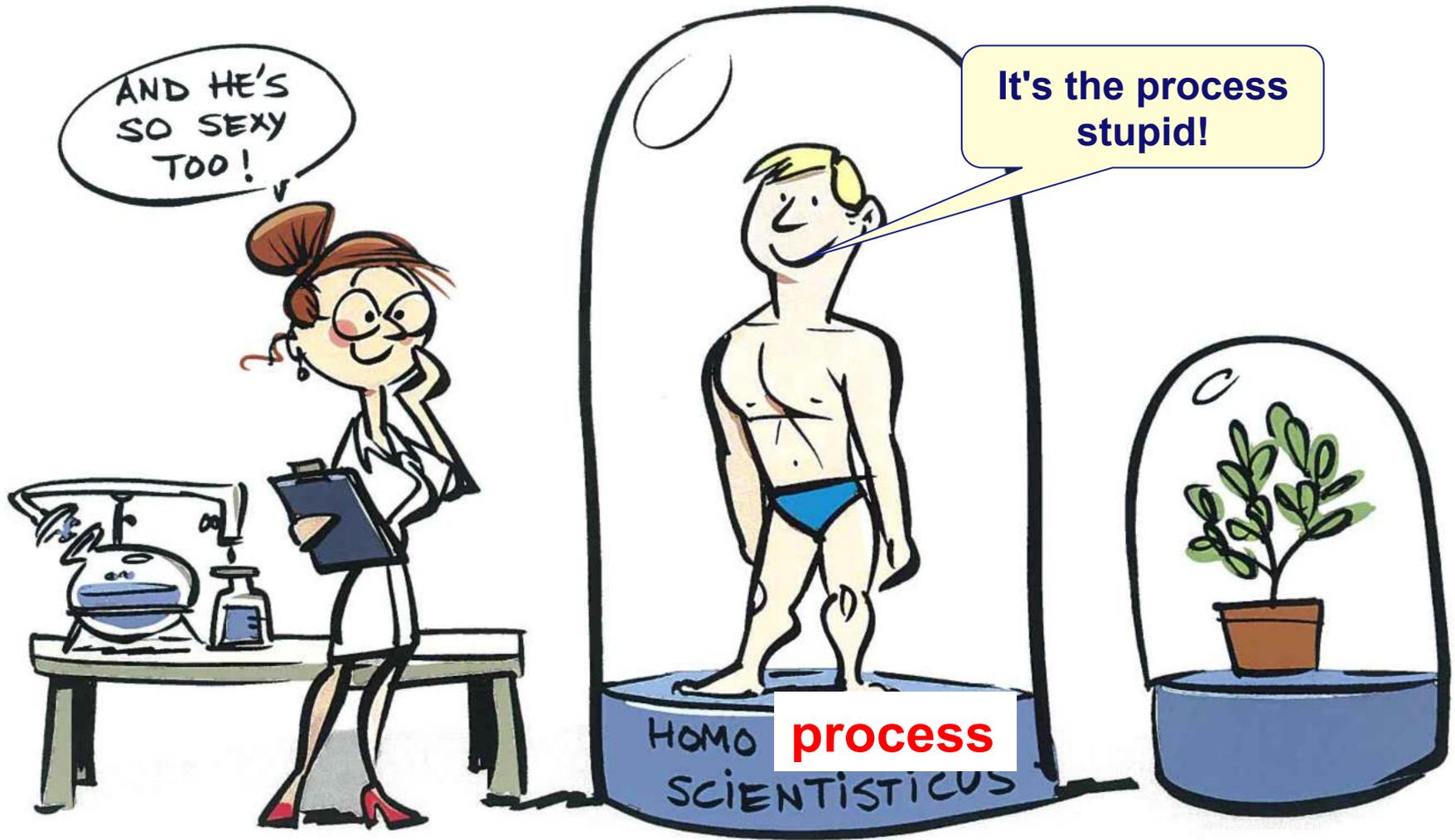
THE DATA SCIENTIST IS A NEW BREED



©Marion van de Wiel 2014

DSC/e 2014

THE **process** SCIENTIST IS A NEW BREED



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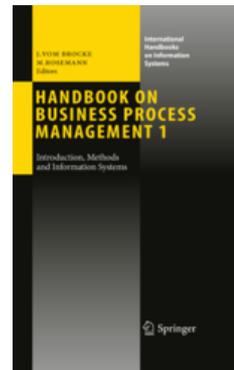
DSC/e 2014

IF I miss one day without feeding him with data,
then I am in trouble...!

More...More...
I need more data!

The principles of process management

1. All work is process work.
2. Any process is better than no process.
3. A good process is better than a bad process.
4. One process version is better than many.
5. Even a good process must be performed effectively.
6. Even a good process can be made better.
7. Every good process eventually becomes a bad process.



Michael Hammer. What is Business Process Management? Handbook on Business Process Management 1, Springer Verlag, 2010

A person is rappelling down a rope from the edge of a large, natural rock overhang. The person is shirtless, wearing shorts and a harness, and is positioned in the upper left quadrant of the frame. The rope extends from the top left towards the center. The background shows a bright, clear sky and a view of a coastline with mountains and water. The rock formations are reddish-brown and textured.

**process
scientist**

fun and challenging

**needs to have the
right tools**

<http://www.tue.nl/dsce/>

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Data Science Center Eindhoven (DSC/e)

Research



Data Analytics: Turning Data into Information

Understanding the Data

Understanding Influencing Behaviors

Innovation



Find out how to collaborate with the DSC/e

People, organizations, and systems are generating torrents of data. These growing data volumes provide exciting opportunities but also induce new "big" challenges. To turn data into real value, scientific breakthroughs are needed, e.g., in the area of data analytics. Collaborative efforts of various scientific communities ranging from computer science and mathematics to electrical engineering and social science, end-user organizations, and system developers are needed to realize these breakthroughs. Therefore, TU/e has launched the Data Science Centre Eindhoven.

News

DSC/e Lecture Series starts in September 2014

10 June 2014



The DSC/e organizes several interesting lectures about the various aspects of Data Science.

[Read more](#)

Wil van der Aalst elected as KNAW member

21 May 2014



Wil van der Aalst received the highest honor for a scientist by being elected as KNAW member.

[Read more](#)

Valuable DSC/e workshop

Education



About the DSC/e



Find out how the DSC/e is organized

(DSC/e). The DSC/e strives to be an internationally leading expertise center when it comes to data science research and education. Research focuses on developing new insights (models, theories, tools) to be able to add and extract value from real sets of heterogeneous data. Education focuses on the skills and scientific knowledge most relevant for tomorrow's data scientist. The DSC/e will operate in close collaboration with other stakeholders and will make optimal use of its geographical location in the Brainport region.

Calendar

DSC/e Lecture Series: September 25, 2014

25 September 2014



prof. dr.ir. GJ van Houtum - TU/e
Department of Industrial Engineering
[Read more](#)

DSC/e Lecture Series: October 6, 2014

6 October 2014

prof. dr. P. De Bra - TU/e Department of Mathematics and Computer Science
[Read more](#)

DSC/e Lecture Series: October 21, 2014

21 October 2014

DSC/e Lecture Series: November 4, 2014

Directly to:

- ▶ [Launch Symposium \(presentations and posters are now available\)](#)
- ▶ [DSC/e in the media](#)
- ▶ [DSC/e YouTube](#)
- ▶ [DSC/e Lecture Series](#)



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E: dsce@tue.nl

- ▶ [Direct contact](#)
- ▶ [Campus map](#)
- ▶ [Route description](#)

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'War on talent': Philips gaat promotieplekken TU Eindhoven betalen

Door: Jurriaan Nolles - 04/06/14, 06:54



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Philips gaat dertig promotieplekken op de Technische Universiteit (TU) van Eindhoven financieren. Het bedrijf doet dit omdat er in de sector grote behoefte is aan nieuw talent. Topman Henk van Houten noemt het een volgende stap in 'the war on talent'.

Het is niet nieuw dat grote bedrijven als Philips, AkzoNobel of ASML geld in universitair onderwijs steken. Het is echter voor Philips wel de eerste keer dat het zo'n grote groep promovendi in één keer financiert. Philips heeft al promovendi (ongeveer tien) op universiteiten rondlopen, maar dat zijn individuele wetenschappers. Ook zijn werknemers van Philips te vinden op andere posities aan de universiteit: sommigen bekleden er één dag per week een leerstoel.

MEER OVER

[Philips Techniek Hoger onderwijs Eindhoven Onderwijs Noord-Brabant Eindhoven Wetenschap Bedrijven](#)



[Nooit meer zoeken naar de djinten dankzij indoor-gps in supermarkt](#)



[Philips werkte jarenlang intensief samen met NSA-spionnen](#)



[Philips blijft voorzichtig over wereldeconomie](#)



[Philips duikt na HEMA ook in DDR-verleden](#)