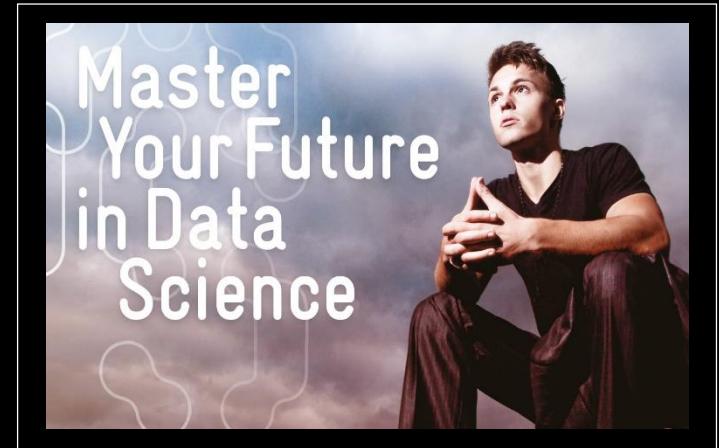


Data Science Drives Digital Innovation

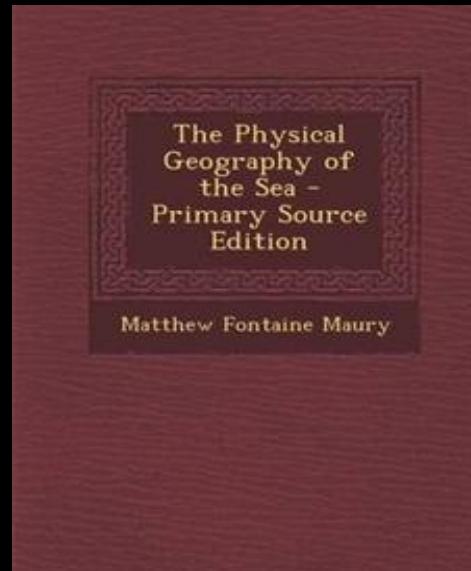
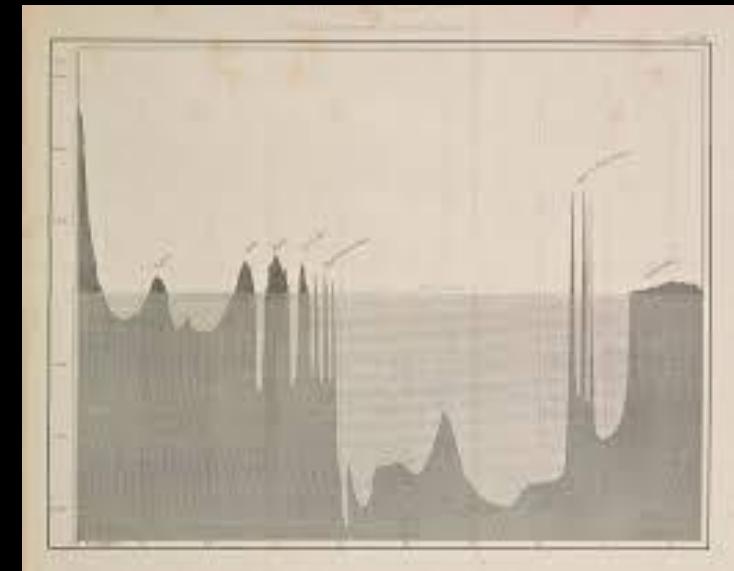
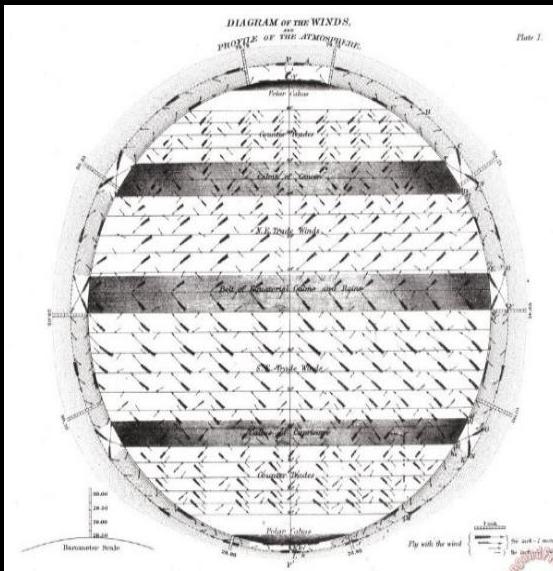
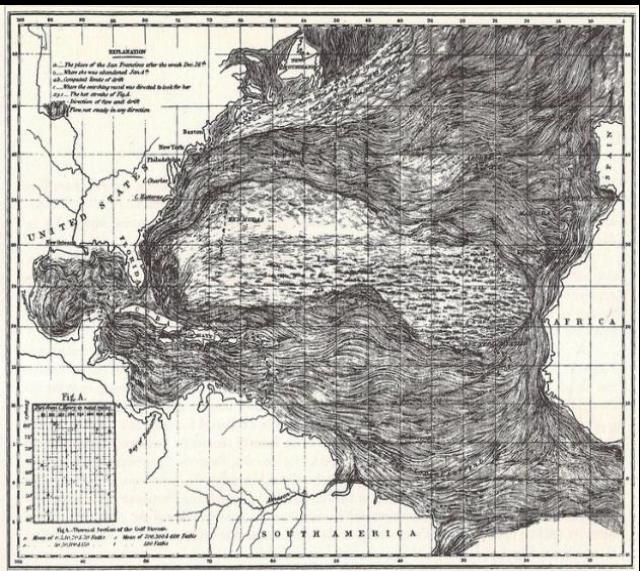
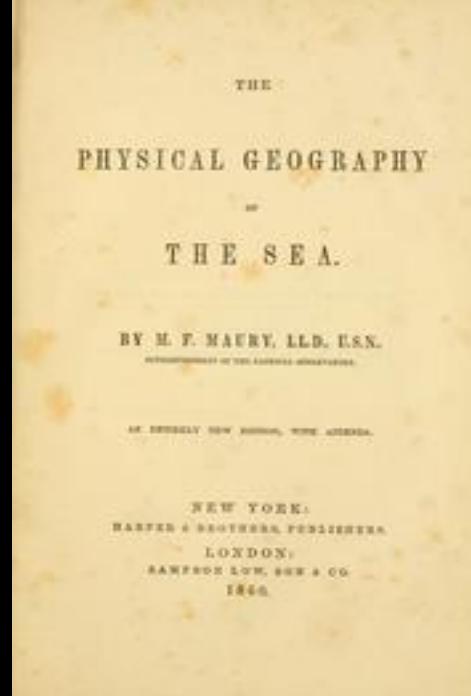
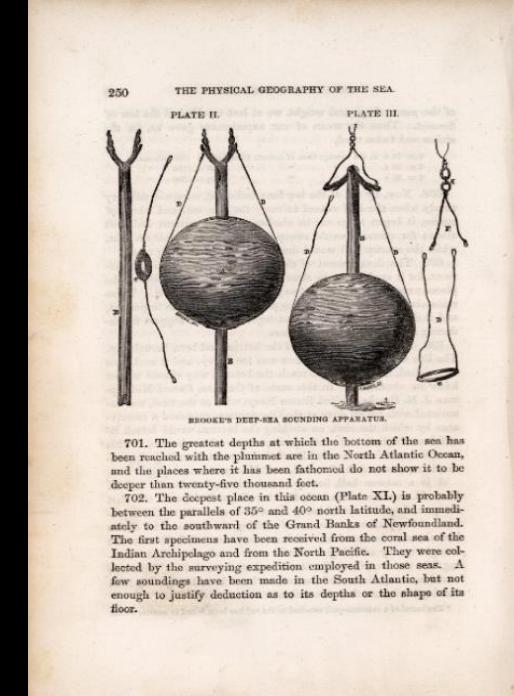
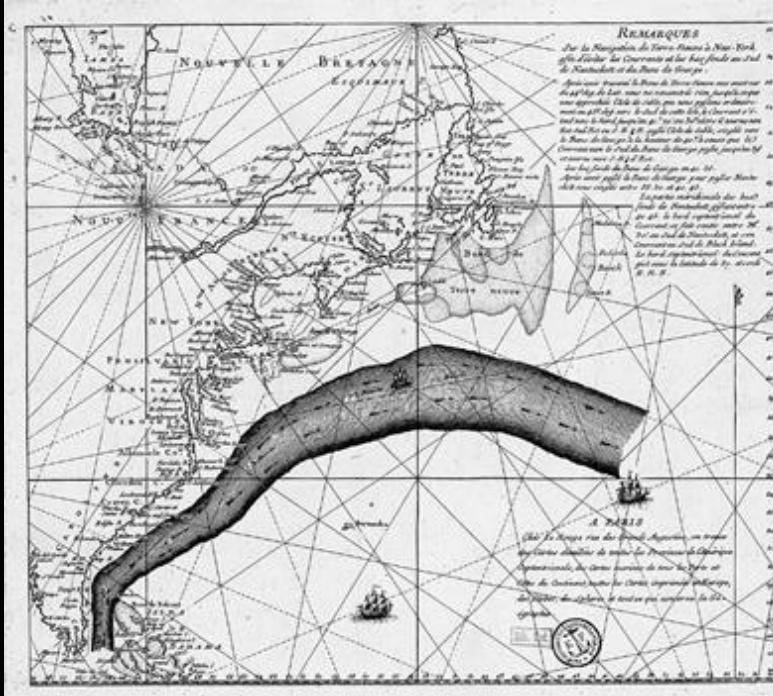


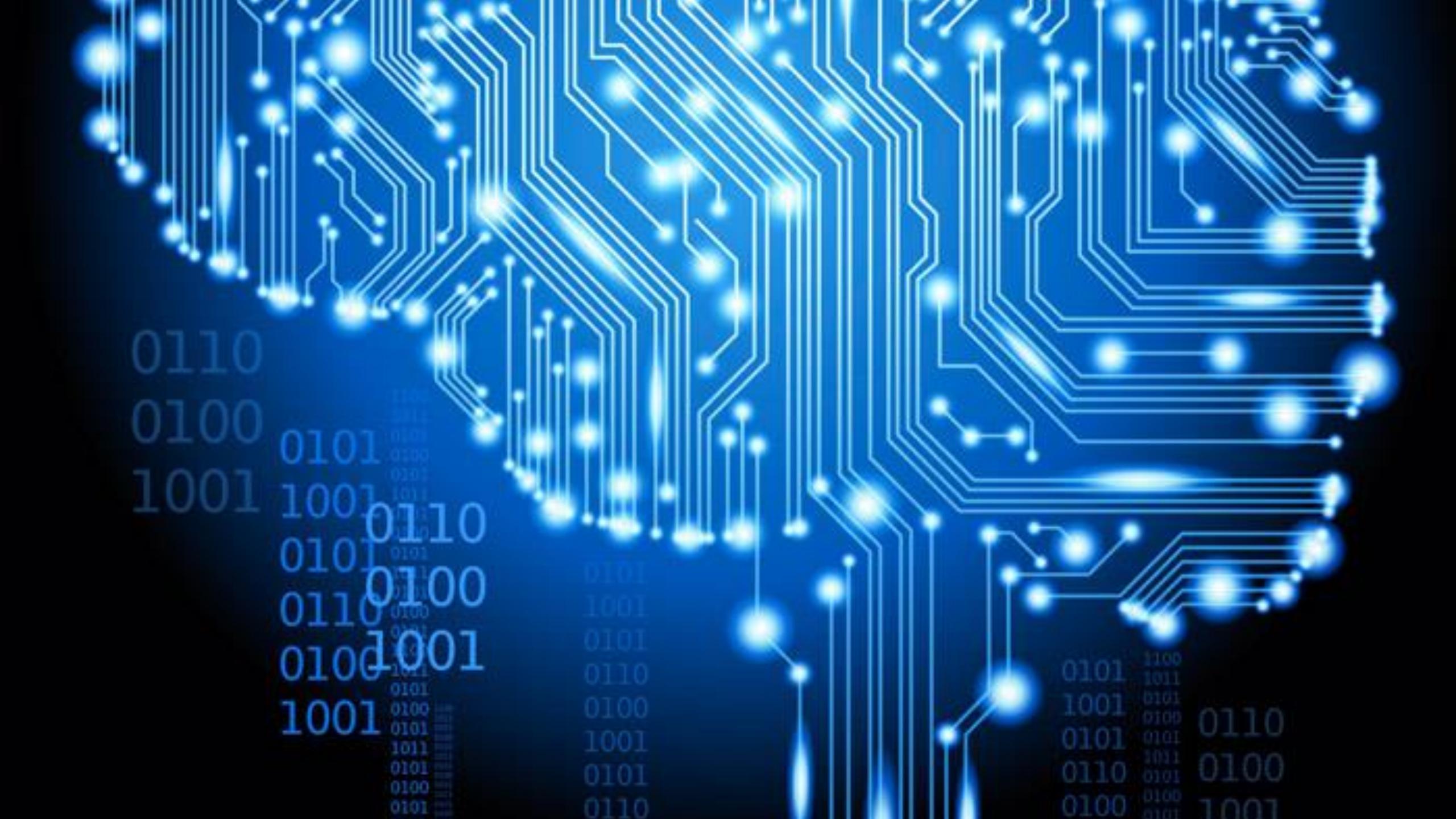
Emile Aarts, January 18, 2018

Data science seeks to use all relevant, often complex and hybrid data to effectively tell a story that can be easily understood by non-experts



Matthew Fontaine Maury, Virginia 1806-1873



The background features a glowing blue circuit board with many bright, glowing nodes and lines, creating a futuristic and technological feel.

0110

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Vehicle, asset, person & pet
monitoring & controlling



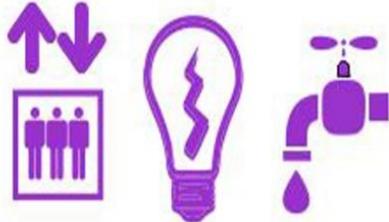
Agriculture automation



Energy consumption



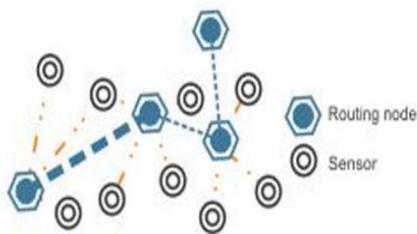
Security &
surveillance



Building management



Embedded
Mobile



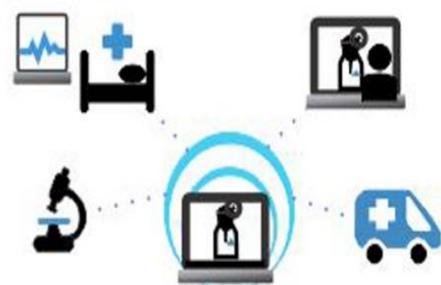
M2M & wireless
sensor network



Everyday things

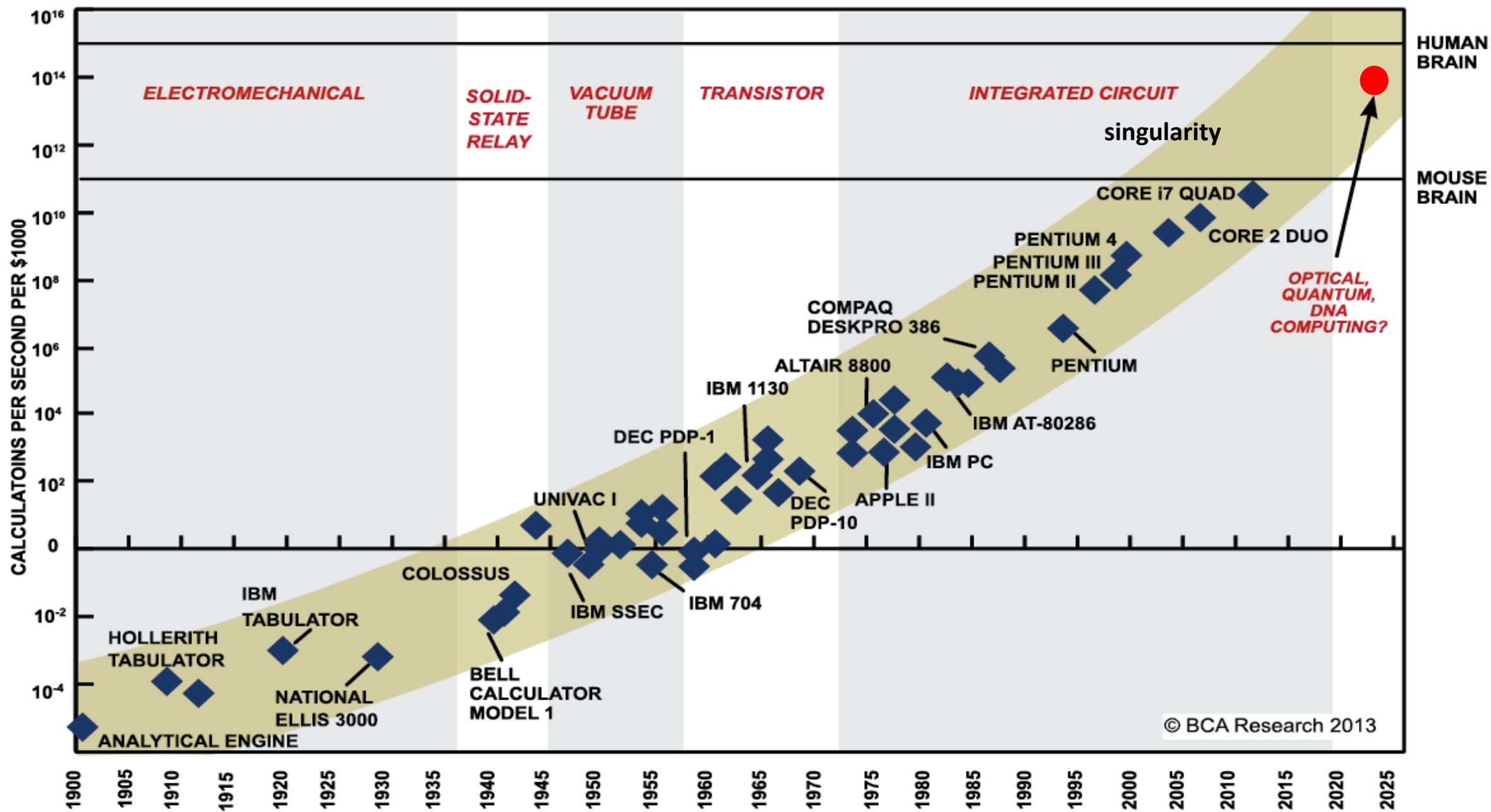


Smart homes & cities



Telemedicine & healthcare

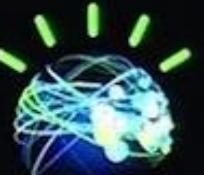
Internet of things



SOURCE: RAY KURZWEIL, "THE SINGULARITY IS NEAR: WHEN HUMANS TRANSCEND BIOLOGY", P.67, THE VIKING PRESS, 2006. DATAPoints BETWEEN 2000 AND 2012 REPRESENT BCA ESTIMATES.



THINK



\$24,000

Who is Stoker?
(I FOR ONE WELCOME OUR
NEW COMPUTER OVERLORDS)

\$ 1,000

\$77,147

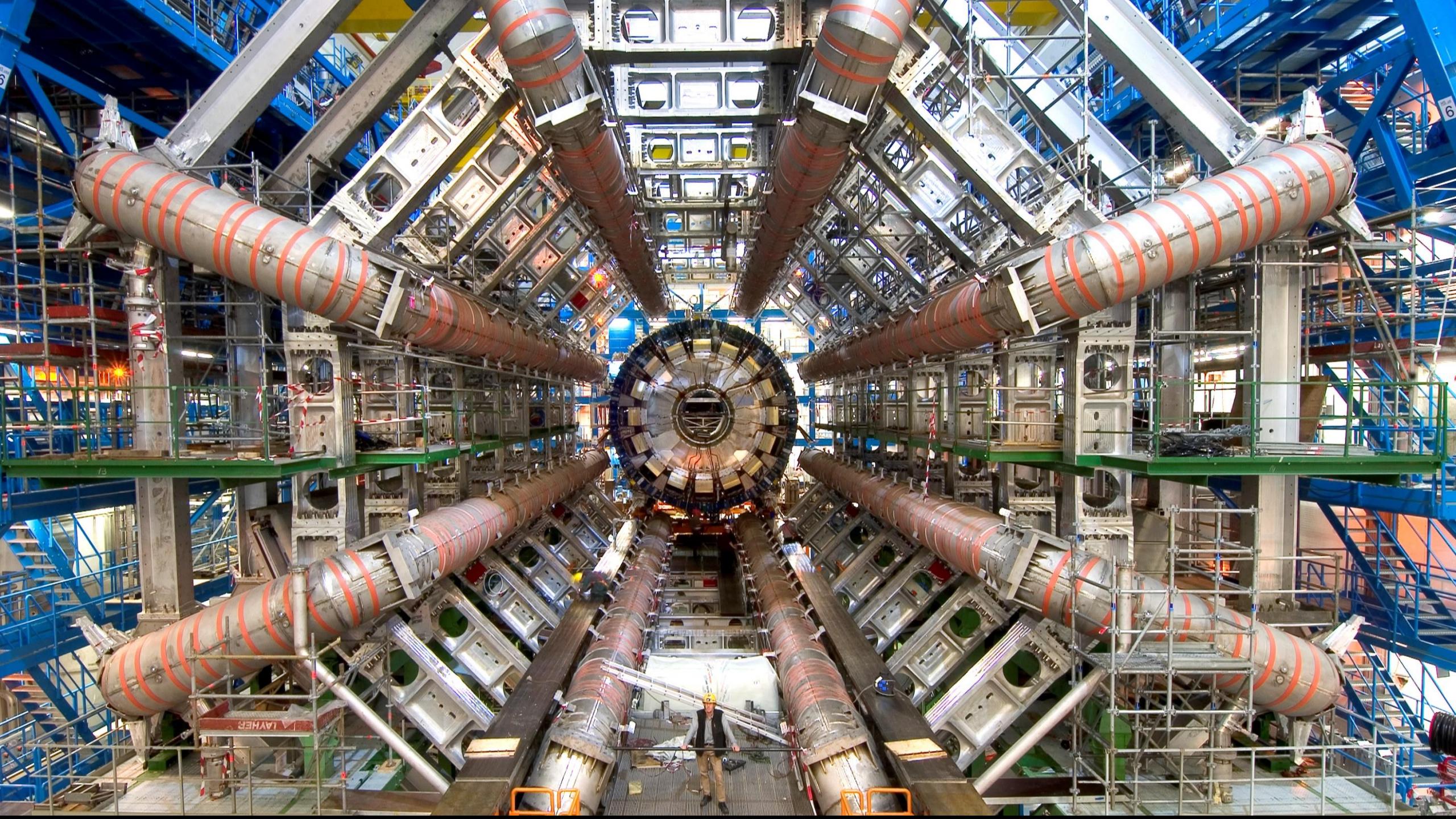
Who is Bram
Stoker?

\$ 17,973

\$21,600

WHO IS
BRAM STOKER?

\$ 5600



Google

[Google Search](#)

[I'm Feeling Lucky](#)

[Advertising Programs](#)

[Business Solutions](#)

[About Google](#)

[Go to Google UK](#)

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Google Search Statistics



1,944,732,081

Google Searches today

[view how many in 1 second](#)

[Google Search Volume \(current and historical\)](#)

[Growth Rate](#)

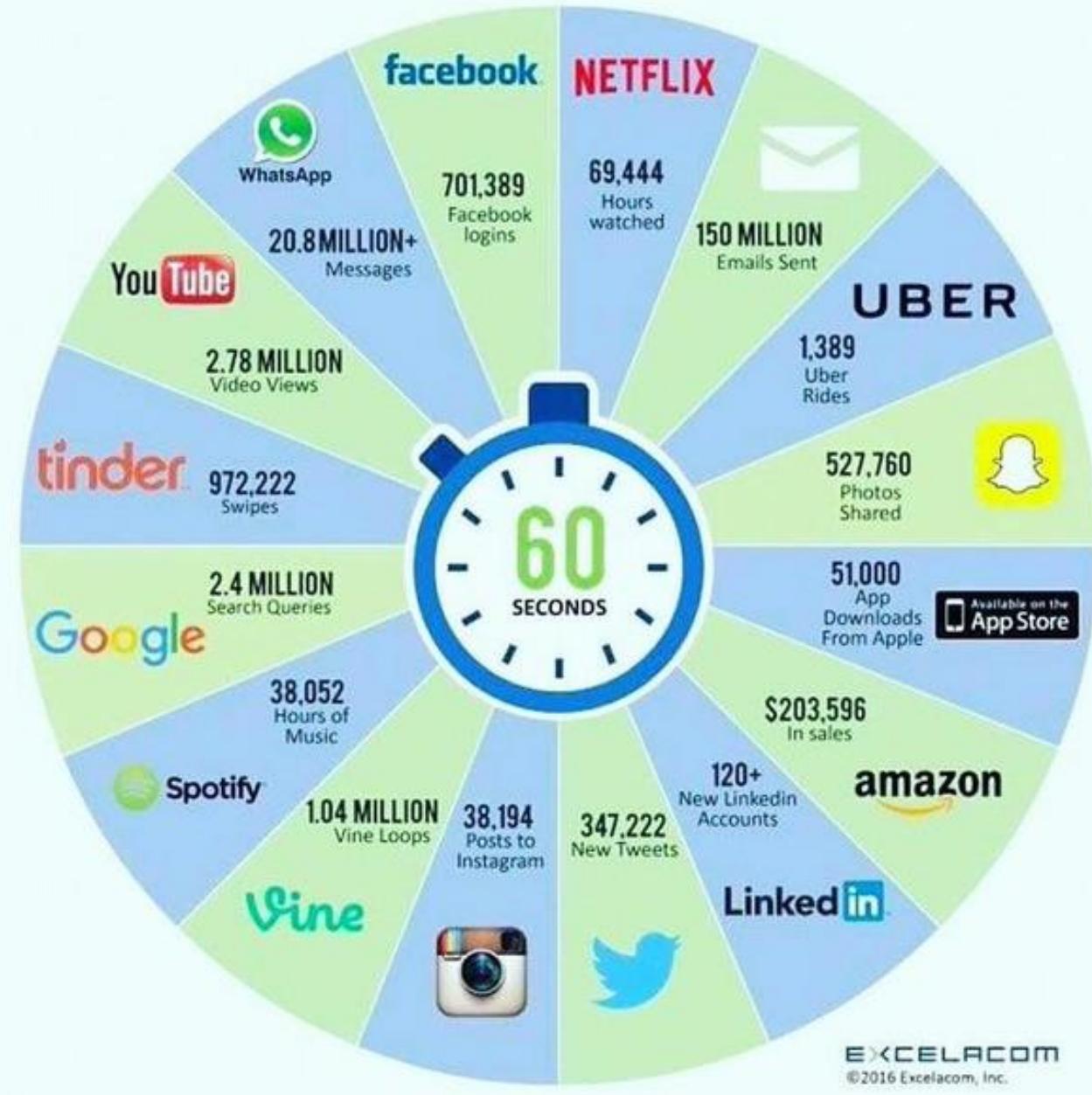
[Search Market Share](#)

[Sources and References](#)

Google now processes over 40,000 search queries every second on average ([visualize them here](#)), which translates to over **3.5 billion searches per day** and **1.2 trillion searches per year** worldwide. The chart below shows the number of searches per year throughout Google's history:

**Click here to see the
live amount of
Google searches per day.**



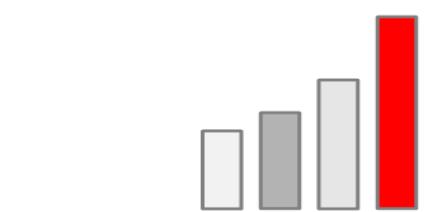


- People produce 400 million tweets and send 3.2 billion likes daily
- They also upload 300 million pictures daily
- There are 1 billion Websites online 
- Google Voice processes 10 years of spoken text daily
- The UK has 2 million surveillance cameras
- Facebook has 1 billion users
- 800 million users watch 4 billion movies daily
- Medical data doubles every five years



Source: NRC 08.02.2013; Gartner 2014

volume



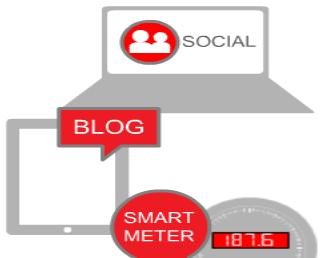
size, quantity

velocity



speed, timing

difference, (in)consistency



variability

quality, accuracy

001X1-0010?0
!0XX=101?001
11??X10-0011

veracity

BIG COMES IN FOUR ‘V’LAVORS



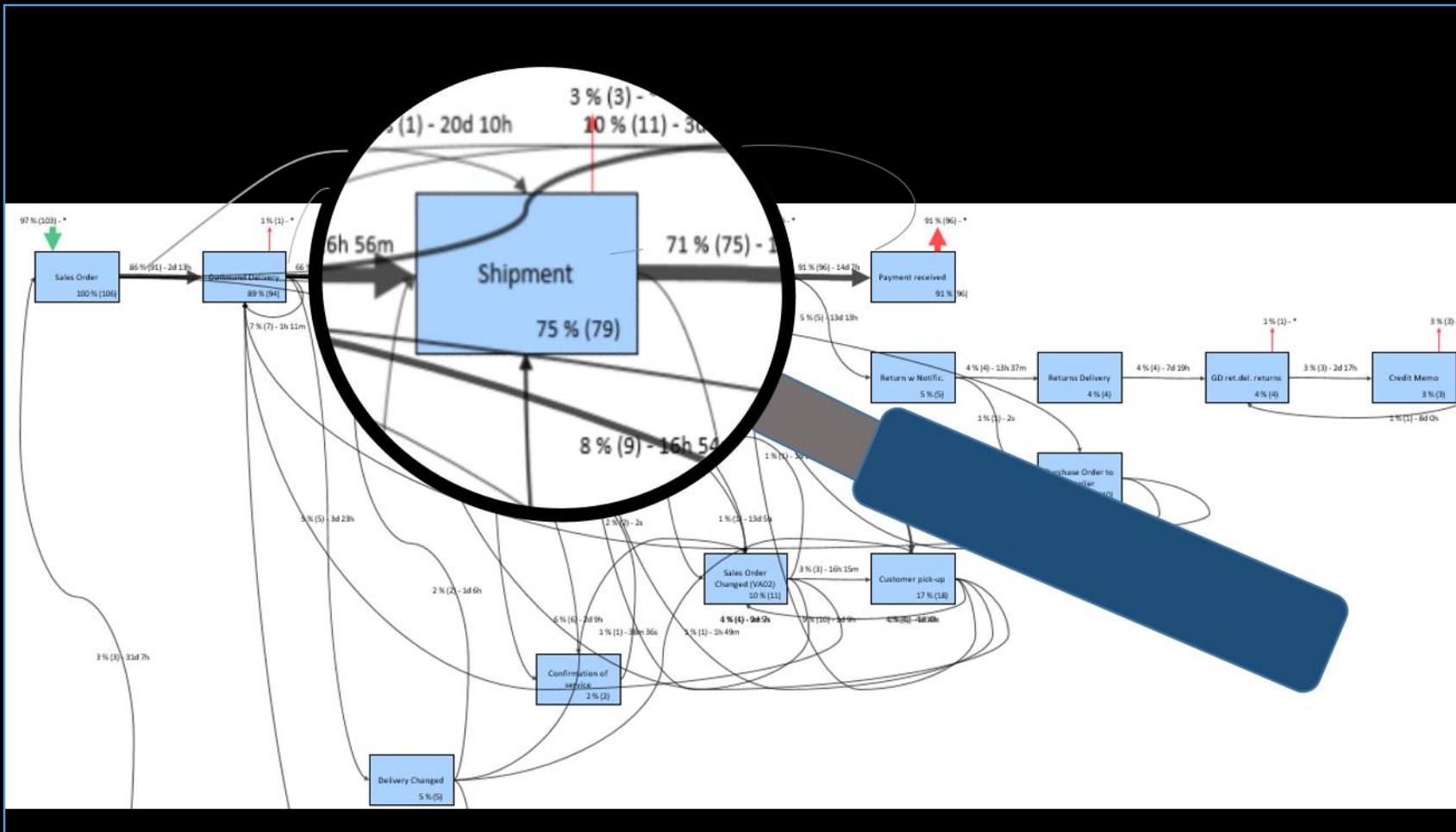
CUSTOMER RETENTION USING BEHAVIOR ANALYTICS



SMART MAINTENANCE USING PREDICTIVE ANALYTICS



BUSINESS MODEL INNOVATION BY SERVICE DATA



WORKFLOW OPTIMIZATION BY PROCESS MINING



Providing
connected
Apps

Sensing and monitoring data

Extracting
meaningful
information

Enhancing the user experience



MORE FROM YOUR RUN

Get GPS tracking, audio feedback and cheers from your friends while you run.

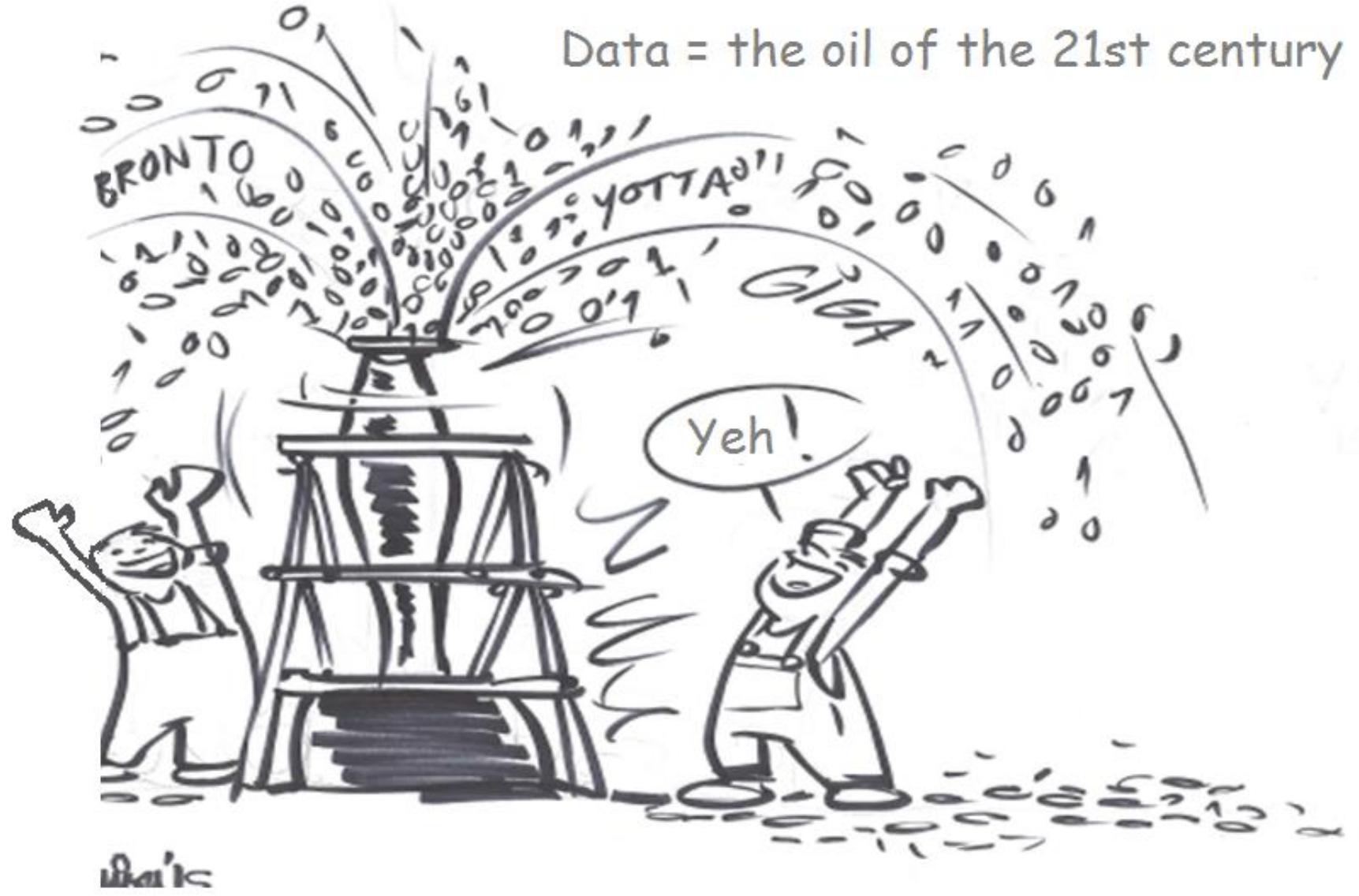
Available on the
App Store

Available on Google play

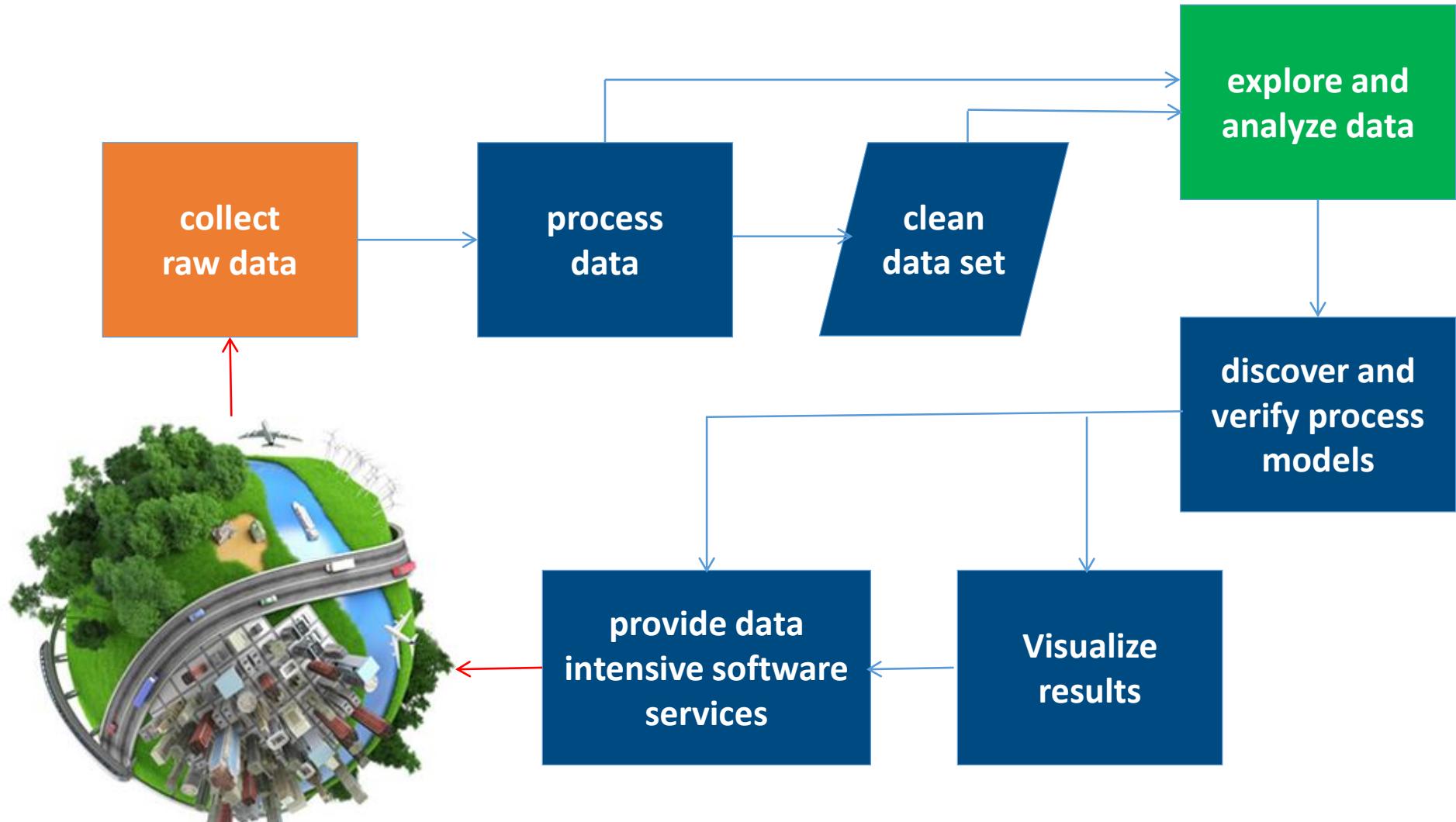


THE WORLD BECOMES CONNECTED

Data = the oil of the 21st century



DATA IS THE NEW FUEL



DATA SCIENCE IS THE NEW KNOWLEDGE

Entity matching: we can find hidden structures



A magnifying glass is focused on a specific sequence of DNA bases (A, T, C, G) within a larger string of genetic code. The sequence being examined is: AGAAAGGGC JAGTGCAAGTC G Disease CATGATGTTGG GCTGAAAAC G GATC. The DNA sequence is presented in a monospaced font, showing a continuous string of letters representing the four nucleotides.

```
ACCCCTGAAGGGATAGGACCCTAGGGCTCTGACCAAGCCTGATCTGGTGGACAGAGGTGCTGAAGGCAGGGCTGGATGCGACAGTCTTCAAGGATCACTCGGCCACAGTGCCTGGCAGATCACCAAGAGCAGCTGAGCCTGACTGAGGCTTATCAGACAGTGCAAGTCTTCAAGGATCACTCGGCCACAGTGCCTGGCAGATCACCAAGAGCAGCTGAGCCTGACTGAGGCTCACCTCCCACATCTGTAGATGGTCAAACCTGCCTCGTAACCTCTGCTAACCTTCAAAATAACACTGAGATGACCCAGCACCTGAAAGCCTACTACCAGGAGTGCAGACGGATAAGTGCAGCTGGTTCTGGAGGAGCTAAGAAAGAGAAAGACTGATTATCCAGTACTTCATCCTGATTCTGCTAACCTTACAGGACACCAGTAAGTGCAGCTGGTTCTGGAGGAGCTAACCTCTGGCTAGCTATGTGGCTTCTGGAGCTTGTGAGGAGATGTACTGGCTGAGCACCTCAGAAGGGTCGGCGCATACATTTCAGCAAAATTAAACAAGGATTCCACCTCTCTAGTTCTGGGGCAAGCTCAGTCTTCCAGCAGTTCAGTCCAGCTATAGTCCAGTCCTTCCACAGGCAGAAACCAAGAATGAATCAGCAGACCTCACAGTAGTTCTTAGGTGAGTTCTCTCAATGTCAGTGTACAGCAAAACCAAGCCAGGCTCCGGTGTCTCATCTCAACTGTTGTGAGGTGTCTGCTTCAGGGAAACATTCTTCATGTGTTGCTTCAGCAAGACATCATTAGCGCTTCCAATAAAATTCTTGCTAAGTGACTGGCGGCCCTGTATTGACCTGAGCAGAGTTCTGGGAAGAGCTCTGTGCTGGAAAGCACTGTCTGGAGTGGCCCTCCCCAGAGGCAGTGGTAGGTGGAGGCAAGTCTCCTATGATGACATTGAAGTGAGCTCTGATCCTTCAGAGGTGGAAGAGGCCATCAACCTGGTGGTAGTCCCCAGCAATGTGGACATTGCTACCAACAGAGGCCTCTGAGCATGGCTCAGGAGTGGACAGAGGTGCTGAAGGCAAGGTCTGGATGTGATGCGGAACCTGGTGTATCCTCTGAAGGAAGGGAGACTGAGGCTTATCAGACAGTGCAAGTCTTCAAGGATCACTCATACTCAGCATTCTGGAGGCTTCAGCTTACAGGACACCAAGTAAGTGCAAGCTGGTTCTGGAGGAGCAGAGTGACACCAAGAGGAGCTTCAAGGCAATTGATCCTTAGCTTGGCCAAATTCTCCGATTAACCAGGCTAGCTATGTGGCTTCTGGTGTGCAATGATCCTTAGCT
```

Validation: we can deal with messiness



CHECK OUT THE
PRICESTATS BLOG

LEARN MORE



STATE STREET
GLOBAL MARKETS.

FINANCIAL SECTOR

Process mining: we can find unknown facts



Visualization: we can show what it means

The image shows a screenshot of the Flitsmeister app interface. On the left is a map of the Netherlands and surrounding areas, displaying traffic density as green and yellow heatmaps on road networks. Several red location markers with camera icons are placed along these roads. A blue circular marker indicates the user's current location. Below the map is a status bar with signal strength, network (vodafone NL 3G), time (16:26), battery level, and a gear icon for settings. The main content area features a large green button with the text "NL FM". At the bottom, there are four large white numbers in red-bordered circles: 120, 109, 207, and 149, likely representing speed limit values.

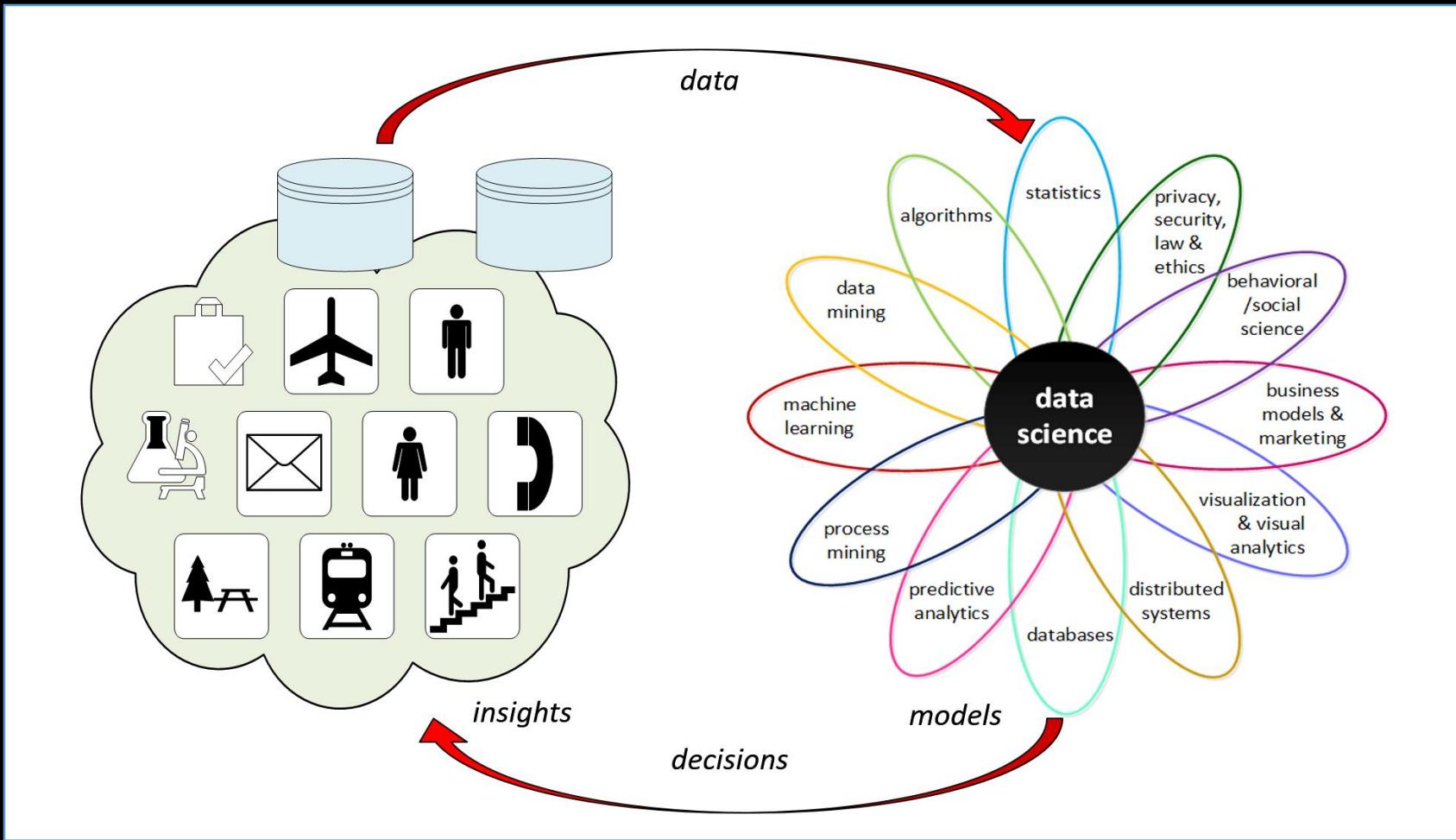
Flitsmeister
de app voor onderweg

NL FM

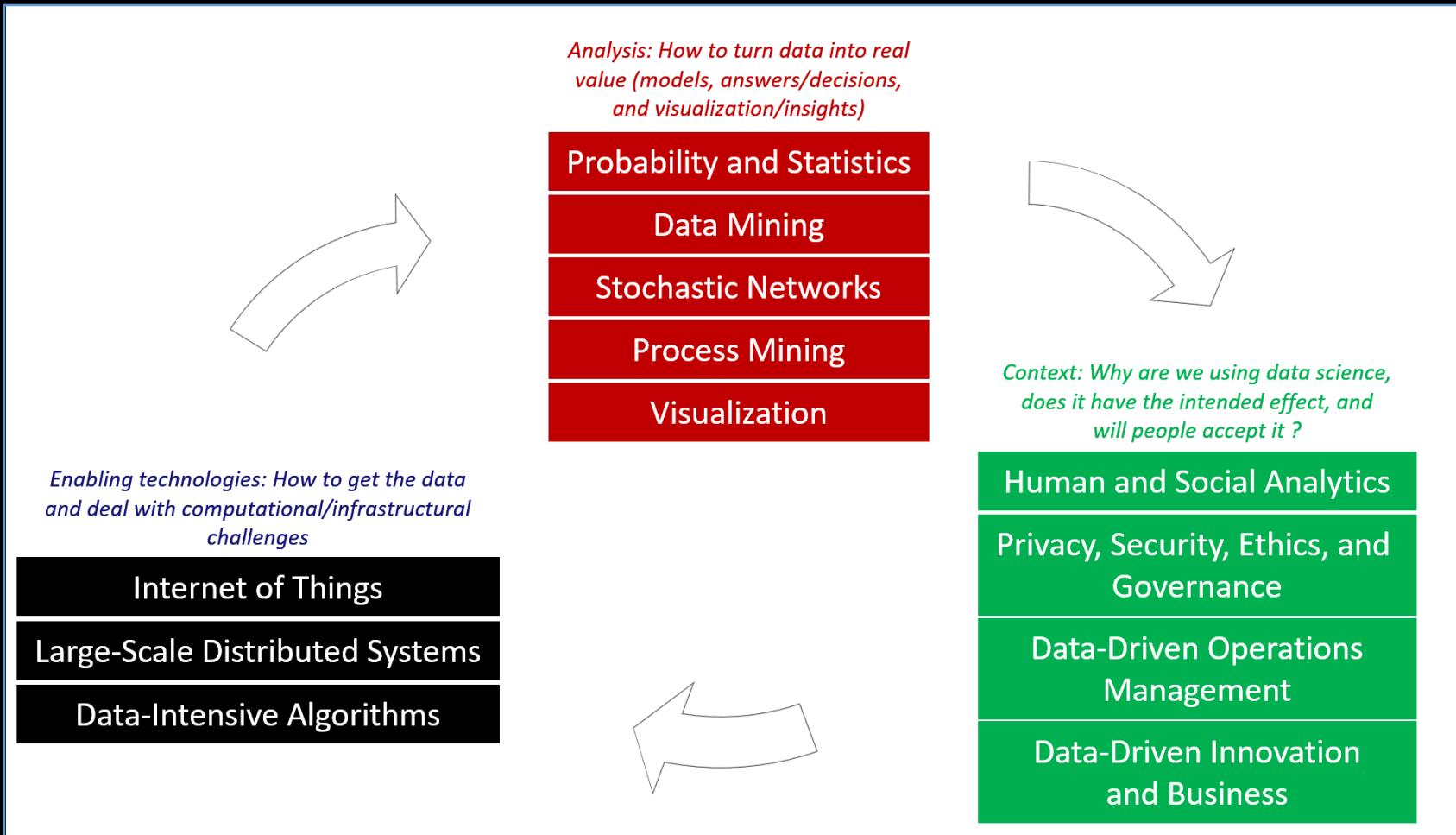
vodafone NL 3G 16:26

Melden A2 92.3

120 109 207 149



DATA SCIENCE COMPETENCES ARE MULTIDISCIPLINARY



DATA SCIENCE COMPETENCES COME IN THREE GROUPS

	COLLECT	-	MOVE	-	ACCESS	
	ANALYZE	-	MINE	-	BROWSE	
	MODEL	-	SIMULATE	-	OPTIMIZE	
	DEDUCE	-	LEARN	-	REASON	
	UNDERSTAND	-	VISUALIZE	-	PERSONALIZE	
	INTERACT	-	PERSUADE	-	TRANSFORM	
	SECURE	-	TRUST	-	TRADE	

SCIENTIFIC CHALENGES IN DATA SCIENCE ARE MANIFOLD

On November 10 1998, [C.F. Jeff Wu](#) coined the term in his lecture "Statistics = Data Science?" in honor of his appointment to the H. C. Carver Collegiate Professorship in Statistics at the University of Michigan.

In 2001, [William S. Cleveland](#) introduced the field of data science as an independent discipline, extending the field of statistics to incorporate "advances in computing with data" (*Statistical Review, Volume 69, No. 1*).

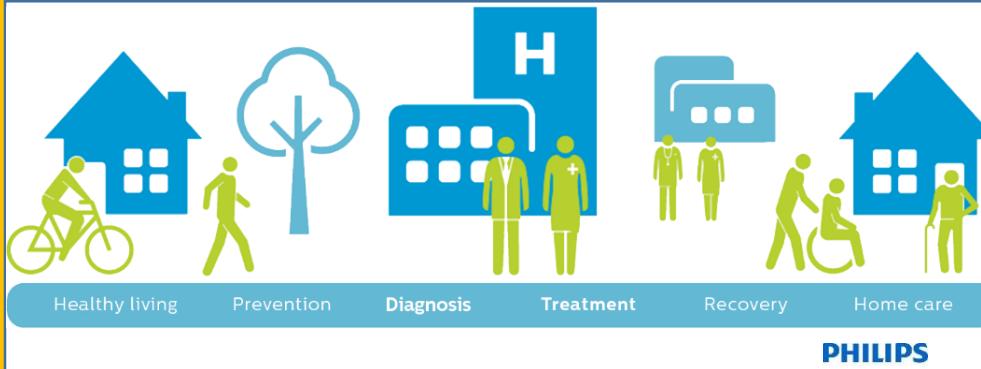
In April 2002, the Committee on Data for Science and Technology (CODATA) started the [*Data Science Journal*](#), January 2003, Columbia University began publishing [*The Journal of Data Science*](#).

The National Science Board defined in their publication "Long-lived Digital Data Collections" data scientists as "[the information and computer scientists, database and software and programmers, disciplinary experts, curators and expert annotators, librarians, archivists, and all mothers, who are crucial to the successful management of a digital data collection.](#)"

Data Science is a new multi-disciplinary field



Health Analytics



Marketing Analytics



HR Analytics

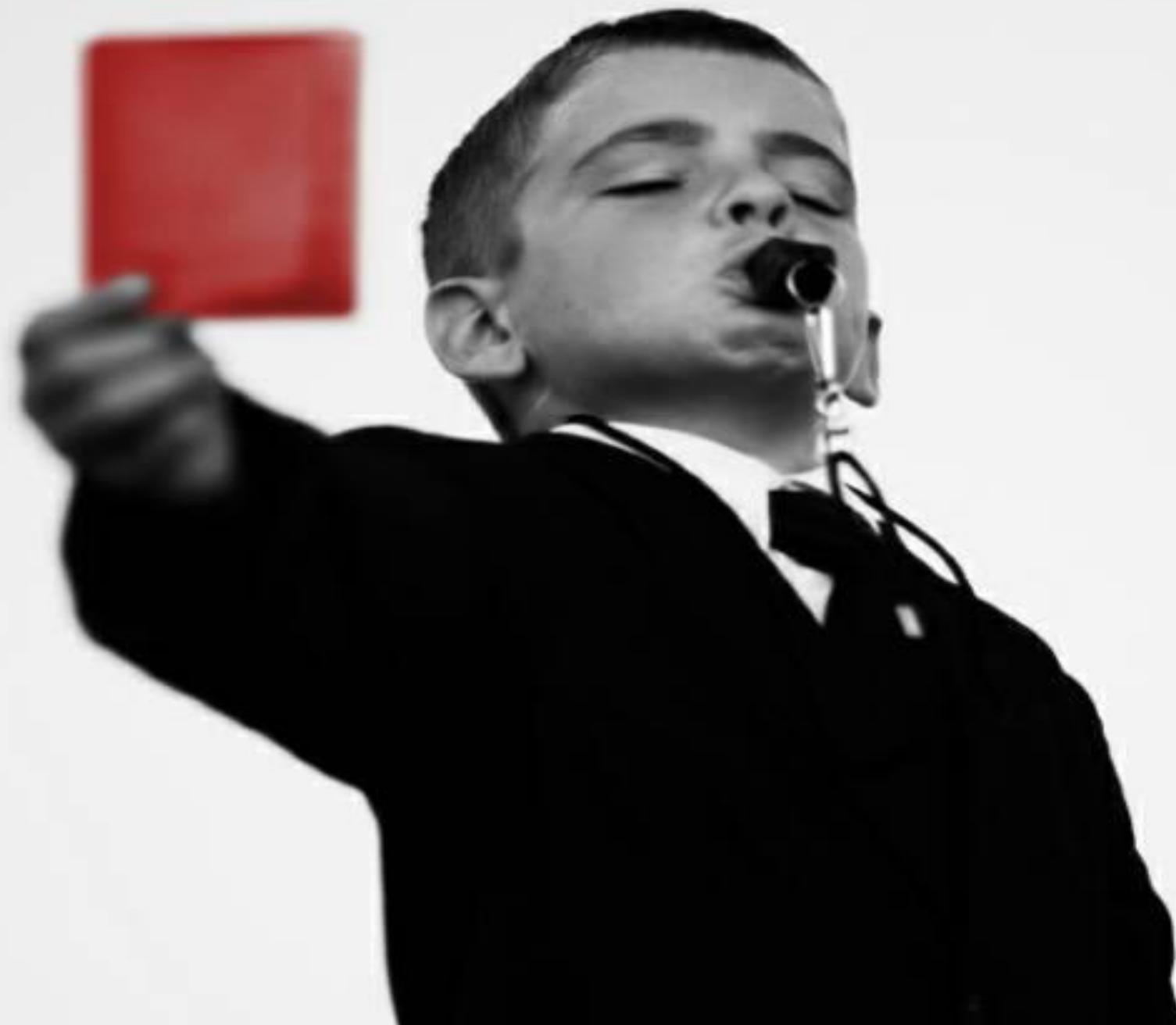


Accounting & Finance Analytics





DARK SIDE OF DATA



Big data can and should bring greater safety, economic opportunity, and convenience to all people

A lack of high-quality, individualized financial data can exclude a person from the mainstream financial system

There is discrimination in the delivery of these ads

Just because something can be measured doesn't mean that it should be measured

Despite their importance, the algorithms used by E-Verify are not disclosed to the public

Big Data allows for a new level of specificity in underwriting, changing how risk is allocated

There are few laws governing the data brokerage industry

Body-worn cameras are poised to help boost accountability for law enforcement and citizens

Fairness: Data Science without prejudice: How to avoid unfair conclusions even if they are true?

Accuracy: Data Science without guesswork: How to answer questions with a guaranteed level of accuracy?

Confidentiality: Data Science that ensures confidentiality: How to answer questions without revealing secrets?

Transparency: Data Science that provides transparency: How to clarify answers such that they become indisputable?



Harvard Business Review

THE MAGAZINE
October 2012

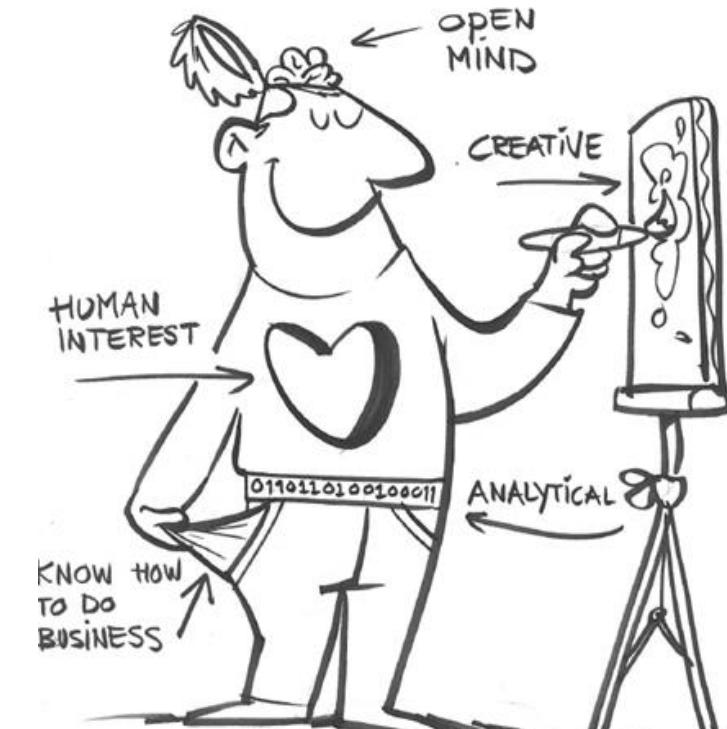


ARTICLE PREVIEW To read the full article, [sign-in or register](#). HBR subscribers, click [here to register for FREE access »](#)

Data Scientist: The Sexiest Job of the 21st Century

We need T-shaped people

THE PERFECT DATA SCIENTIST



Large scale

Jeremy

*Data Regulatory
Officer*



Melissa

*On-line Data
Business Strategist*

Public

Private



Debora

*Consultant
Data Concessions*

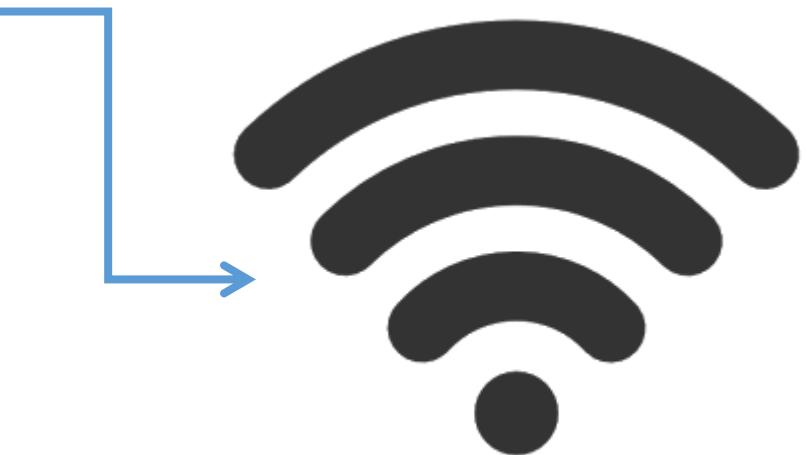
Small and medium scale

Master Your Future in Data Science



JADS

Jheronimus
Academy
of Data Science



Data Science Hotspot

edu ca tion

JADS provides a number of data science programs at undergraduate, graduate and post-graduate level to educate the data scientist of the future

re se arch

Offering Data science research in three locations. Research programs that enhance the relevance of academic research to business and society.

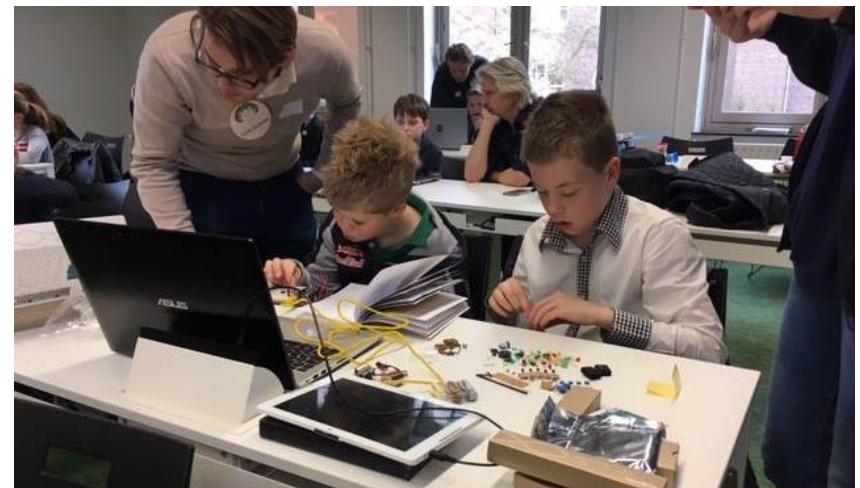
bu. si ness

JADS offers great opportunities for organizations to become part of the data science ecosystem in 's-Hertogenbosch.

COMBINING DATA SCIENCE & ENTREPRENEURSHIP

----- *elective*





CODERDOJO EDUCATES CHILDREN

Personal care and wellbeing



Monitoring non-intrusively biomarkers and body functions and feeding back information.

Finance and insurance



Developing data driven options for innovative financial and insurance related business improvements.

Productivity and maintenance



Monitoring performance remotely and enabling long-distance control and maintenance.

City management and control



Enabling adaptive public space support by urban service management and commissioning.

Branding and marketing



Analyzing customer behavior and mapping needs on business propositions.

Agro, food, and life science

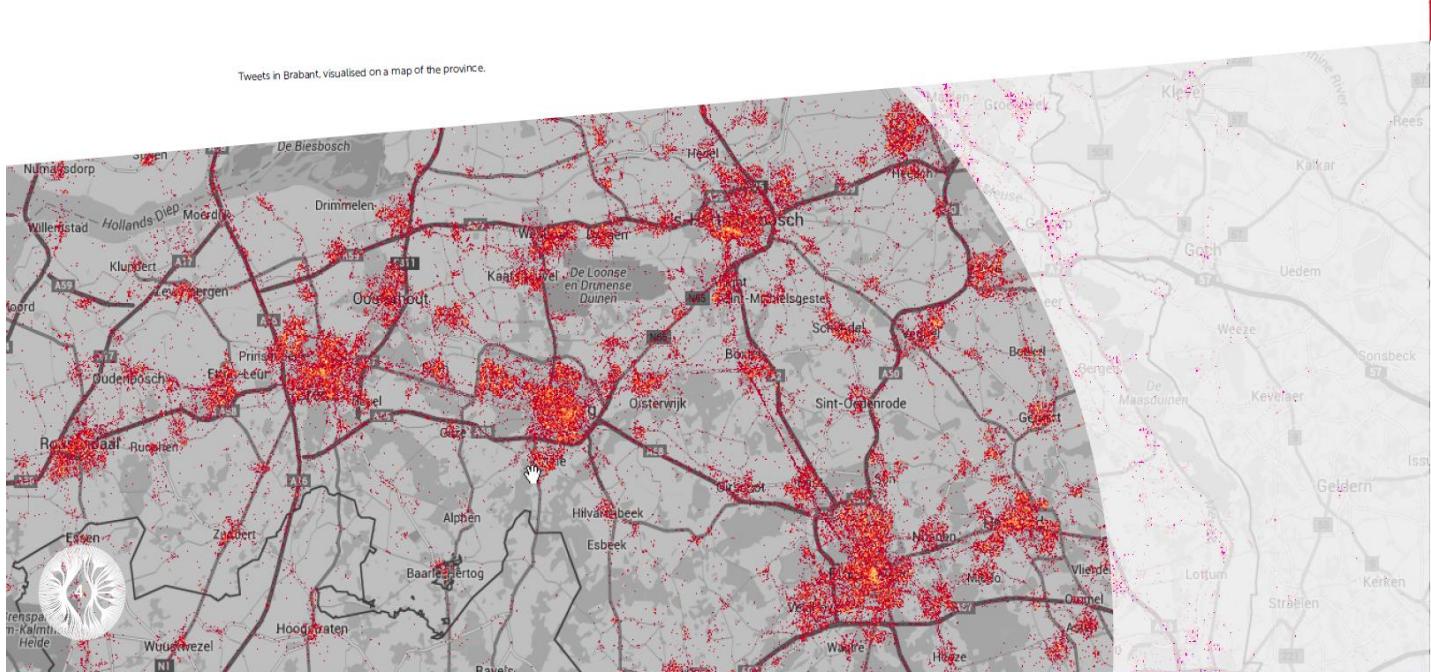


Providing decision support by correlating information from different life-science related sources.

**PROUD PARTNER OF
JHERONIMUS
ACADEMY OF
DATA SCIENCE**

brandloyalty | JADS

BRABANT - DATA SCIENCE IN ACTION



FIRST CLASS BREEDING GROUND IN DATA SCIENCE

*Brabant, where you find the brains to solve
the problems of today*



INTEREST IN COLLABORATION IS STRONG

64%

my organization is
looking for data science
talents

66%

my organization wants to
experiment with new data-
driven business models

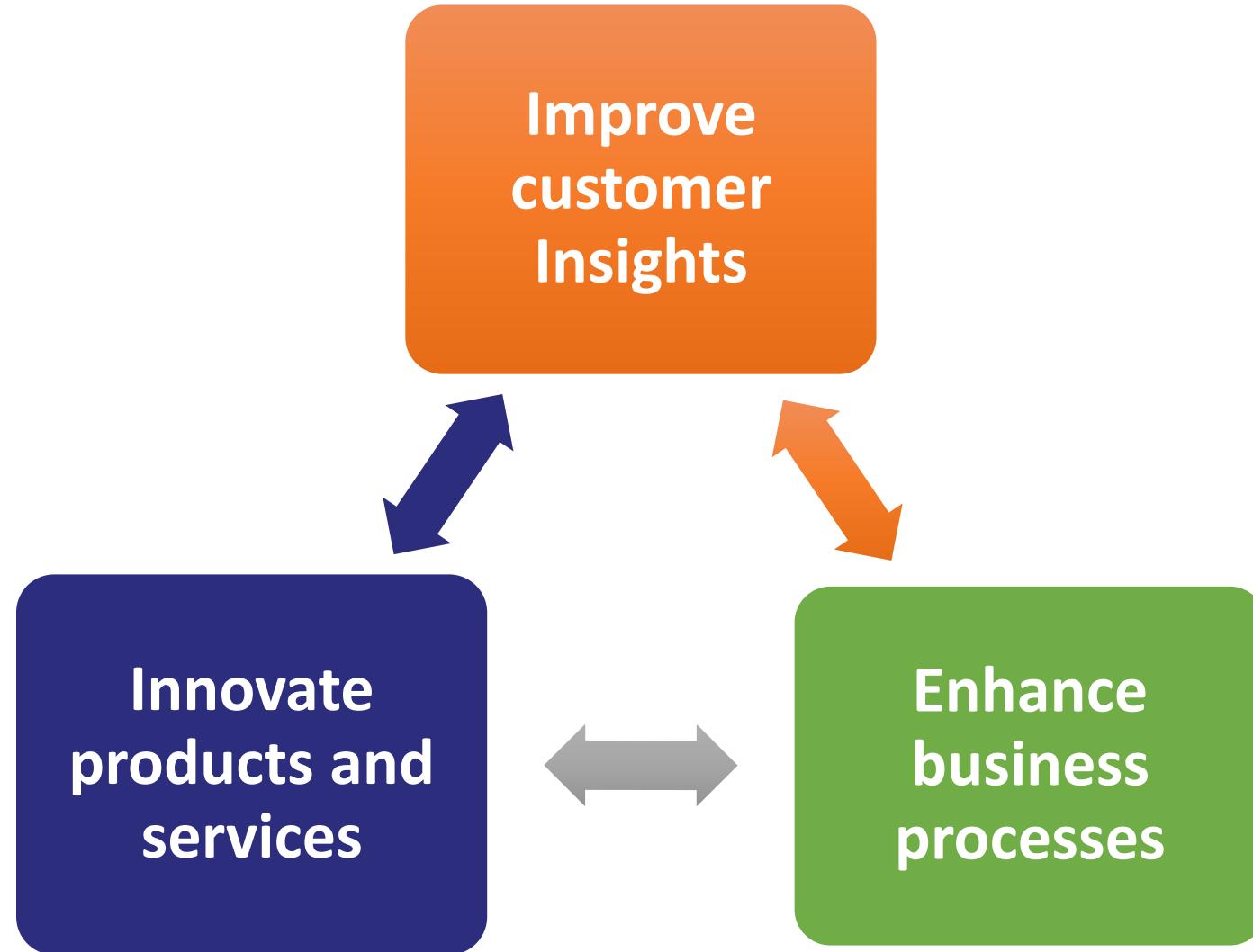
43%

my organization wants
to be a leading data
intensive company

46%

my organization wants to
wants to develop data
science competences

THERE ARE MULTIPLE REASONS TO COLLABORATE



THERE ARE THREE PATHWAYS TO DATA USE



MAKE BETTER DECISIONS



UNDERSTAND CUSTOMER PREFERENCES



CREATE CUSTOMER TRANSPARENCY



MEASURE PUBLIC OPINION



REDUCE RISKS



FIND ANOMALIES



CALCULATE RISKS



THERE IS NO ALTERNATIVE

Thank you



**FIRST CLASS
BREEDING GROUND
IN DATA SCIENCE**

Brabant, where you find the brains to solve
the problems of today

