Towards a New & (more) Ethical Revenue Model of Data

prof. dr. ir. Erik Mannens

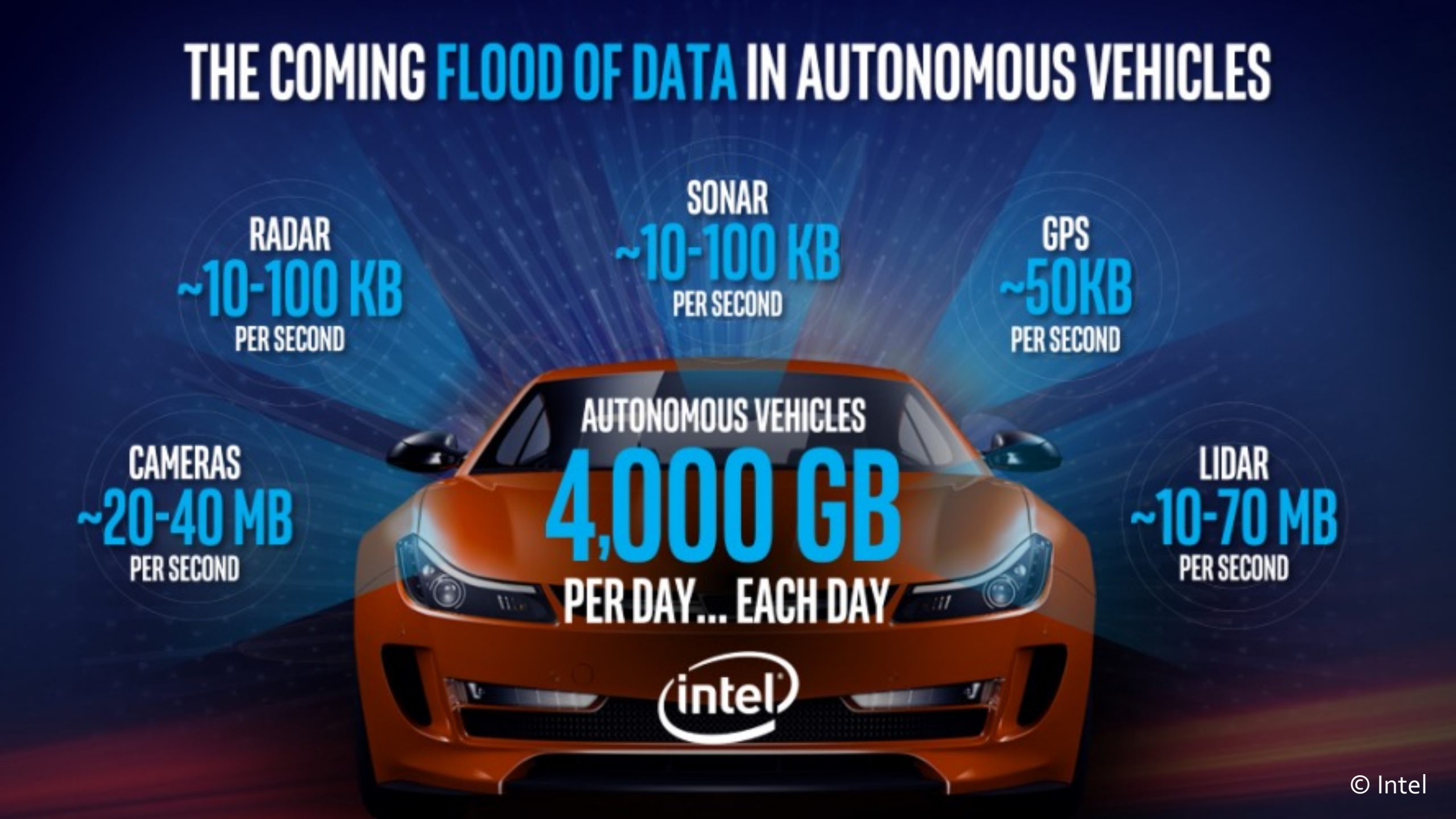

© Andy Bannister


© NASA

2017 This Is What Happens In An Internet Minute

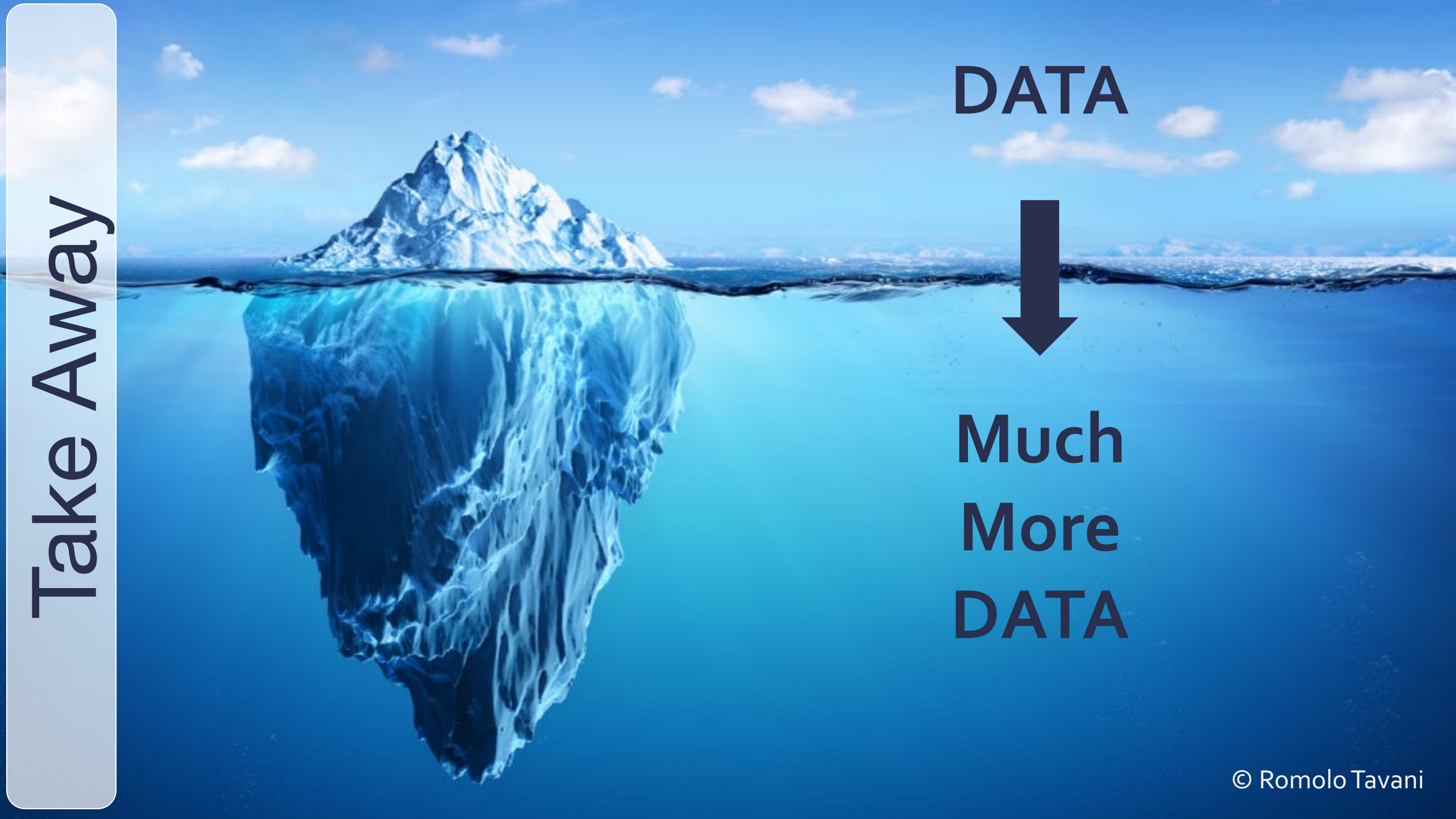
2020 This Is What Happens In An Internet Minute

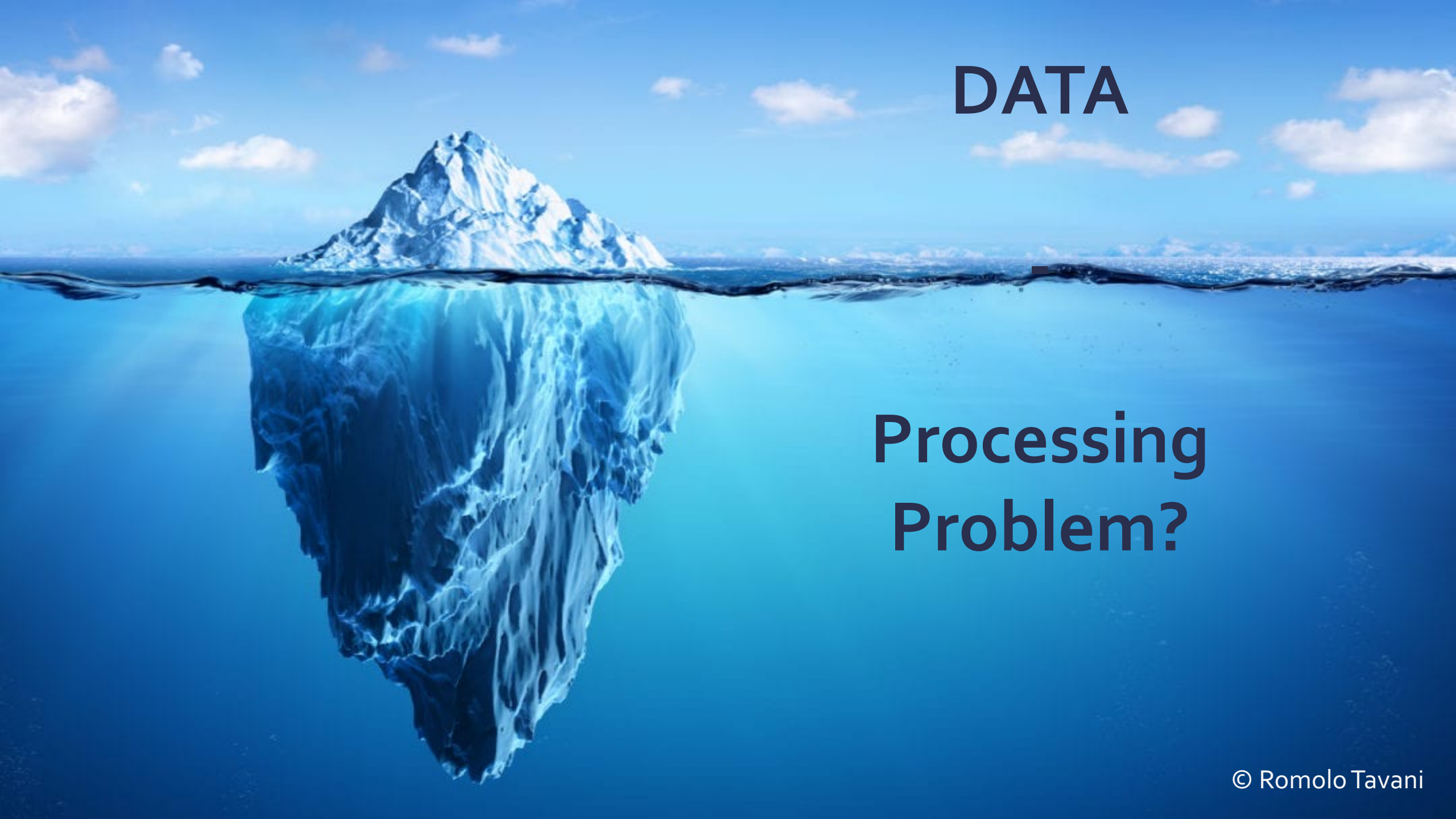
Created By:
@LoriLewis
@OfficiallyChadd


THE COMING FLOOD OF DATA IN AUTONOMOUS VEHICLES
RADAR
~10-100 KB
PER SECOND
SONAR
~10-100 KB
PER SECOND
GPS
~50KB
PER SECOND
CAMERAS
~20-40 MB
PER SECOND
AUTONOMOUS VEHICLES
4,000 GB
PER DAY... EACH DAY
LIDAR
~10-70 MB
PER SECOND
intel
© Intel


© Vchalup

Take Away

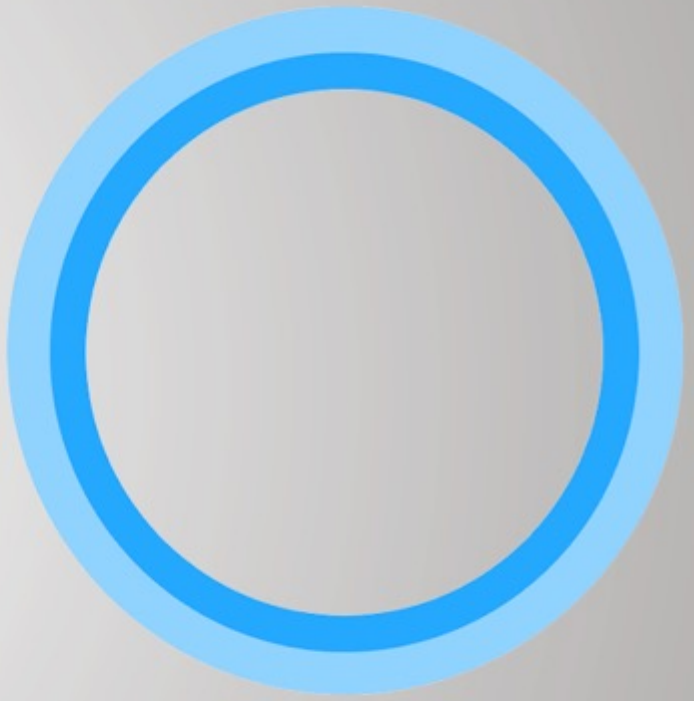




Multiple heterogeneous Data Sets

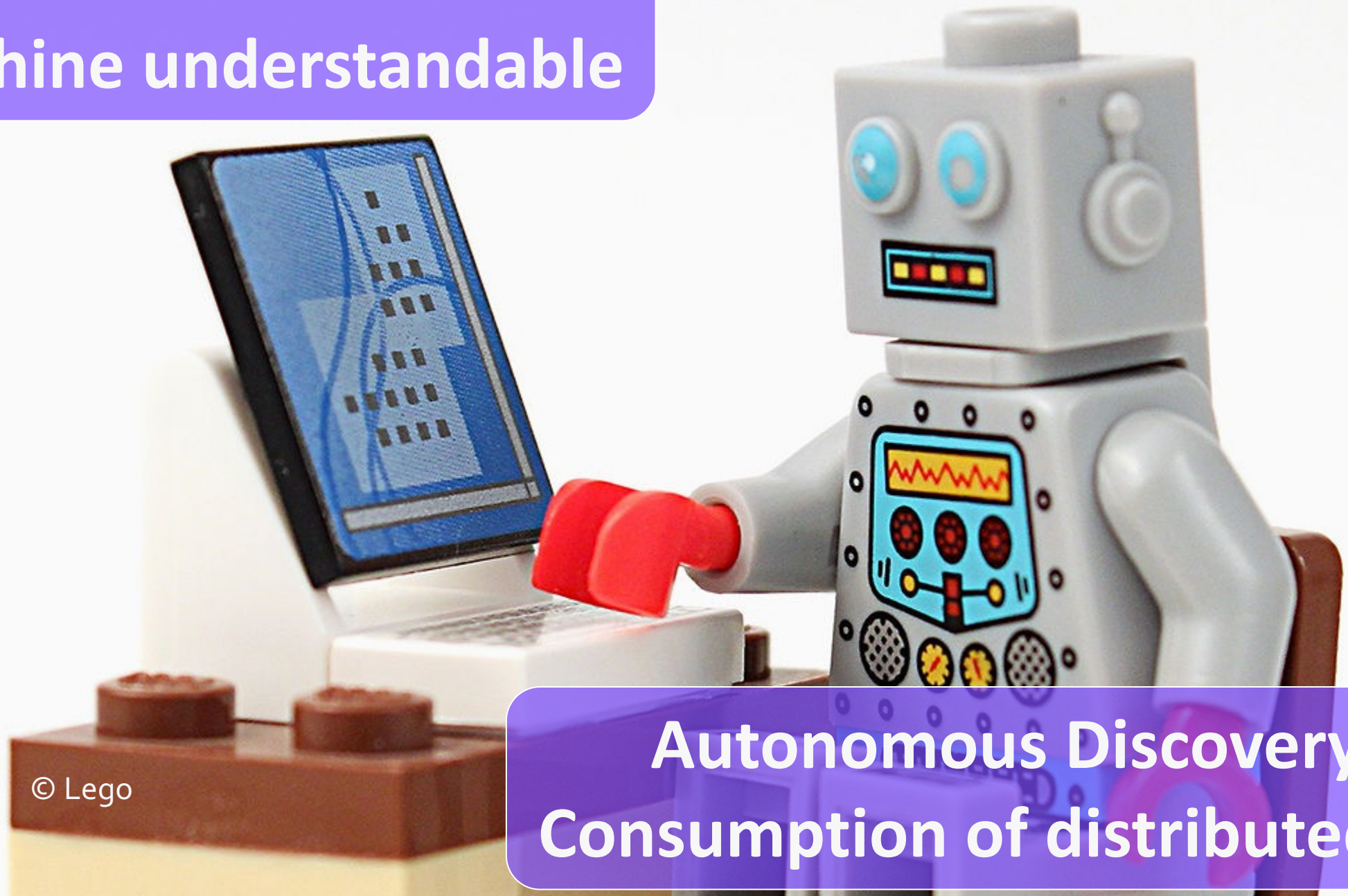
This is what Data looks like

Democratize Knowledge for Machines



Quality depends greatly on the Amount of accessible Knowledge

Annotate the Web to be Machine understandable



© Lego

Autonomous Discovery & Consumption of distributed Data

Silos of Data

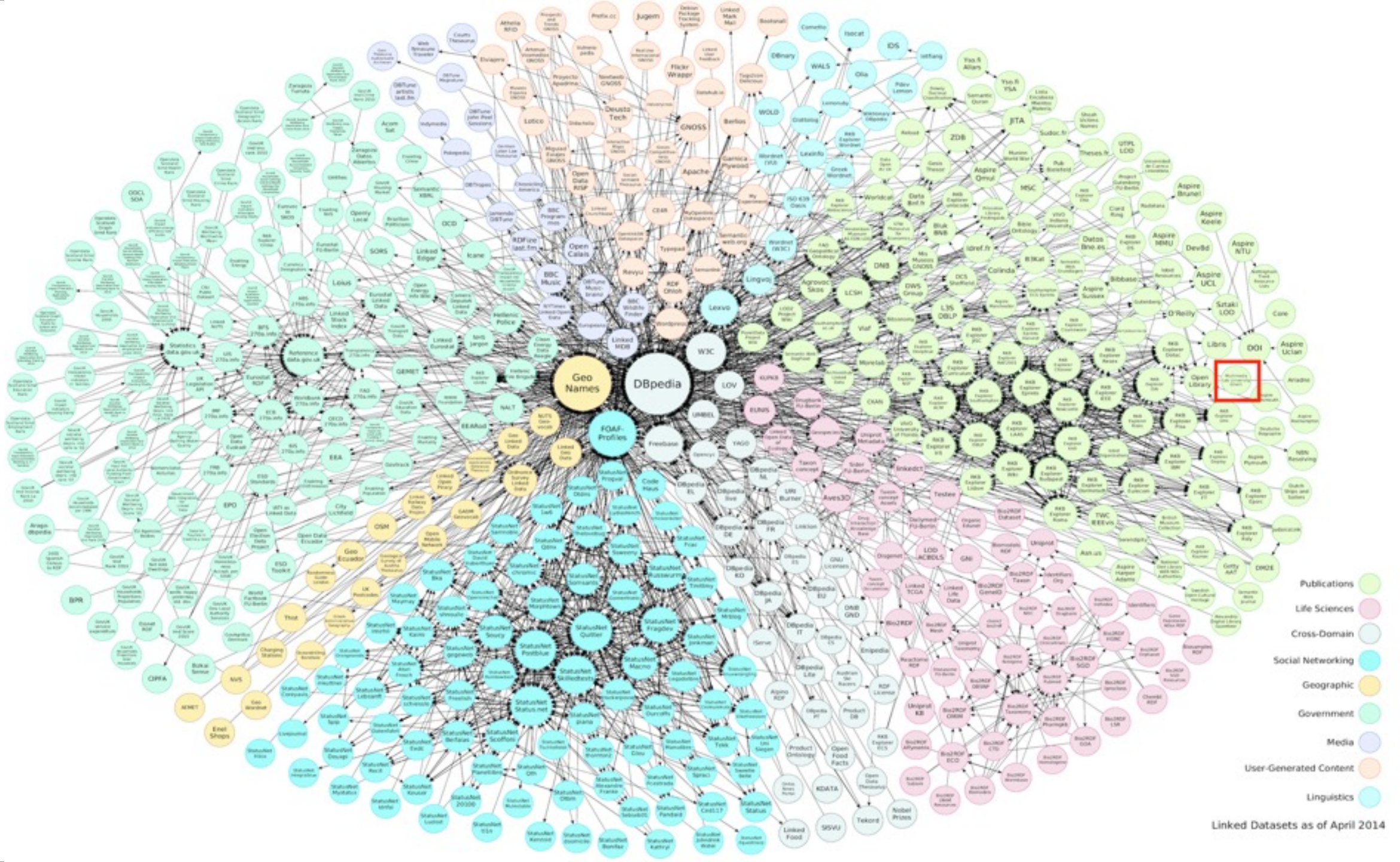
“Stop Hugging your Data”

Standards

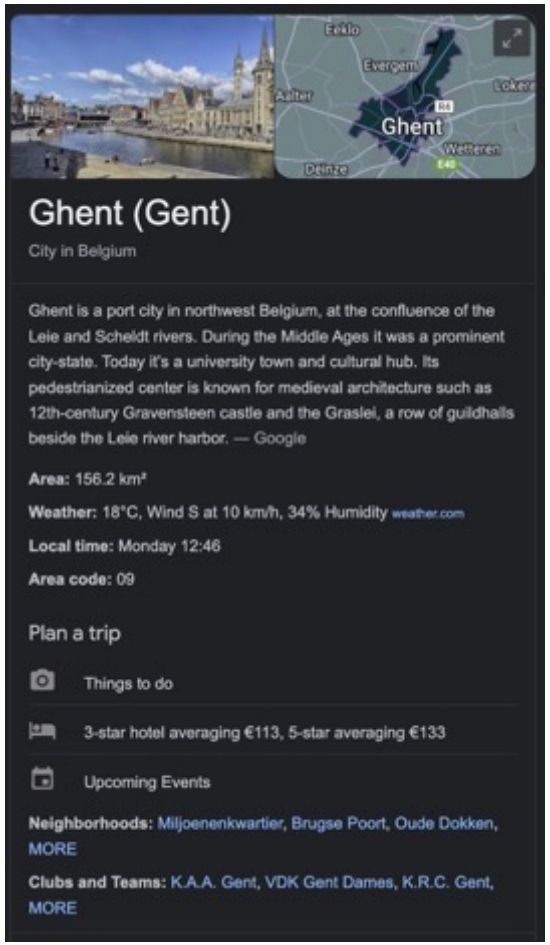
Semantics

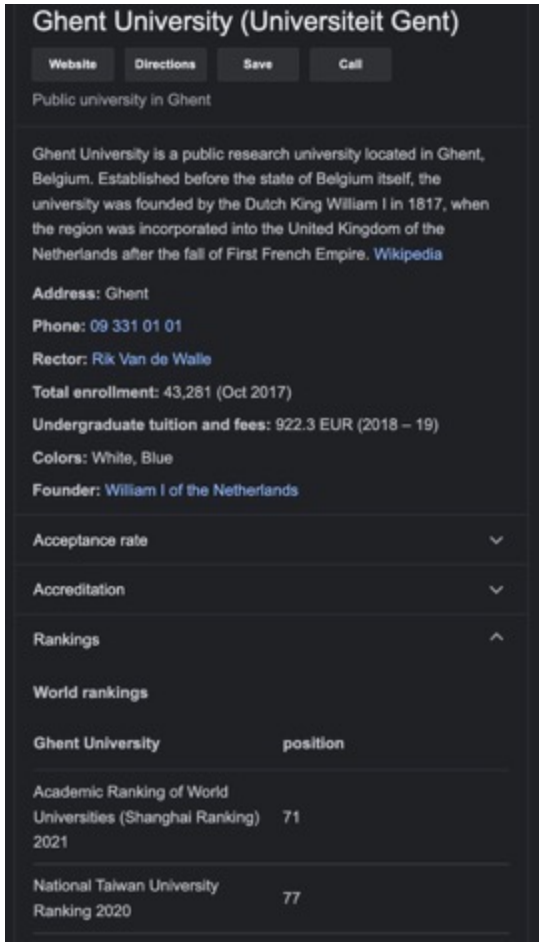
Connect your Silos

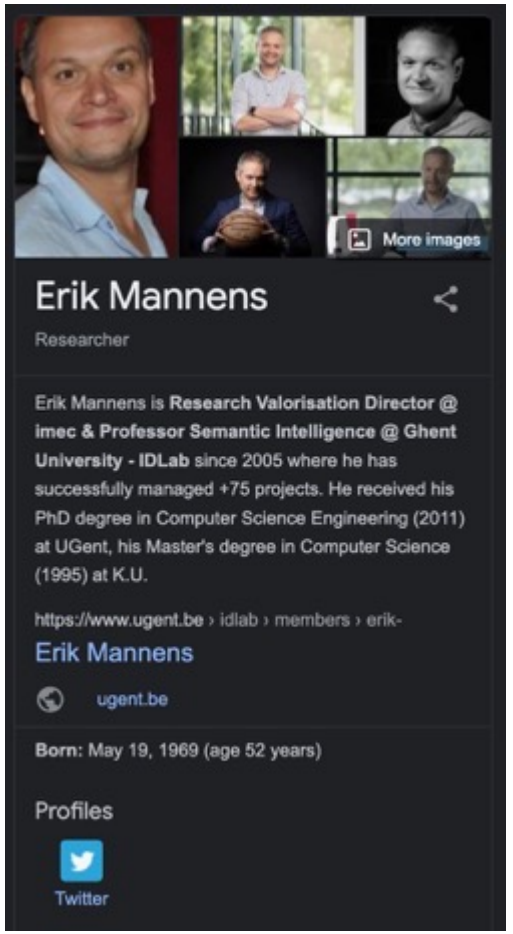
Linked Open Data



Knowledge Graphs







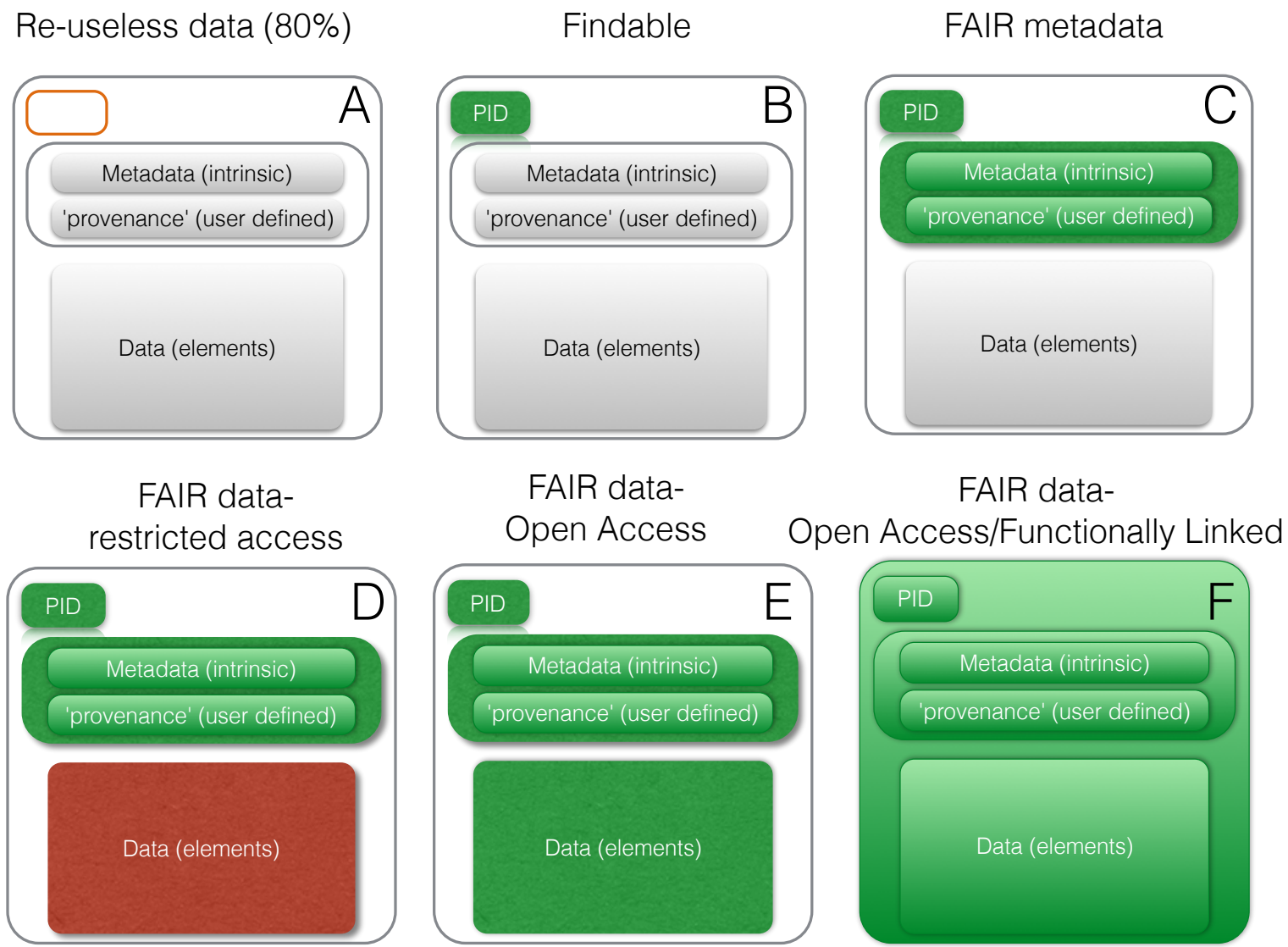
FLANDERS


participation
everyone has the means
to actively engage
open data
opportunity
new social & business
opportunities
empower
every voice is heard
no restrictions
free & unrestricted access
to all available data
transparency
promotes accountability
and provides information
digital
convenient &
reusable data
access
available to all
availability
committable, operable
& usable upon demand

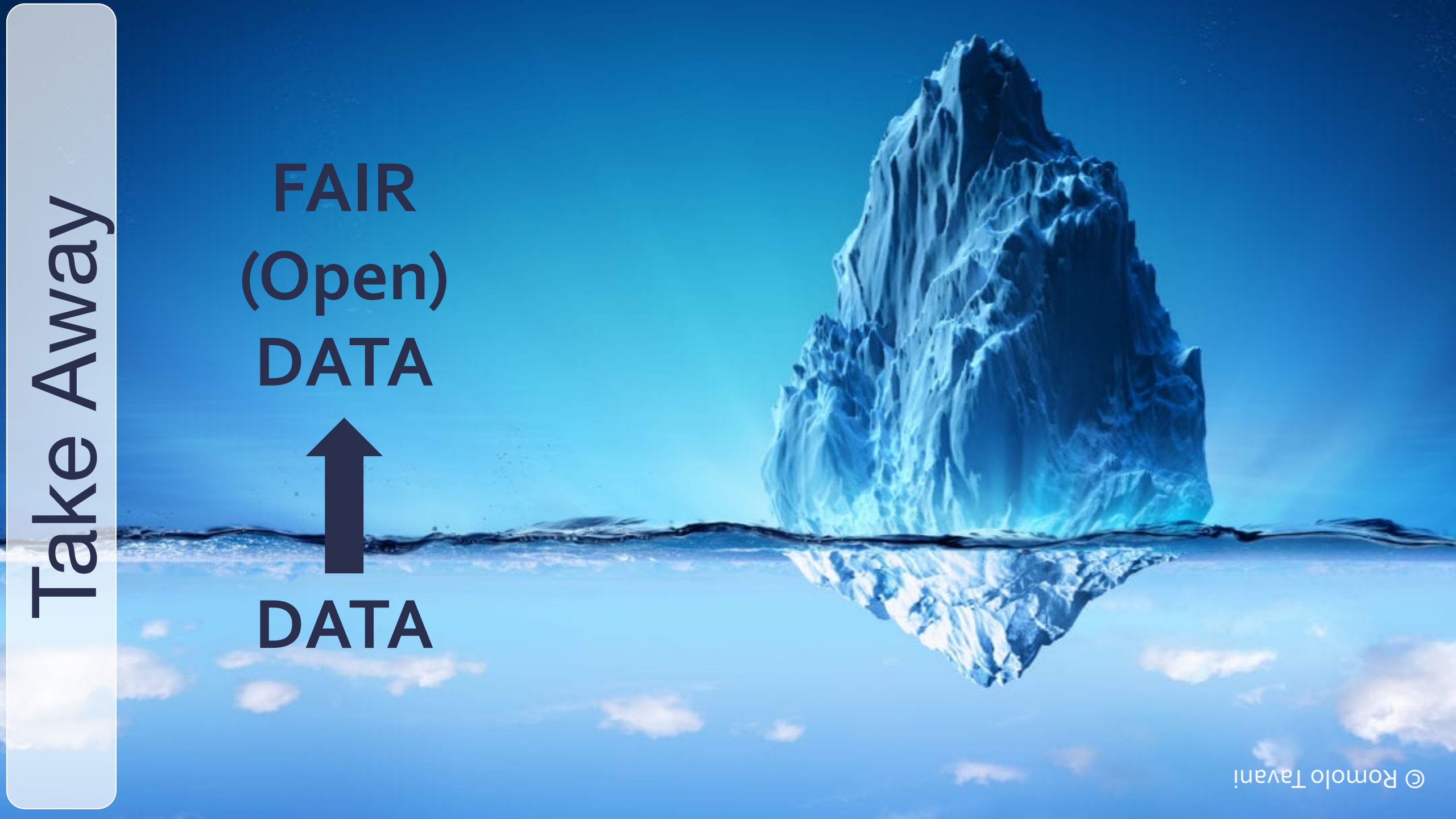
FAIR

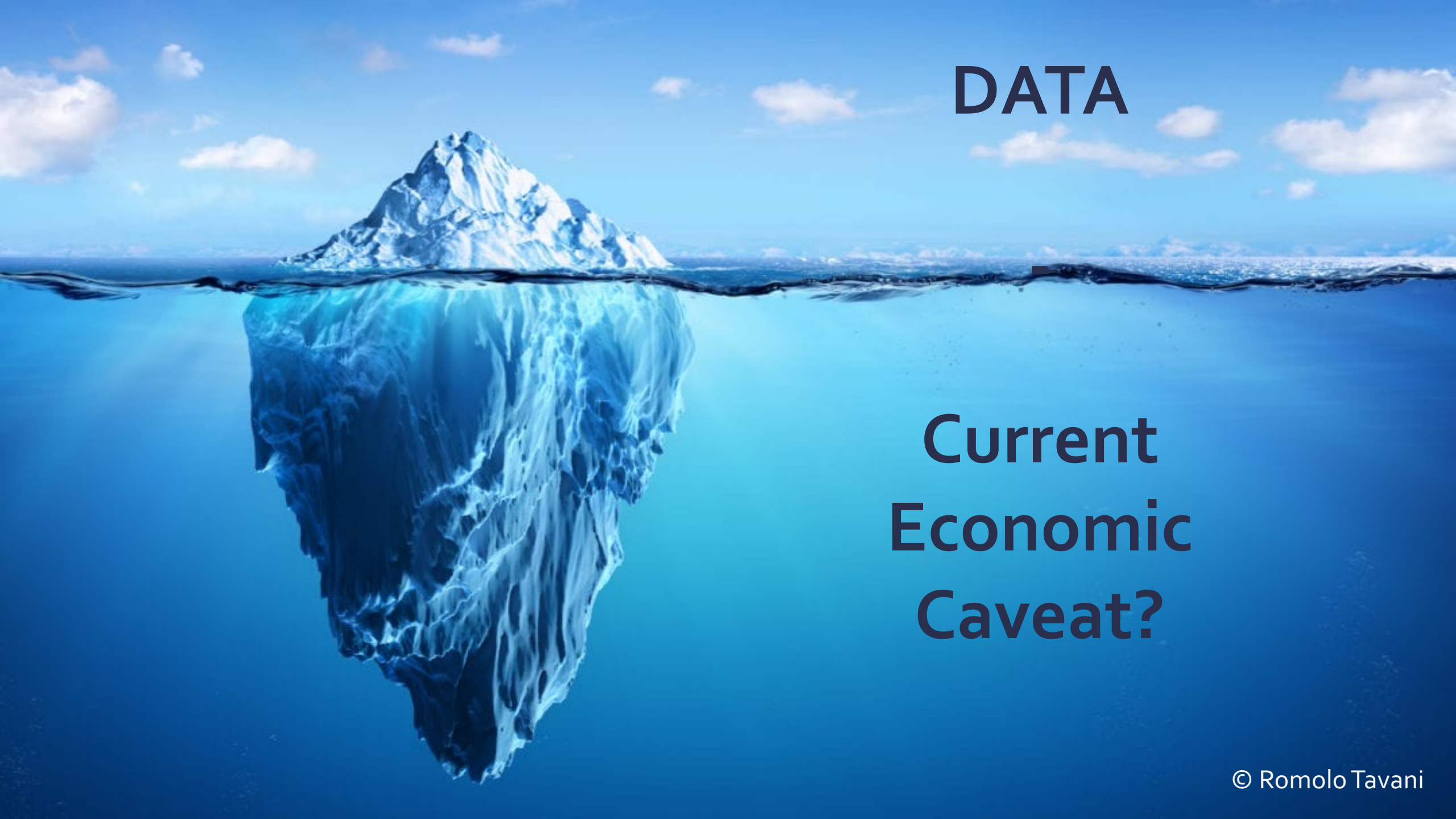
FINDABLE
ACCESSIBLE
INTEROPERABLE
RE-USABLE

Data as increasingly FAIR Digital Objects



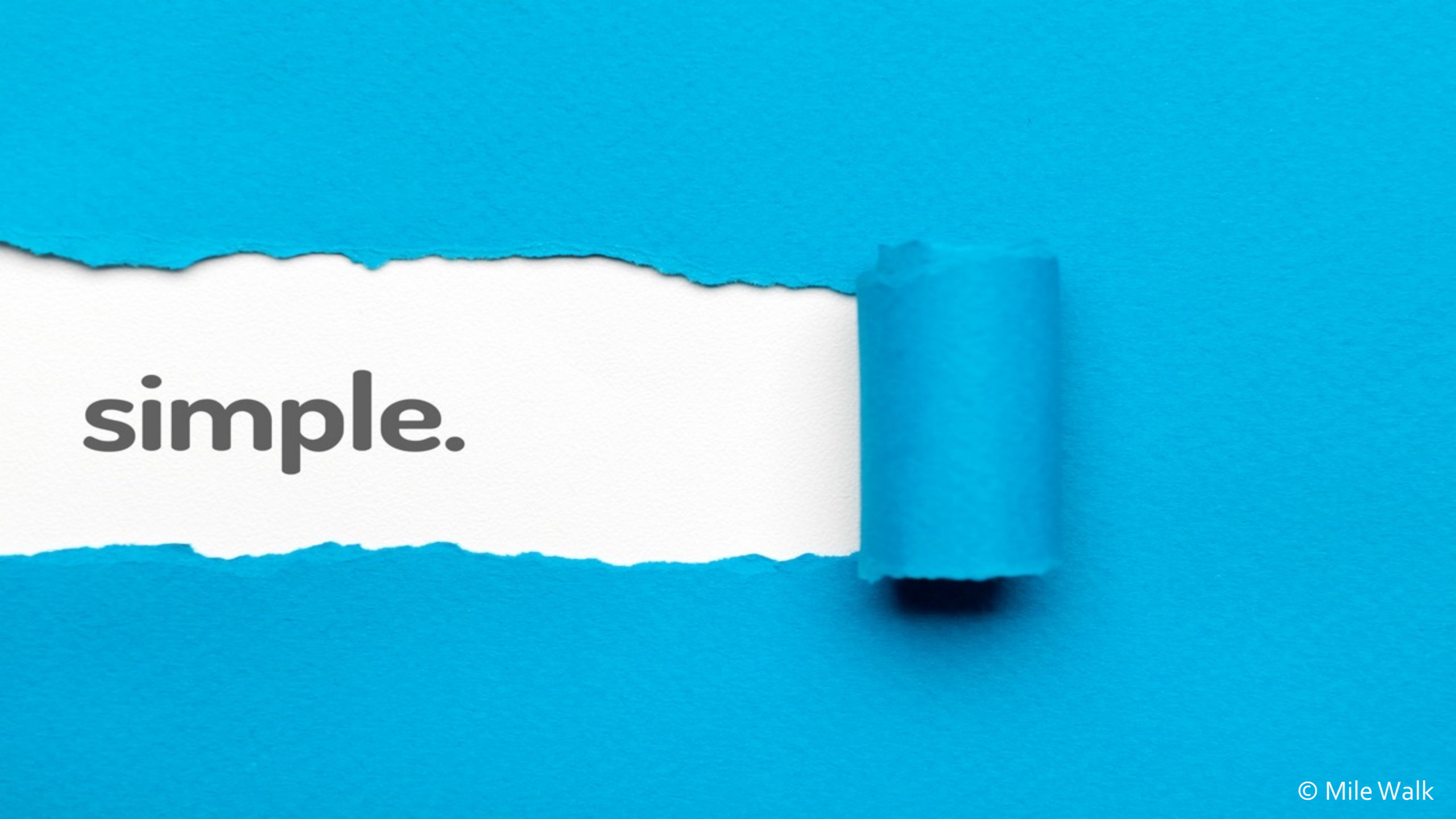
Take Away





Web 1.0 - 1990

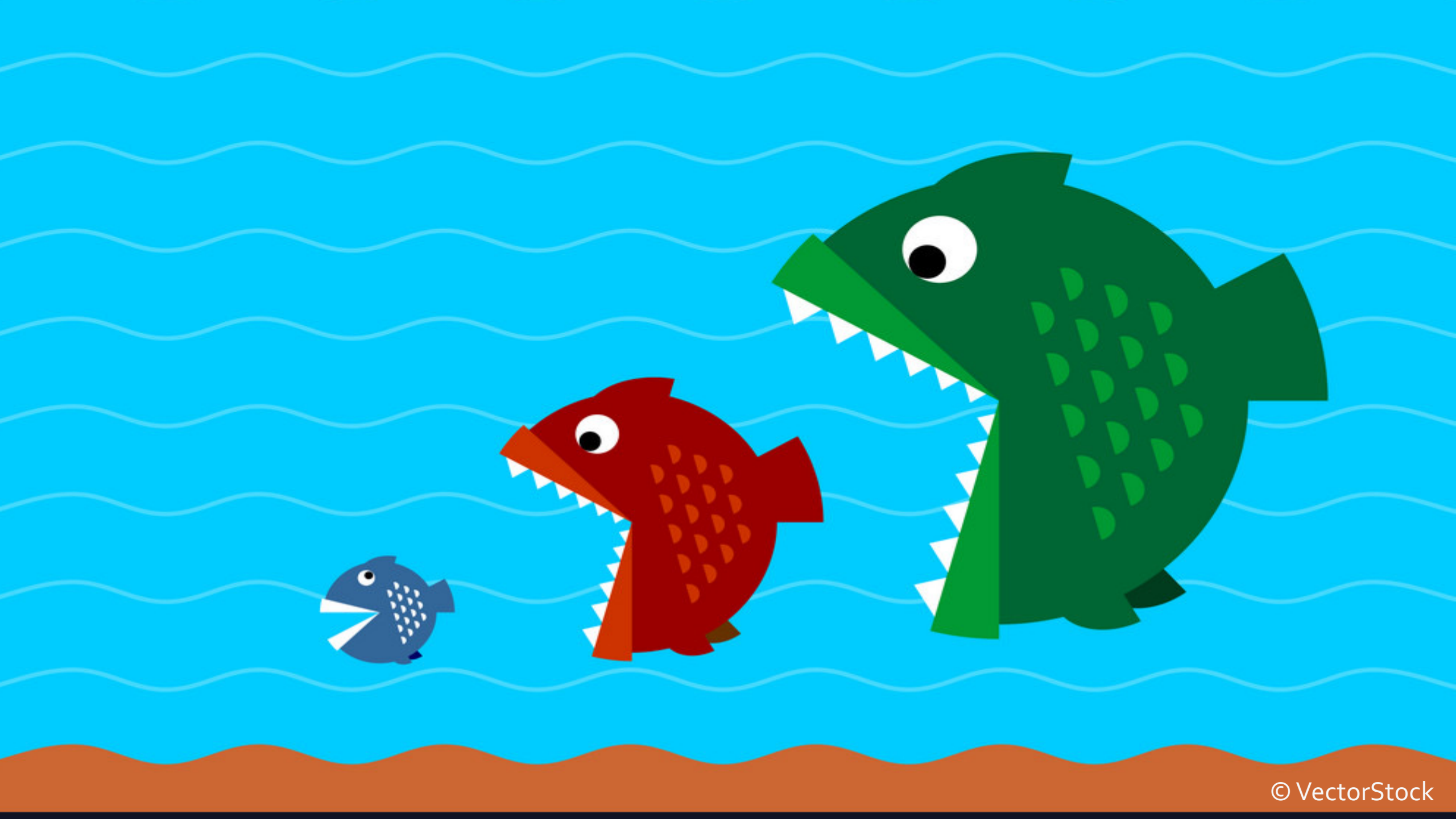
read only → consumers → free content (with ads)



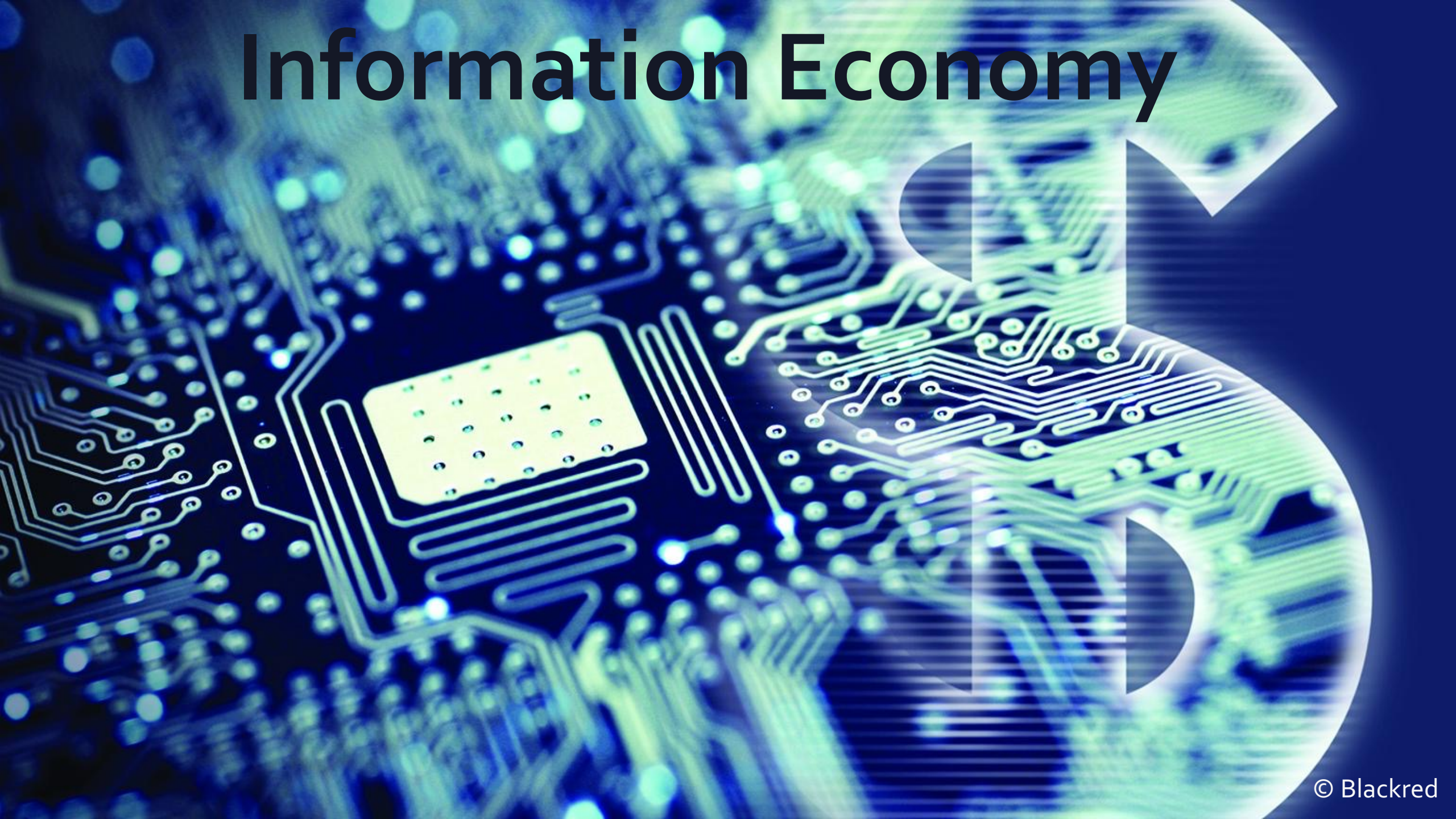

© Bigelow


FREE BEER!
FREE LUNCH!
& FALSE ADVERTISING!
© Allesvooruwmancave


センタービル
BURGER KING
渋谷センター街
5·6F
GOODYEAR
CALORIE 0
CALORIE HALF
ENERGY
ASBee
GAME
歌広場
松屋

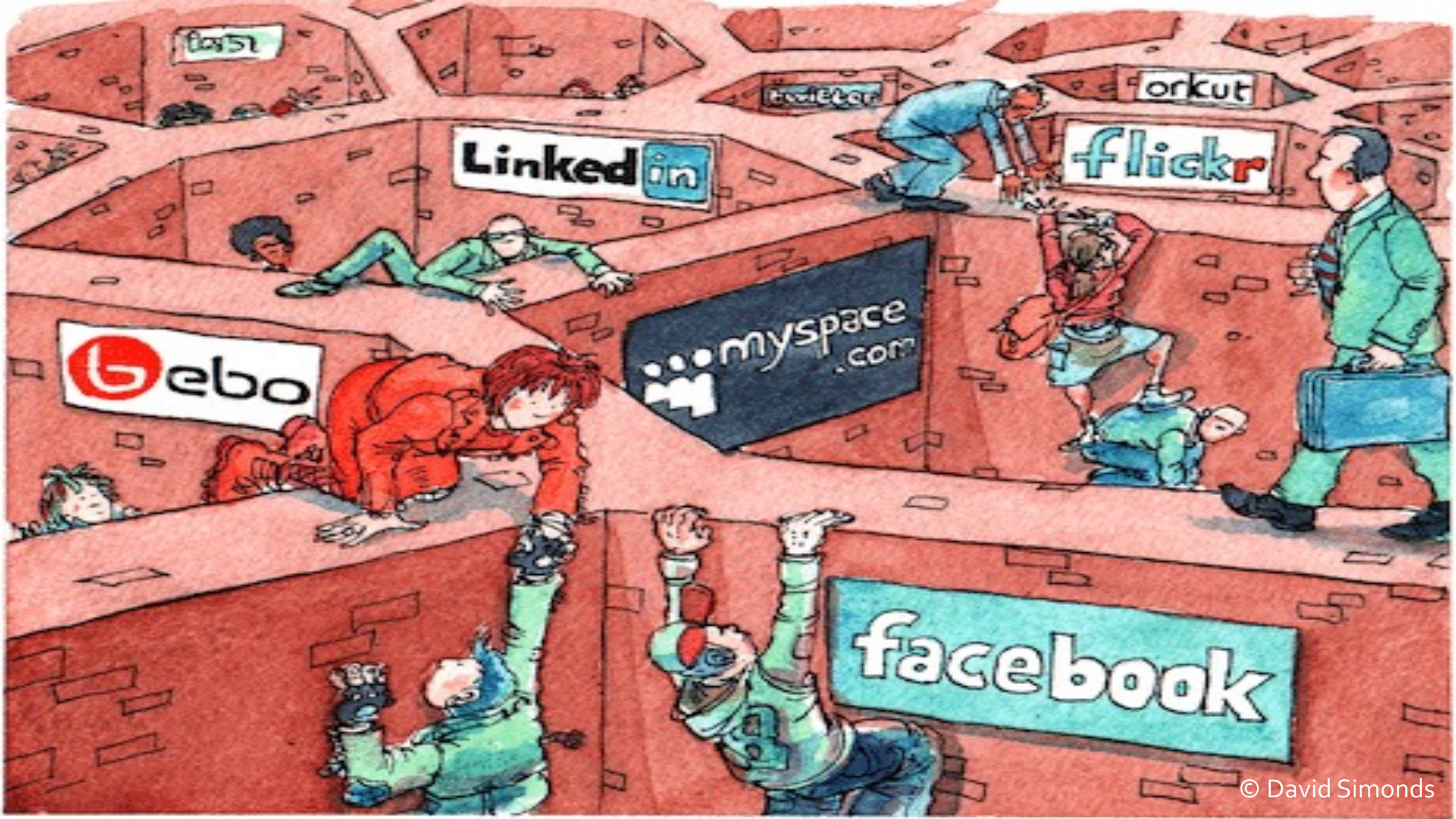

© VectorStock

Information Economy



Web 2.0 - 2005

read/write → producers → data harvesting & data selling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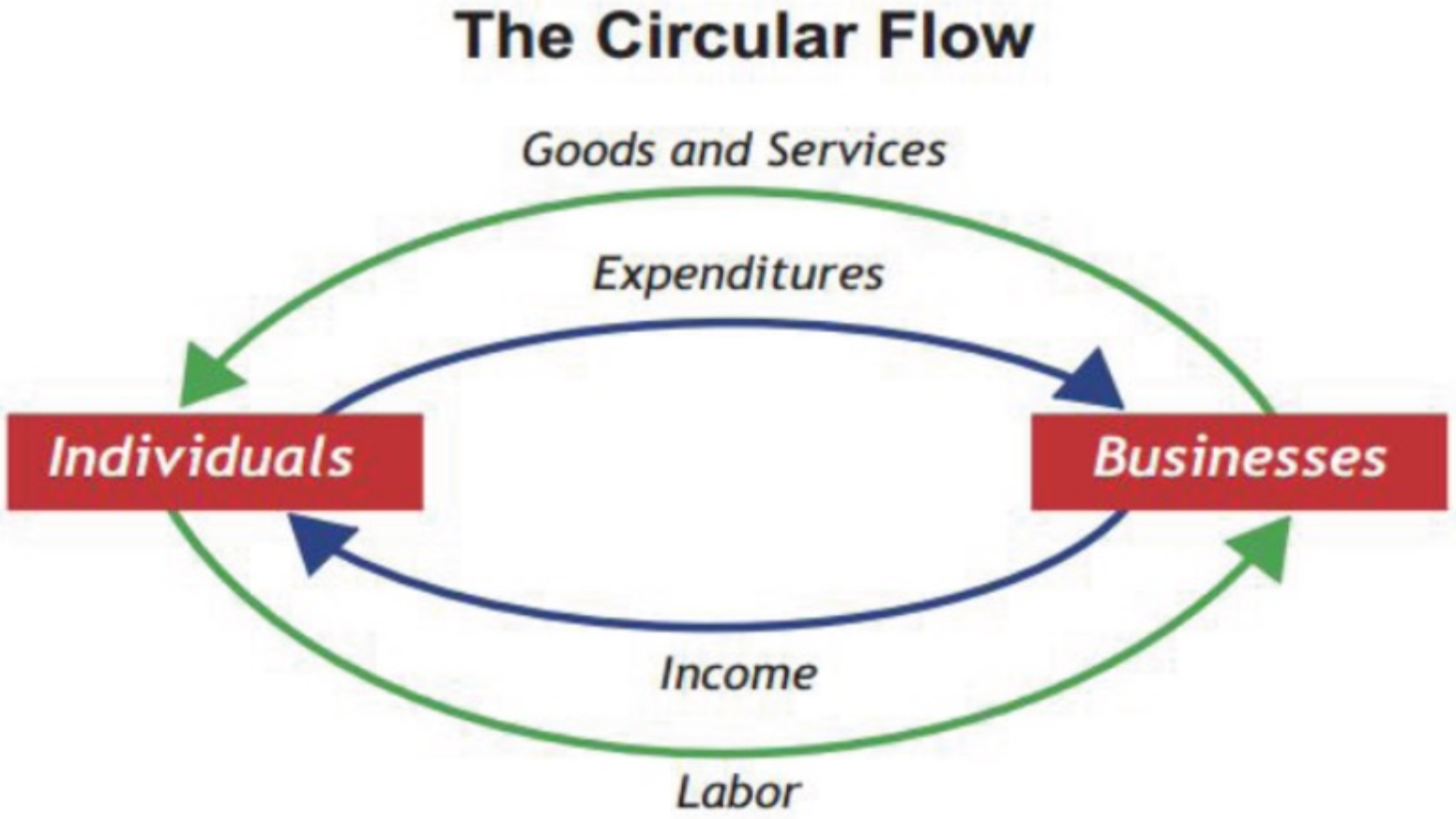
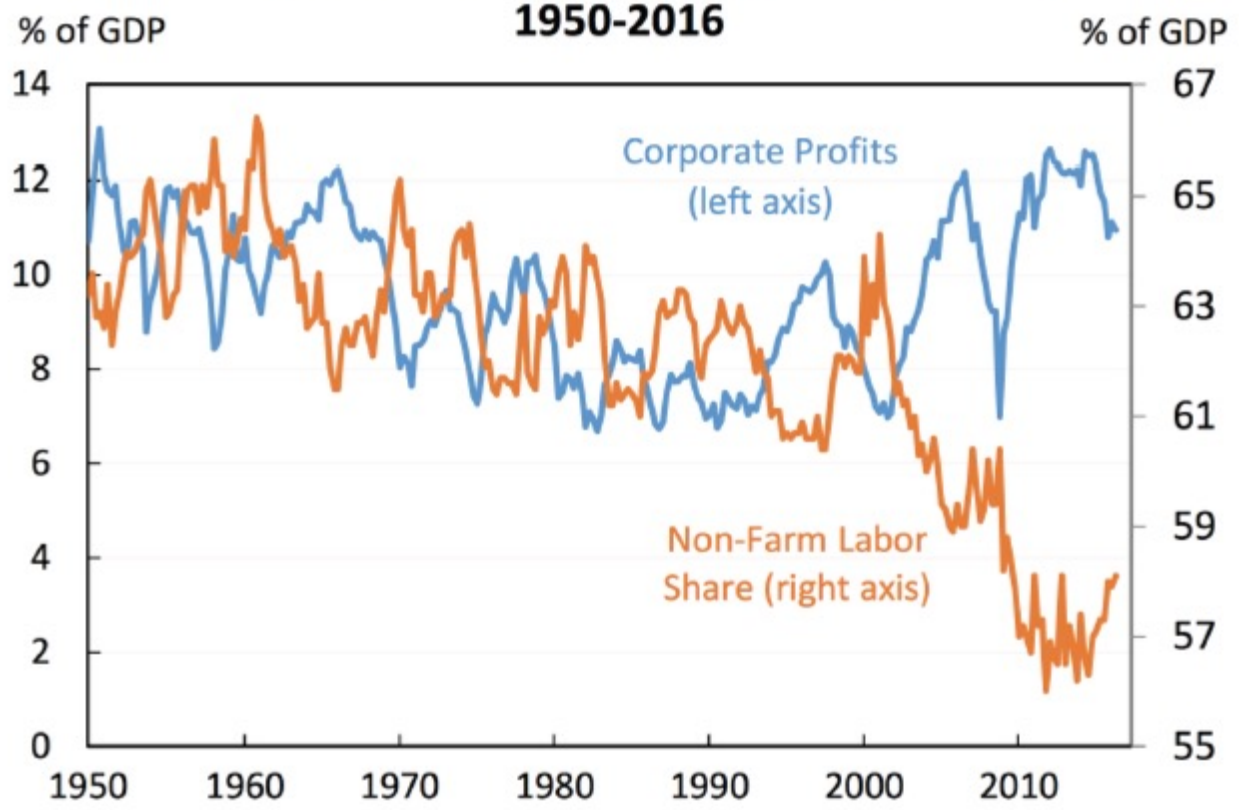
Where did that bring us?



FLANDERS

Increasing income inequality

Figure 5: Non-Farm Labor and Corporate Profits Share of GDP, 1950-2016



Source: Bureau of Economic Analysis, Bureau of Labor Statistics; CEA calculations

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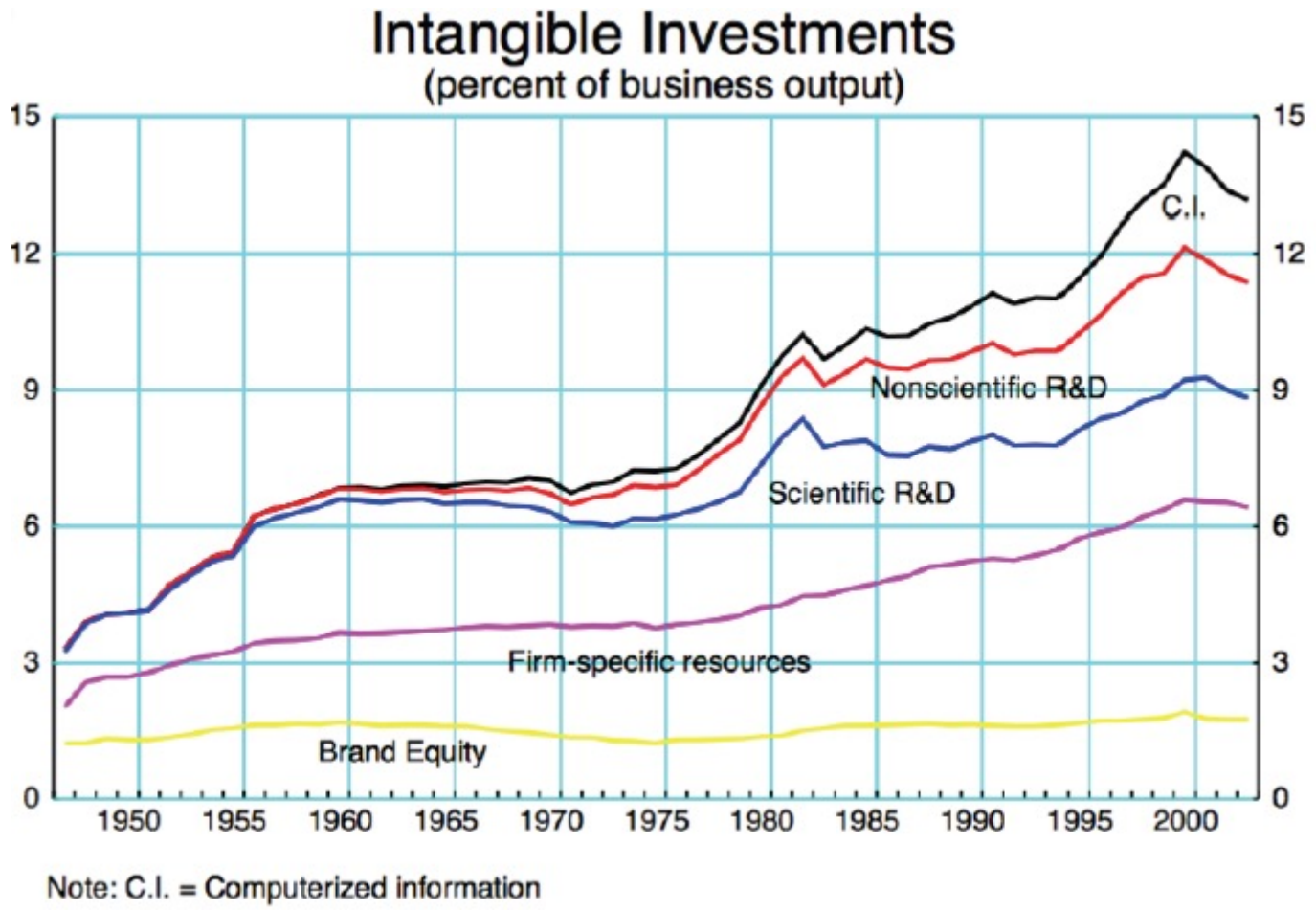
Increasing intangible assets (Knowledge)

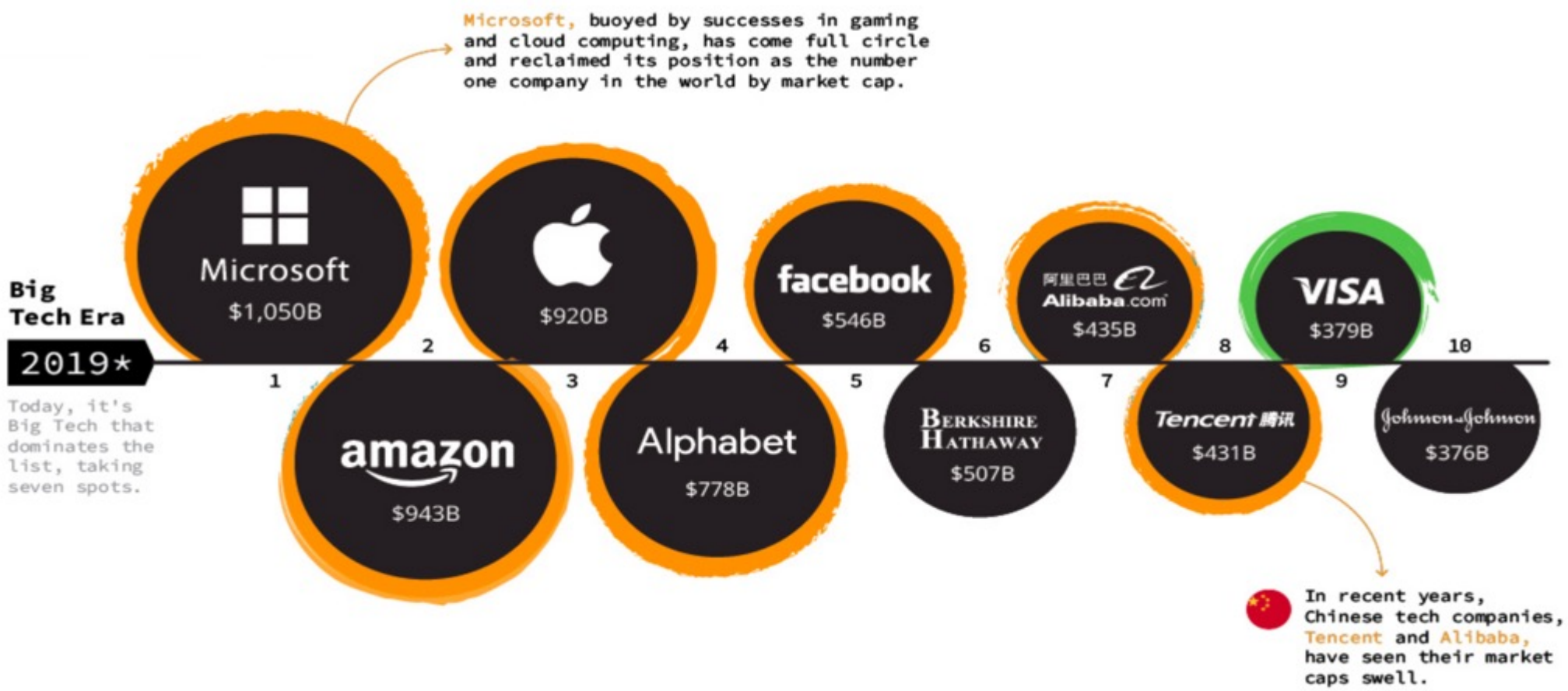


FLANDERS

Public corp's by market capitalization (2004)

FLANDERS

Public corp's by market capitalization (2019)



FLANDERS

THE DATA ƀOLLAR STORE

Companies that invest most in AI R&D?

FLANDERS

Companies that invest most in Data?

So … How many times do they cash?

FLANDERS

Driving a Wedge – Makes one think, right?

© Toysfromthepast

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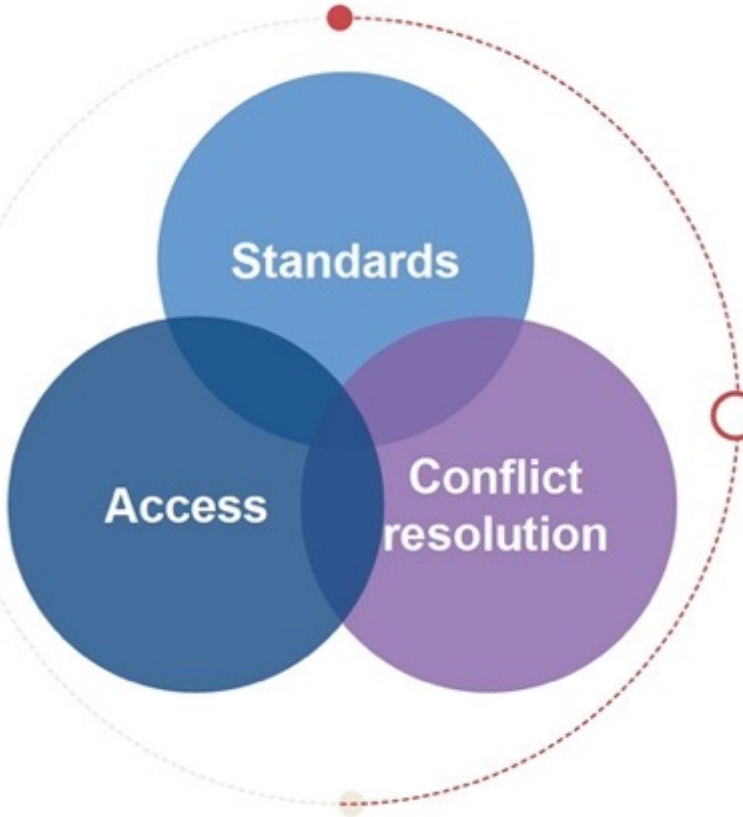
FLANDERS

Platform Economy … the Good, the Bad & the Ugly

Traffic lights

Google, Apple
Amazon, etc.



Roundabouts

The Internet
The World Wide Web

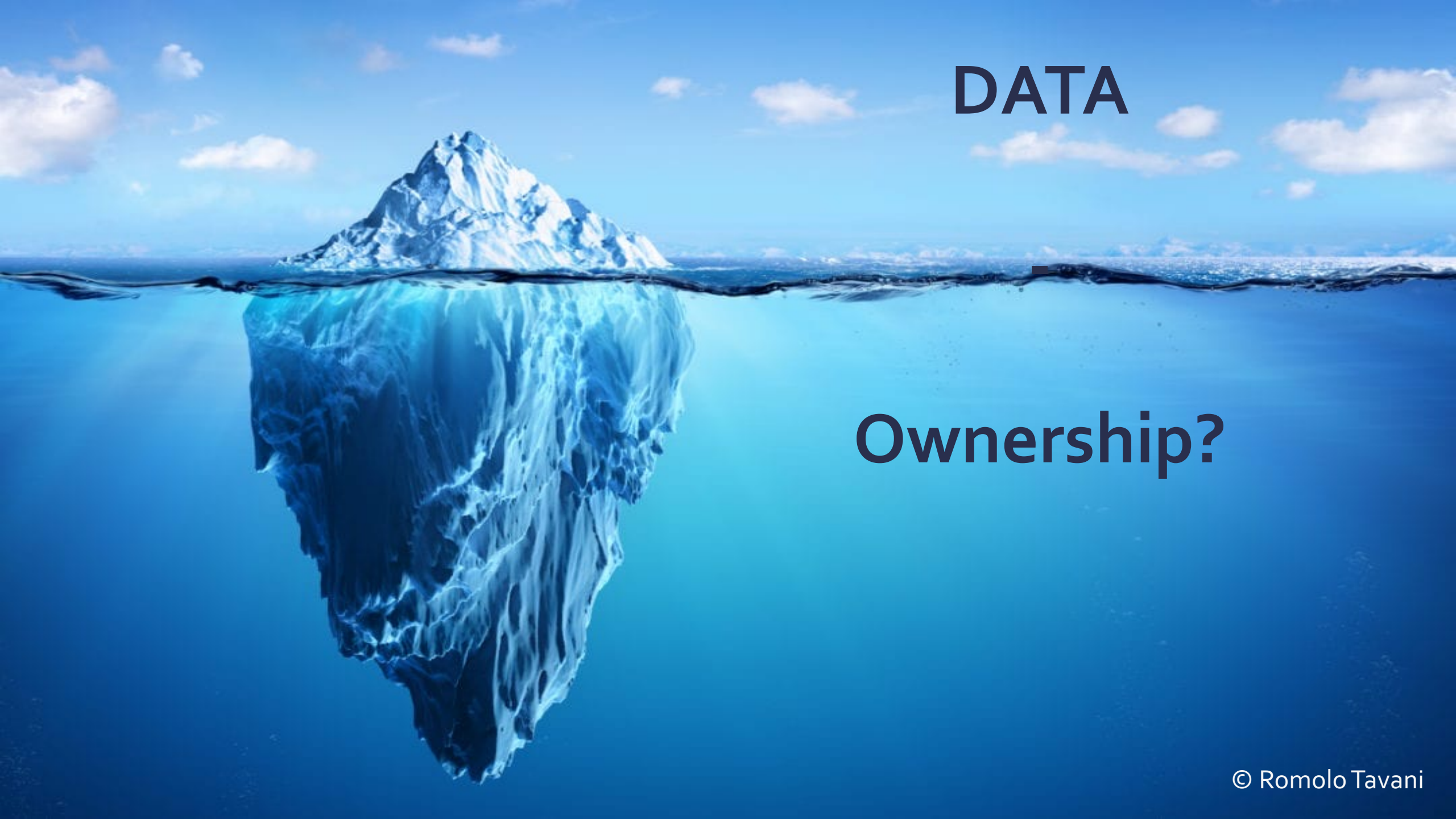
FLANDERS

Complicated, Closed, Cumbersome

Simple, Open, Free

Simple, Open, Free
(Free … as in Freedom, not as in Free beer)

Take Away



Web3 - 2020

decentralisation, transparency, privacy → self-control → SOLID & Blockchain

?

?

?

FLANDERS

Todays Web Ecosystems

WINNER TAKES ALL

VECTOR

Facebook isn't 'free' when the cost is your data – and Zuckerberg knows it

How Tim Cook and Mark Zuckerberg's war of words reveals a profound split – and potential shift – in how technology companies view and respect our privacy.

RENE RITCHIE 12 Apr 2018 24

The Customer is the product.

You pay more
for “relevant” people
based on their data they share.

FLANDERS

Todays Web Ecosystems

EXTREME BARRIERS FOR NON-DOMINANT PLAYERS

SERVICE PROVIDERS

HIGH INVESTMENTS,
HIGH RISKS TO
INTRODUCE SERVICES

LARGEST PORTION
OF ADDED VALUE
TO THE GIANTS

WITHOUT ACCESS TO THE DATA,
LIMITED INNOVATION
OPPORTUNITIES

END-USER (ACQUISITION)

EXTREME HASSLE
FOR USER TO CHANGE SERVICE
=TRANSFER ALL THE DATA

COMBINING SERVICES ON
SAME DATA NOT POSSIBLE

FLANDERS

DATA OWNERSHIP AS A BUSINESS MODEL WILL NO LONGER BE SUSTAINABLE.

legal pressure
GDPR

societal pressure
data leaks & ownership

competition pressure
lack of innovation

BLOCKCHAIN
(distributed ledgers)

The Properties of Distributed Ledger Technology (DLT)

Programmable
A blockchain is programmable (i.e. Smart Contracts)

Secure
All records are individually encrypted

Anonymous
The identity of participants is either anonymous or pseudonymous

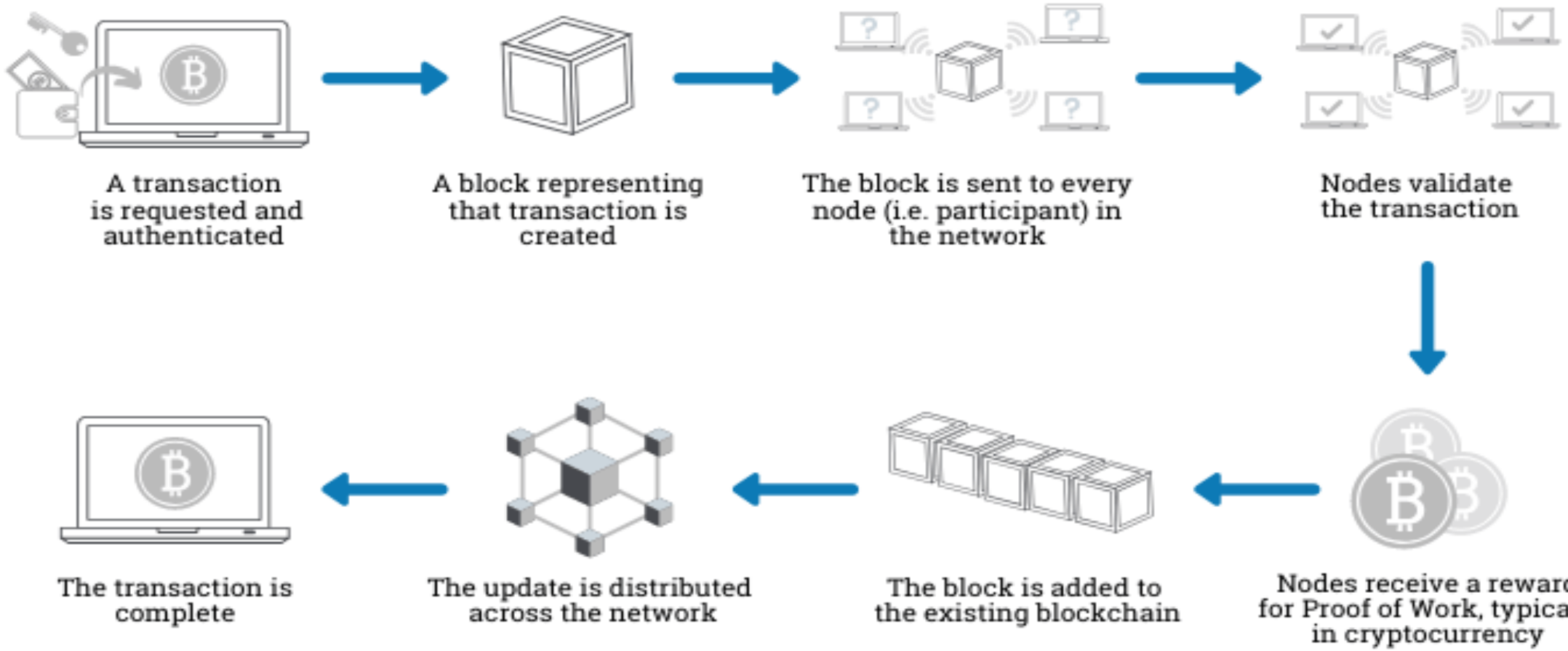
Distributed
All network participants have a copy of the ledger for complete transparency

Immutable
Any validated records are irreversible and cannot be changed

Time-stamped
A transaction timestamp is recorded on a block

Unanimous
All network participants agree to the validity of each of the records

How does a transaction get into the blockchain?



Criticism : (ecologically) inefficient

Proof-of-Work (PoW) is the consensus mechanism first popularized for permissionless blockchains and cryptocurrencies through the Bitcoin network. This PoW network is run by validators, so-called miners, who add new blocks of transactions to the network on an ongoing basis. As a reward, these miners receive incentives in the form of block rewards (a fixed amount that is predetermined) and transaction fees (paid by each user conducting a transaction).

Bitcoin's PoW miners compete for these incentives by adding computational power to the network; the more computational power, the higher the chance to receive the incentive. Specialized PoW mining hardware devices generate computational power, so-called ASIC miners, which consume vast amounts of energy in the process. Accordingly, Bitcoin's PoW miners are incentivized to add more and more computational power to the network, consuming more and more

FLANDERS

Criticism : “Proof of Work” vs. “Proof of Stake”

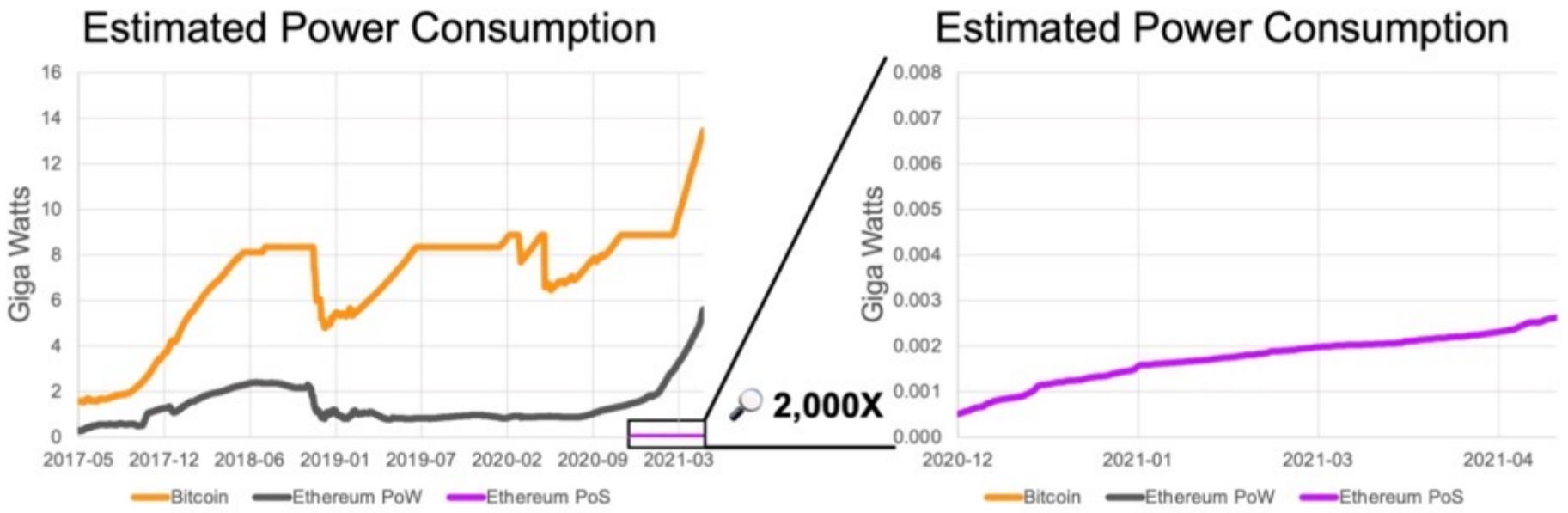


Figure 2 — Bitcoin and Ethereum PoW energy consumption compared to Ethereum PoS (from Digiconomist).

FLANDERS

CRYPTO

Bitcoin

A matter of design: why Bitcoin consumes so much energy

Of all the 21 million Bitcoins that can exist at the same time, nearly 90 percent was already mined in mid-2021. This, however, does not necessarily mean that the Bitcoin supply is running out as the last Bitcoin was forecast to be mined around the year 2140. This is a design choice in the cryptocurrency: The closer Bitcoin gets to its supply limits, the computing power – and therefore energy - needed to mine goes up incrementally. The BTC mining difficulty or amount of computing power being applied to mine Bitcoin reflects that: Bitcoin mining in, say, 2014 – when there were less Bitcoin in circulation - was easier and less energy consuming than in 2021. By then, there were significantly more coins in circulation and the cryptocurrency's design essentially tries to halt the creation of more.

Bitcoin Mining Energy Consumption in TeraWatt/Year

FLANDERS

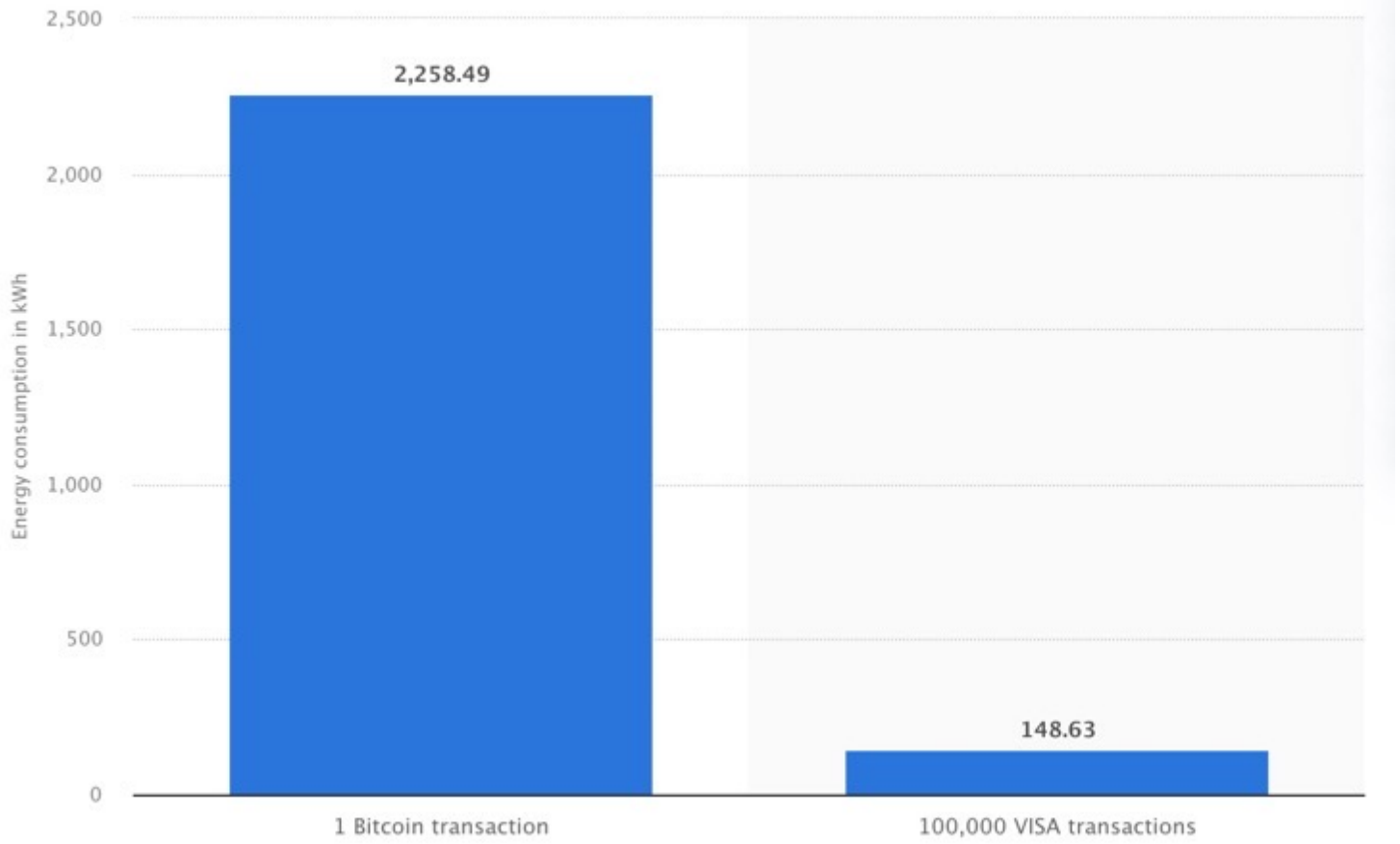
Buy a “mars” bar for 0.00002 Bitcoin

LONDON — Bitcoin transactions use so much energy that the electricity used for a single trade could power a home for almost a whole month, according to a paper from Dutch bank ING.

Published on 22/02/21

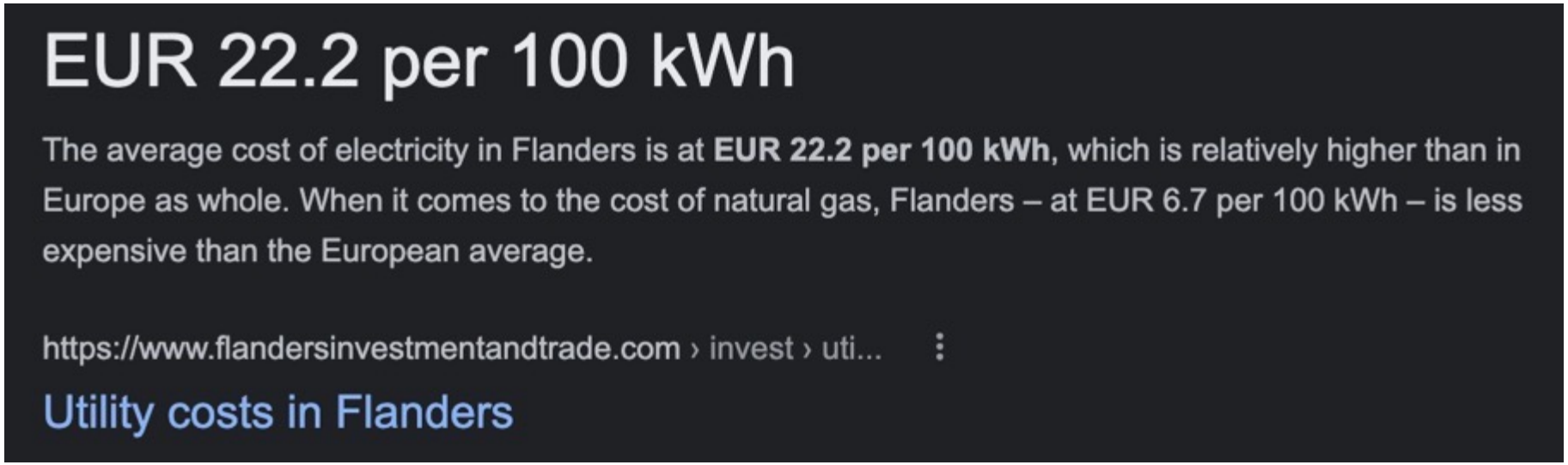
FLANDERS

Bitcoin Transaction Cost



FLANDERS

Criticism : (ecologically) inefficient … squared!!!



Thus … current Bitcoin transaction cost = 496 €

FLANDERS

SOLID

“inverted” Apps using only decentralized Data

ALL HAVE # PERSONAL DATA PODS

SENSITIVITY LEVELS
ACCESS CONTROL RULES
DATA RETENTION POLICIES
DIFFERENT LIFE SPANS

FLANDERS

End Users choose where they store their Data

Author's name and latest profile picture
stored in author's personal data pod

Work-related opinion about an article
stored in data pod of author's company

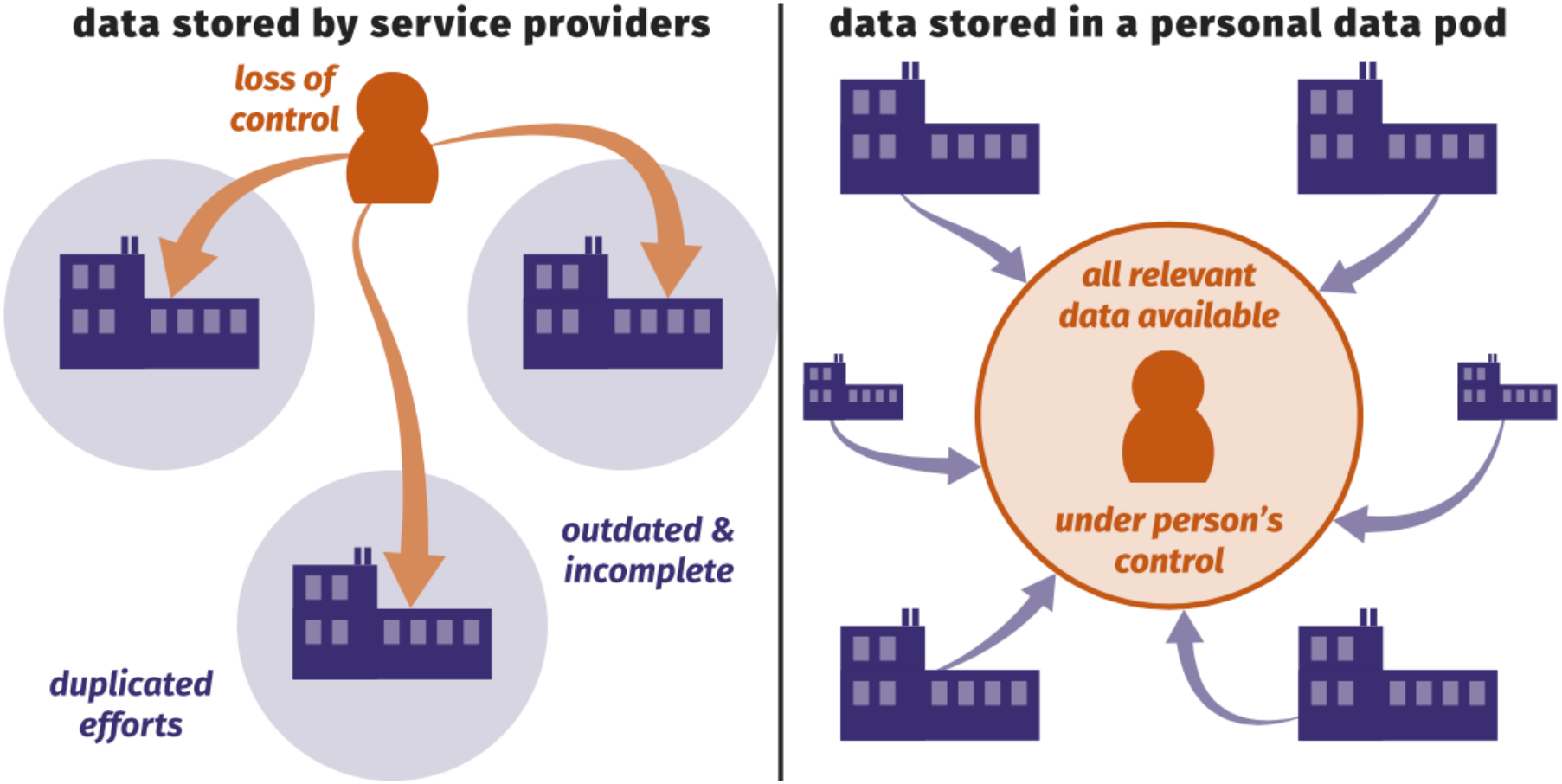
Discussed article title and photo
stored in news website's data pod

Likes on this post
each one in different individuals' data pods

Comments on this post
each one in different individuals' data pods

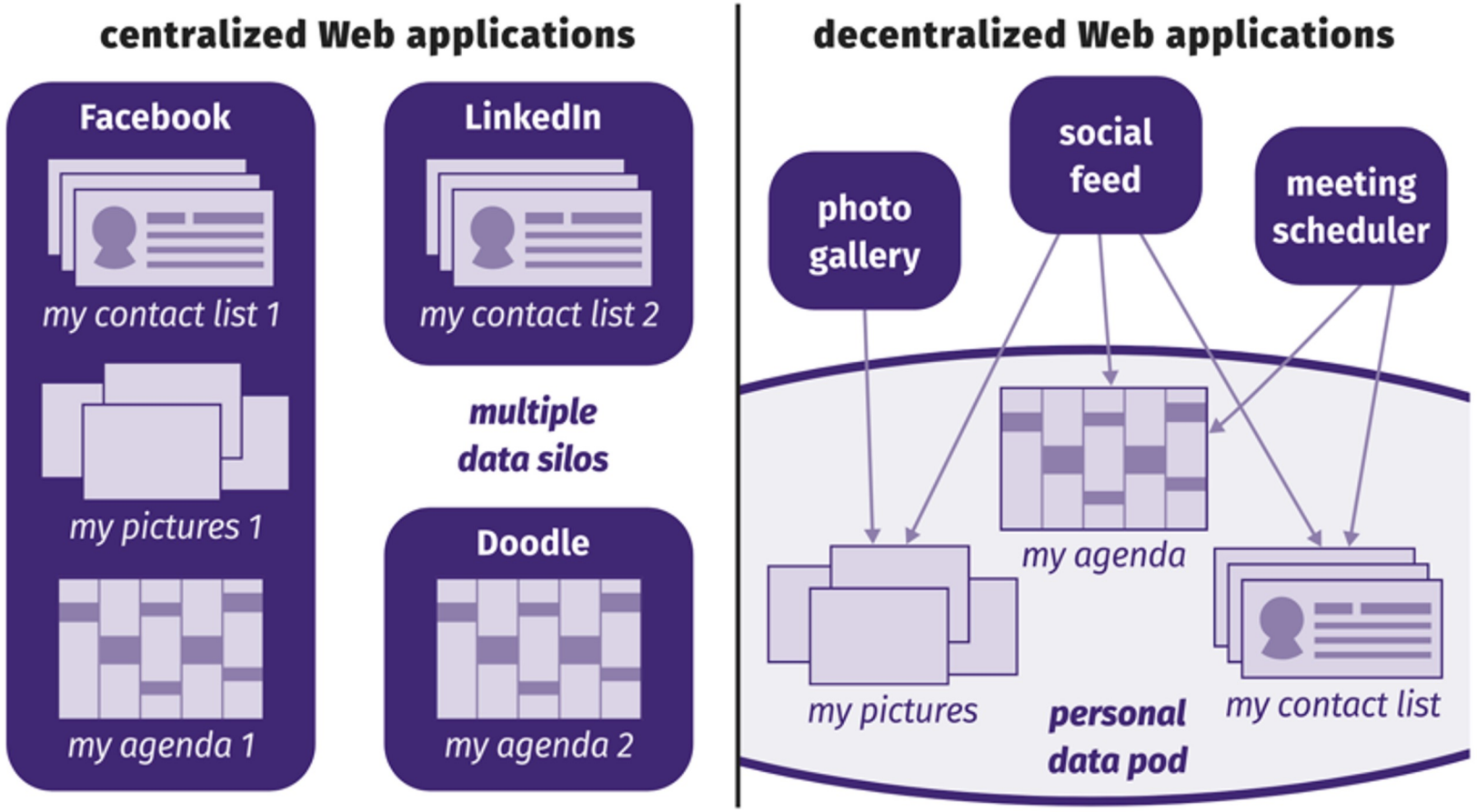
FLANDERS

Give Citizens back Control of their personal Data



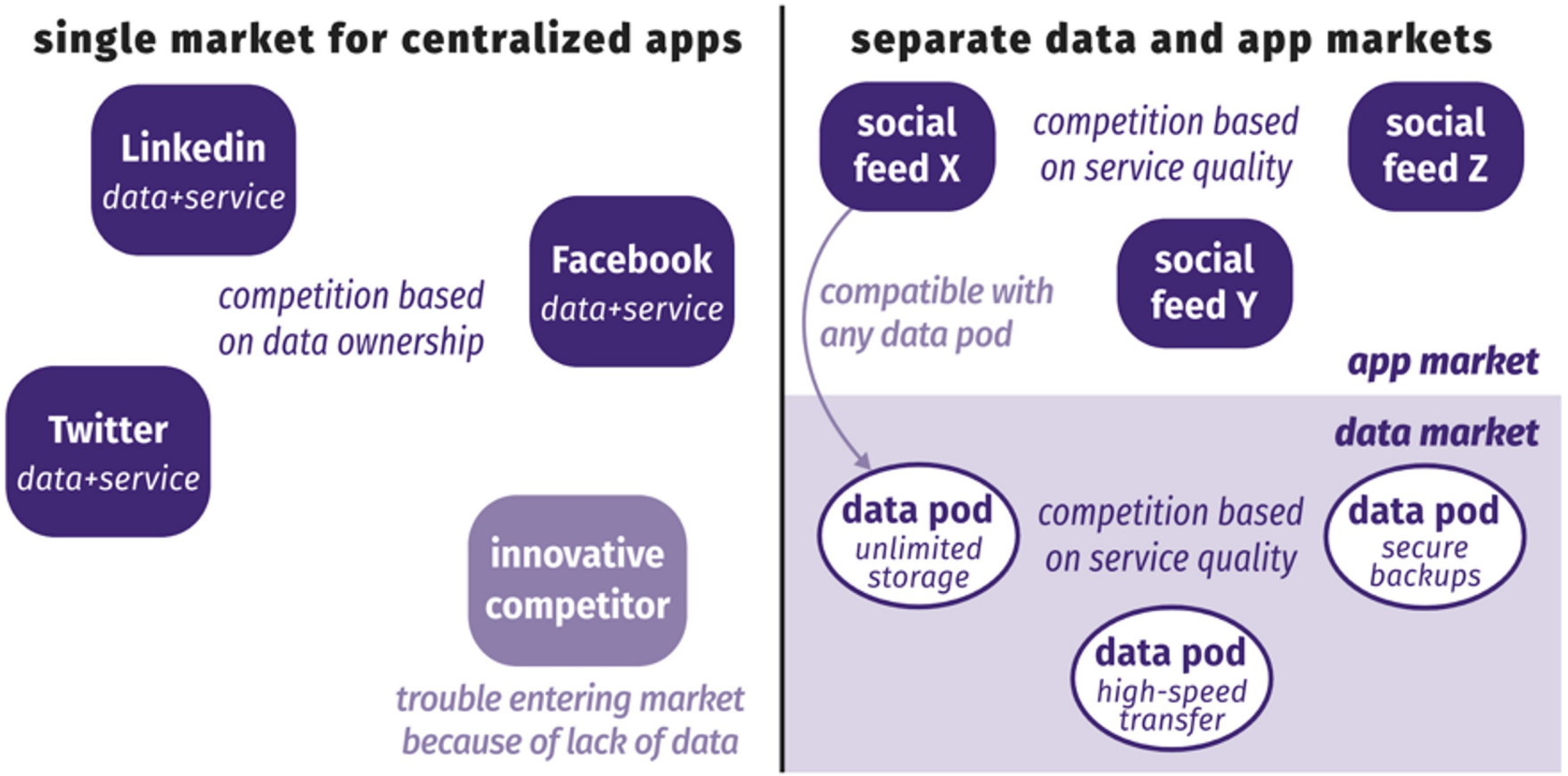
FLANDERS

Applications evolve into Views



FLANDERS

Two-level Competition with Multiple Winners



FLANDERS

Solid is not a platform to replace others, but a way of building for the Web.

Solid is an ecosystem.

Standards enable interoperability

Solid is a movement.

We need to shift the app builder mindset.

Solid is a community.

Building Solid requires different people, companies, and organisations.

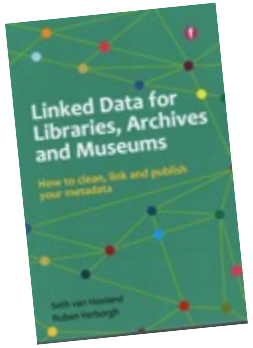
Co-shaping the Future of the Web

IMEC ACTIVITIES SETTING THE GLOBAL SCENE

FRONTRUNNER
WITH NEW CONCEPTS

DRIVING
STANDARDS

REFERENCE
IMPLEMENTATIONS



RML LDF SOLID

Massachusetts Institute of Technology

KEY CONTRIBUTIONS SINCE 2007 IN SEMANTIC WEB, OPEN DATA, LINKED DATA, SCALABLE QUERYING

DBpedia

inrupt

50+ INDUSTRY COLLABORATIONS

FLANDERS

Take Away

Take Away

Apps are Views

DATA pods

a
more ethical
revenue model
of
DATA

What's Next?

Flanders leads the Way (internationally)

'We moeten weer baas worden over onze data'

De Gentse computerwetenschapper Ruben Verborgh werkt samen met de Brit Tim Berners-Lee aan het platform Solid. Dat laat gebruikers toe zelf hun data te beheren. © Thomas Sweertvaegher

ROLAND LEGRAND | 11 mei 2019 07:53

In deze digitale wereld zijn we de controle over onze data verloren. Dat moet anders, vindt de Gentse professor Ruben Verborgh. 'Bedrijven en individuen moeten hun eigen data beheren en zelf kunnen beslissen wie ze mag zien.' Het Facebook-model heeft afgedaan.

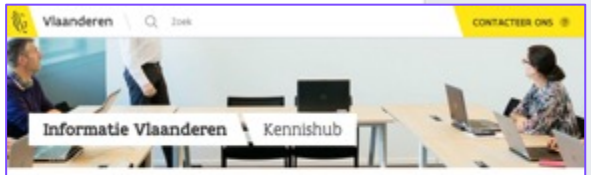
Hij ziet eruit als een jonge techie uit Silicon Valley, maar Ruben Verborgh is professor aan de Universiteit Gent, gespecialiseerd in het wereldwijde web. Hij gebruikt zijn expertise om het bestaande web radicaal te hervormen en werkt daarbij samen met niemand minder dan de uitvinder van het web, de Brit Tim Berners-Lee.

OPINIE INTERNETREUZEN

Tem de Big Tech: stop data in privékluizen

Om de macht van grote technologiebedrijven terug te dringen, moet je gebruikers controle over hun persoonlijke data geven, schrijft Ruben Verborgh.

Ruben Verborgh
Onderzoeker bij Imec en Massachusetts Institute of Technology, en hoogleraar Webtechnologie aan de UGent. Deze bijdrage verscheen ook in NRC.
Donderdag 30 juli 2020 om 3.25 uur



Virtuele themanamiddag "Solid - burgers in regie van hun eigen gegevens"

28 sept 2020

13:00 - 13:55

Introductie Solid: setting the scene

Welkom en introductie van het concept
Ruben Verborgh (UGent -imec)

What governments and Solid can do for each other
How Solid can impact governments, citizens and business, and why Flanders is in pole position.
Sir Tim Berners-Lee (Inrupt)

Burgers in regie van hun eigen gegevens - Waarom Vlaanderen dit belangrijk vindt
De minister-president licht toe waarom de Vlaamse overheid met veel interesse het concept onderzoekt om haar dienstverlening te verbeteren.
Minister-president Jan Jambon

Is de burger daar ook klaar voor?
Situatieschets van de verschillende initiatieven die vandaag al lopen bij de Vlaamse onderzoeksinstellingen en overheden
Lieven De Marez (UGent - imec)

Enkele koplopers aan het woord
Pitch van initiatieven die binnen verschillende domeinen vormgegeven worden.
Frederik Delaplace (VRT) - Paul Theyskens (Mydata.org) - Erik Mannens (UGent - imec) - Goedele Van der Spiegel (Informatie Vlaanderen)

FLANDERS

SolidLab Vlaanderen

SolidLab Vlaanderen heeft de ambitie om Vlaanderen de leidinggevende Europese kennisregio te maken op het vlak van persoonlijke datakluizen en hun toepassing in de dataeconomie, en dit in een quadruple helix samen met de beleidsmaker, burger en ondernemer.

Ministerraad - Plan Vlaamse Veerkracht van 17 december 2021

Documenten ministerraad - plan vlaamse veerkracht 17 december 2021
De documenten van deze ministerraad zullen beschikbaar zijn vanaf 20 december 2021 - 14:00 uur.

Plan Vlaamse Veerkracht: subsidie Imec voor opstart SolidLab Vlaanderen

17 december 2021 op voorstel van viceminister-president Hilde Crevits

In het kader van de versterking van het onderzoeksveld en de versnelling van Onderzoek&Ontwikkeling **keurt** de Vlaamse Regering **de opstart goed van SolidLab Vlaanderen en voorziet hiervoor 7 miljoen euro subsidie aan Imec**. SolidLab Vlaanderen zal **technologisch, maatschappelijk en applicatieonderzoek opzetten om persoonlijke datakluizen mogelijk te maken** en expertise in Vlaanderen daarover uit te bouwen.

FLANDERS

Research Challenges

Society

- User research and Solid readiness
- Governance and business models
- User interface & User Experience (UX) Design

Technology

- Interop of personal data sources
- Integrity: access control and archiving
- Scalability
- Workflows, processes and orchestration
- Information security

Infrastructure and Testing

- Generic panel and Technical Infrastructure
- Methodology

Effort

Total: 33 FTE (3,5 M€ budget/Y)

Type R&D: FTE
- 65% technology
- 35% society

Type R&D: FTE
- 45% PhD
- 55% (senior) researcher

Research Teams

Society

- User research and Solid readiness
- Governance and business models
- User interface & User Experience (UX) Design

Technology

- Interop of personal data sources
- Integrity: access control and archiving
- Scalability
- Workflows, processes and orchestration
- Information security

Infrastructure and Testing

- Generic panel and Technical Infrastructuur
- Methodology

Importance for Flanders

Jan Jambon

Jan Jambon, Minister-president van de Vlaamse Regering en Vlaams minister van Buitenlandse Zaken, Cultuur, Digitalisering en Facilitair Management

Data Utility Company
Citizen profile

Vlaanderen | DIGITAAL VLAANDEREN

Hilde Crevits

Viceminister-president van de Vlaamse Regering en Vlaams minister van Economie, Innovatie, Werk, Sociale economie en Landbouw

Career management

Wouter Beke

Vlaams minister van Welzijn, Volksgezondheid, Gezin en Armoedebestrijding

Health care

Benjamin Dalle

Vlaams minister van Brussel, Jeugd en Media

Media

Your Data, Your Choice !!!

FLANDERS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© Inzlove


© Me, Myself & I


© NASA

Ethical

Economical

Ecological

Eugenical

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Prof. dr. ir. Erik Mannens

m: erik.mannens@ugent.be
t: @erikmannens
l : https://www.linkedin.com/in/erikmannens/
m: +32 473/27.44.17

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