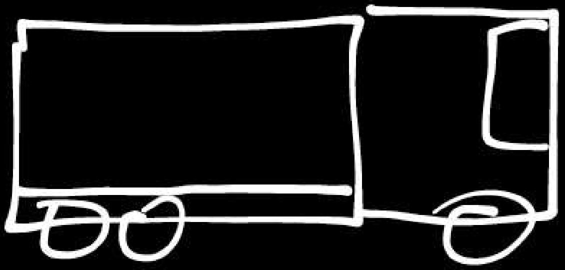
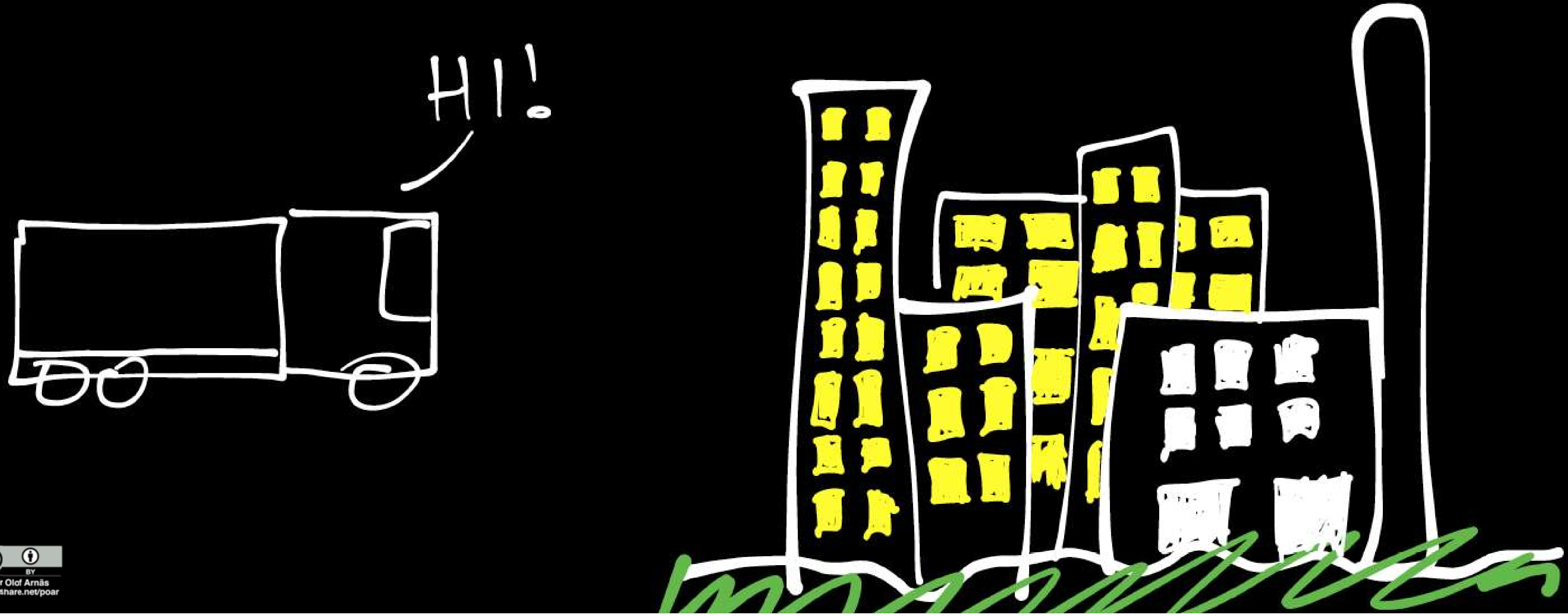
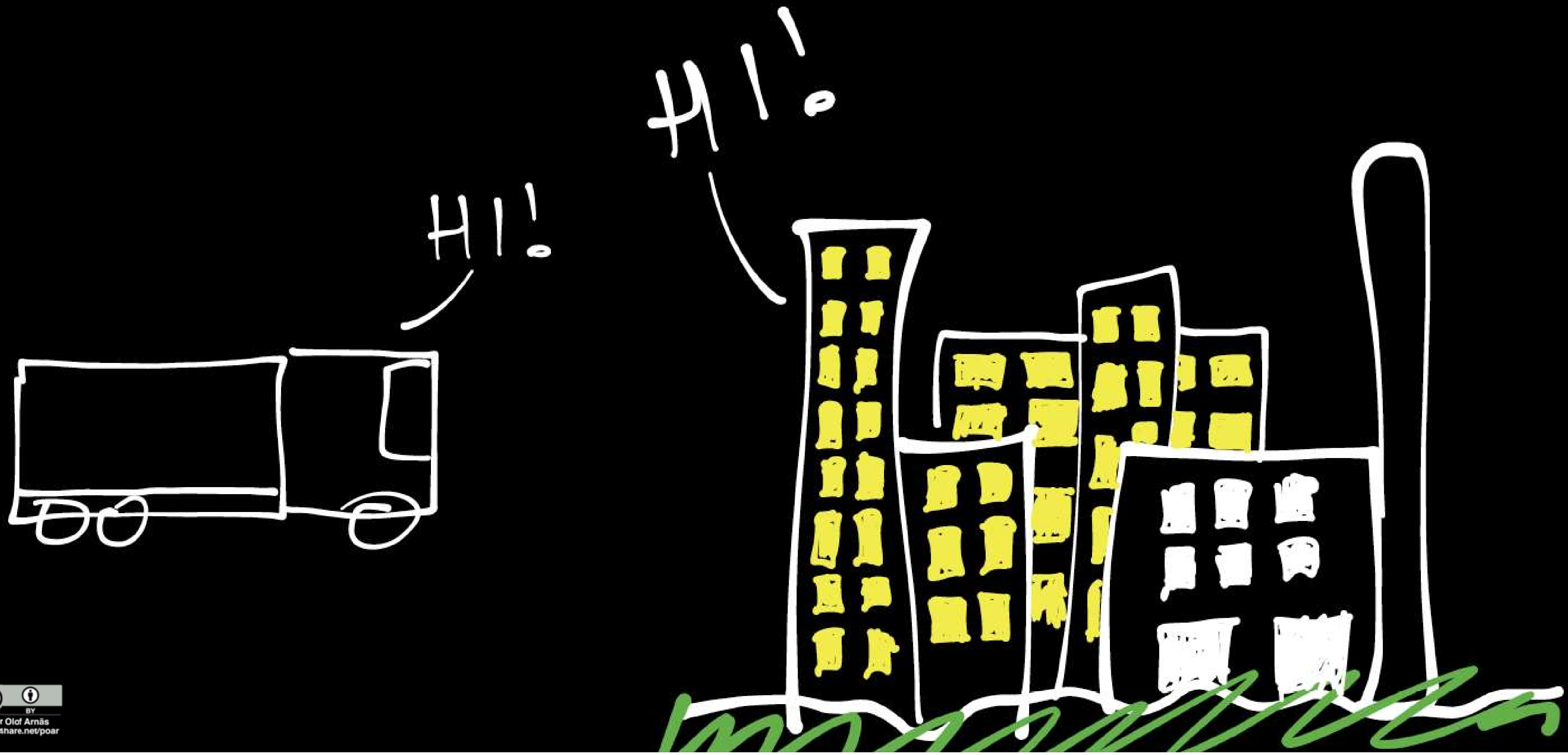
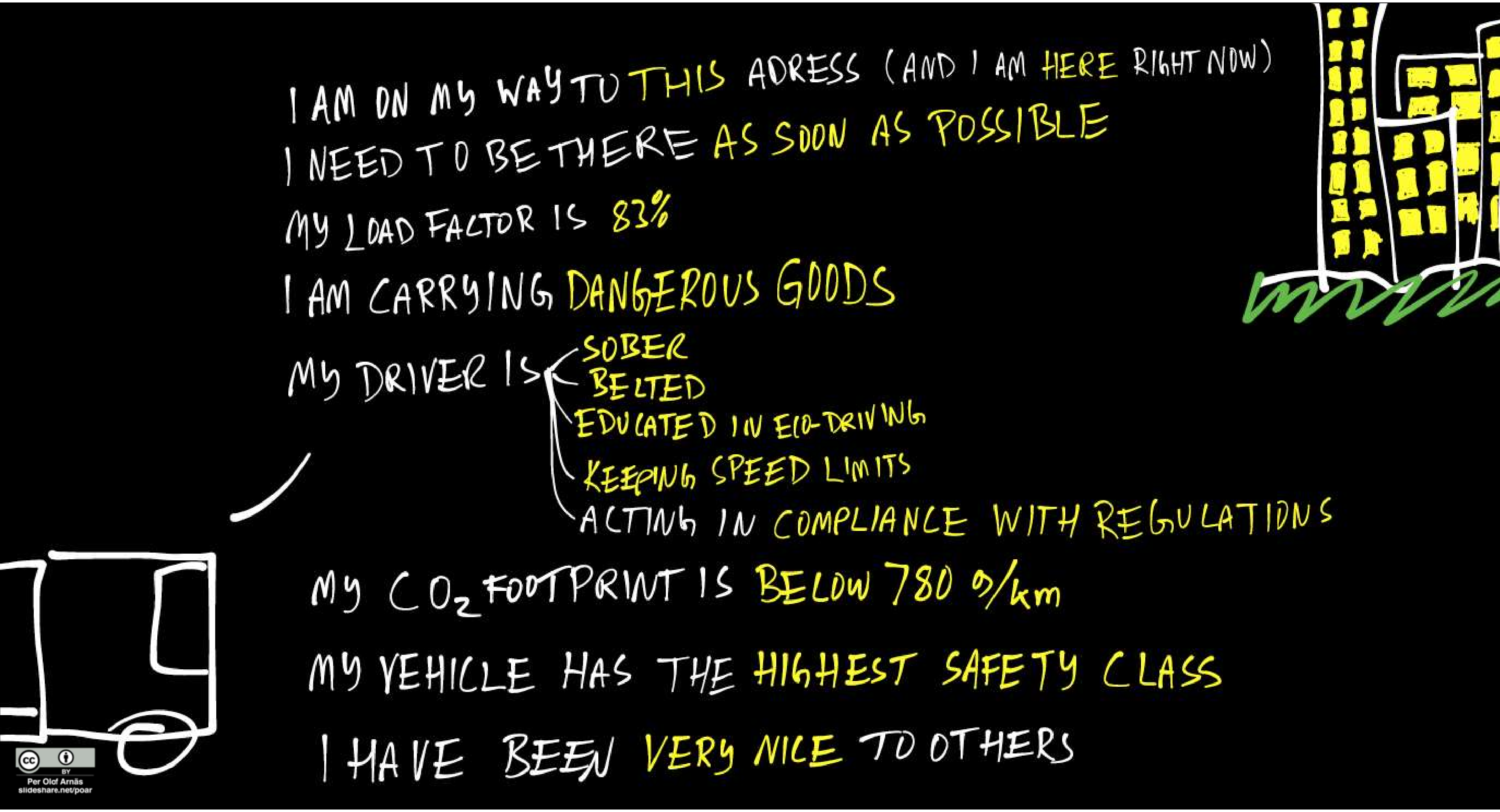



HI!


HI!
HI!



I AM ON MY WAY TO THIS ADRESS (AND I AM HERE RIGHT NOW)

I NEED TO BE THERE AS SOON AS POSSIBLE

MY LOAD FACTOR IS 83%

I AM CARRYING DANGEROUS GOODS

MY DRIVER IS
- SOBER
- BELTED
- EDUCATED IN ECO-DRIVING
- KEEPING SPEED LIMITS
- ACTING IN COMPLIANCE WITH REGULATIONS

MY CO_2 FOOTPRINT IS BELOW 780 g/km

MY VEHICLE HAS THE HIGHEST SAFETY CLASS

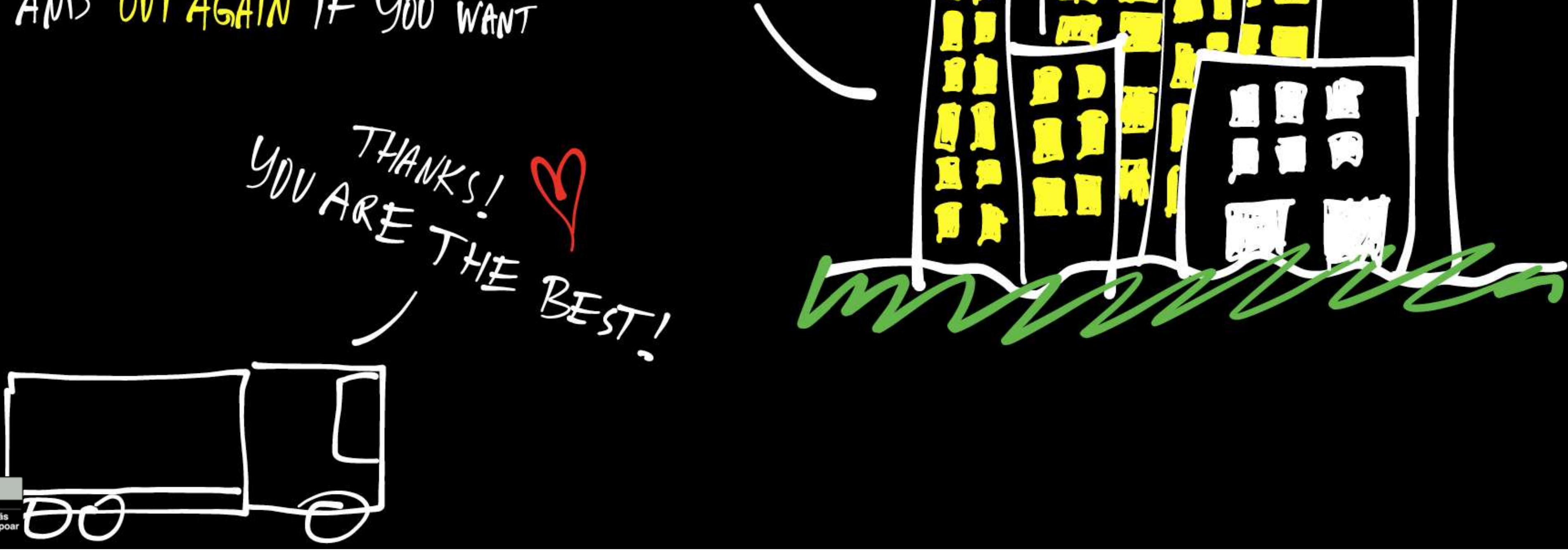
I HAVE BEEN VERY NICE TO OTHERS

WELCOME!

I CAN SEE THAT YOU ARE ONE OF THE GOOD GUYS.

YOU WILL GET ACCESS TO THE BUS LANES.

ALSO, I CAN GUIDE YOU TO YOUR DESTINATION
AND OUT AGAIN IF YOU WANT


THANKS!
YOU ARE THE BEST!

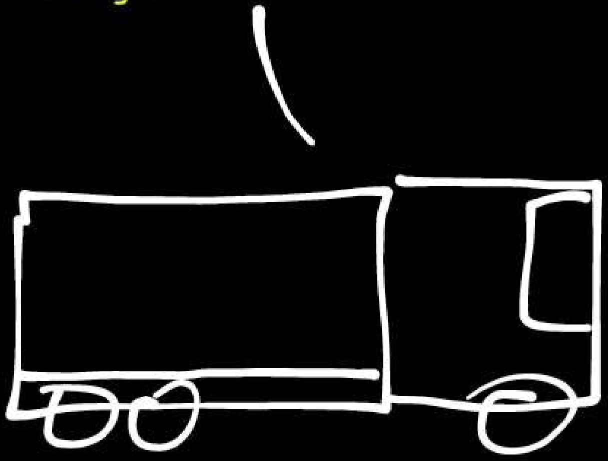
CC BY
Per Olof Arnäs

BYE! THANKS FOR THE HELP. I SAVED 66 MINUTES!

AND MY CO_2 FOOTPRINT DURING MY VISIT WAS ONLY 5291 g.

MY PREVIOUS RECORD WAS 7218 g.

BYE!
WELCOME BACK!



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UNIVERSITY OF TECHNOLOGY

NORTHERN LEAD

Some observations regarding the digital future of transportation

Per Olof Arnäs, PhD

Chalmers University of Technology
Service Management and Logistics
per-olof.arnas@chalmers.se
about.me/perolofarnas
Slides: slideshare.net/poar
@Dr_PO

CC BY
Per Olof Arnäs

OKIMG_5751 by taymtaym on Flickr (CC-BY)

But first I want to know more about…

YOU

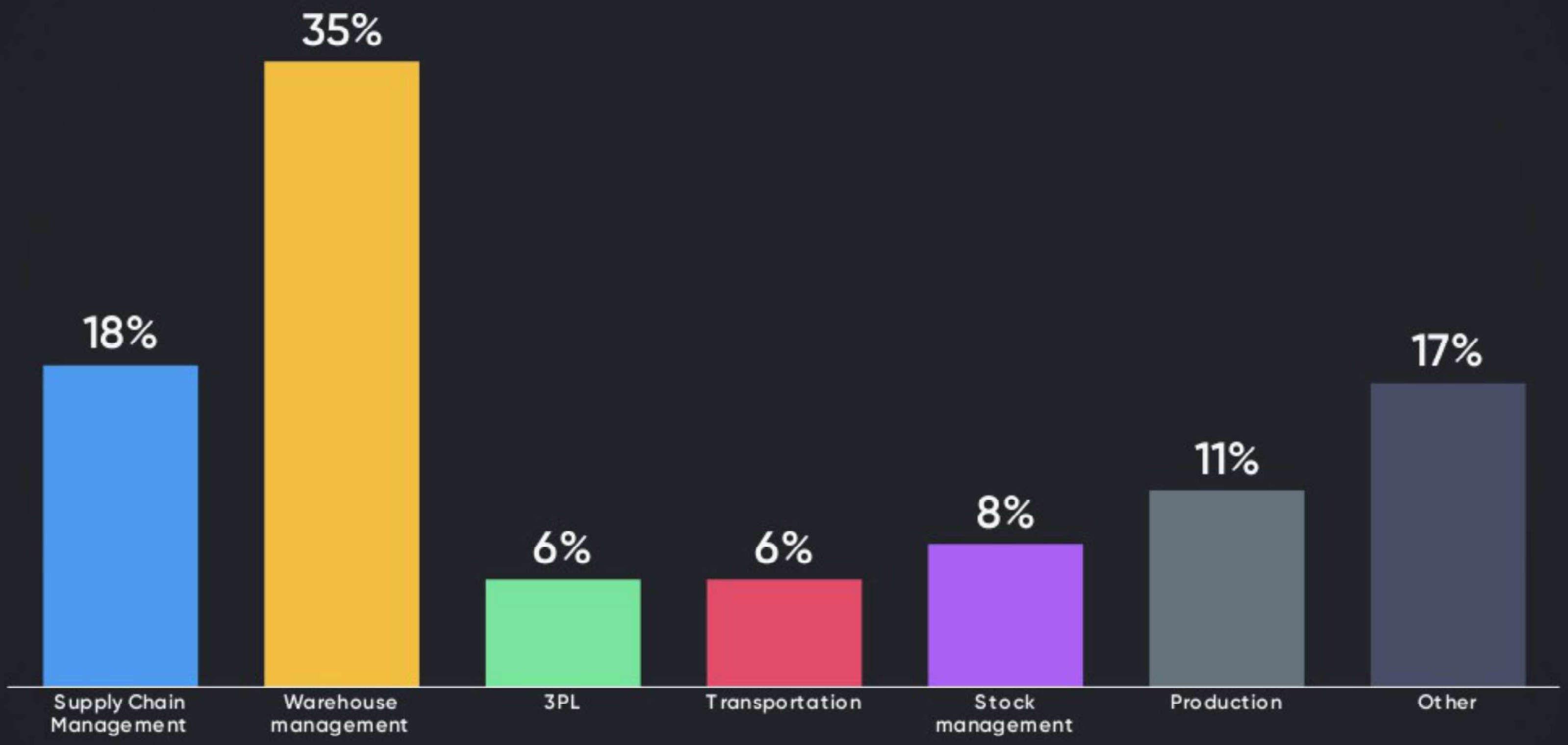
Mentimeter

menti.com

66 78 75

cc BY
Per Olof Arnäs

What is your main focus?



61

5
GLOBAL TRENDS

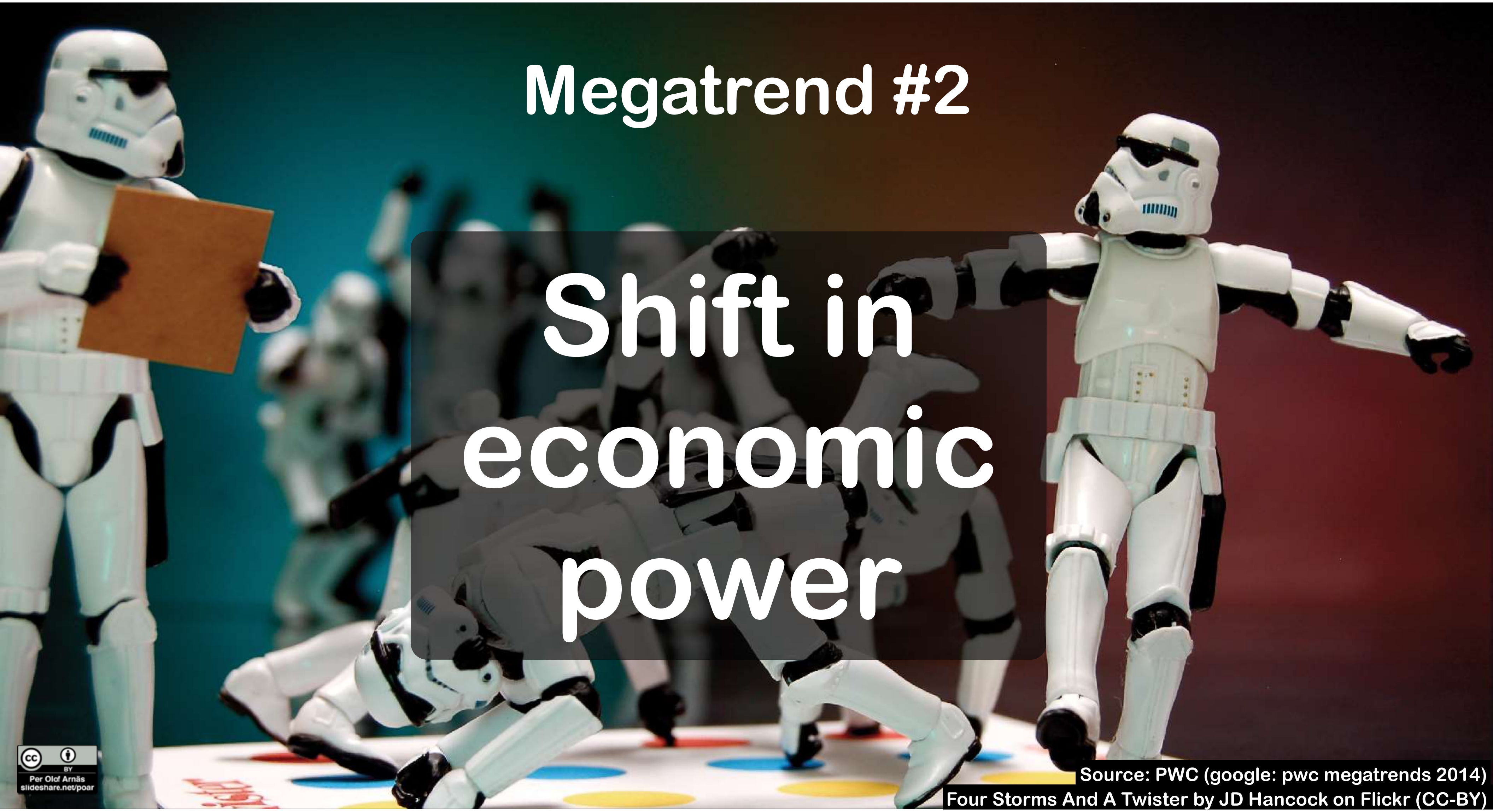
Source: PWC (google: pwc megatrends 2014)

Doing some Sisyphus work by Kalexanderson on Flickr (CC-BY,NC,SA)

Megatrend #1

Demographic and social change

Source: PWC (google: pwc megatrends 2014)
Crowd by James Cridland on Flickr (CC-BY)



Megatrend #2

Shift in economic power

Source: PWC (google: pwc megatrends 2014)
Four Storms And A Twister by JD Hancock on Flickr (CC-BY)

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Per Olof Arnäs

Megatrend #3

Rapid urbanisation

CC BY
Per Olof Arnäs

Source: PWC (google: pwc megatrends 2014)
Boston Downtown at Night by Werner Kunz on Flickr (CC-BY,NC,SA)

Megatrend #4

Climate change and resource scarcity

Source: PWC (google: pwc megatrends 2014)
¡Rayos! by José Eugenio Gómez Rodríguez on Flickr (CC-BY,NC,SA)

Megatrend #5

Technological breakthroughs

Source: PWC (google: pwc megatrends 2014)

5 GLOBAL TRENDS

Demographic and social change

Rapid urbanisation

Shift in economic power

Technological breakthroughs

Climate change and resource scarcity

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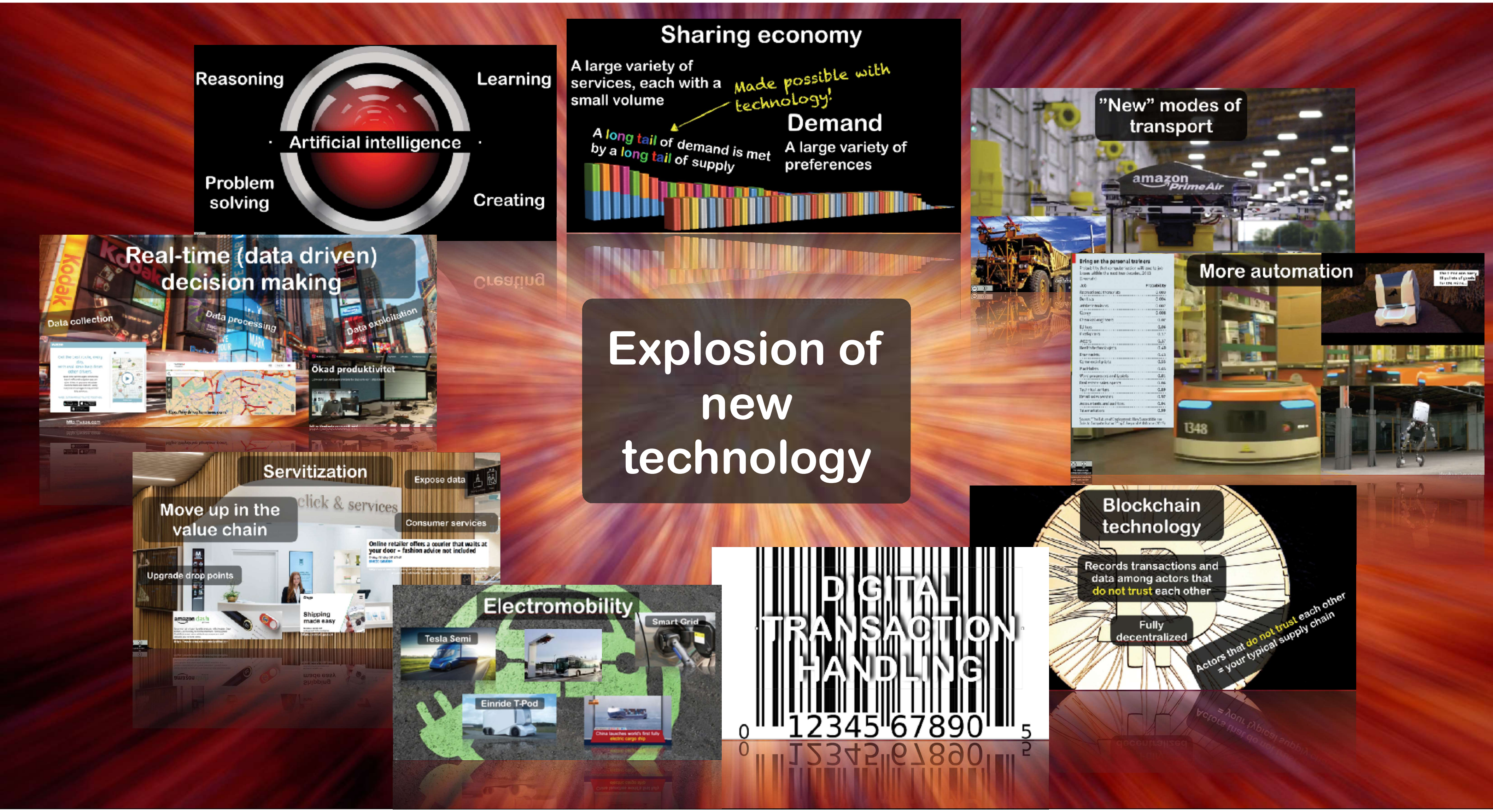


Explosion of new technology

Artificial intelligence

Reasoning

Learning

Problem solving

Creating

Sharing economy

A large variety of services, each with a small volume

Made possible with technology!

A long tail of demand is met by a long tail of supply

Demand

A large variety of preferences

"New" modes of transport

Real-time (data driven) decision making

Data collection

Data processing

Data exploitation

Ökad produktivitet

http://waze.com

https://mydrive.tomtom.com/

More automation

Bring on the personal trainers

Servitization

Move up in the value chain

Expose data

Consumer services

Upgrade drop points

Online retailer offers a courier that waits at your door – fashion advice not included

Electromobility

Tesla Semi

Smart Grid

Einride T-Pod

China launches world's first fully electric cargo ship

DIGITAL TRANSACTION HANDLING

Blockchain technology

Records transactions and data among actors that do not trust each other

Fully decentralized

Actors that do not trust each other = your typical supply chain

Things are happening outside the freight industry

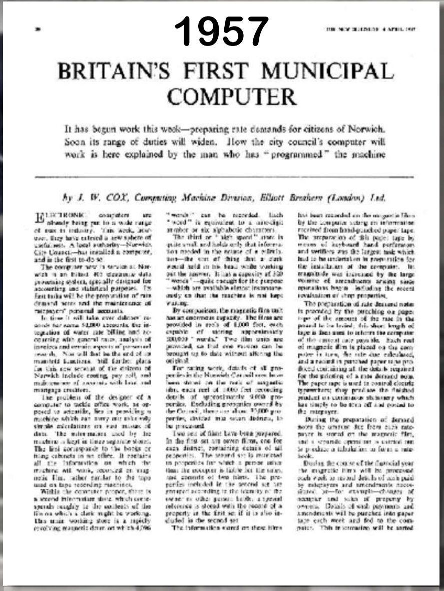
(and have been for some time)

WESTWOOD
TRANSPORT LTD
BECCLES, SUFFOLK
PHONE
BECCLES
2050
CITY TREASURERS
DEPARTMENT

Things are happening **outside** the freight industry

(and have been for some time)

ELLIOTT
ELECTRONIC COMPUTER
CITY TREASURERS DEPARTMENT
WESTWOOD TRANSPORT LTD
BECCLES, SUFFOLK
PHONE BECCLES 2050


1957

BRITAIN'S FIRST MUNICIPAL COMPUTER

It has begun work this week—preparing rate demands for citizens of Norwich. Soon its range of duties will widen. How the city council's computer will work is here explained by the man who has "programmed" the machine

by J. W. COX, Computing Machine Division, Elliott Brothers (London) Ltd.

Things are happening outside the freight industry

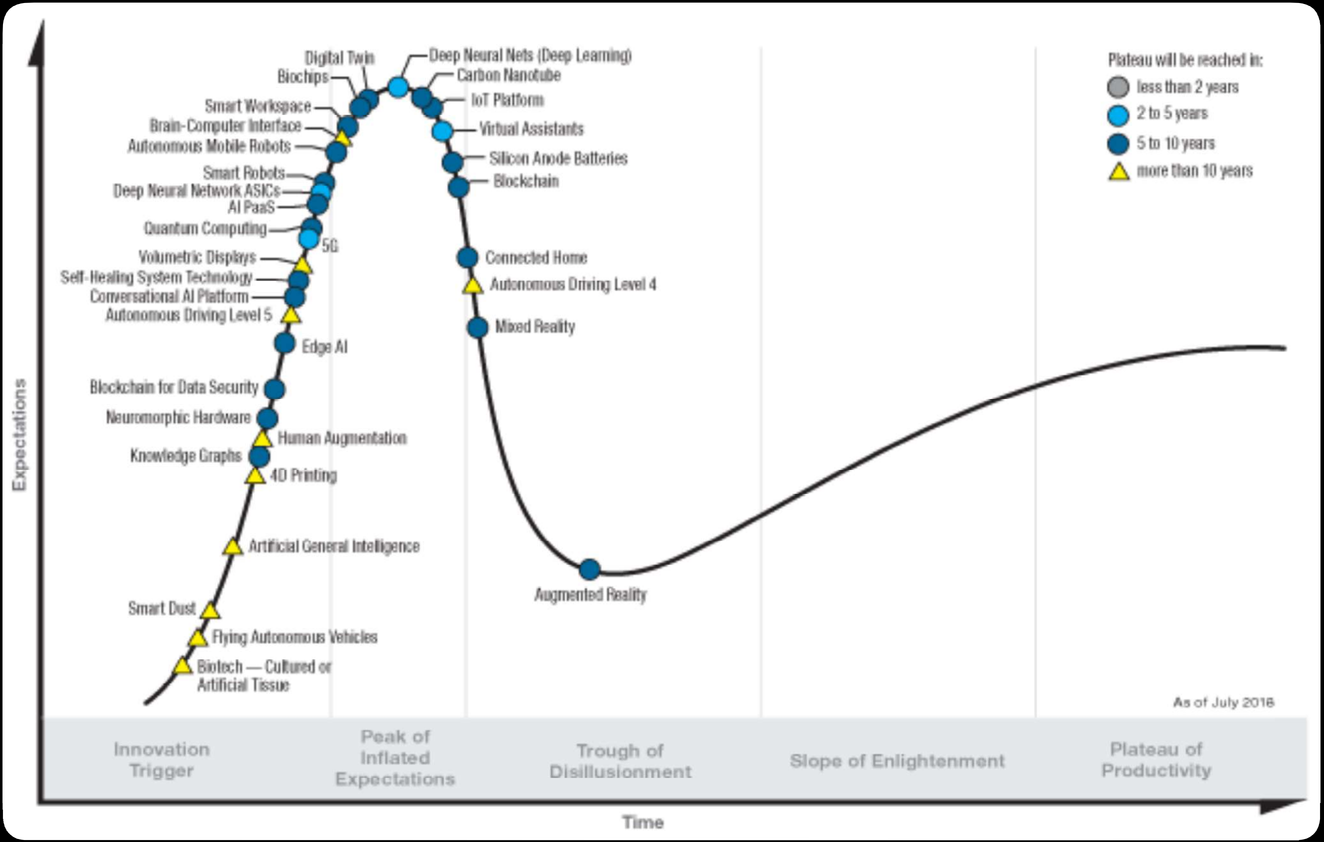
(and have been for some time)

2015

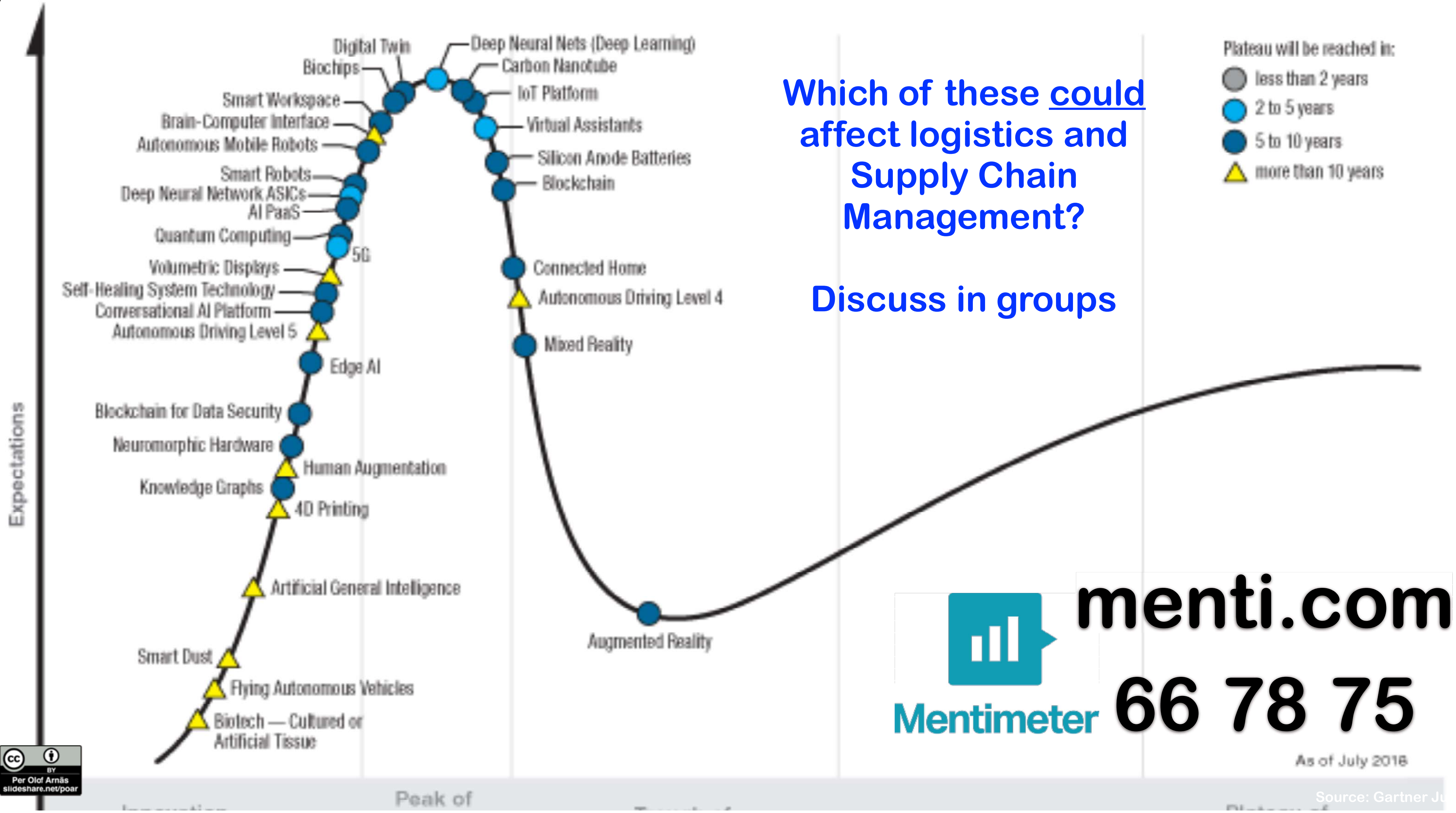
FREE RASPBERRY PI WITH THIS ISSUE
The MagPi
The official Raspberry Pi magazine
#PIZERO
Raspberry Pi Zero is a real $5 computer. Learn to code while you play Minecraft (or do just about anything else you can dream up)
RASPBERRY PI ZERO
FREE WITH ISSUE #40 The MagPi
Drone
CCTV system
Robotics
Wearable tech
Motion detector
PLUS: ASTRO PI IS EN ROUTE TO THE INTERNATIONAL SPACE STATION

Image: Richard Hancock, twitter.com/CanaryWorf

Gartners Hype Cycle for Emerging Technologies



Source: Gartner July 2017



Which of these could affect logistics and Supply Chain Management?

Discuss in groups

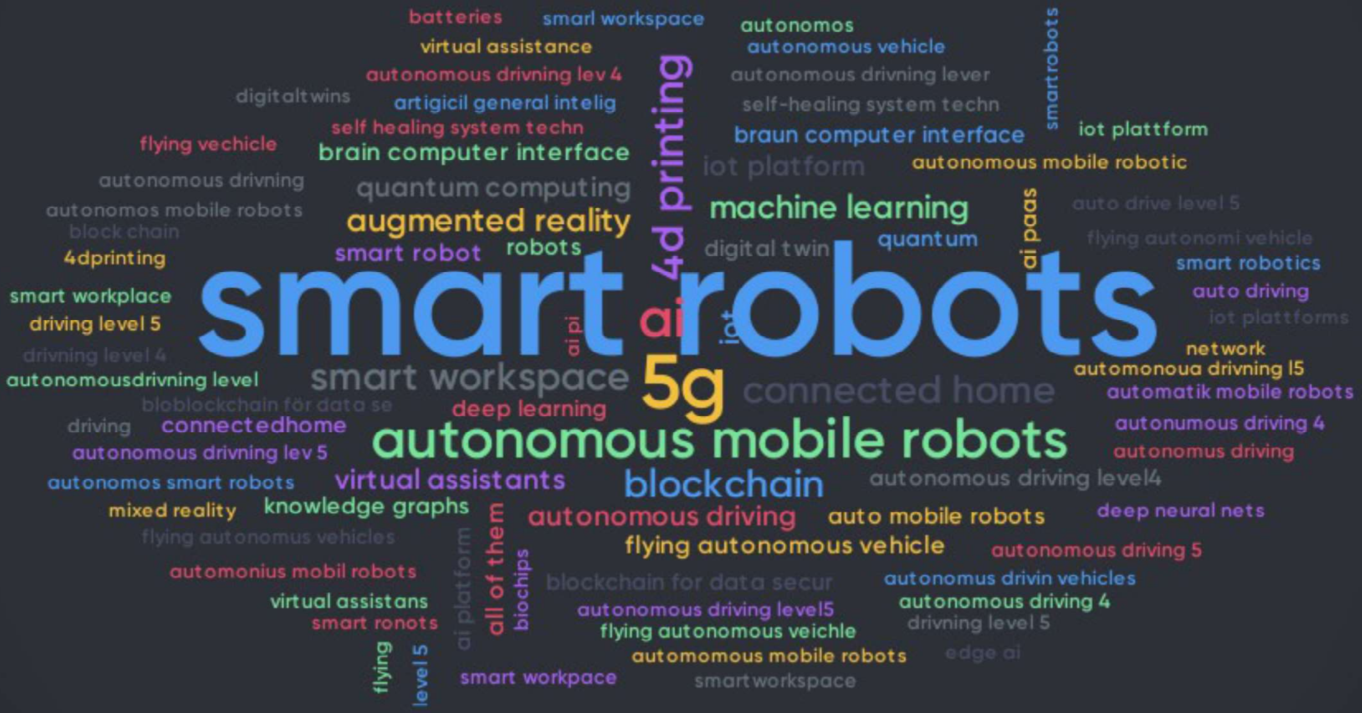
menti.com

Mentimeter

66 78 75

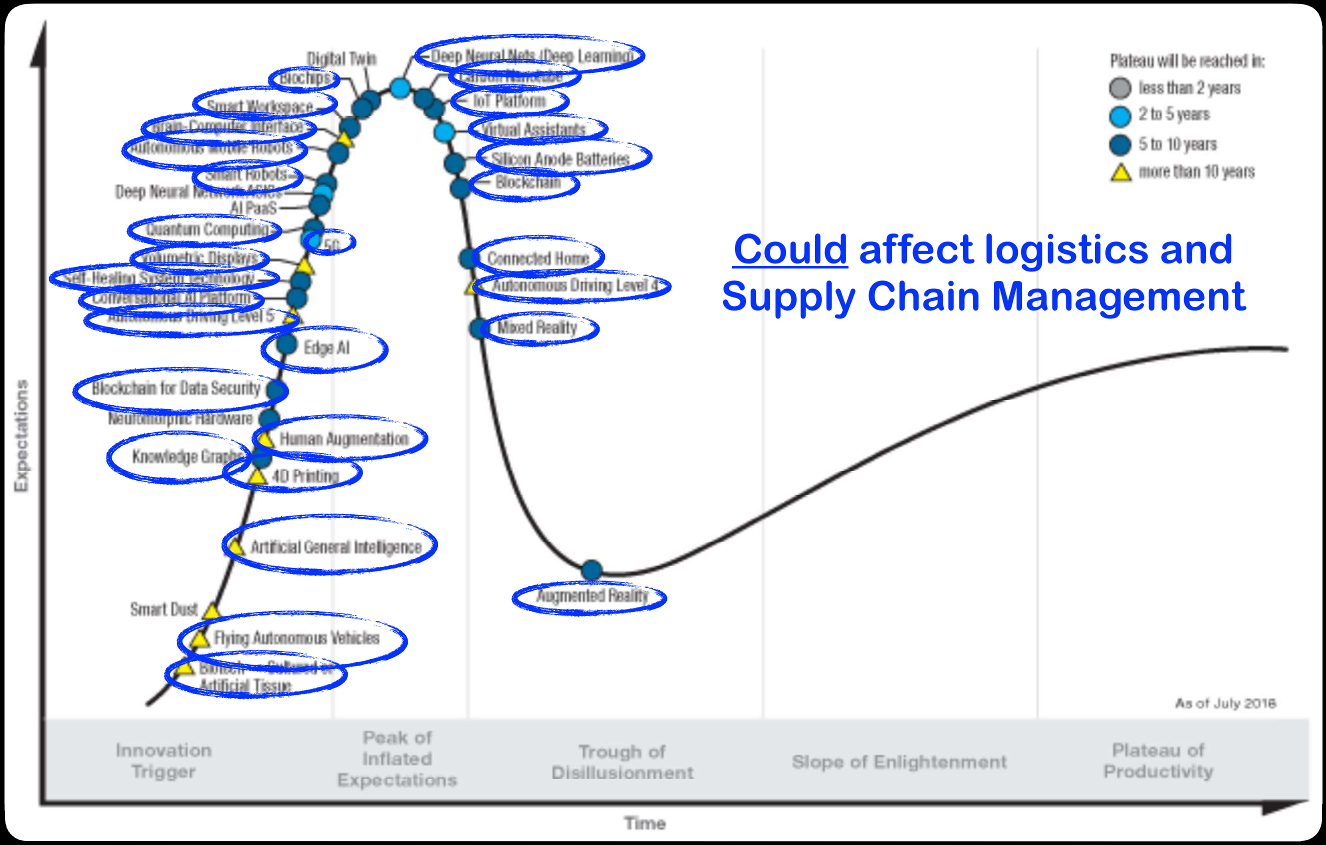
Source: Gartner Ju 2018

Which of the emerging technologies will affect your industry?



65

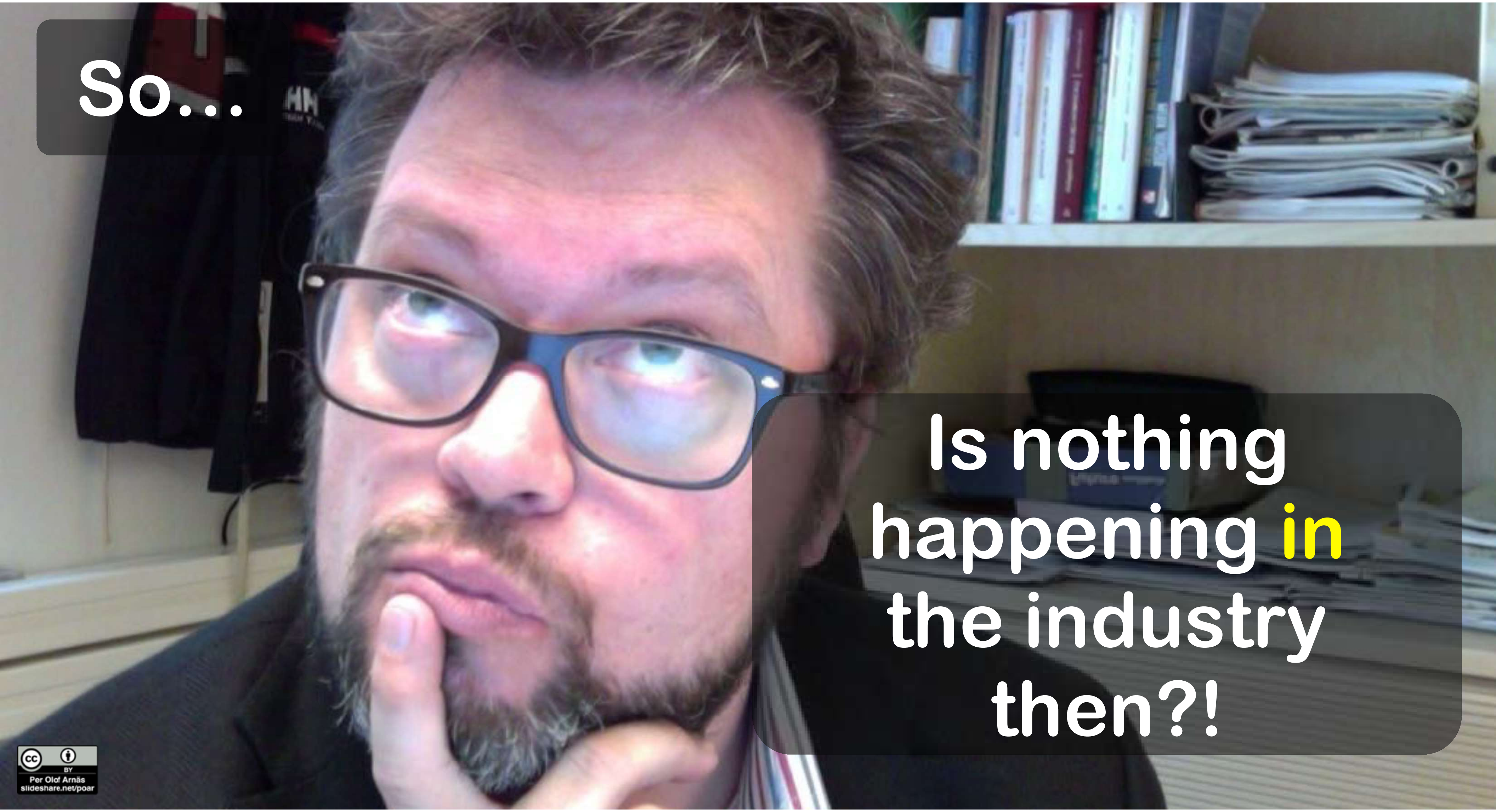
Gartner’s Hype Cycle for Emerging Technologies



Could affect logistics and Supply Chain Management

CC BY
Per Olof Arnäs

Source: Gartner July 2018



So...

Is nothing happening in the industry then?!

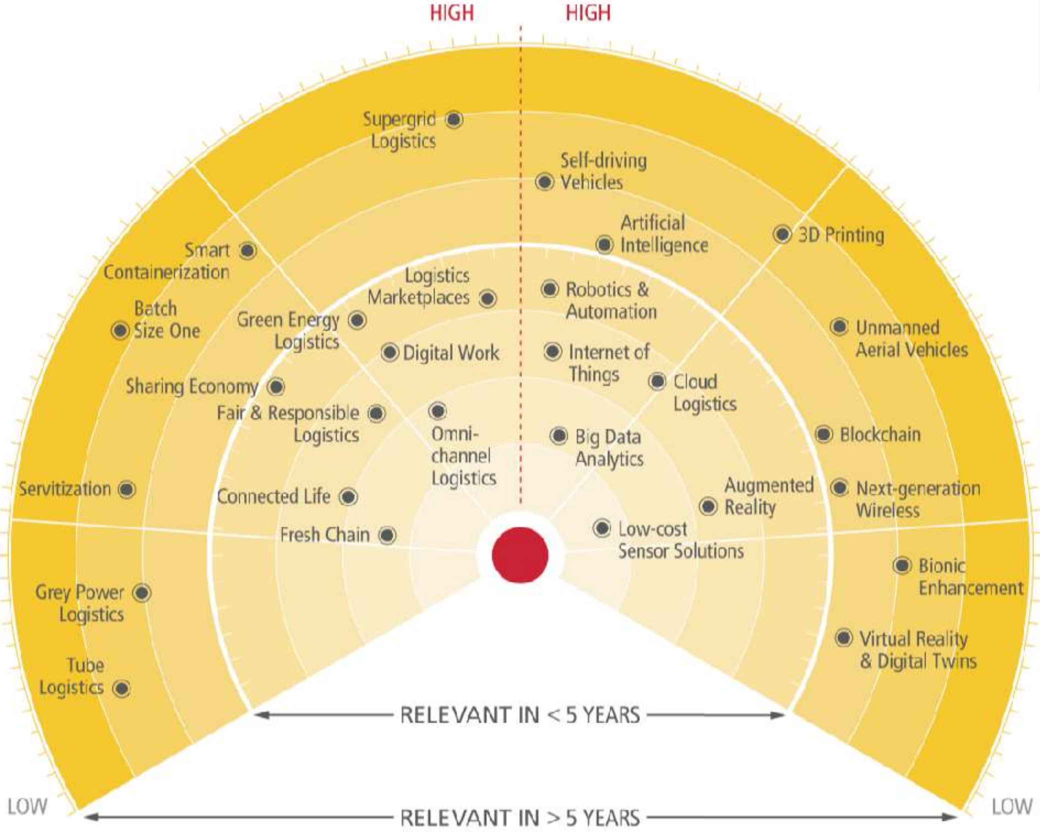
At a Glance: the Logistics Trend Radar

HIGH: Creates new (potentially disruptive) ways of doing business

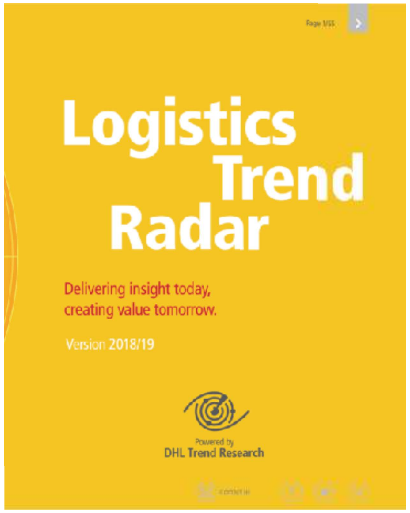
LOW: Provides incremental improvement opportunities

Social & Business Trends

Technology Trends


HIGH
HIGH
Supergrid Logistics
Self-driving Vehicles
Artificial Intelligence
3D Printing
Smart Containerization
Logistics Marketplaces
Robotics & Automation
Batch Size One
Green Energy Logistics
Digital Work
Internet of Things
Unmanned Aerial Vehicles
Sharing Economy
Cloud Logistics
Fair & Responsible Logistics
Omni-channel Logistics
Big Data Analytics
Blockchain
Servitization
Connected Life
Augmented Reality
Next-generation Wireless
Fresh Chain
Low-cost Sensor Solutions
Grey Power Logistics
Bionic Enhancement
Virtual Reality & Digital Twins
Tube Logistics
RELEVANT IN < 5 YEARS
LOW
RELEVANT IN > 5 YEARS
LOW

2018/19



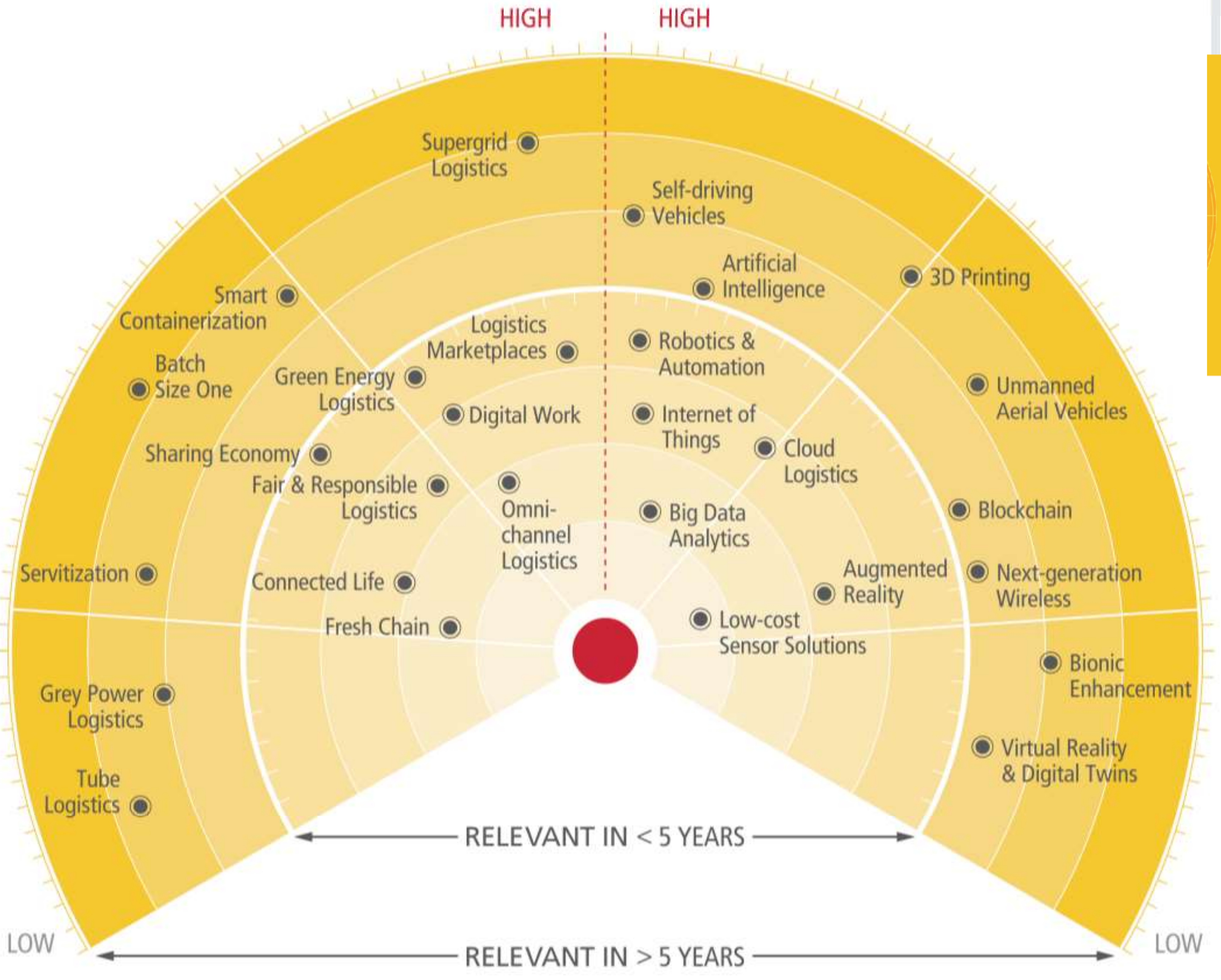
Logistics Trend Radar

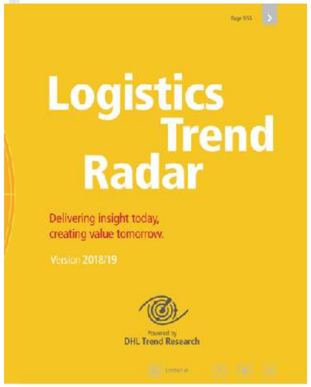
Delivering insight today, creating value tomorrow.

Version 2018/19

Powered by DHL Trend Research

https://www.logistics.dhl/global-en/home/insights-and-innovation/thought-leadership/trend-reports/logistics-trend-radar.html


HIGH
HIGH
Supergrid Logistics
Self-driving Vehicles
Artificial Intelligence
3D Printing
Smart Containerization
Logistics Marketplaces
Robotics & Automation
Batch Size One
Green Energy Logistics
Digital Work
Internet of Things
Unmanned Aerial Vehicles
Sharing Economy
Cloud Logistics
Fair & Responsible Logistics
Omni-channel Logistics
Big Data Analytics
Blockchain
Servitization
Connected Life
Augmented Reality
Next-generation Wireless
Fresh Chain
Low-cost Sensor Solutions
Bionic Enhancement
Grey Power Logistics
Virtual Reality & Digital Twins
Tube Logistics
RELEVANT IN < 5 YEARS
LOW
LOW
RELEVANT IN > 5 YEARS


Logistics Trend Radar

Delivering insight today, creating value tomorrow.

Version 2018/19

Powered by DHL Trend Research

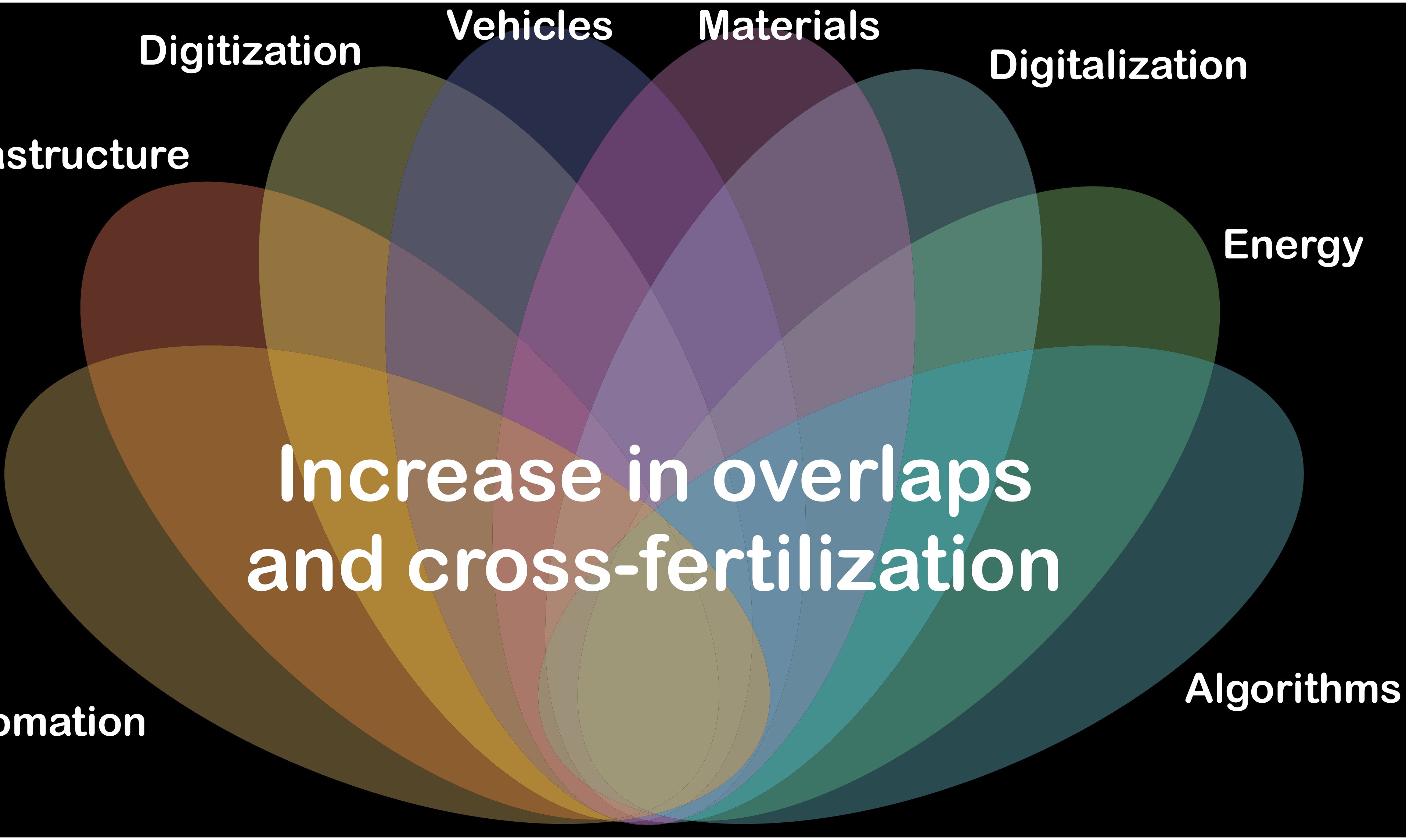
Digitization:

Make analogue information digital

Digitalization:

Increased use of digital technology

Both are important! (and interesting)



Increase in overlaps and cross-fertilization

Infrastructure

Digitization

Vehicles

Materials

Digitalization

Energy

Algorithms

Automation

CC BY
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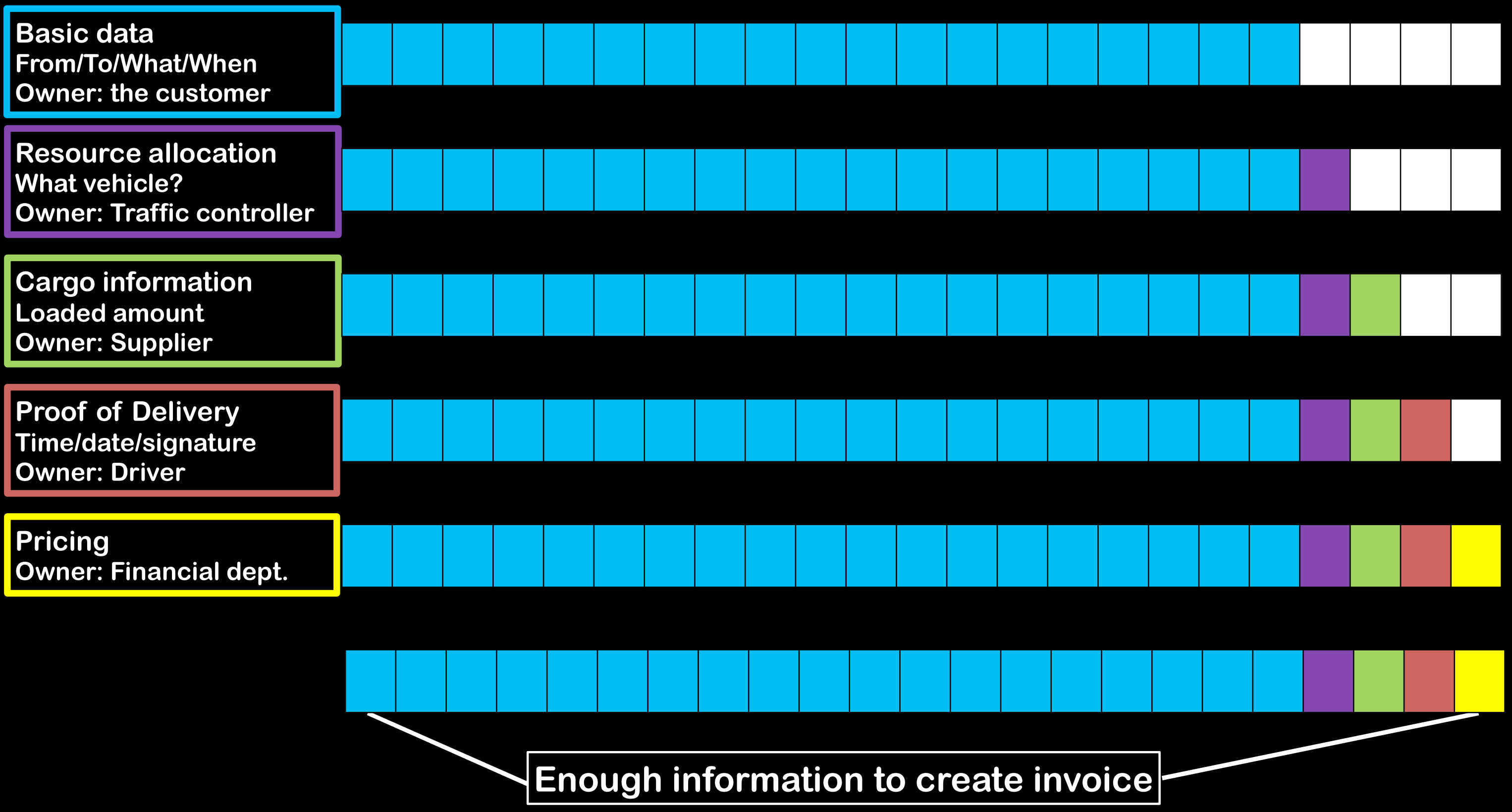
NORTHERN
LEAD

DIGITAL TRANSACTION HANDLING

0 12345 67890 5

From order to invoice

(transportation company)



Basic data
From/To/What/When
Owner: the customer

Resource allocation
What vehicle?
Owner: Traffic controller

Cargo information
Loaded amount
Owner: Supplier

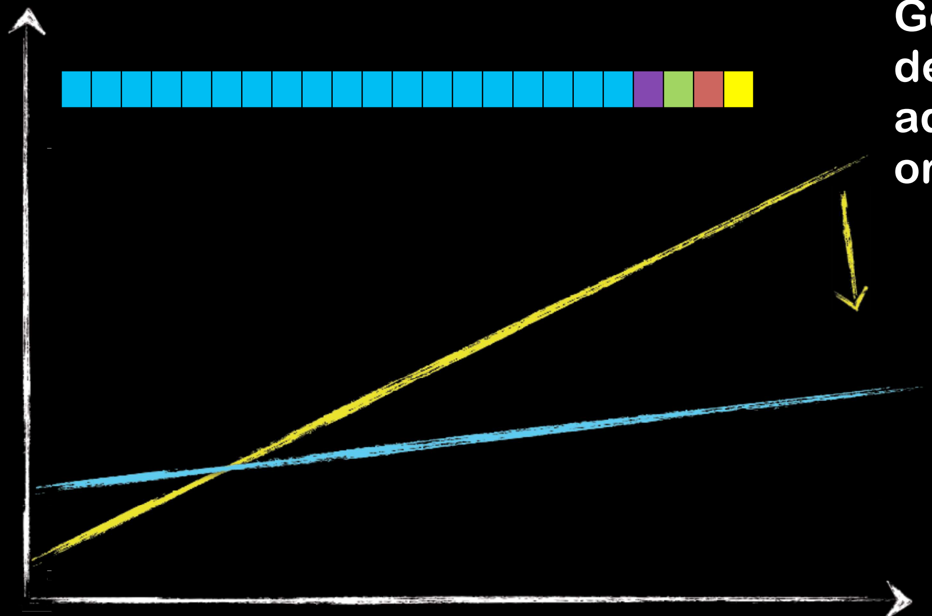
Proof of Delivery
Time/date/signature
Owner: Driver

Pricing
Owner: Financial dept.

Enough information to create invoice

All of these steps cost money!

An increase in the number of orders lead to increased cost



Total cost for
administration of all orders

Goal: De-couple the dependecy between administative cost and order volume

Handle exceptions – not transactions!

Number of orders per year

Integration of digital and physical worlds

XBOX 360
KINECT
for XBOX 360

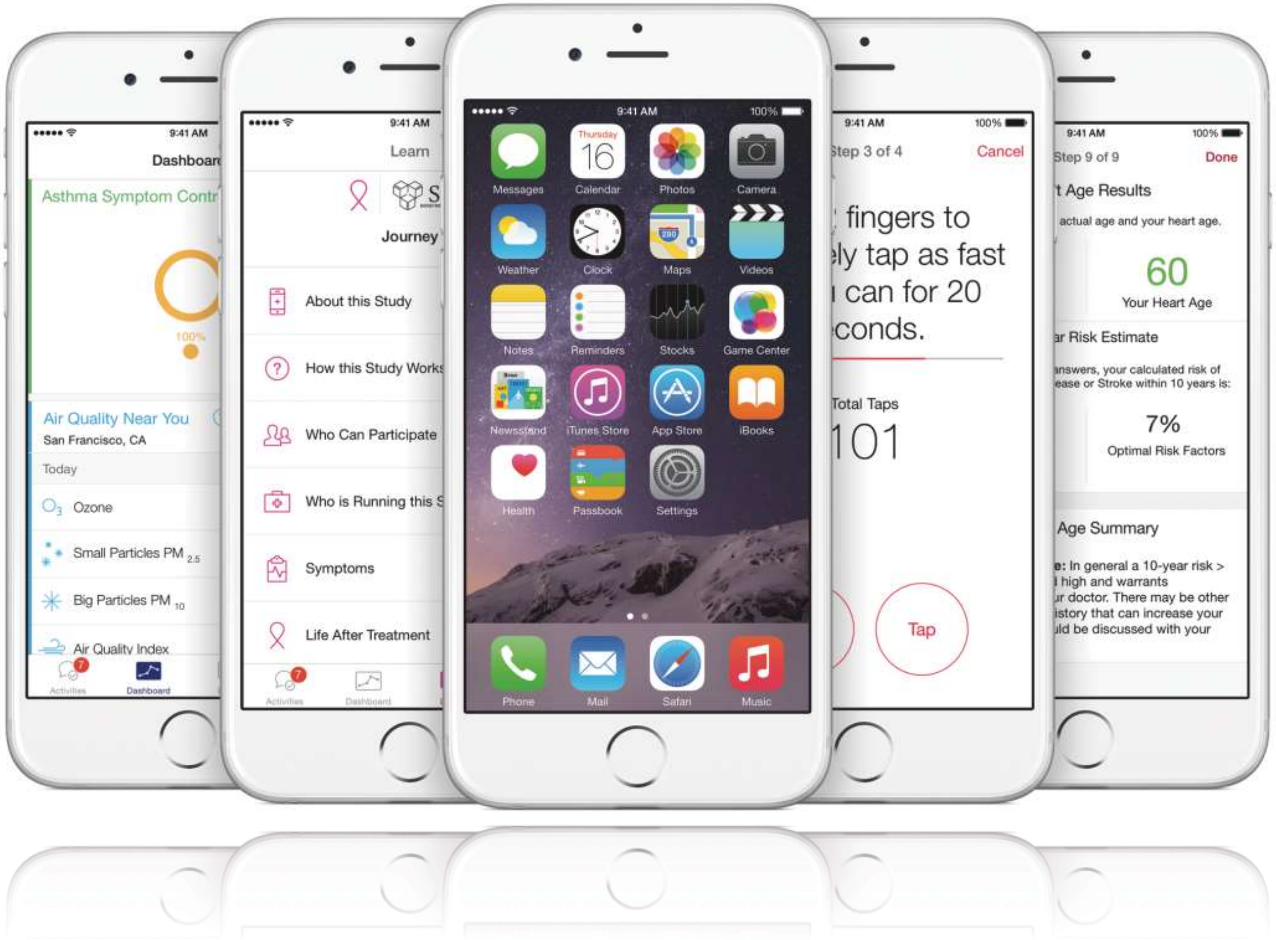
20:35
50
20km/h
30m

http://www.sygic.com/gps-navigation/addon/head-up-display

YouTube
360-degree video

Say hi to the new sensors

http://mobsentech.com


Dashboard
Asthma Symptom Contr
100%
Air Quality Near You
San Francisco, CA
Today
Ozone
Small Particles PM 2.5
Big Particles PM 10
Air Quality Index
Activities
Dashboard
Learn
Journey
About this Study
How this Study Works
Who Can Participate
Who is Running this S
Symptoms
Life After Treatment
9:41 AM
Messages
Calendar
Photos
Camera
Weather
Clock
Maps
Videos
Notes
Reminders
Stocks
Game Center
Newsstand
iTunes Store
App Store
iBooks
Health
Passbook
Settings
Phone
Mail
Safari
Music
Step 3 of 4
Cancel
fingers to
ly tap as fast
can for 20
conds.
Total Taps
101
Tap
Step 9 of 9
Done
t Age Results
actual age and your heart age.
60
Your Heart Age
r Risk Estimate
7%
Optimal Risk Factors
Age Summary

cc BY
Per Olof Arnäs

”New” modes of transport

amazon PrimeAir
685E
Goldstrike, USA
www.hutnyak.com
velove armadillo

https://www.youtube.com/watch?v=HG76DcXySuw

https://www.youtube.com/watch?v=50sv4M4rgBM

Electromobility

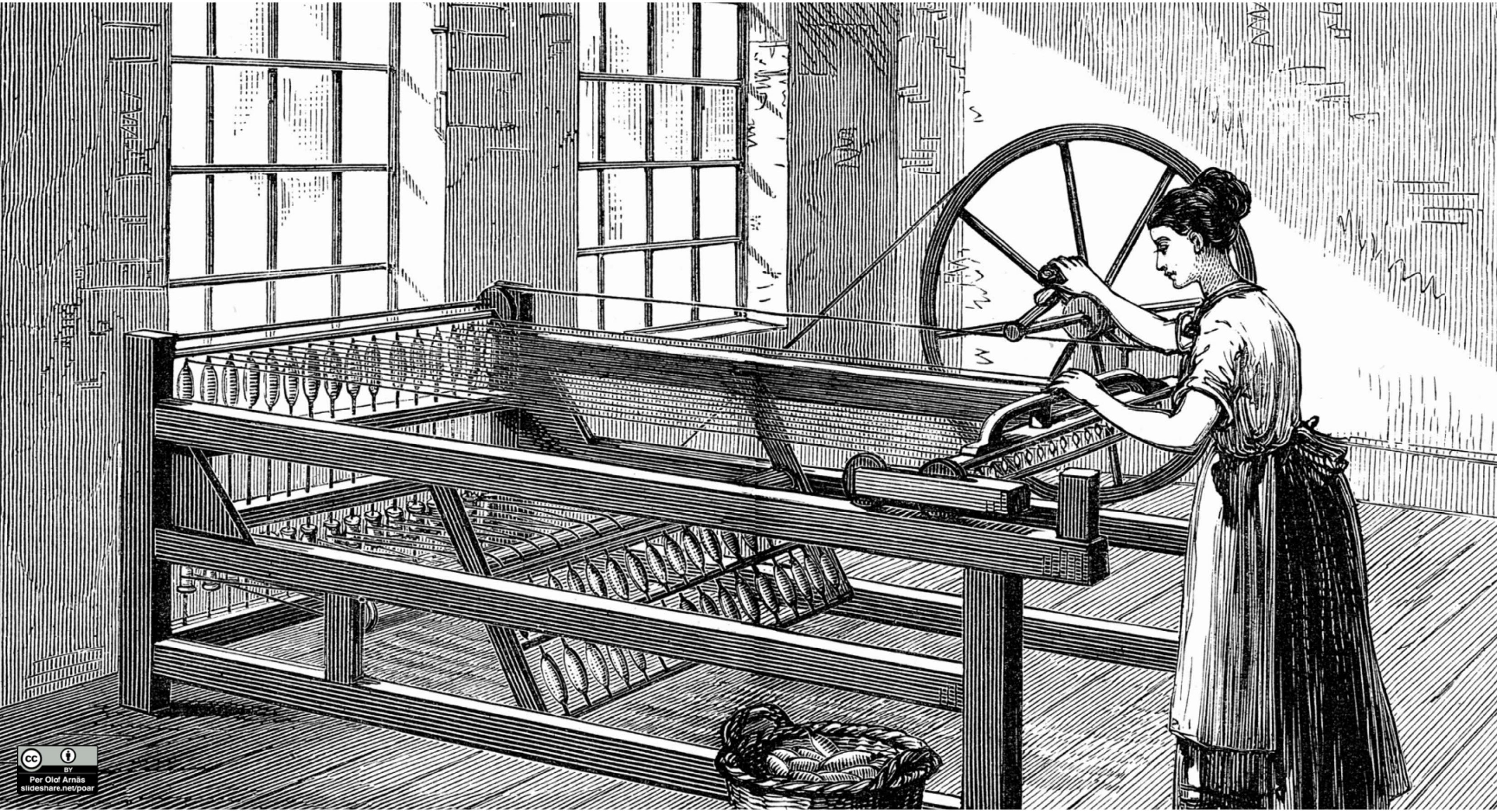
Tesla Semi

Electric bus

Smart Grid

Einride T-Pod

DAILY POST
ENGLISH
www.dailypost.in
China launches world's first fully electric cargo ship



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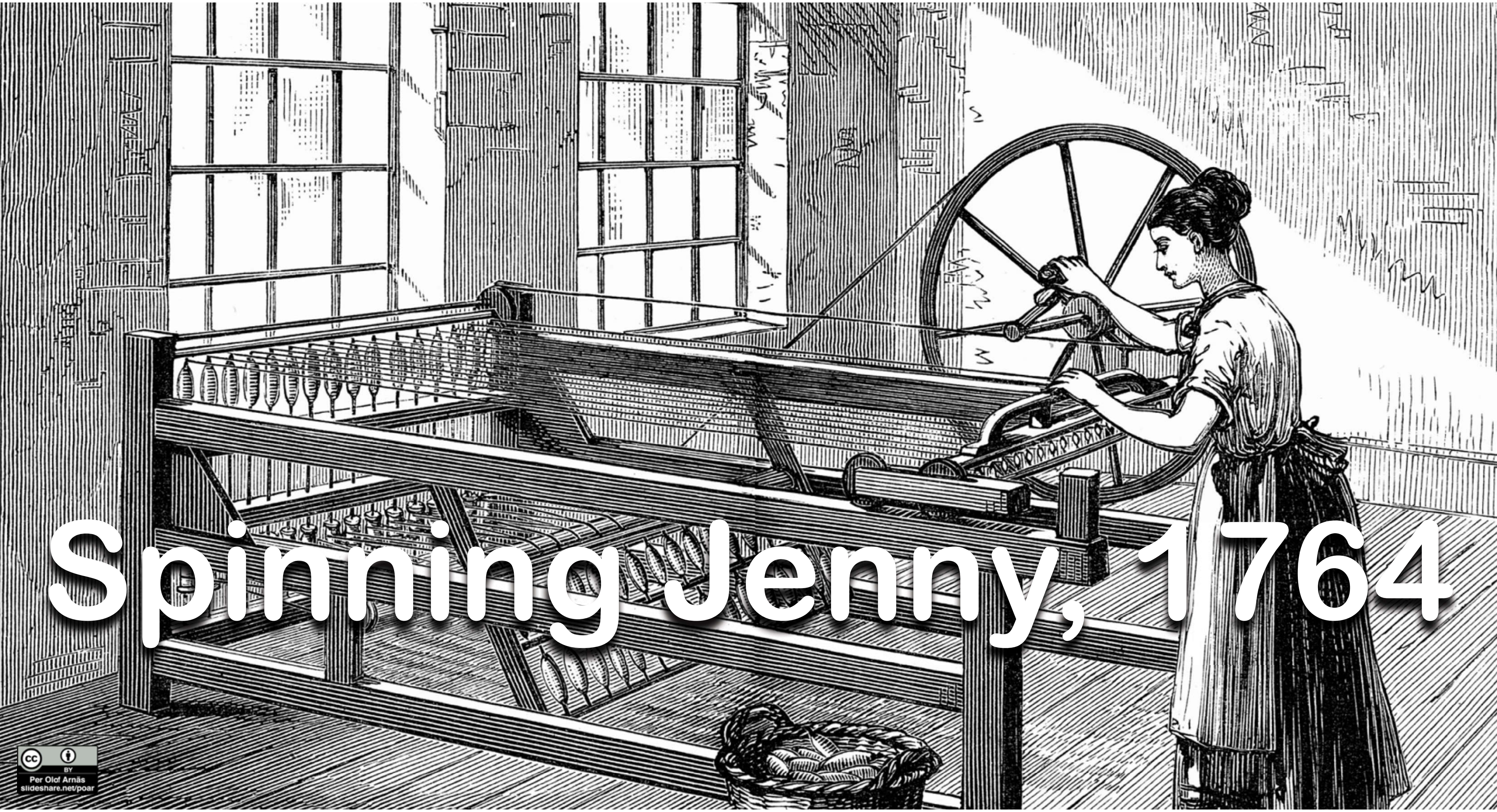
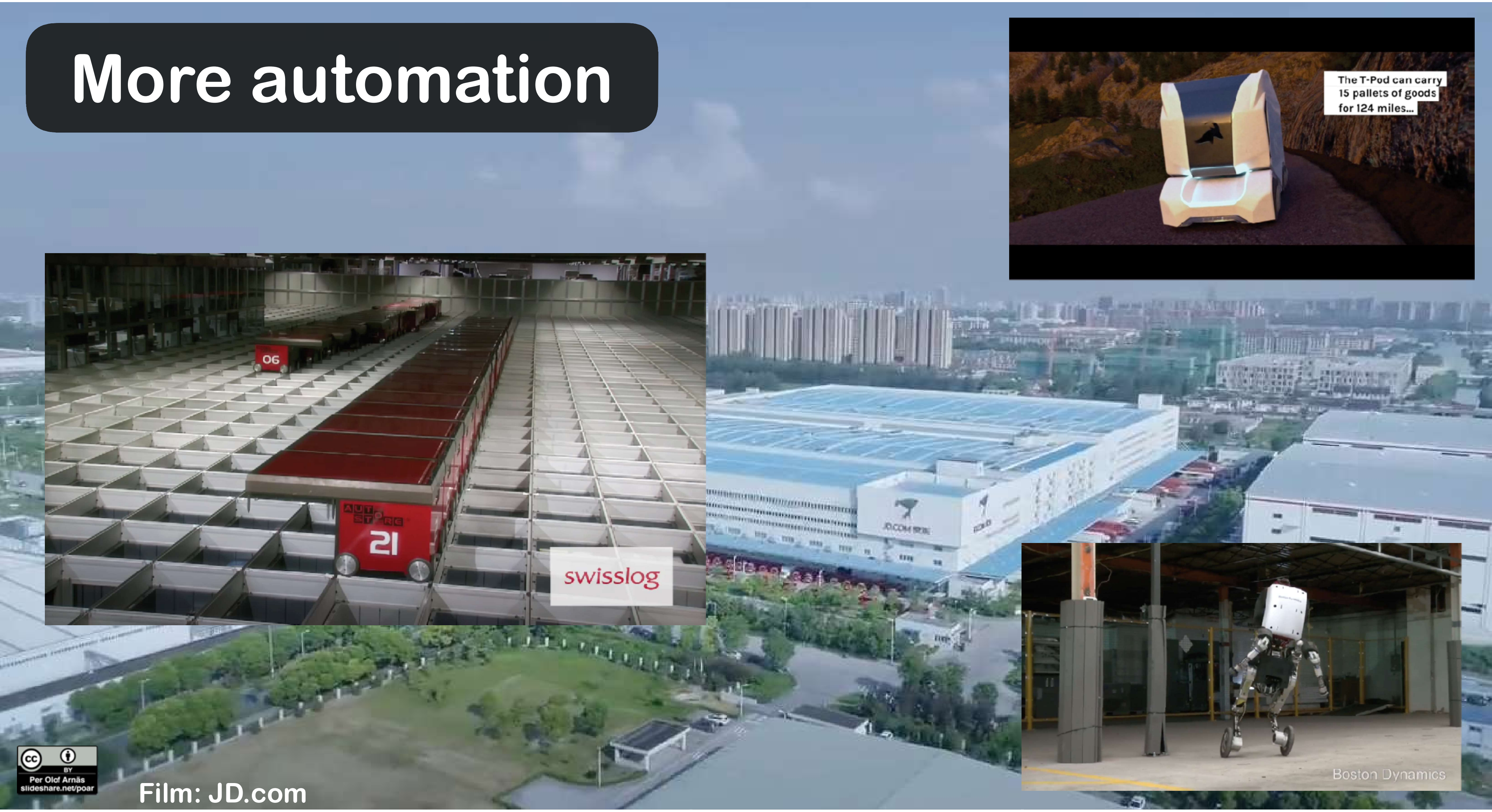
NORTHERN LEAD



Spinning Jenny, 1764

More automation


The T-Pod can carry 15 pallets of goods for 124 miles...
06
AUTOSTORE
21
swisslog
JD.COM
Boston Dynamics

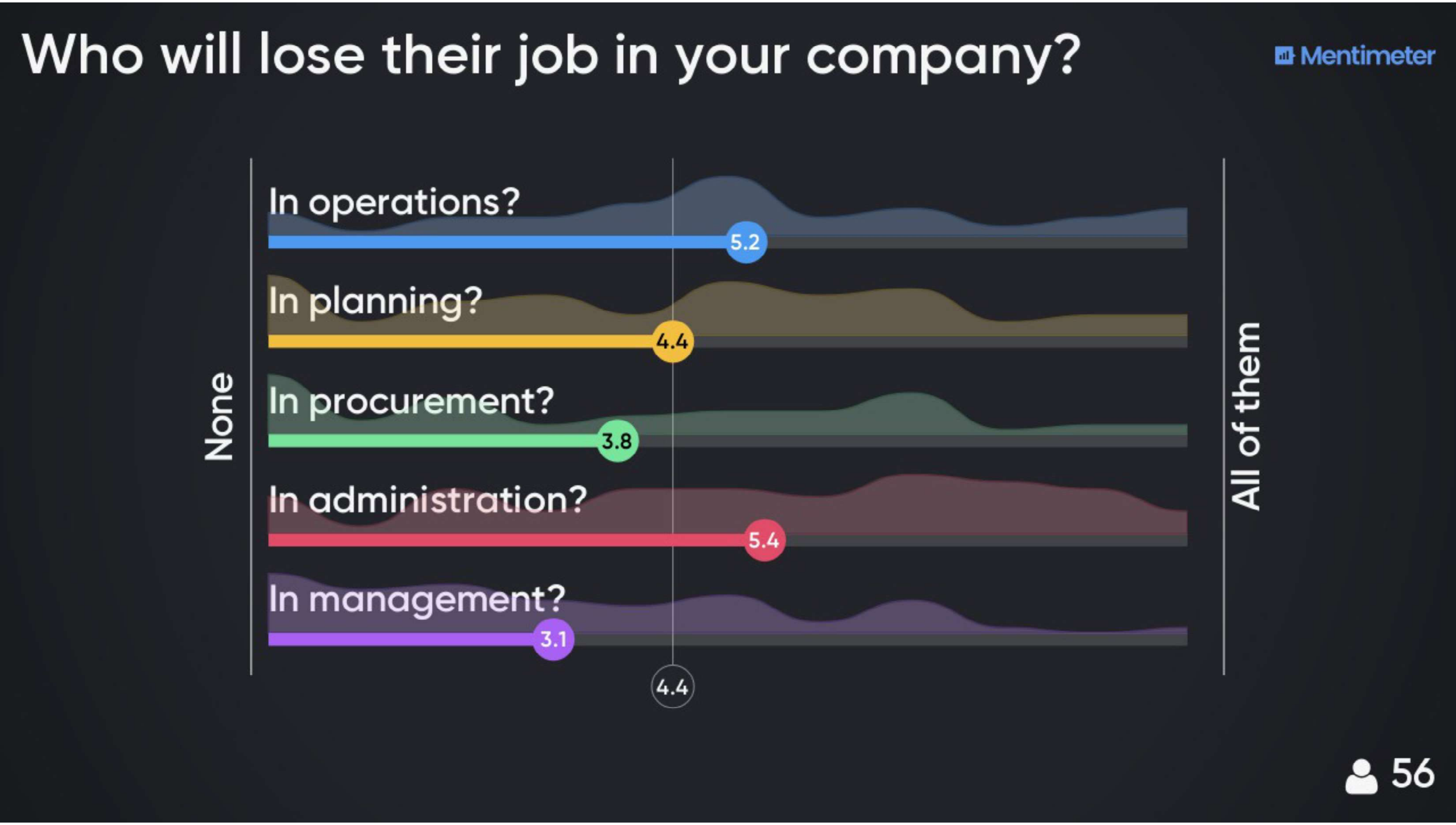
Film: JD.com

Will you lose your job to automation?

Mentimeter

menti.com

66 78 75



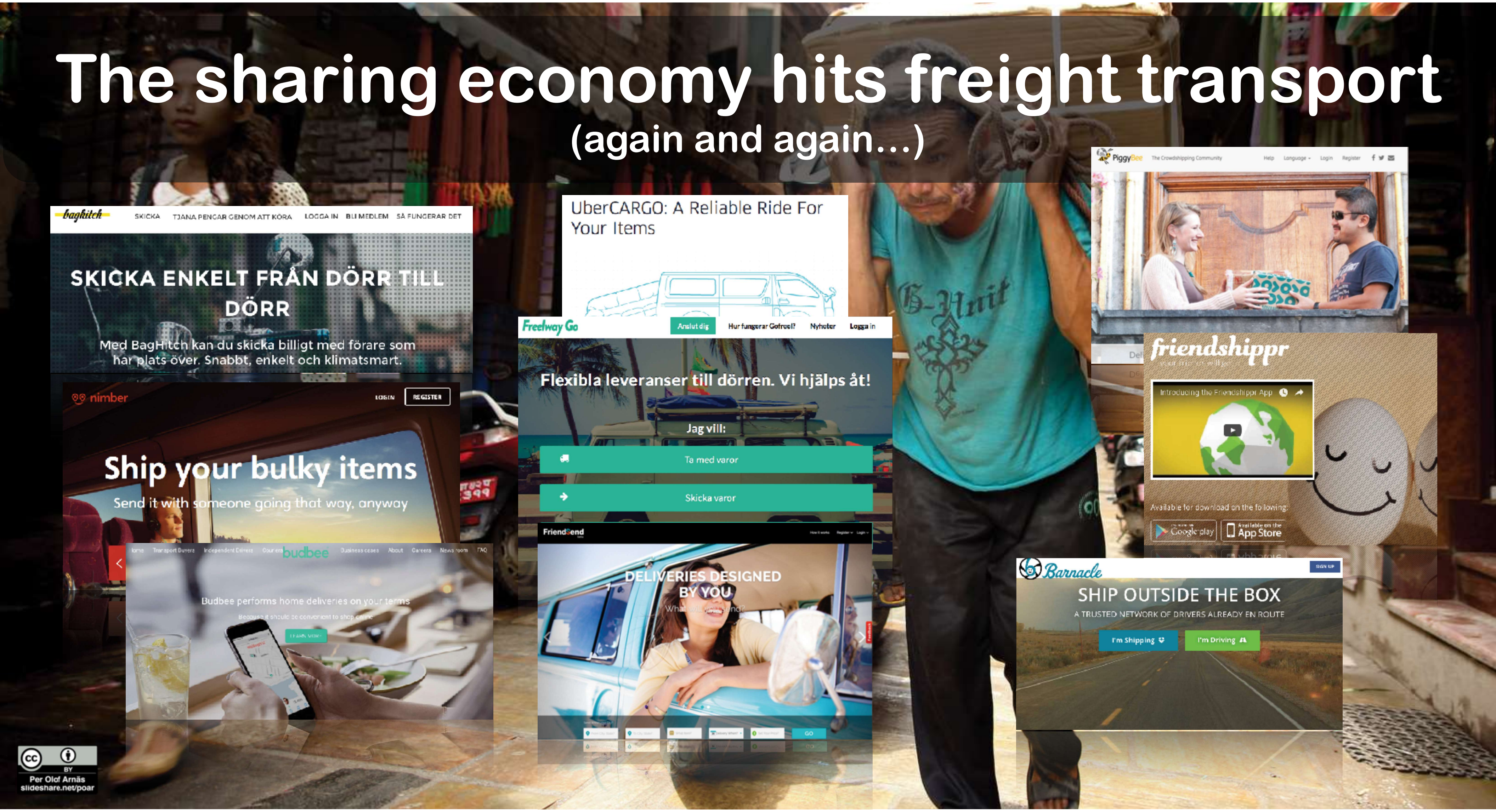
Who will lose their job in your company?

Mentimeter

56

The sharing economy hits freight transport

(again and again…)



SKICKA ENKELT FRÅN DÖRR TILL DÖRR

Med BagHitch kan du skicka billigt med förare som har plats över. Snabbt, enkelt och klimatsmart.

Ship your bulky items

Send it with someone going that way, anyway

Budbee performs home deliveries on your terms

Because it should be convenient to shop online

UberCARGO: A Reliable Ride For Your Items

Flexibla leveranser till dörren. Vi hjälps åt!

Jag vill:

DELIVERIES DESIGNED BY YOU

What will you send?

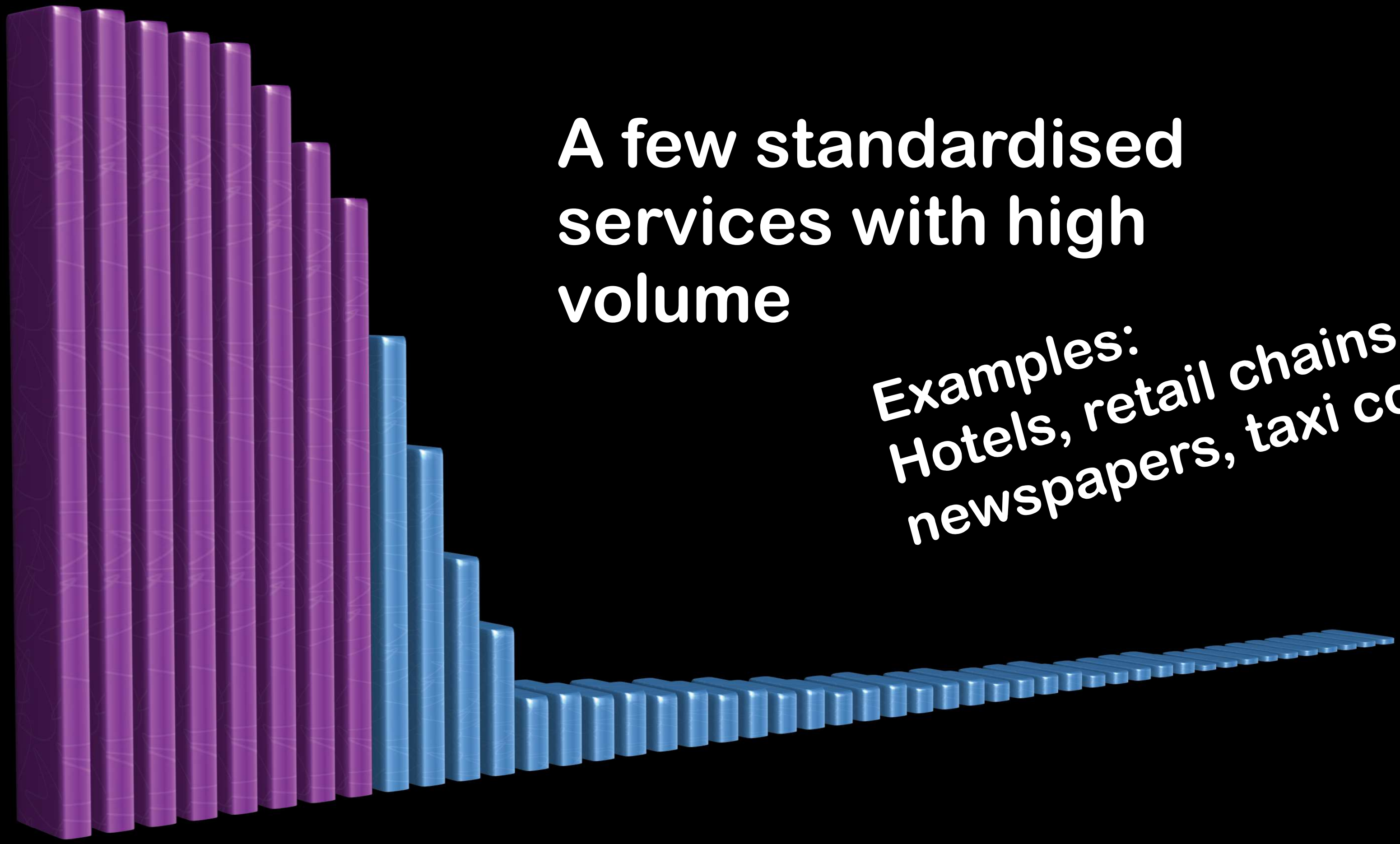
Available for download on the following:

SHIP OUTSIDE THE BOX

A TRUSTED NETWORK OF DRIVERS ALREADY EN ROUTE

baghitch
SKICKA
TJANA PENGAR GENOM ATT KÖRA
LOGGA IN
BLI MEDLEM
SÅ FUNGERAR DET
nimber
LOGIN
REGISTER
budbee
Transport Buyers
Independent Drivers
Business cases
About
Careers
News room
FAQ
LEARN MORE
Freelway Go
Anslut dig
Hur fungerar Gofreel?
Nyheter
Logga in
Ta med varor
Skicka varor
FriendSend
How it works
Register
Login
GO
PiggyBee
The Crowdshipping Community
Help
Language
Login
Register
friendshippr
Introducing the Friendshippr App
Google play
Available on the App Store
Barnacle
SIGN UP
I'm Shipping
I'm Driving

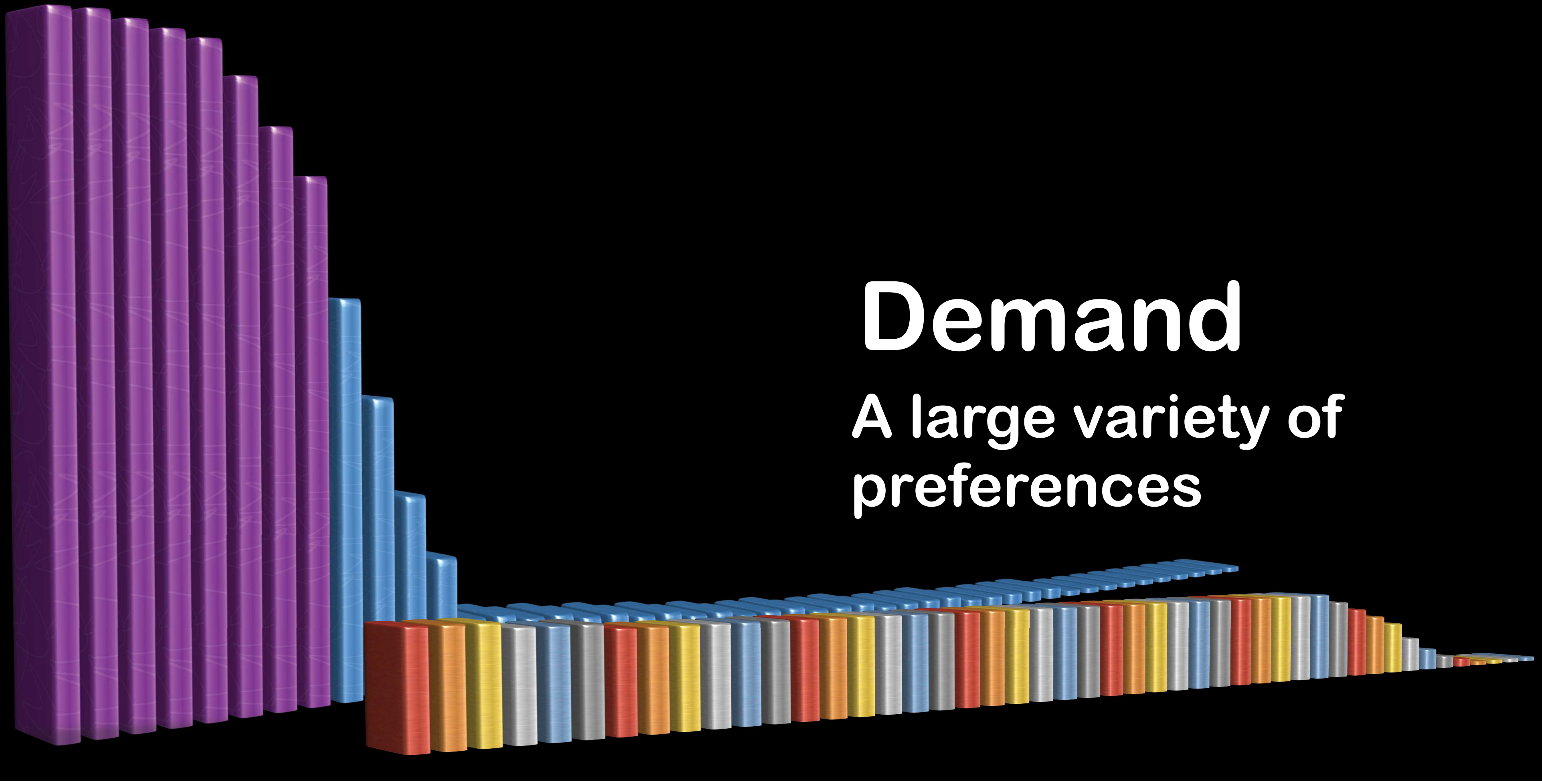
Supply (traditional)



A few standardised services with high volume

Examples:
Hotels, retail chains, newspapers, taxi companies

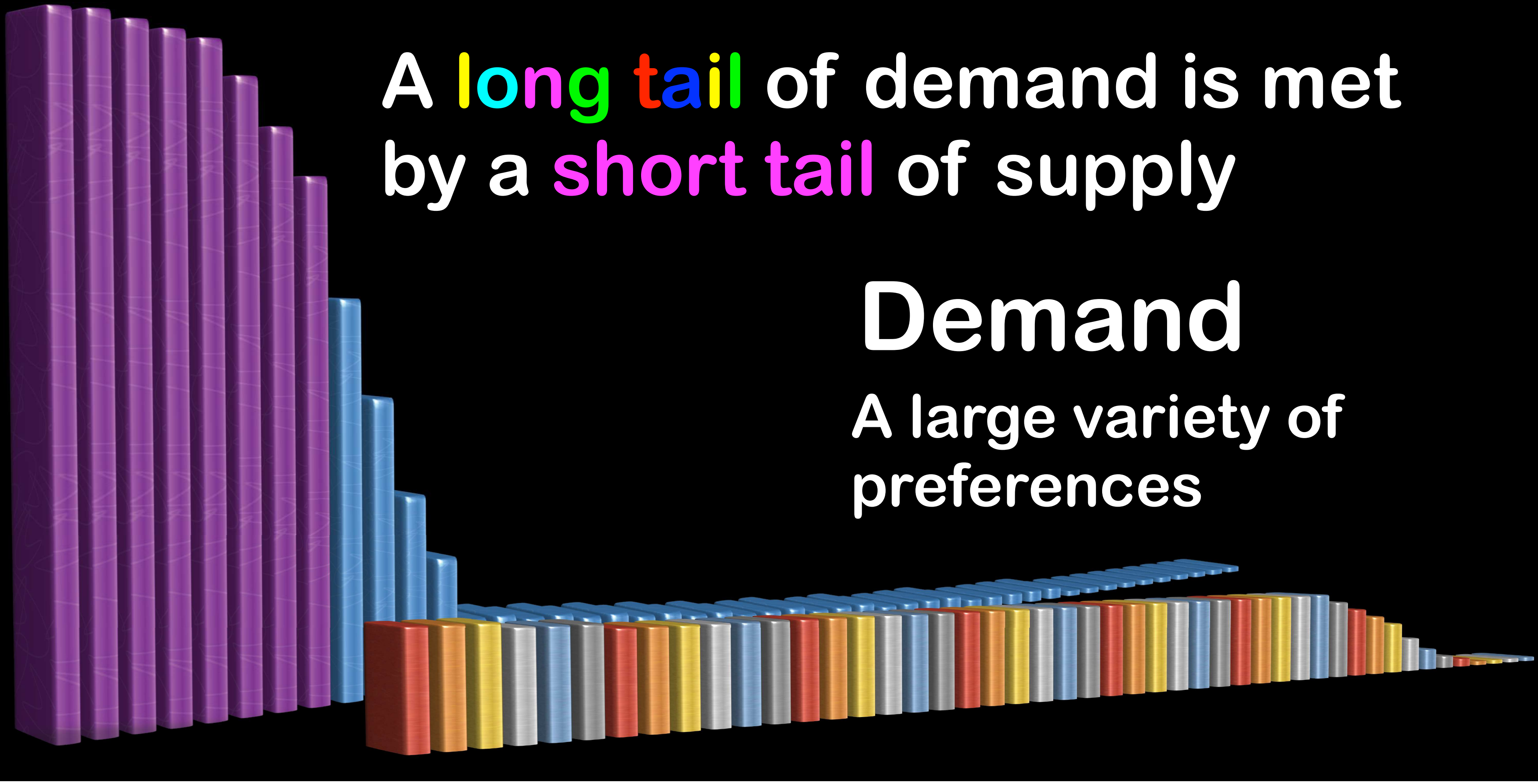
Supply (traditional)



Demand

A large variety of preferences

Supply (traditional)



A long tail of demand is met by a short tail of supply

Demand

A large variety of preferences

Supply (traditional)

A long tail of demand is met by a short tail of supply

Demand

A large variety of preferences

Supply (sharing economy)

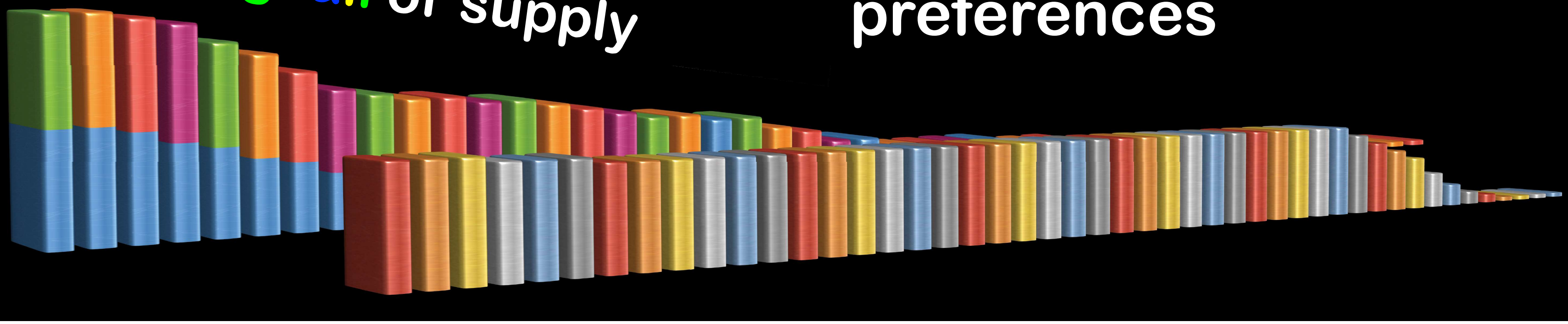
A large variety of services, each with a small volume

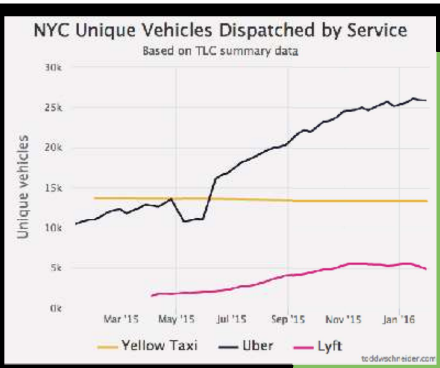
Made possible with technology!

Demand

A large variety of preferences

A long tail of demand is met by a long tail of supply





Uber The world's largest taxi company, owns no vehicles.

Facebook The world's most popular media owner, creates no content.

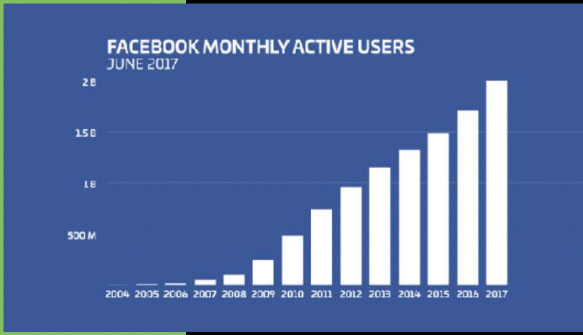
Alibaba The most valuable retailer, has no inventory.

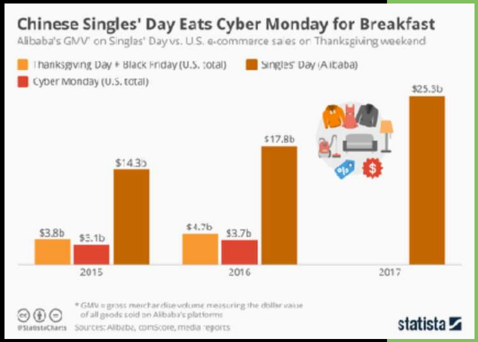
Airbnb The world's largest accommodation provider, owns no real estate.

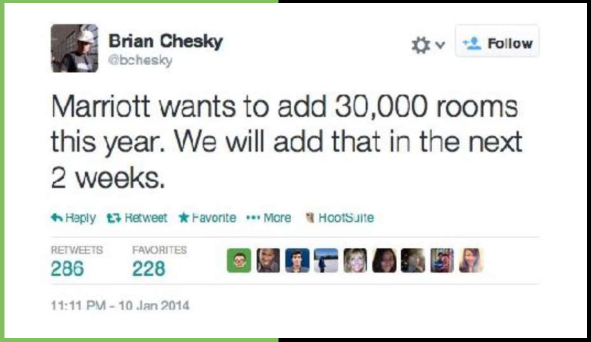
Something interesting is happening.
TOM GOODWIN

wetpoint
creative digital solutions

/WetpaintMENA







Brian Chesky @bchesky

Marriott wants to add 30,000 rooms this year. We will add that in the next 2 weeks.

RETWEETS 286 FAVORITES 228

11:11 PM - 10 Jan 2014

https://www.statista.com/chart/11810/singles-day-vs-cyber-monday-and-black-friday/

Servitization

Expose data

Move up in the value chain

Consumer services

Upgrade drop points

click & services
click & services
hiss
M
MALL OF SCANDINAVIA
postnord
LUREN MED
SCANDINAVIA
FAMILJE WC
Tide
Start Shop
Cottons
Minimum iron
Woolens
Areas of development for logistics companies in relation to e-commerce
Process improvement
Secure identification on pickup/delivery
Sustainable and climate friendly
Improved delivery rate
Delivery and pickup during weekends
Faster and better returns
Better infrastructure on consumer side
Faster, more reliable and secure deliveries in Europe
Customer controls last mile
Support companies that want to add E-commerce to their business
Better security
Better delivery experience
Collect in store
3PL targeted at E-commerce
Home delivery
Local same-day delivery
Marketing of the E-channel
Distribution of food
Infrastructure development
Service development

Online retailer offers a courier that waits at your door – fashion advice not included

Friday, 02 May 2014 1:46

BROEDE CARMODY

http://www.smartcompany.com.au/growth/innovation/41765-online-retailer-offers-a-courier-that-waits-at-your-door-fashion-advice-not-included.html

amazon dash BUTTON

Never run out of your favorite products with Amazon Dash Button—exclusively for Prime members. Simply press Dash Button and relax while Amazon reorders and delivers your favorite items.

https://www.amazon.com/dashbutton

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Mall of Scandinavia

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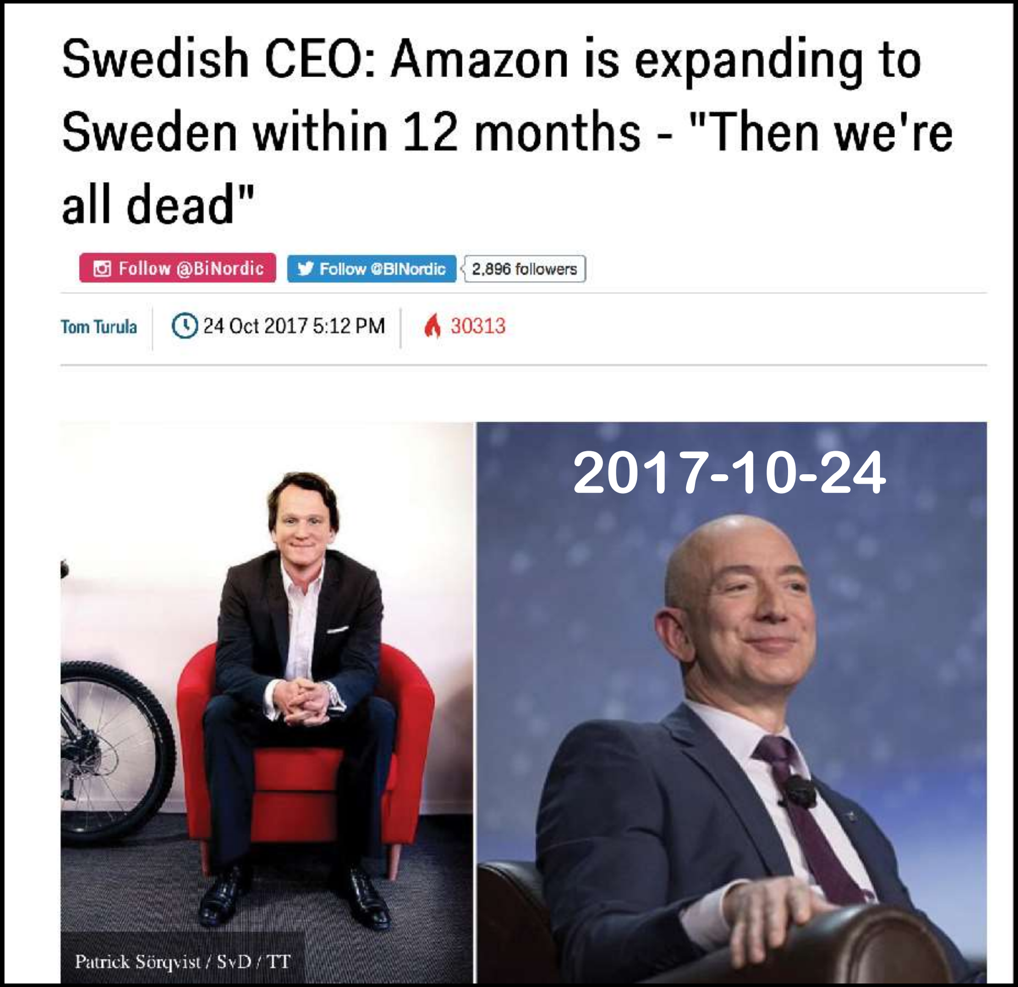

Swedish CEO: Amazon is expanding to Sweden within 12 months - "Then we're all dead"

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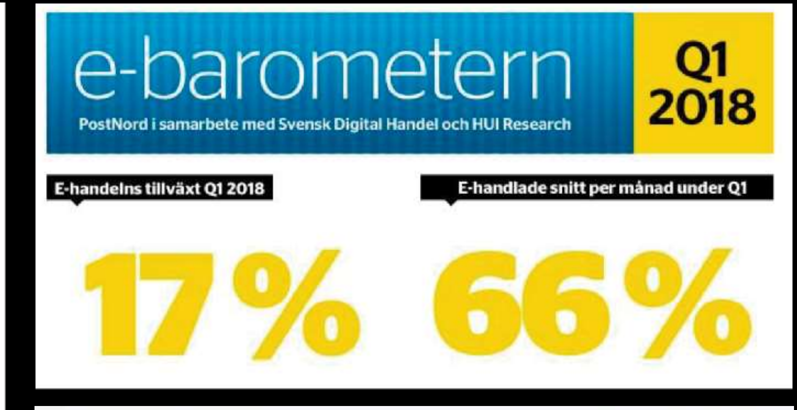
Tom Turula | 24 Oct 2017 5:12 PM | 30313

2017-10-24

Patrick Sörqvist / SvD / TT



e-barometern

PostNord i samarbete med Svensk Digital Handel och HUI Research

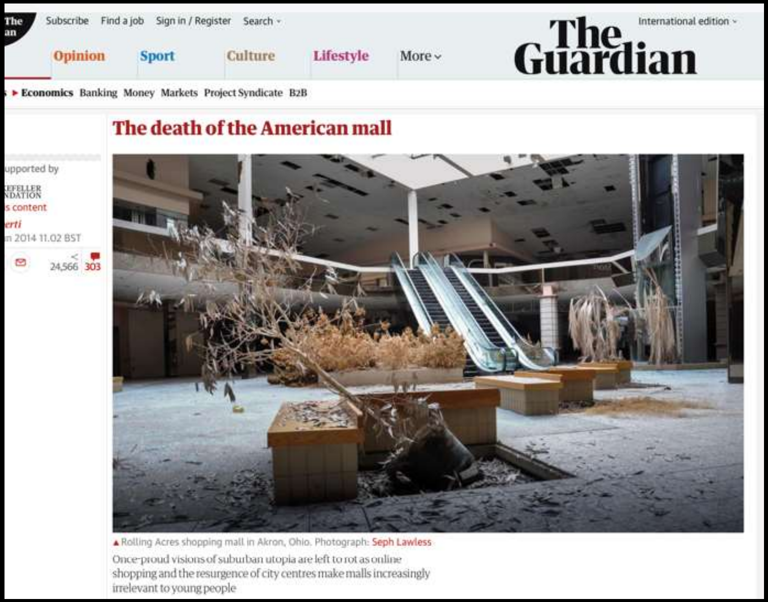
Q1 2018

E-handelns tillväxt Q1 2018

17%

E-handlade snitt per månad under Q1

66%



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303

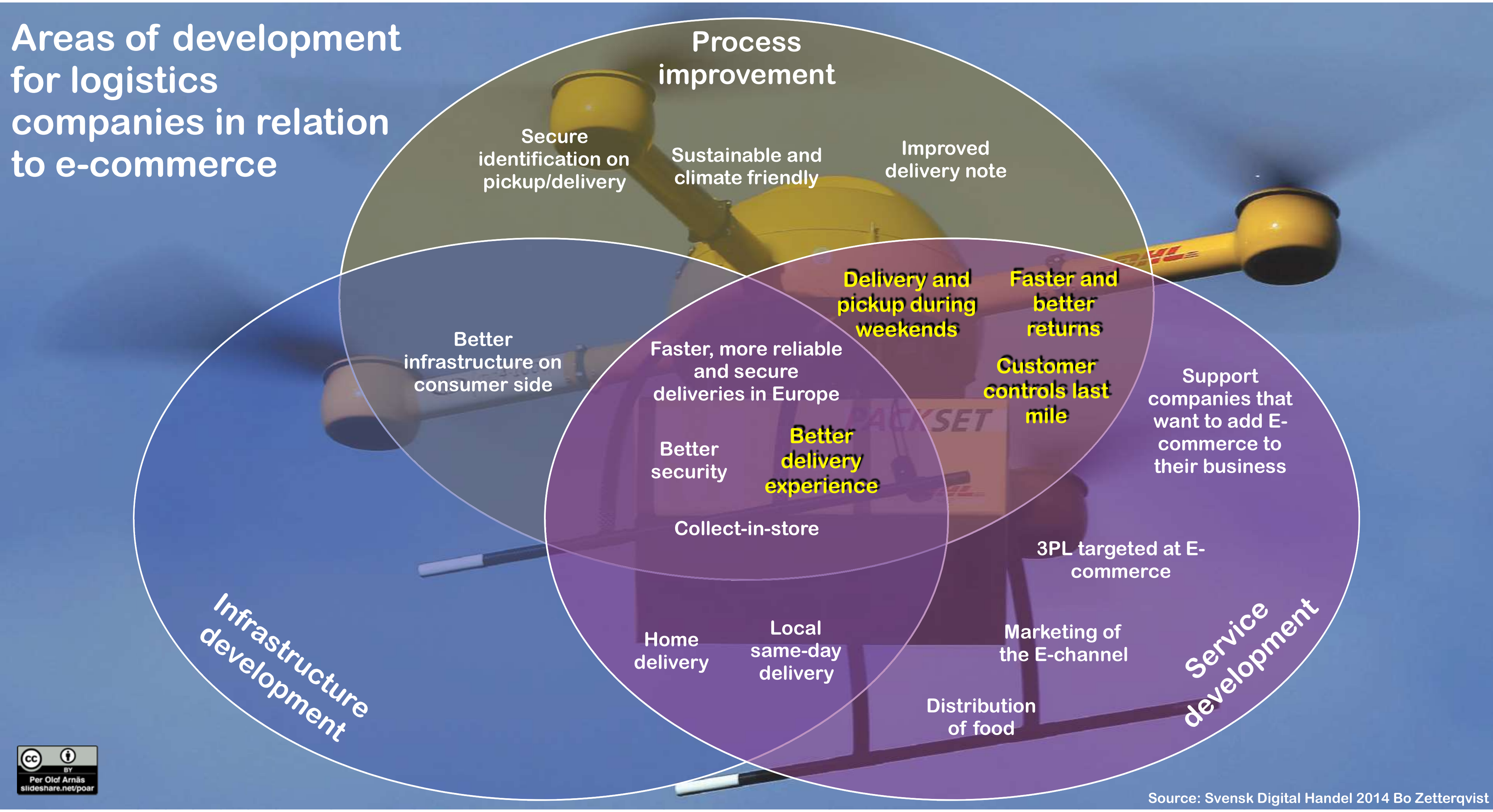
The death of the American mall

Rolling Acres shopping mall in Akron, Ohio. Photograph: Seph Lawless

Once-proud visions of suburban utopia are left to rot as online shopping and the resurgence of city centres make malls increasingly irrelevant to young people

https://nordic.businessinsider.com/were-all-dead---amazon-is-launching-in-sweden-within-12-months-according-to-top-executive-2017-10
https://www.theguardian.com/cities/2014/jun/19/-sp-death-of-the-american-shopping-mall

Areas of development for logistics companies in relation to e-commerce



Process improvement

Secure identification on pickup/delivery

Sustainable and climate friendly

Improved delivery note

Better infrastructure on consumer side

Delivery and pickup during weekends

Faster and better returns

Customer controls last mile

Faster, more reliable and secure deliveries in Europe

Better security

Better delivery experience

Collect-in-store

Support companies that want to add E-commerce to their business

3PL targeted at E-commerce

Home delivery

Local same-day delivery

Marketing of the E-channel

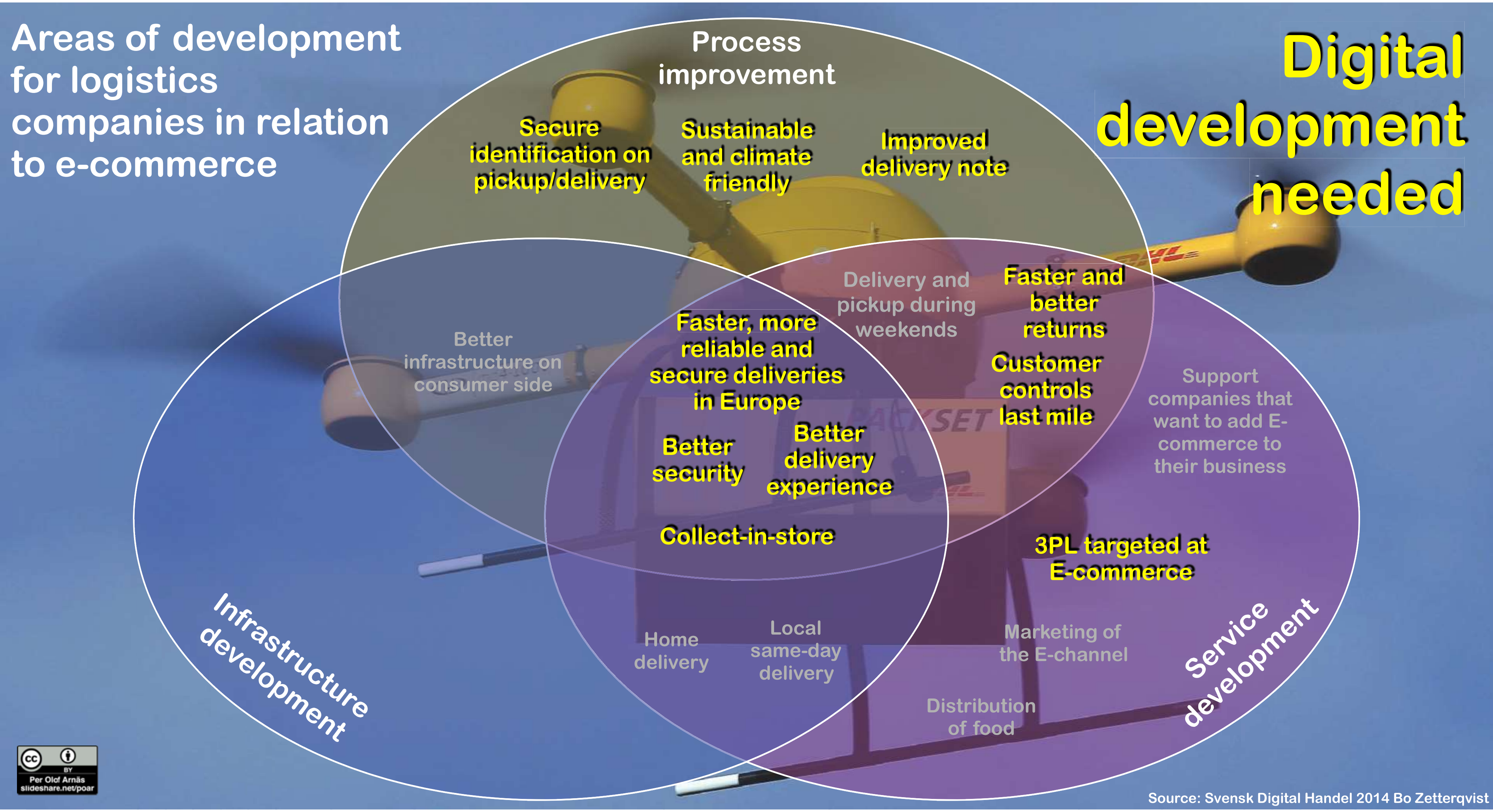
Distribution of food

Infrastructure development

Service development

Source: Svensk Digital Handel 2014 Bo Zetterqvist

Areas of development for logistics companies in relation to e-commerce



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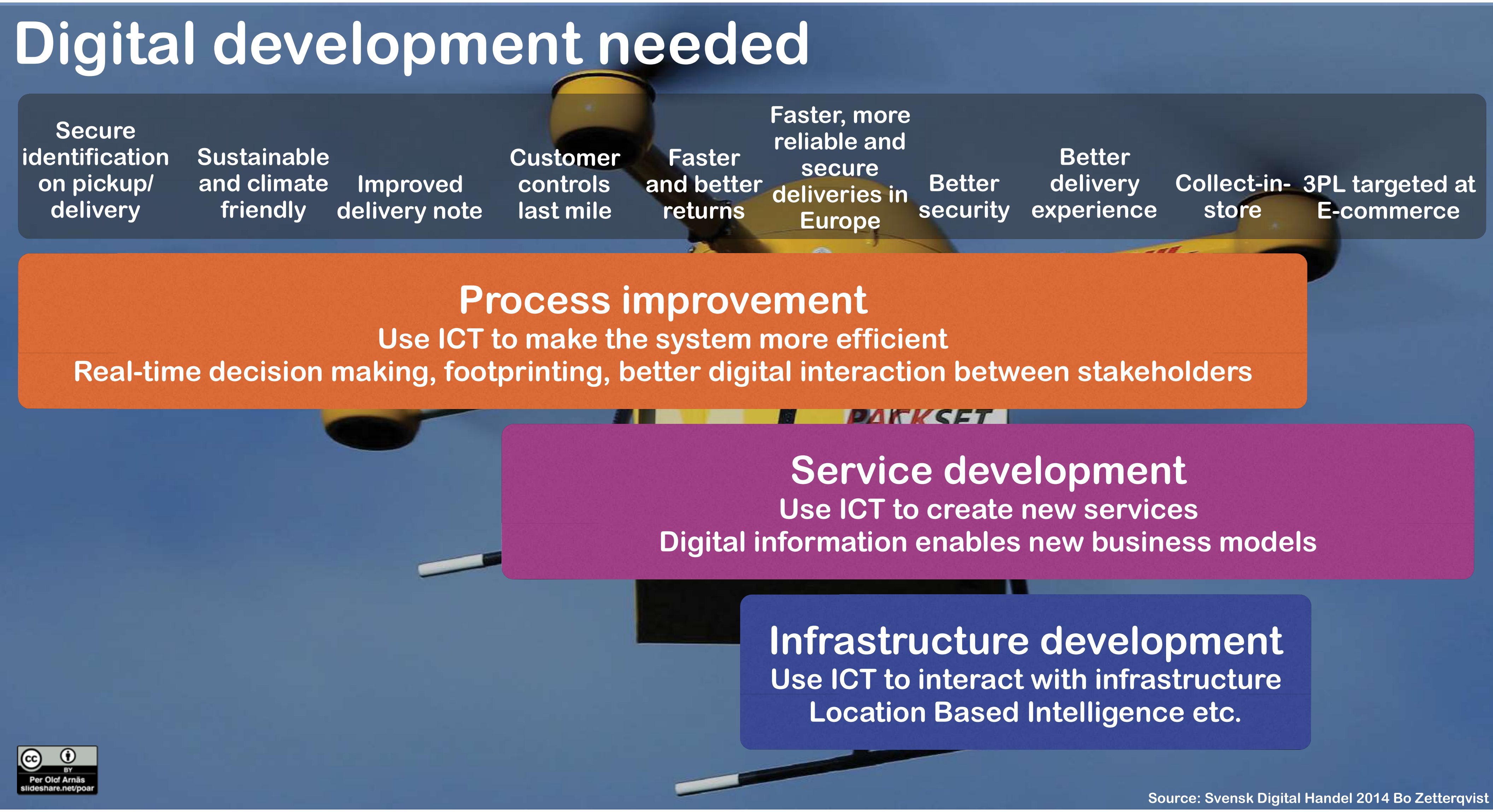
Service development

Digital development needed

Source: Svensk Digital Handel 2014 Bo Zetterqvist

Digital development needed



- Secure identification on pickup/ delivery
- Sustainable and climate friendly
- Improved delivery note
- Customer controls last mile
- Faster and better returns
- Faster, more reliable and secure deliveries in Europe
- Better security
- Better delivery experience
- Collect-in-store
- 3PL targeted at E-commerce

Process improvement

Use ICT to make the system more efficient

Real-time decision making, footprinting, better digital interaction between stakeholders

Service development

Use ICT to create new services

Digital information enables new business models

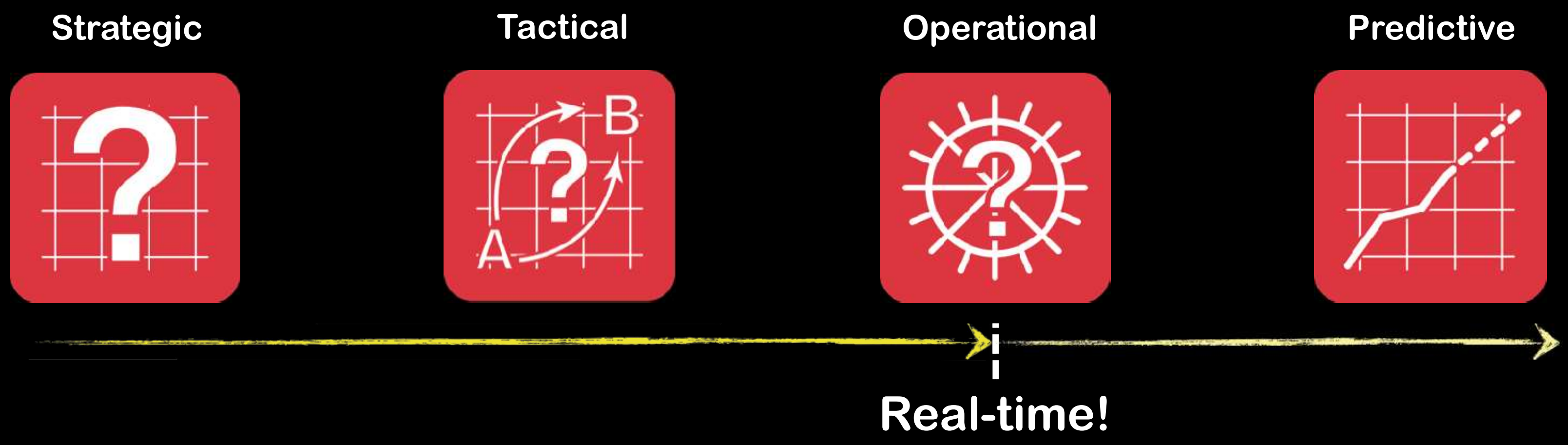
Infrastructure development

Use ICT to interact with infrastructure

Location Based Intelligence etc.

Source: Svensk Digital Handel 2014 Bo Zetterqvist

Time horizons


Strategic
Tactical
A
B
Operational
Predictive
Real-time!

We are approaching
this boundary

…and we are
starting to
move past it!

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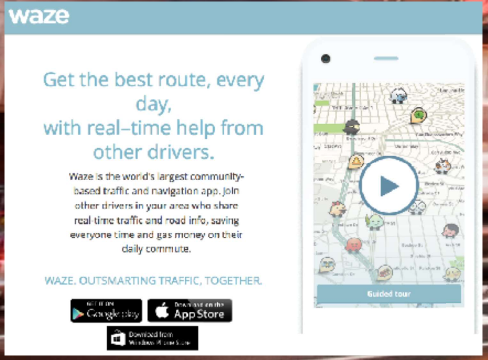
Per Olof Arnäs

Real-time (data driven) decision making

Data collection

Data processing

Data exploitation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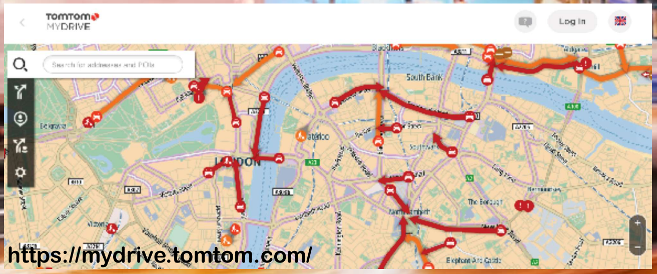
Guided tour

Get the best route, every day, with real–time help from other drivers.

Waze is the world's largest community-based traffic and navigation app. Join other drivers in your area who share real-time traffic and road info, saving everyone time and gas money on their daily commute.

WAZE. OUTSMARTING TRAFFIC, TOGETHER.

http://waze.com


TomTom MYDRIVE
Log in
LONDON

https://mydrive.tomtom.com/

MINDCONNECT
Hem
Tjänster
Nyheter
Om oss
Kontakta oss
English
5%

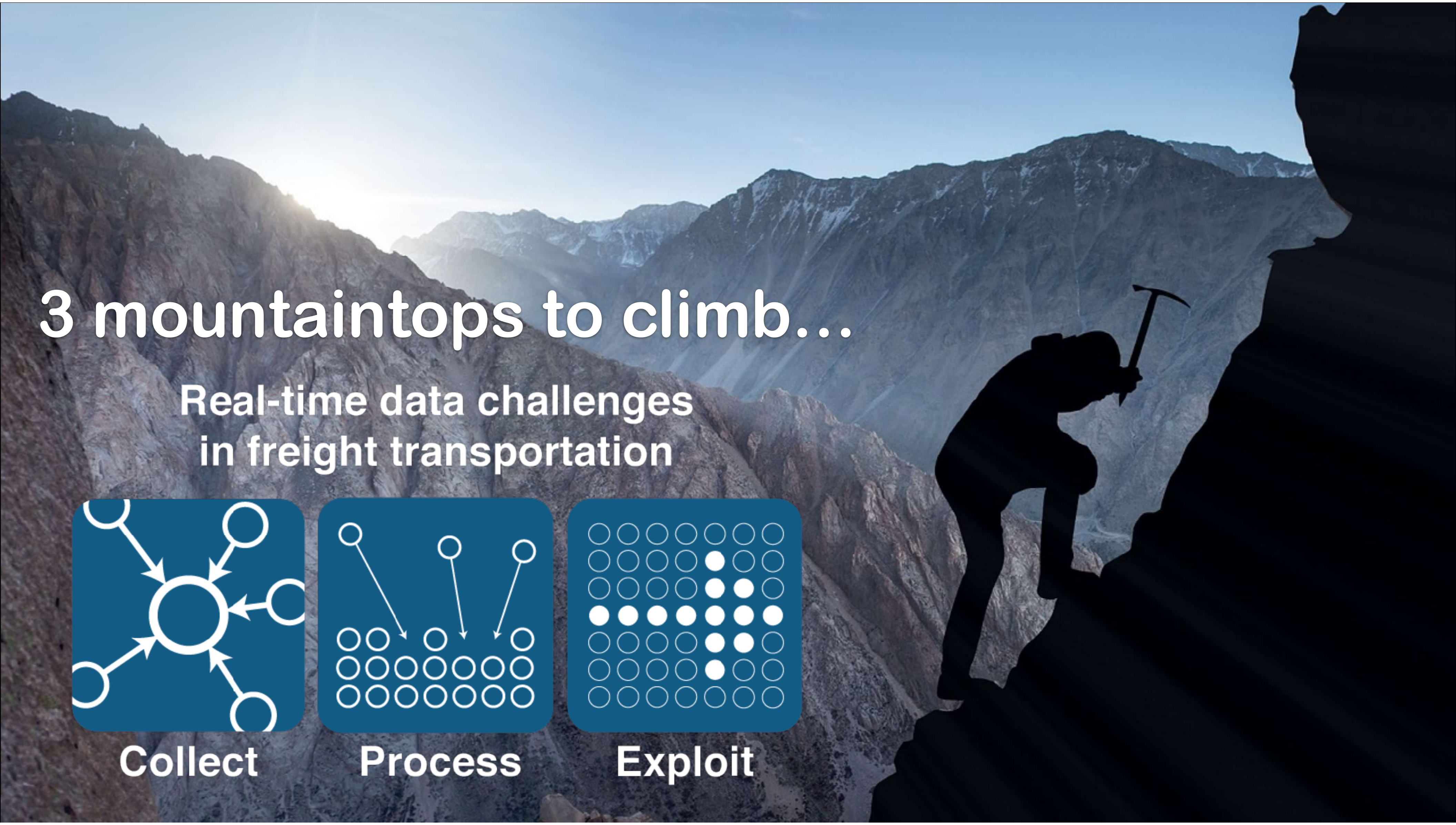
Ökad produktivitet

CityFlow gör vardagen enklare för dig som kör i Stockholm

CityFlow - tar yrkesförare eff...

http://mindconnect.se/

The Action of New York City by Trey Ratcliff on Flickr (CC-BY,NC,SA)



3 mountaintops to climb…

Real-time data challenges
in freight transportation

Collect

Process

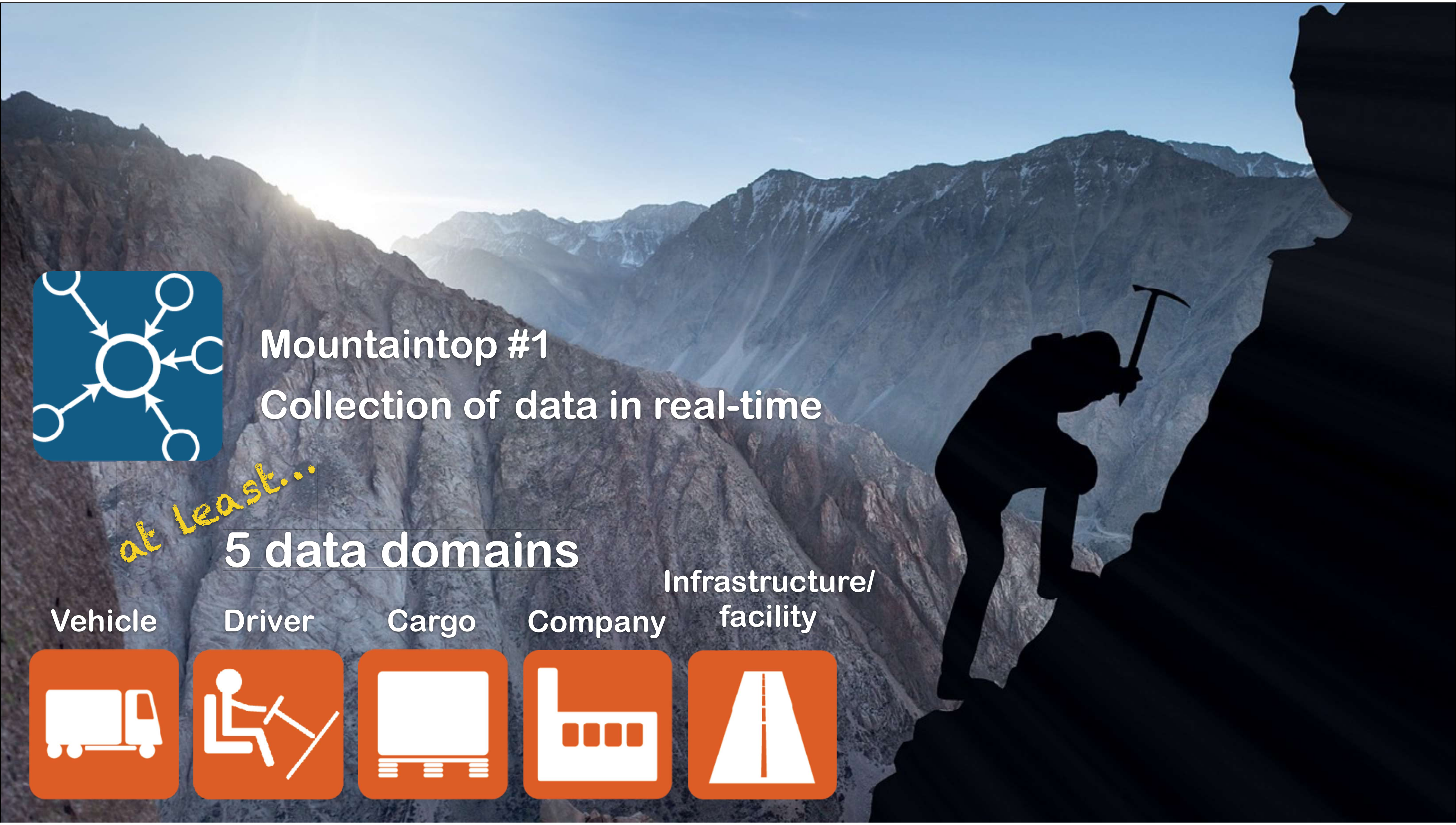
Exploit

Mountaintop #1

Collection of data in real-time

3 data types

- Fixed
- Historical
- Snapshot



Mountaintop #1

Collection of data in real-time

at least...

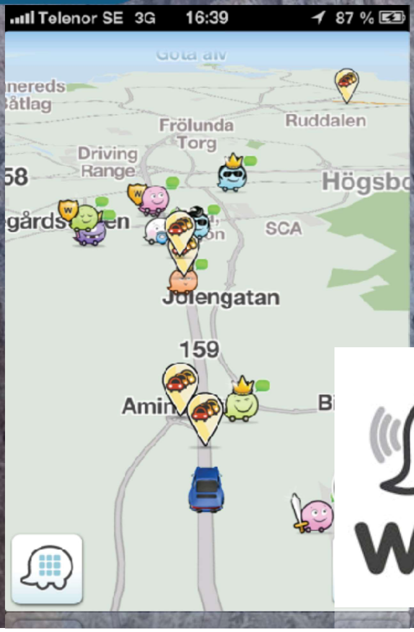
5 data domains

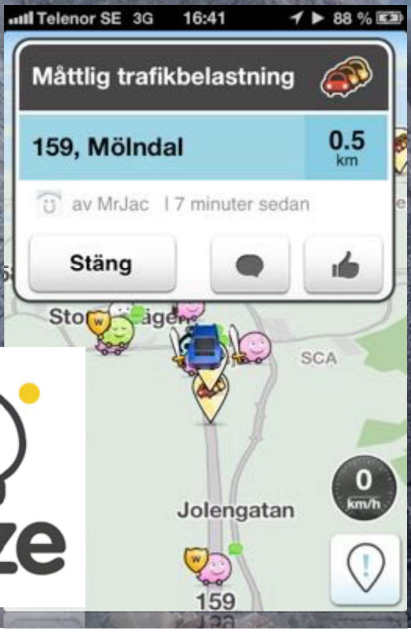
- Vehicle
- Driver
- Cargo
- Company
- Infrastructure/ facility

DATA MATRIX

	Fixed	Historical	Snapshot
Vehicle	Length Weight Width Height Capacity + other PBS-criteria	Emissions Fuel consumption Route	Position Speed Direction
Cargo	Weight Origin Destination Accepted ETA	Temperature + other state variables	Temperature + other state variables
Driver	Education/training	Speed (ISA) Rest/break schedule Traffic behaviour Belt usage Alco lock history	Schedule status (time to next break etc.)
Company	Contracts/ agreements	Previous interactions	Backoffice support
Infrastructure /facility	Map + fixed data layers	Traffic history	Current traffic Queue Availability

Mountaintop #2
Processing of data in real-time


Telenor SE 3G 16:39 87 %
Göta älv
Frölunda Torg
Ruddalen
Driving Range
Högsbo
SCA
Jolengatan
159

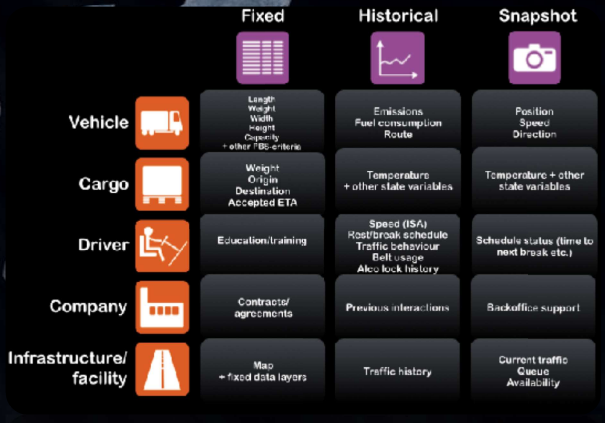

Telenor SE 3G 16:41 88 %
Stäng
SCA
Jolengatan
0 km/h
159

Måttlig trafikbelastning

159, Mölndal 0.5 km

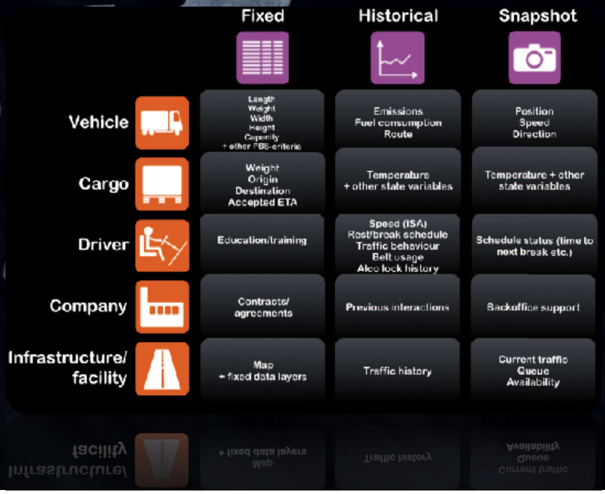
av MrJac | 7 minuter sedan

waze



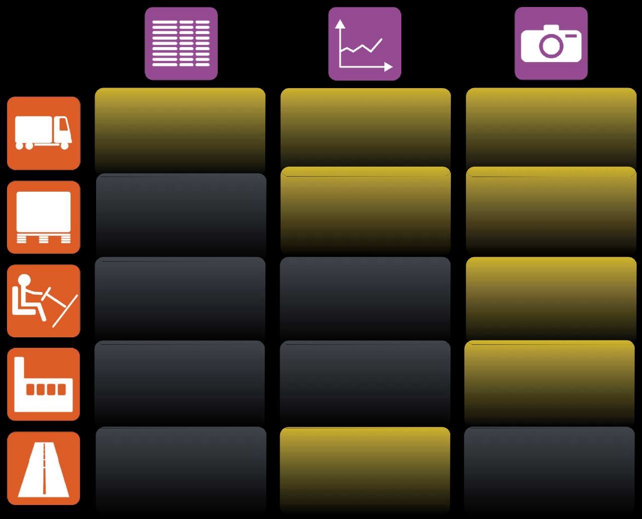
	Fixed	Historical	Snapshot
Vehicle	Length Weight Width Height Capacity + other PBS-criteria	Emissions Fuel consumption Route	Position Speed Direction
Cargo	Weight Origin Destination Accepted ETA	Temperature + other state variables	Temperature + other state variables
Driver	Education/training	Speed (ISA) Rest/break schedule Traffic behaviour Belt usage Alco lock history	Schedule status (time to next break etc.)
Company	Contracts/ agreements	Previous interactions	Backoffice support
Infrastructure/ facility	Map + fixed data layers	Traffic history	Current traffic Queue Availability

Mountaintop #3
Exploiting data in real-time

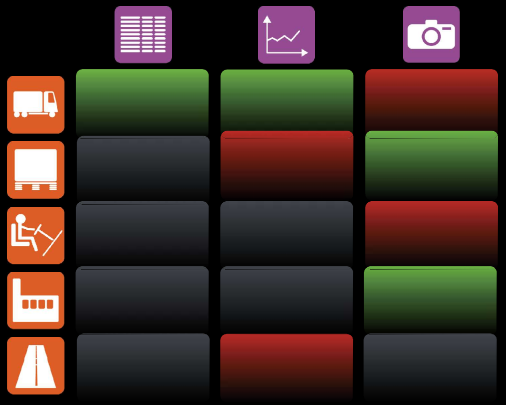


	Fixed	Historical	Snapshot
Vehicle	Length Weight Width Height Capacity + other PBS-criteria	Emissions Fuel consumption Route	Position Speed Direction
Cargo	Weight Origin Destination Accepted ETA	Temperature + other state variables	Temperature + other state variables
Driver	Education/training	Speed (ISA) Rest/break schedule Traffic behaviour Belt usage Alco lock history	Schedule status (time to next break etc.)
Company	Contracts/ agreements	Previous interactions	Backoffice support
Infrastructure/ facility	Map + fixed data layers	Traffic history	Current traffic Queue Availability

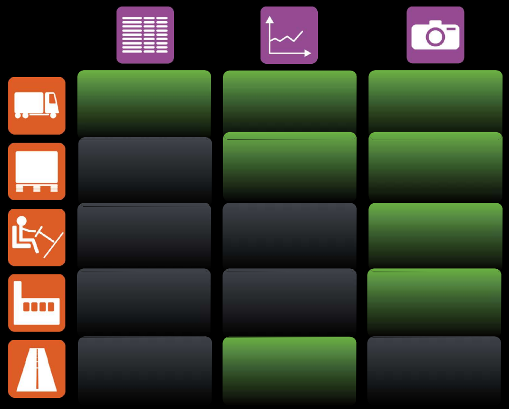
Requirement



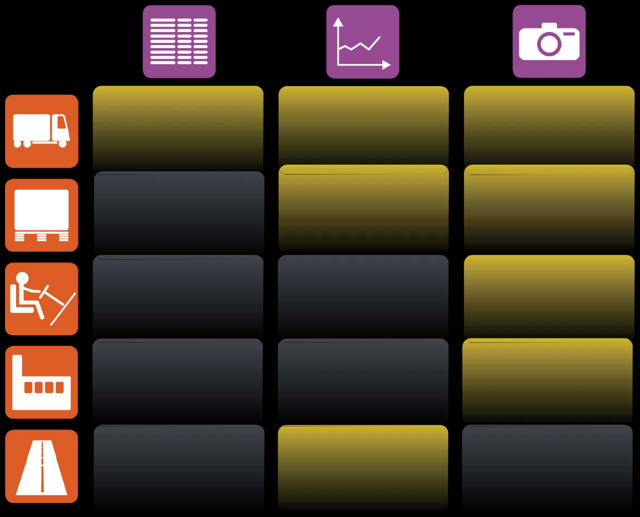
Transport 1



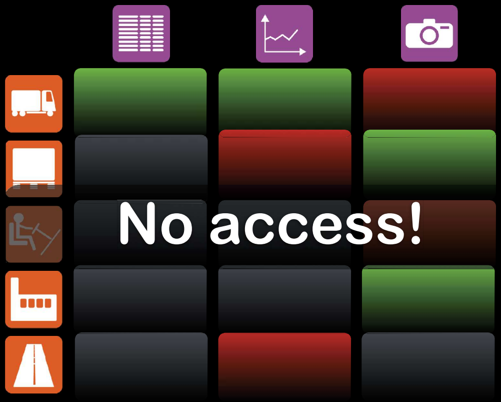
Transport 2



Requirement

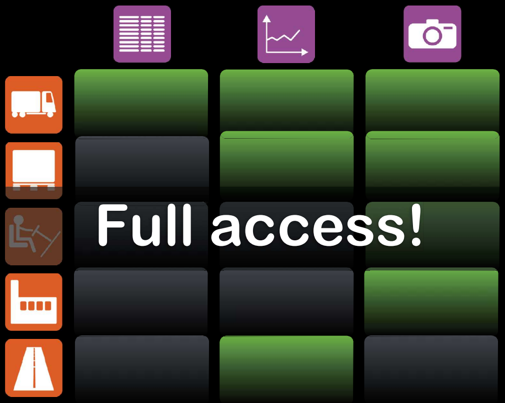


Transport 1



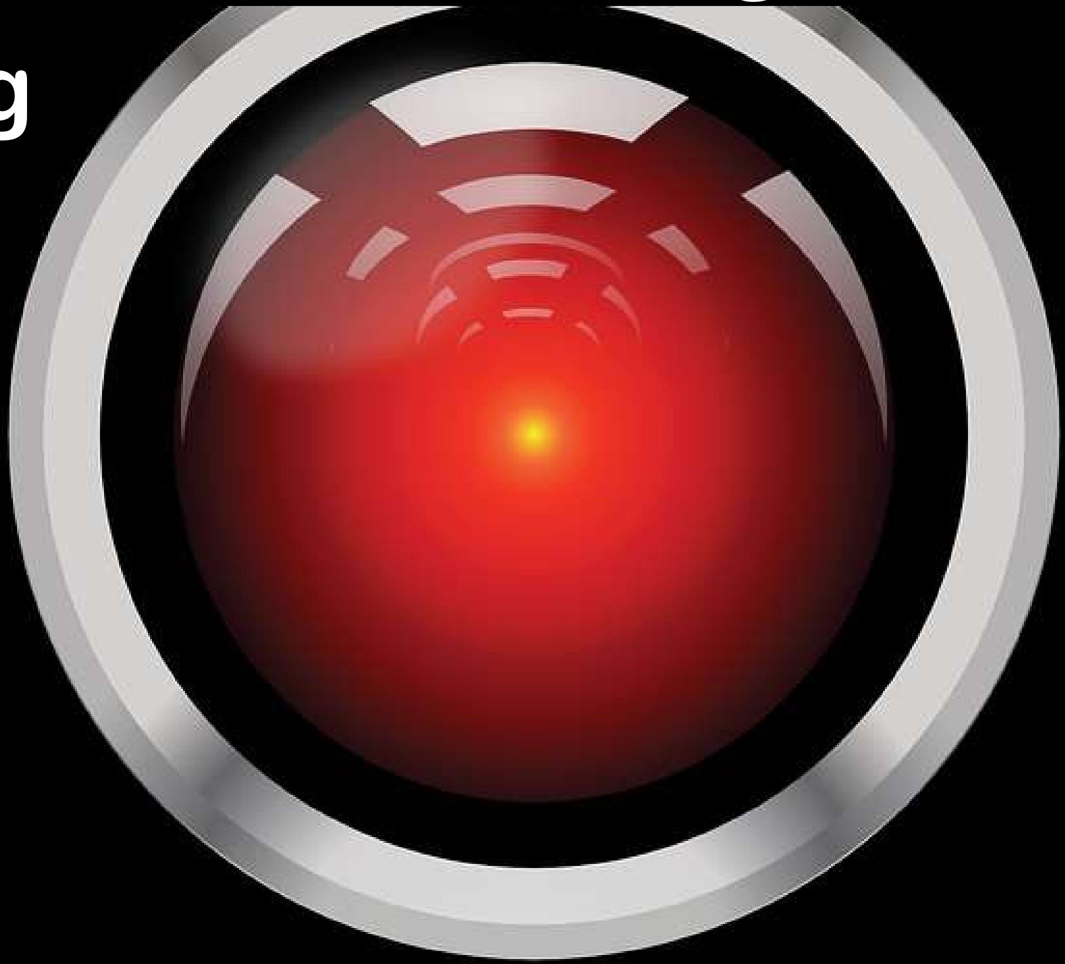
No access!

Transport 2



Full access!

Artificial intelligence



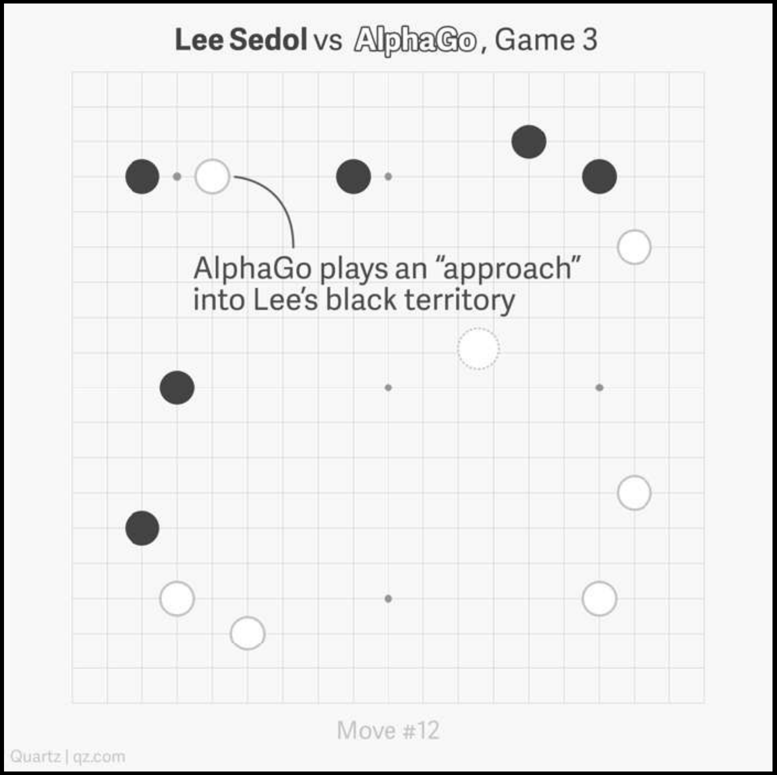
Reasoning

Learning

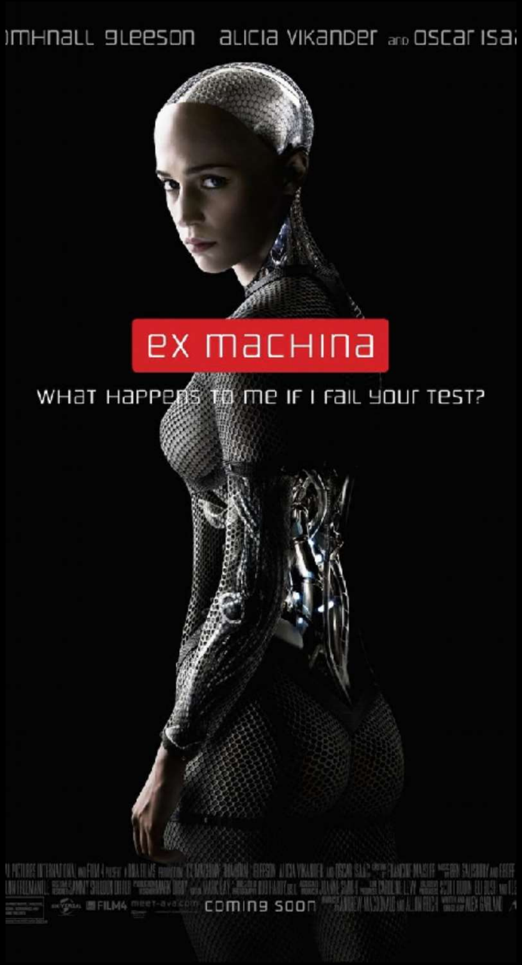
Problem solving

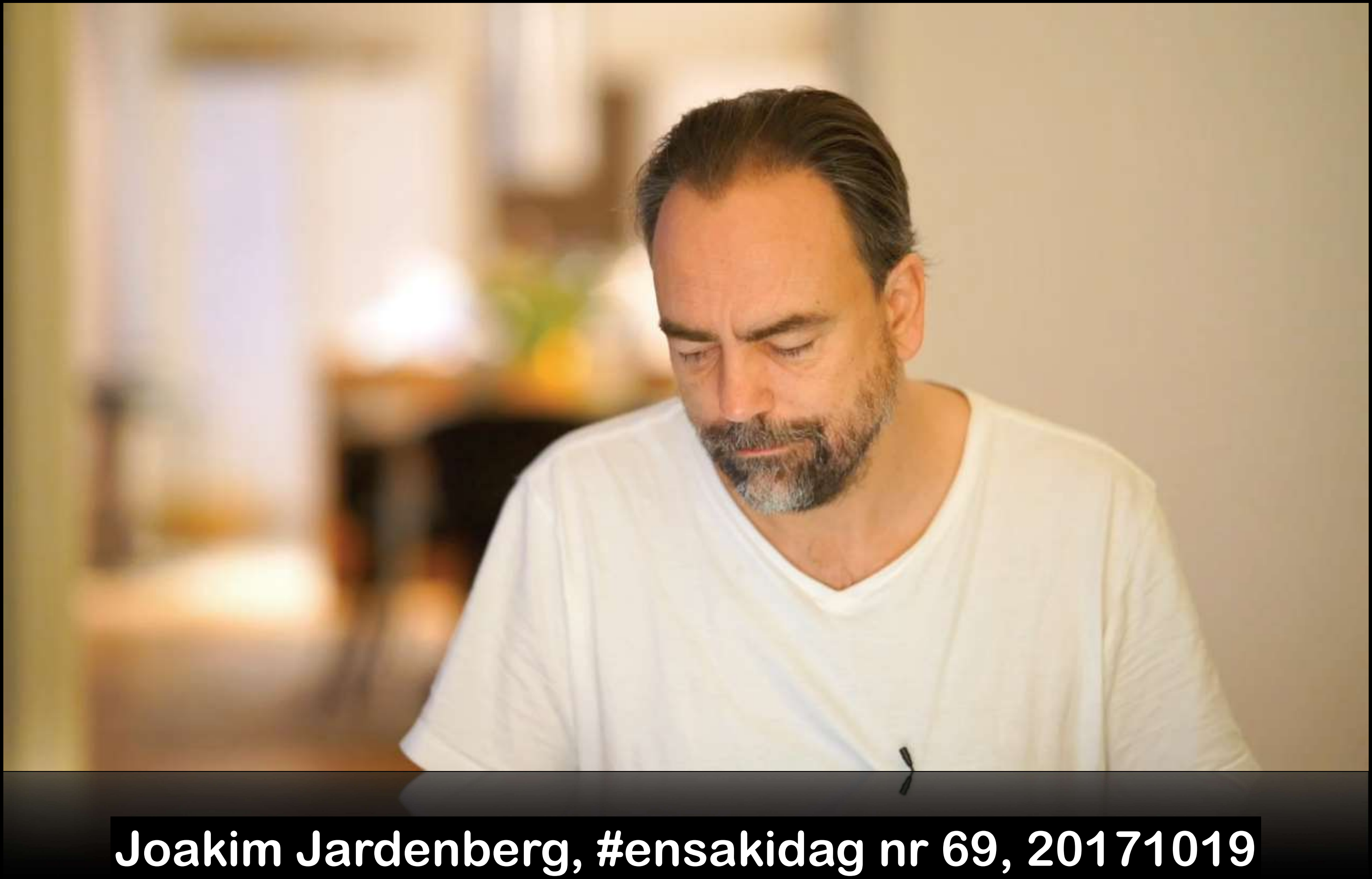
Creating

Specialised AI


Lee Sedol vs AlphaGo, Game 3
AlphaGo plays an "approach" into Lee's black territory
Move #12
Quartz | qz.com

General AI

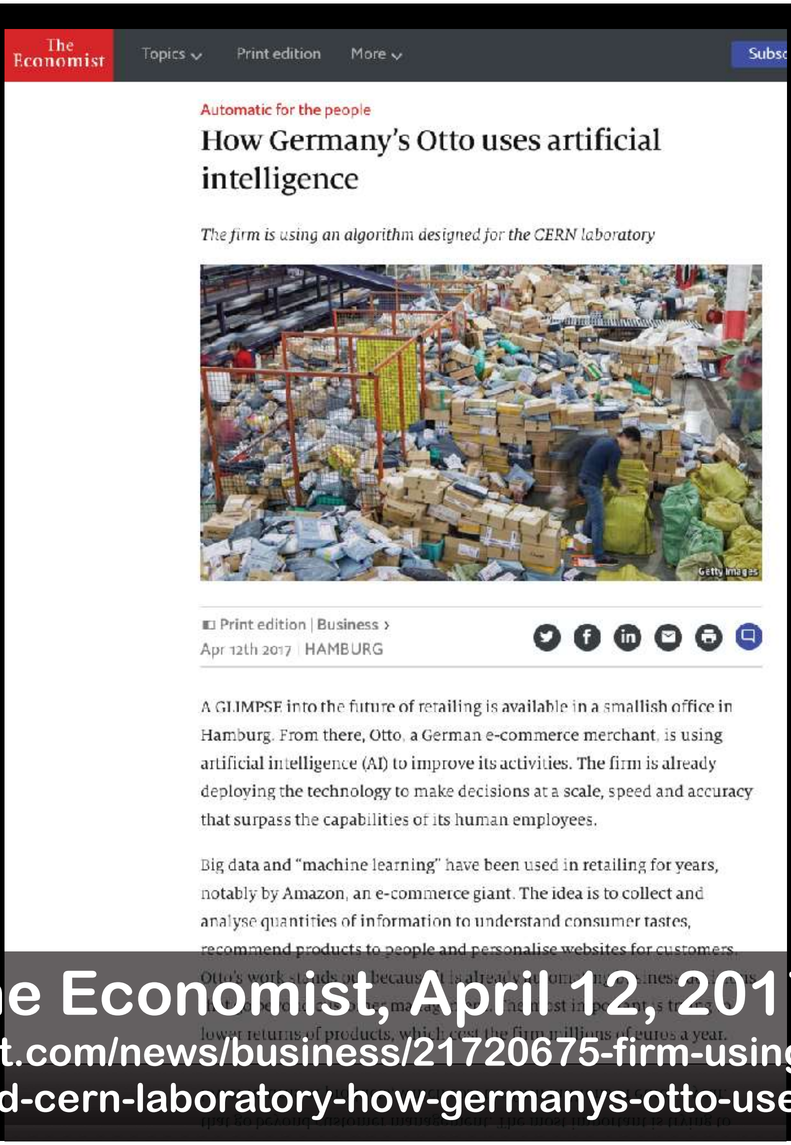

mhnall gleeson
alicia vikander and oscar isa
ex machina
WHAT HAPPENS TO ME IF I FAIL YOUR TEST?
coming soon



Joakim Jardenberg, #ensakidag nr 69, 20171019

Case

German e-retailer Otto uses artificial intelligence to make operational decisions



Automatic for the people

How Germany's Otto uses artificial intelligence

The firm is using an algorithm designed for the CERN laboratory

Print edition | Business ›
Apr 12th 2017 | HAMBURG

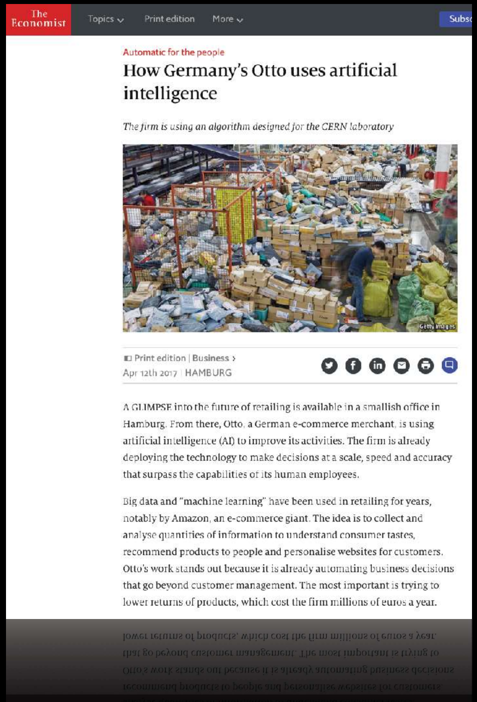
A GLIMPSE into the future of retailing is available in a smallish office in Hamburg. From there, Otto, a German e-commerce merchant, is using artificial intelligence (AI) to improve its activities. The firm is already deploying the technology to make decisions at a scale, speed and accuracy that surpass the capabilities of its human employees.

Big data and "machine learning" have been used in retailing for years, notably by Amazon, an e-commerce giant. The idea is to collect and analyse quantities of information to understand consumer tastes, recommend products to people and personalise websites for customers.

The Economist, April 12, 2017
http://www.economist.com/news/business/21720675-firm-using-algorithm-designed-cern-laboratory-how-germanys-otto-uses

The Problem

- Returns are expensive
- Customers less likely to return product if delivery lead time is short
- Long delivery lead times due to dropshipping
- Customers want one shipment
- Leads to unwanted inventory



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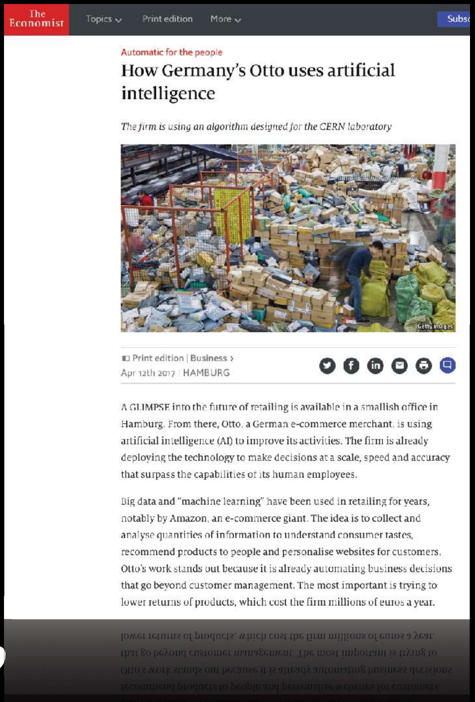
The Economist, April 12, 2017

http://www.economist.com/news/business/21720675-firm-using-algorithm-designed-cern-laboratory-how-germanys-otto-uses

The Solution

- Enable short lead times without increasing inventory
  - At the same time, avoid multiple shipments to the same customer
- Try to predict future customer orders and pre-order from supplier
  - Too much data for human analysis, however



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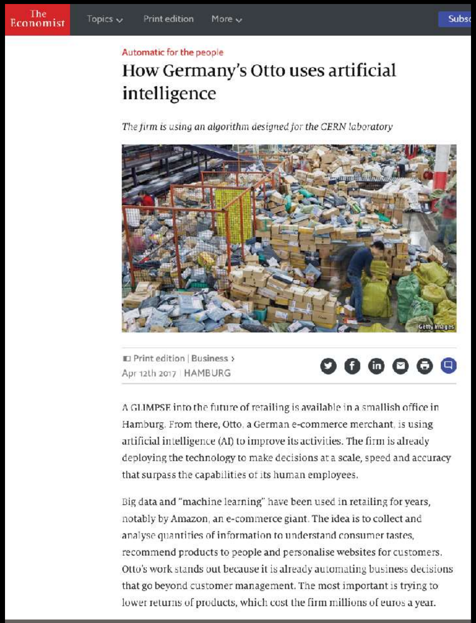
Per Olof Arnäs

The Solution (cont.)

- Use an AI to analyse 3 bn transactions and 200 variables (past sales, searches on site, weather etc.)
- The AI foresees future customer orders and makes procurement decisions based on these projections



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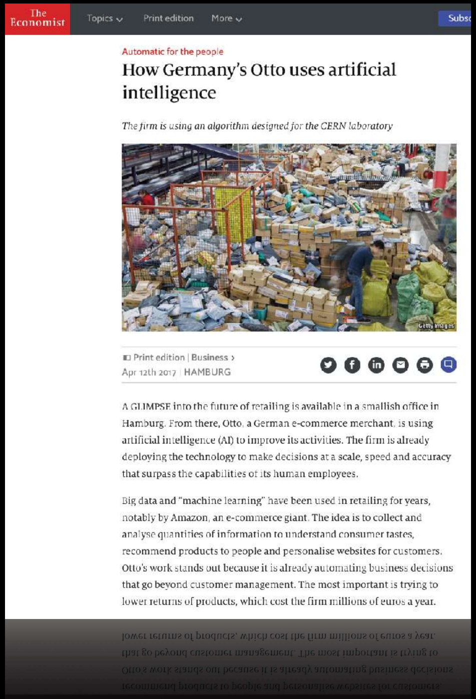
The Results

- The AI predicts with 90% accuracy what will be sold within 30 days
- The AI procures around 200 000 items per month
- Returns are diminished by 2 million items per year
- Stock level has been reduced by 20%

More personel were hired (!)



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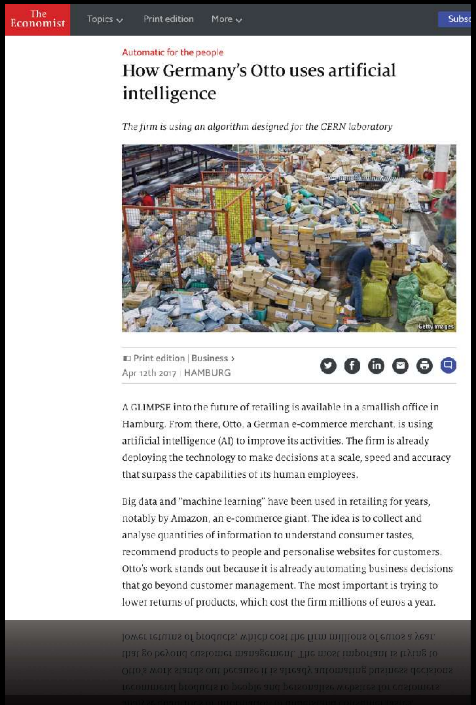
Takeaways

- AI used to make **existing processes** better
- AI is **not only** for Amazon and Google
- This development **has just started…**



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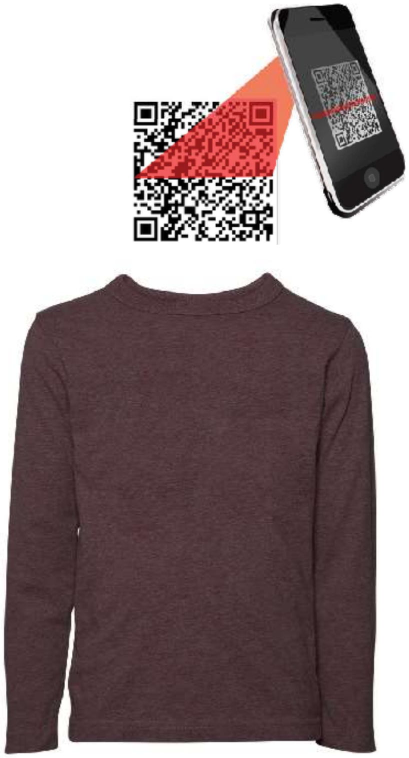


Example:
You are looking to buy a new sweater from a store.

The sweater has a unique QR code attached.

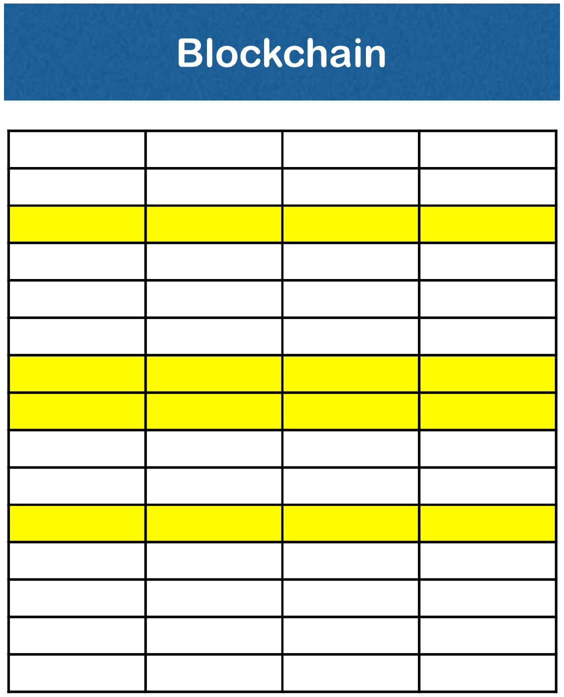
You scan the code with your mobile.

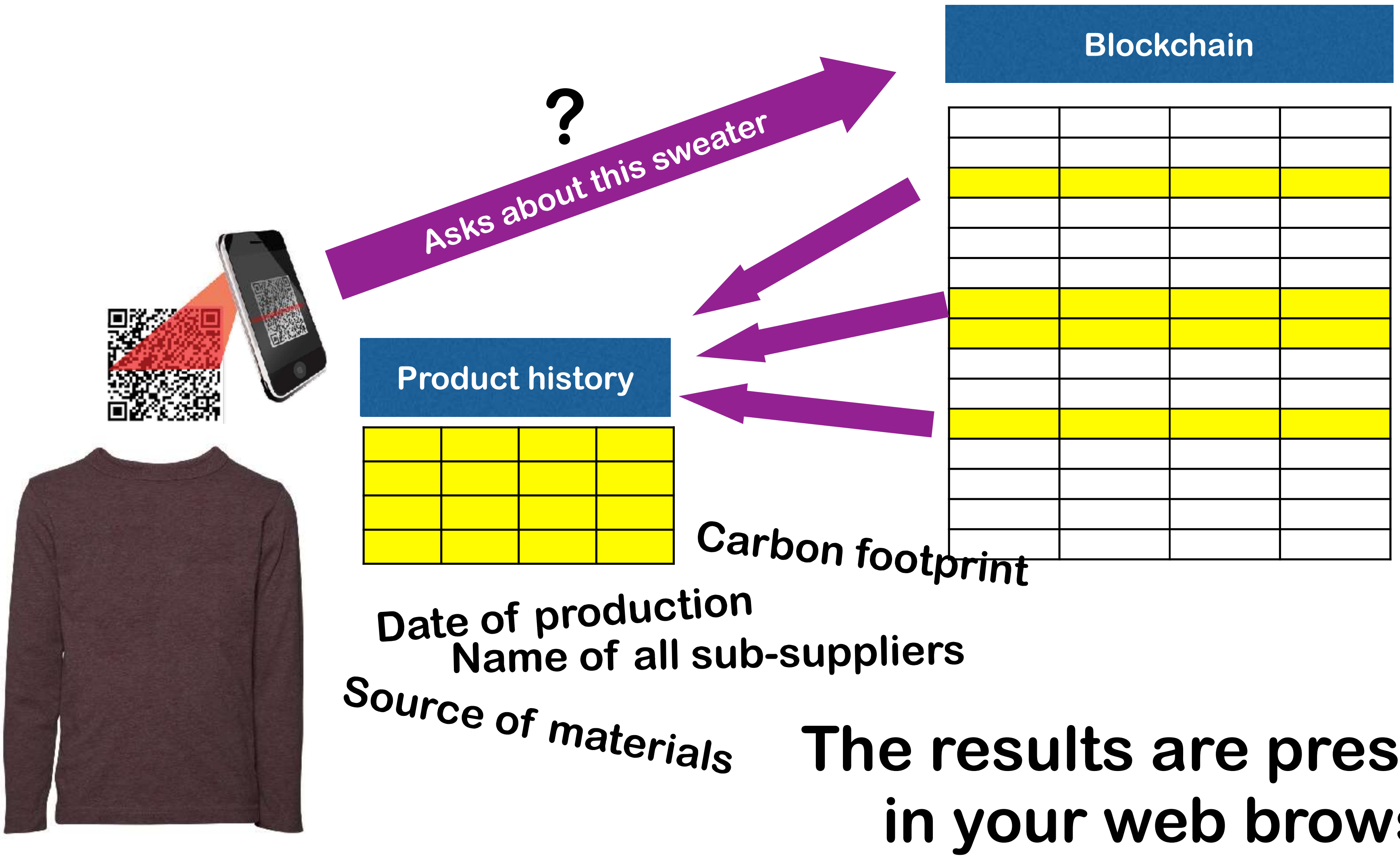
?

Asks about this sweater

(Computers do this for you)

The QR code is a hyperlink that asks a query of the relevant blockchain(s)


Blockchain



Blockchain

?

Asks about this sweater

Product history

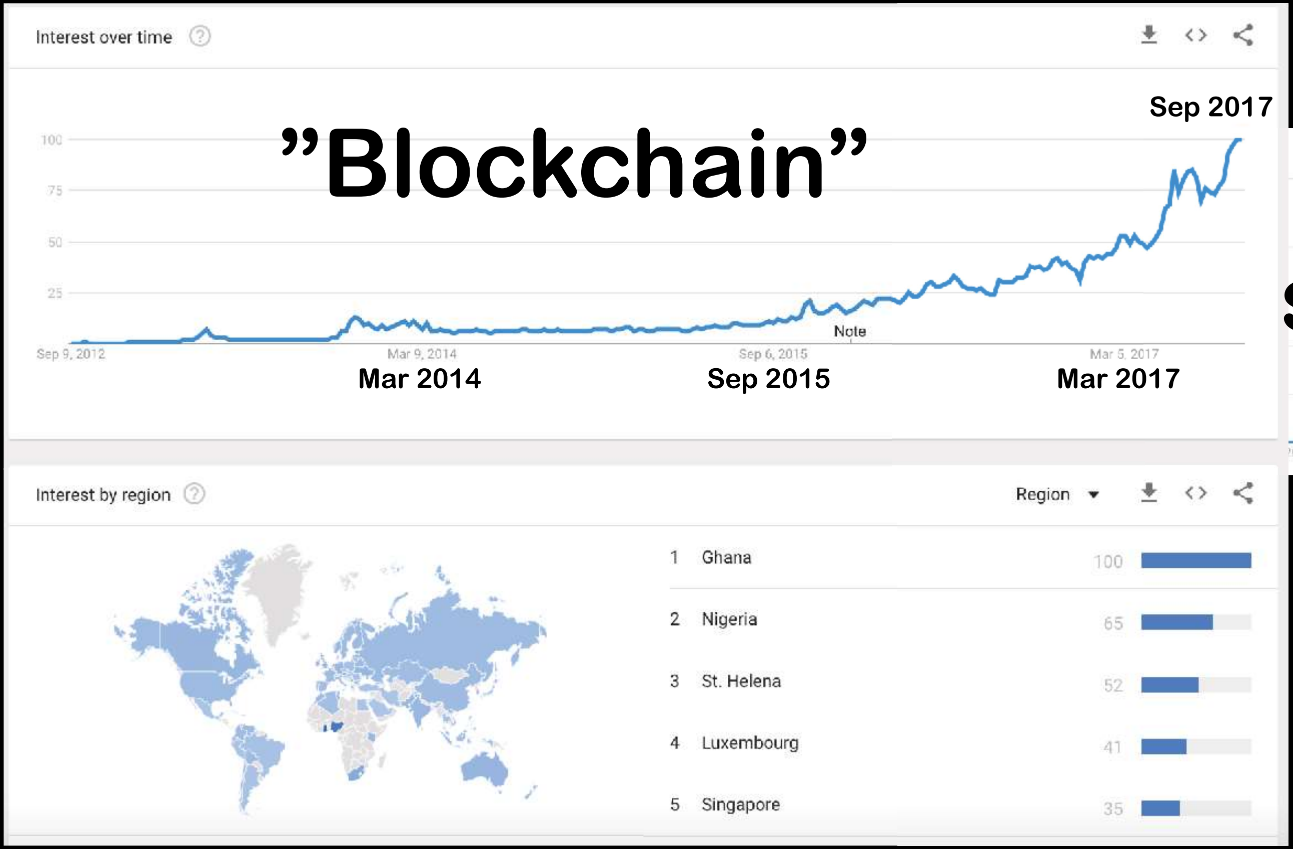
Carbon footprint

Date of production

Name of all sub-suppliers

Source of materials

The results are presented in your web browser


Interest over time
100
75
50
25
Sep 9, 2012
Mar 9, 2014
Sep 6, 2015
Mar 5, 2017
Note
Interest by region
Region

”Blockchain”

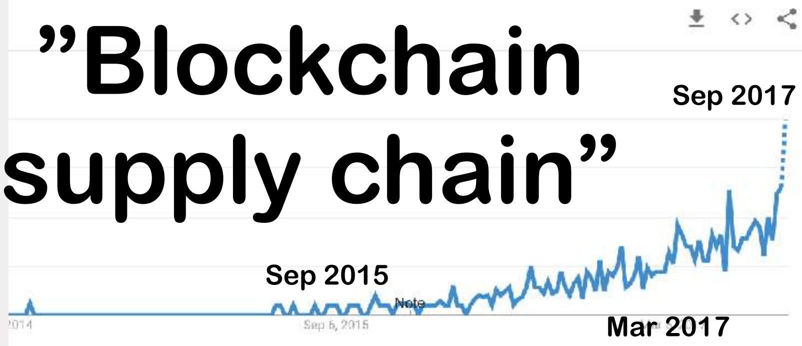
Sep 2017

Mar 2014

Sep 2015

Mar 2017

1	Ghana	100
2	Nigeria	65
3	St. Helena	52
4	Luxembourg	41
5	Singapore	35



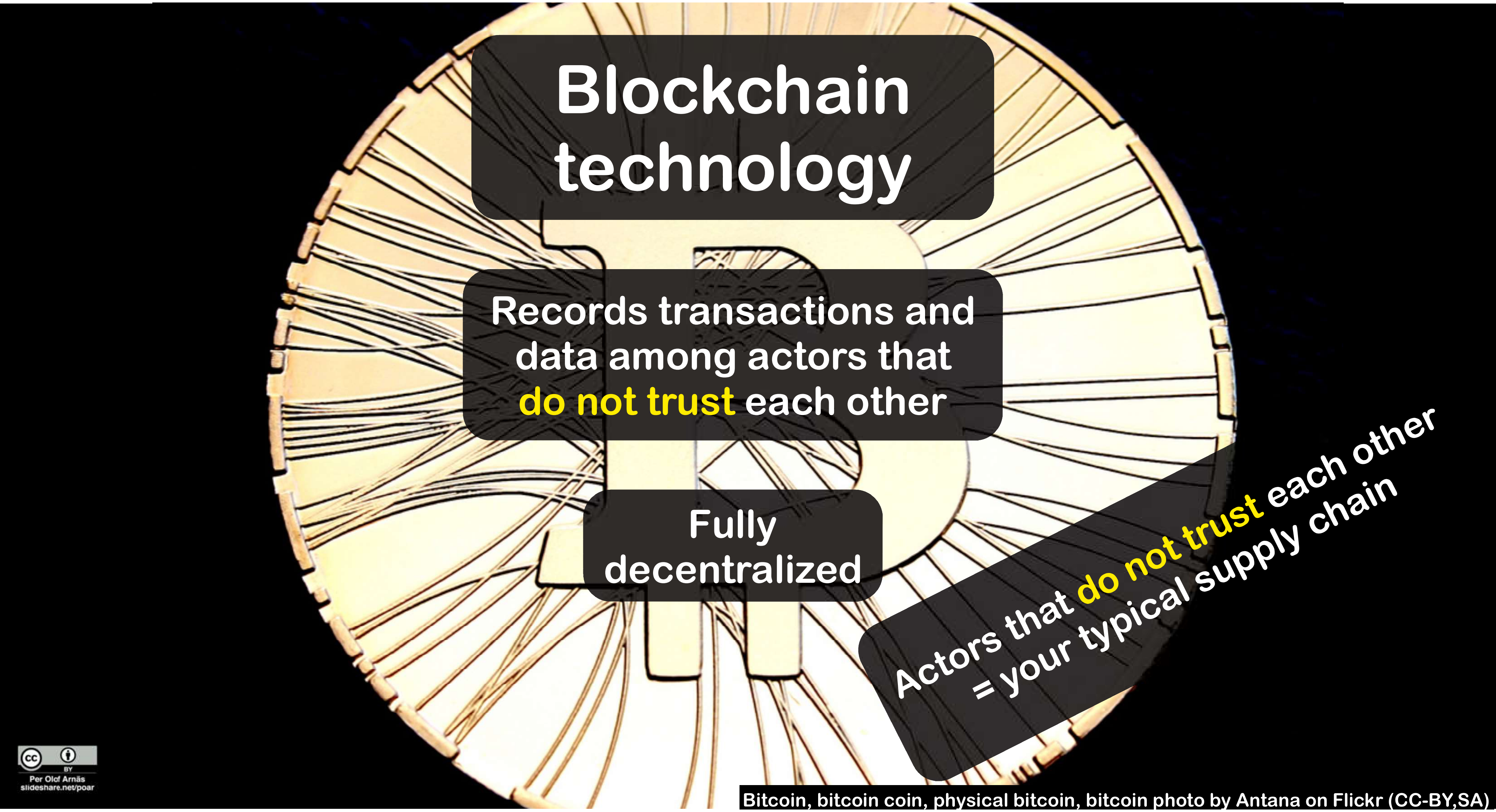
”Blockchain supply chain”

Sep 2017

Sep 2015

Mar 2017

Just 2 years!



Blockchain technology

Records transactions and data among actors that do not trust each other

Fully decentralized

Actors that do not trust each other
= your typical supply chain

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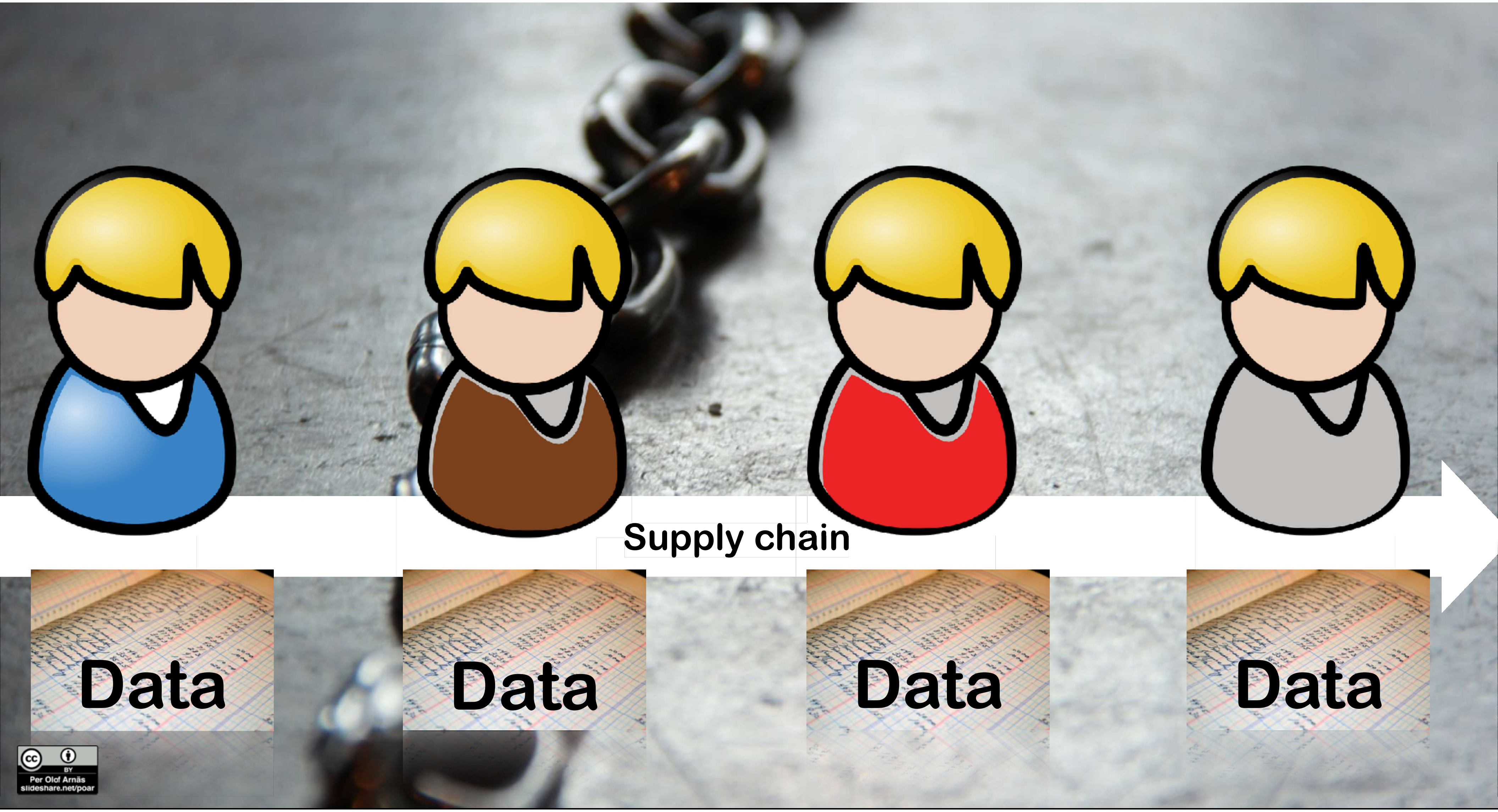
Per Olof Arnäs

Bitcoin, bitcoin coin, physical bitcoin, bitcoin photo by Antana on Flickr (CC-BY,SA)



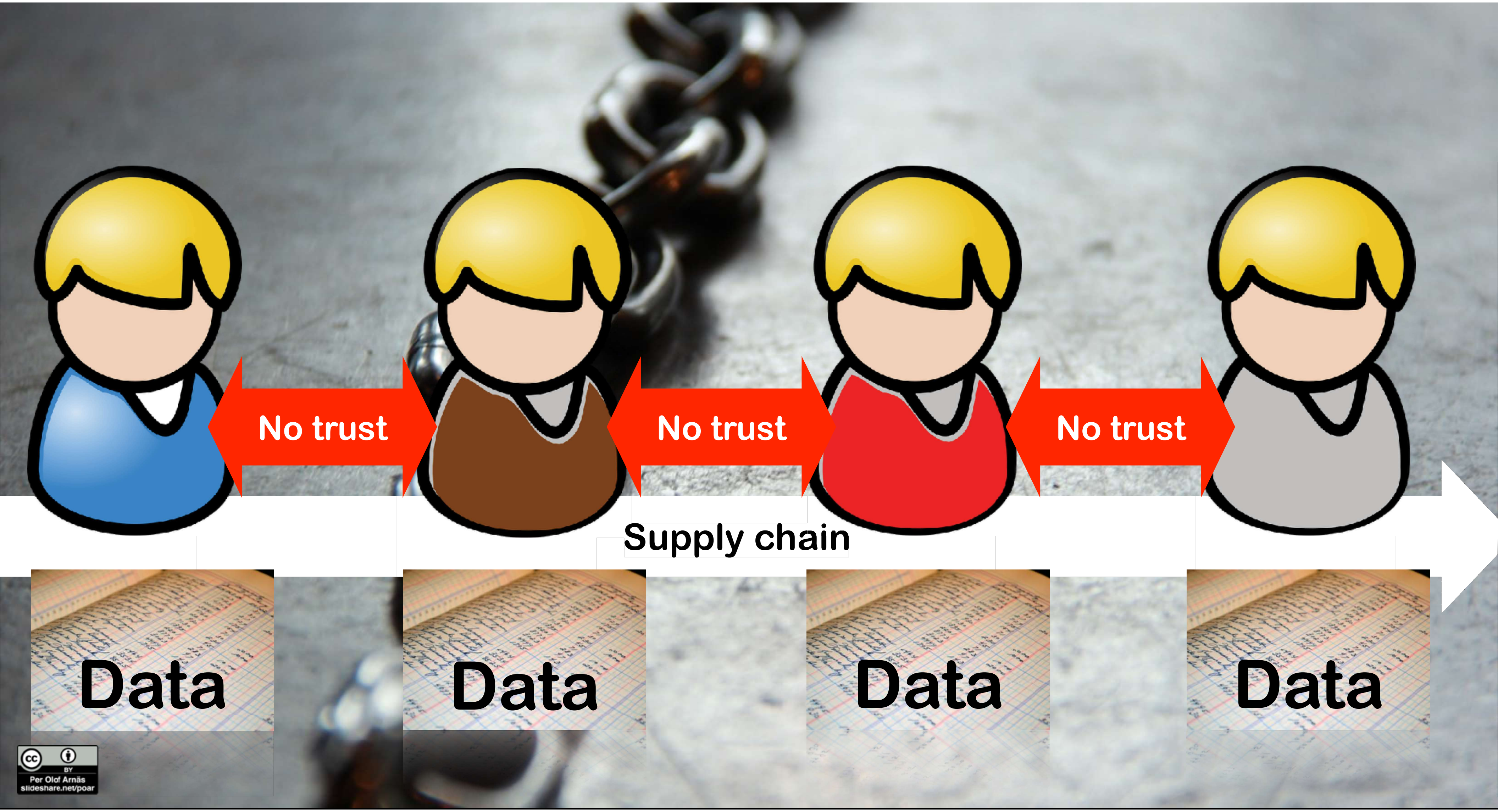
Supply chain

Data

Data

Data

Data



No trust

No trust

No trust

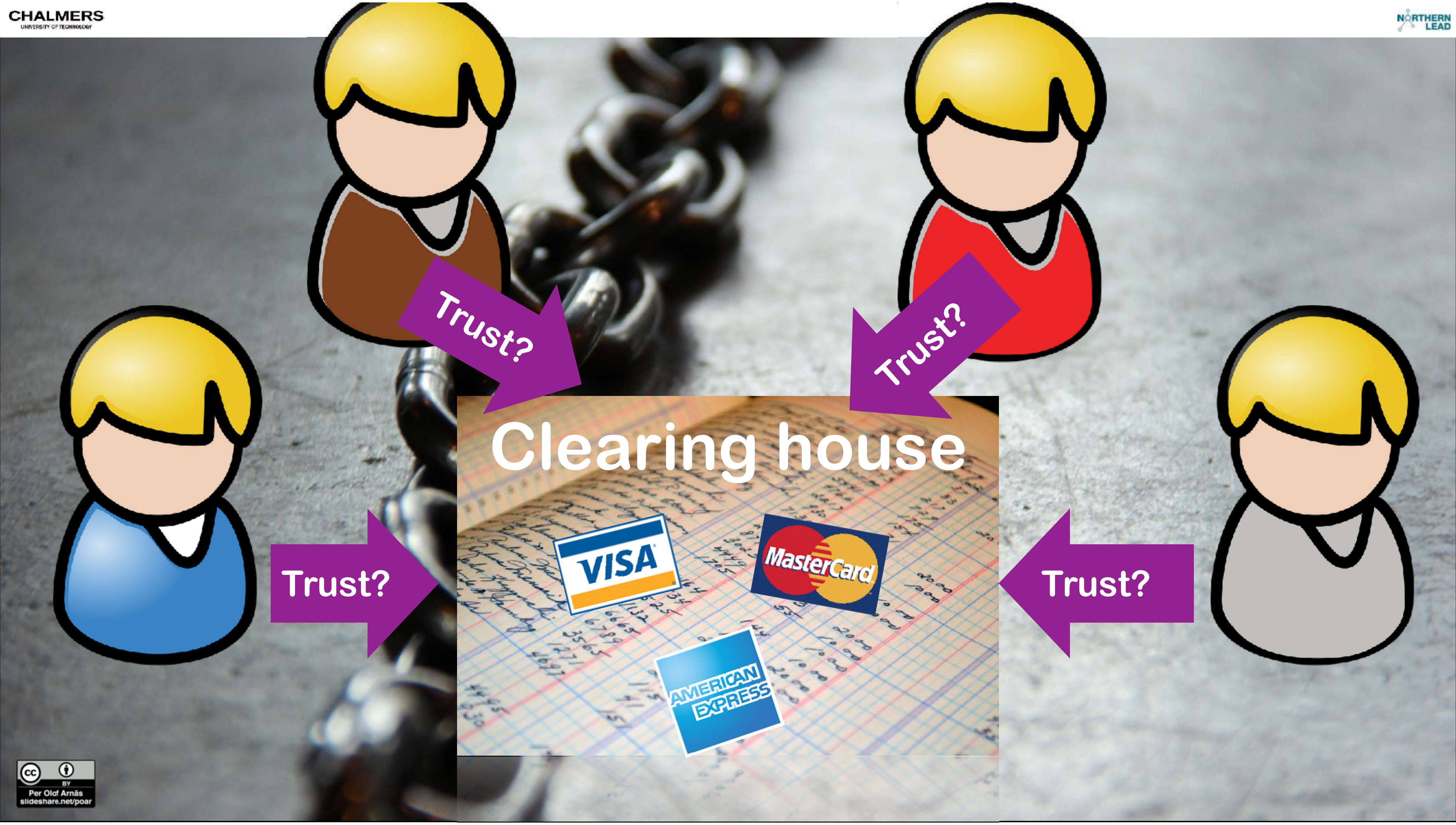
Supply chain

Data

Data

Data

Data



Clearing house

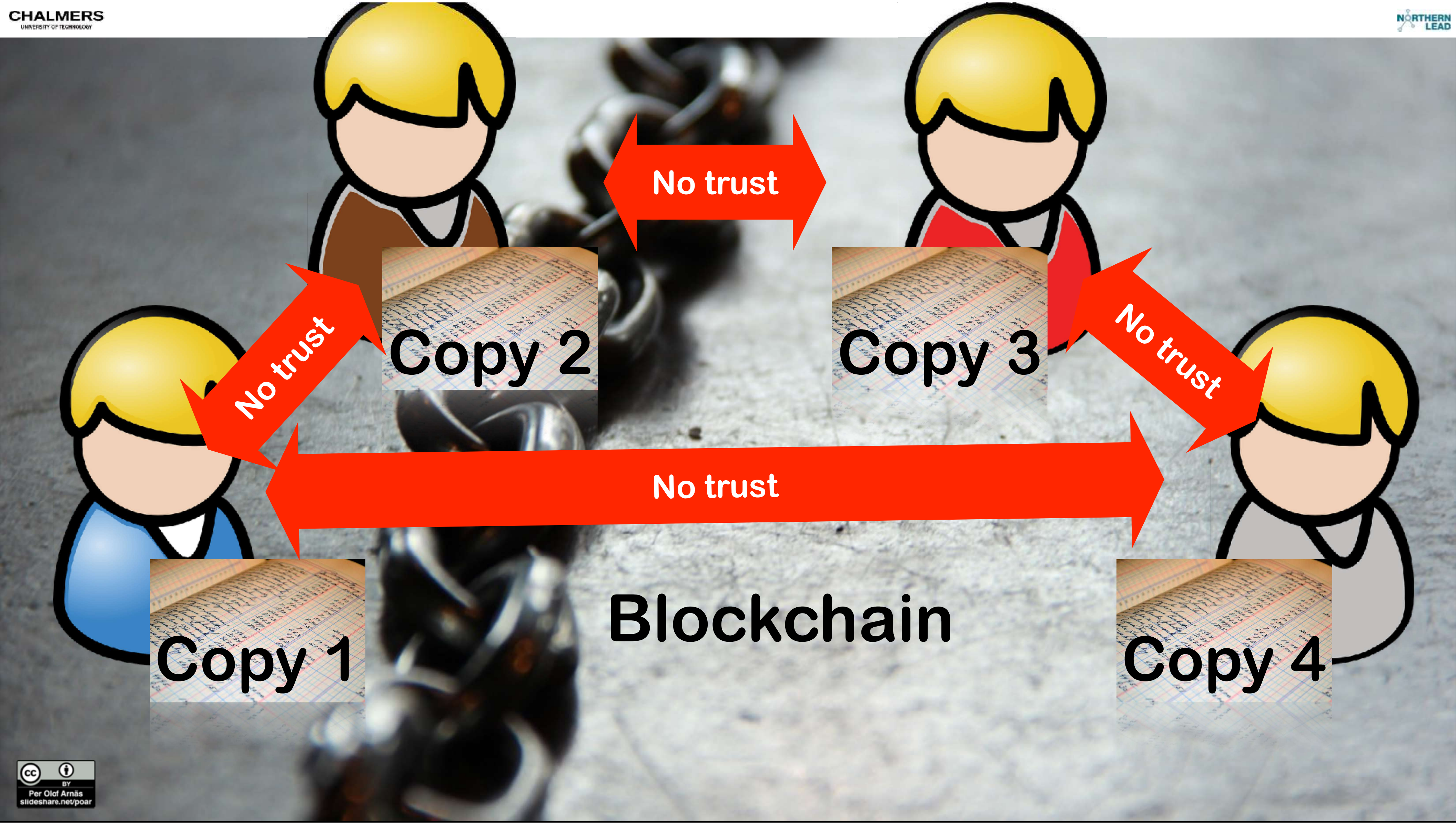
Trust?

Trust?

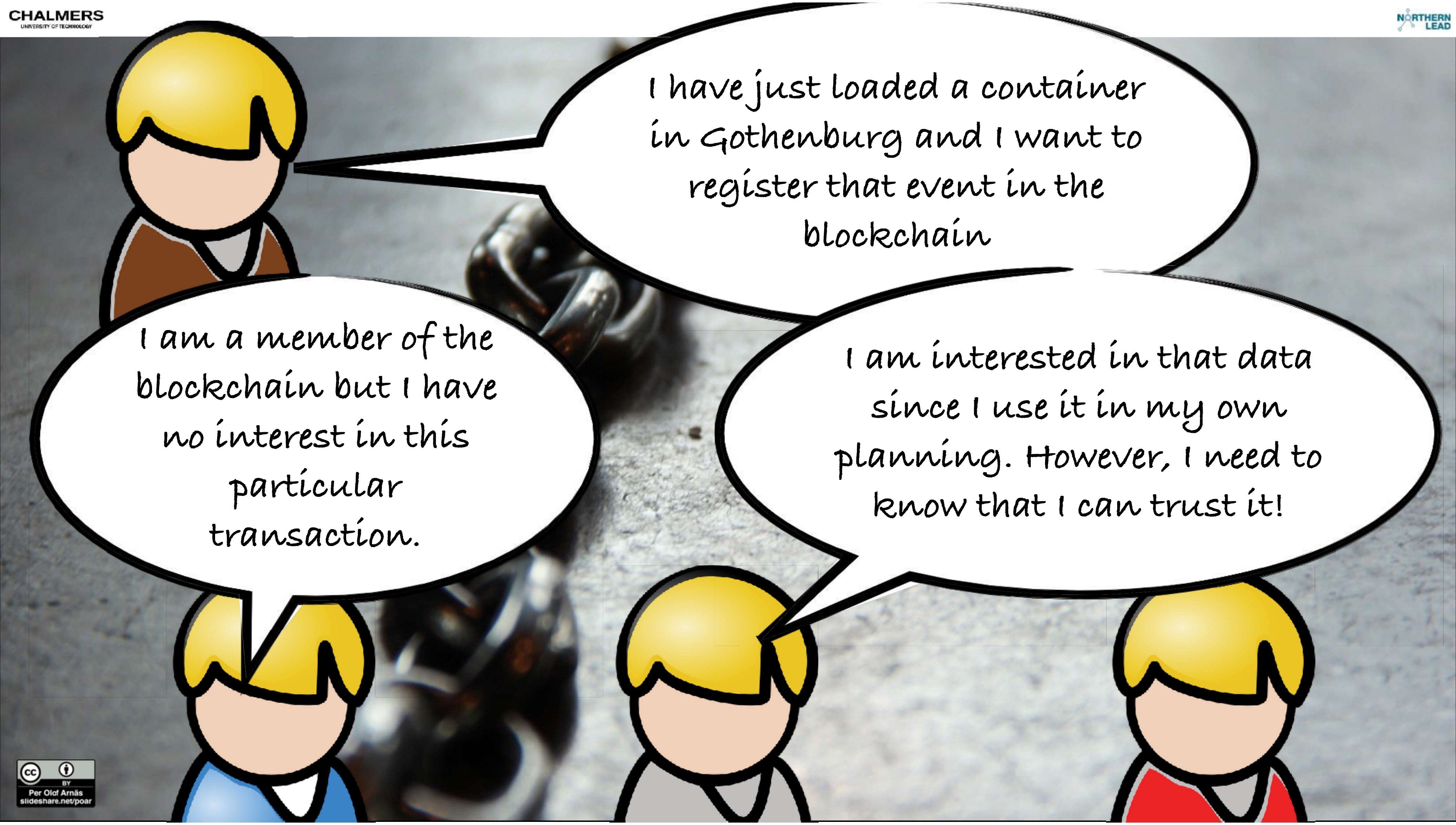
Trust?

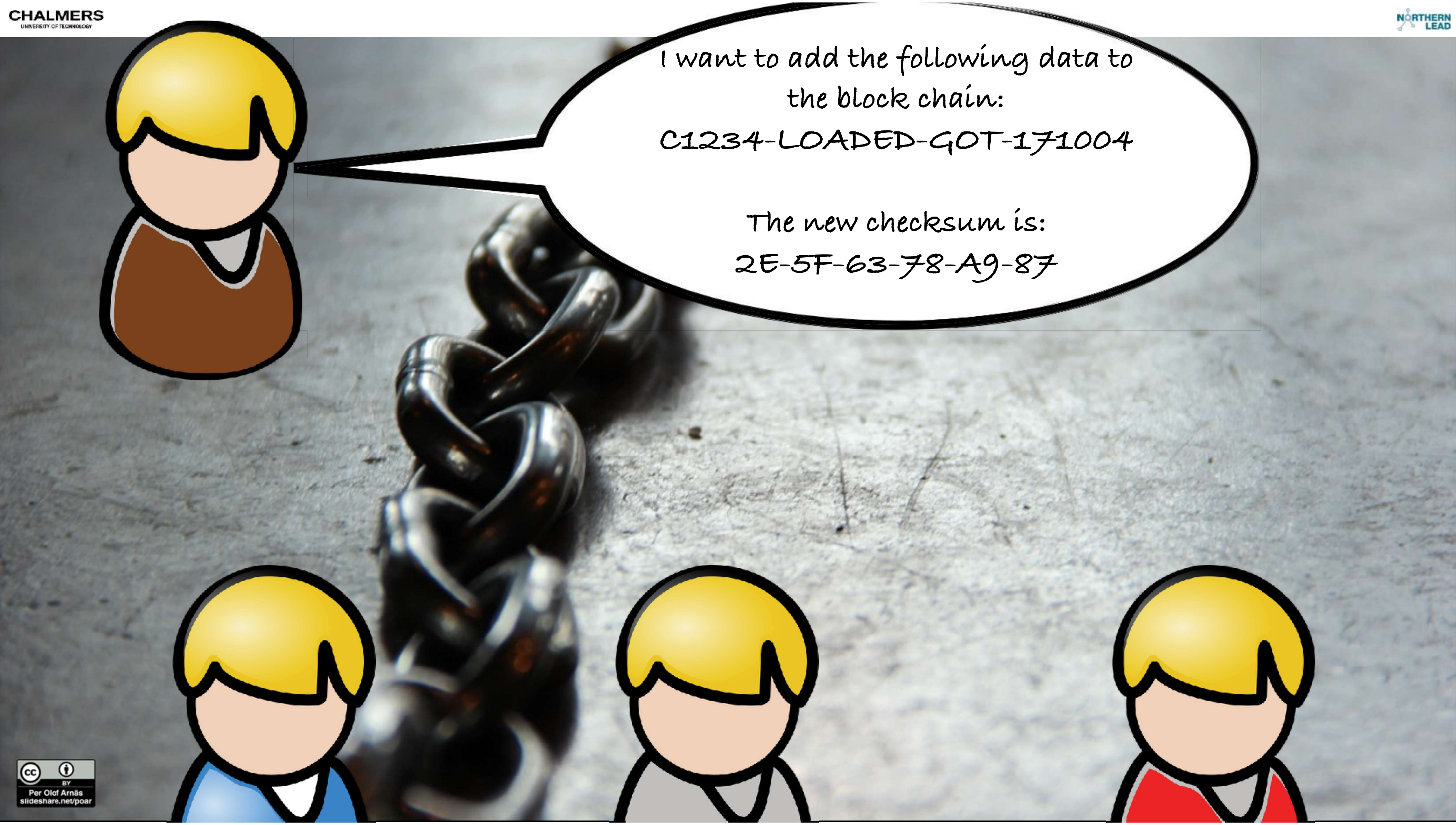
Trust?

VISA
MasterCard
AMERICAN EXPRESS


No trust
No trust
No trust
No trust
Copy 1
Copy 2
Copy 3
Copy 4

Blockchain


I have just loaded a container in Gothenburg and I want to register that event in the blockchain
I am a member of the blockchain but I have no interest in this particular transaction.
I am interested in that data since I use it in my own planning. However, I need to know that I can trust it!


I want to add the following data to the block chain:
C1234-LOADED-GOT-171004

The new checksum is:
2E-5F-63-78-A9-87

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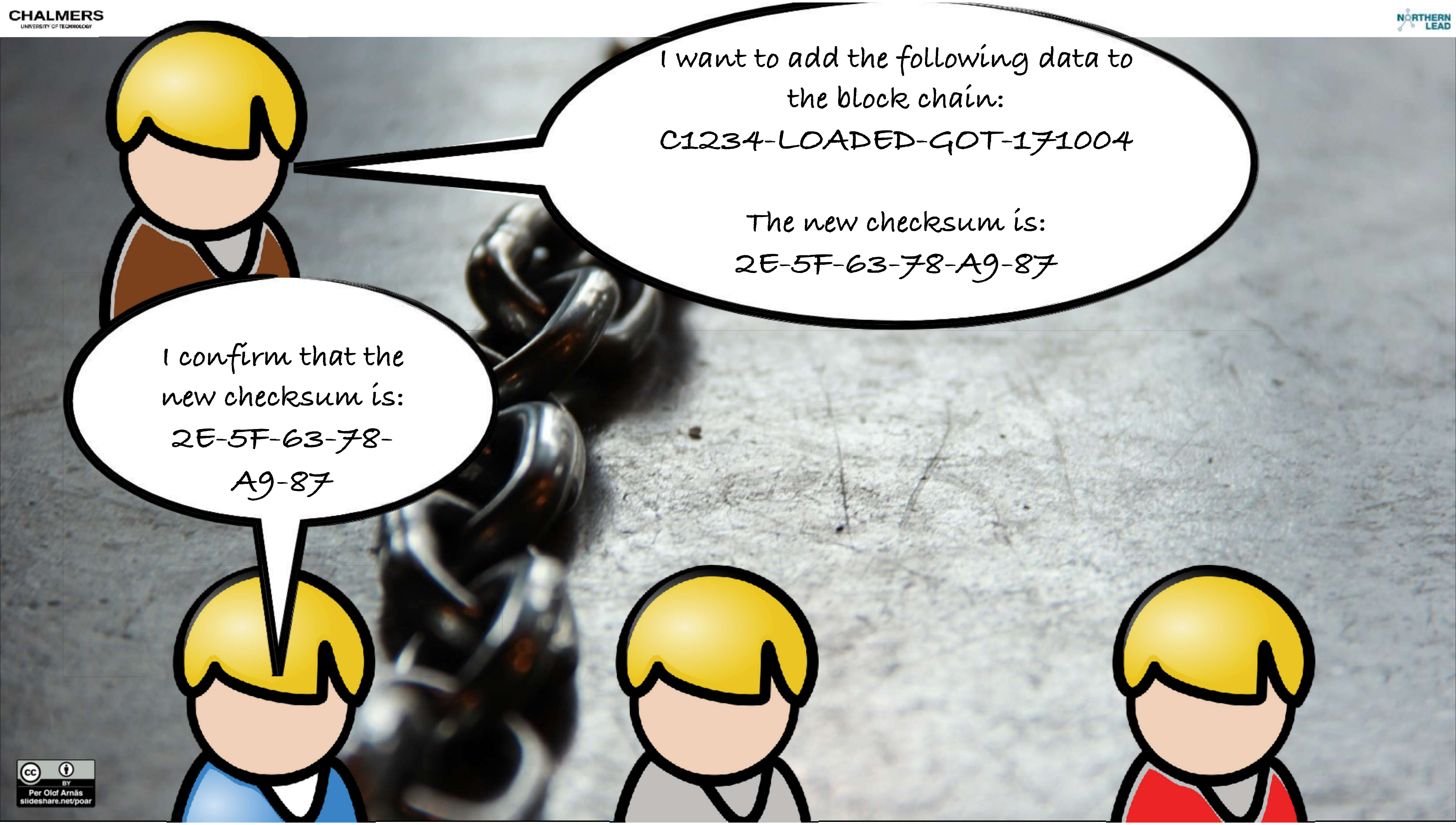
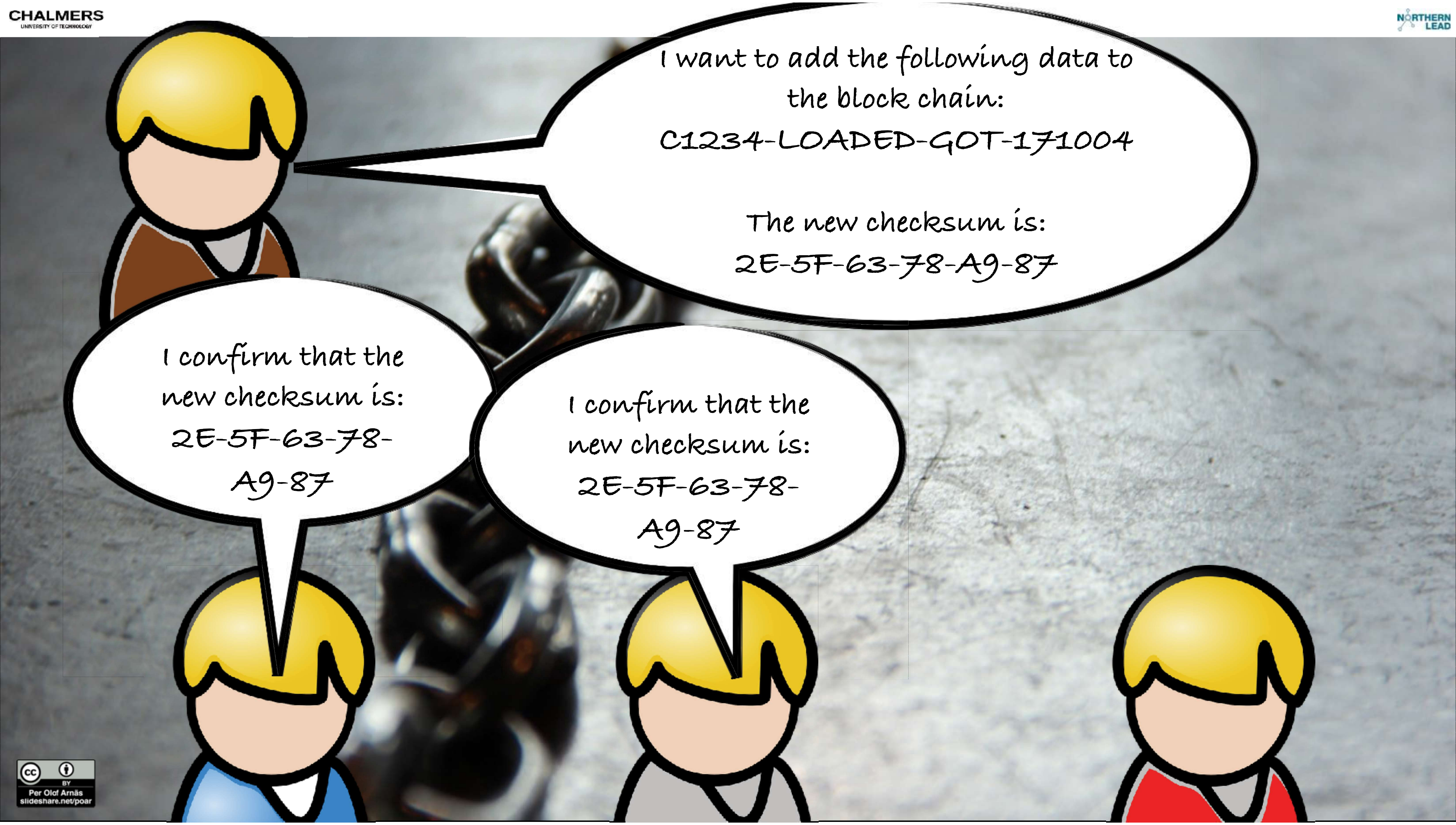
Per Olof Arnäs


I want to add the following data to the block chain:
C1234-LOADED-GOT-171004
The new checksum is:
2E-5F-63-78-A9-87
I confirm that the new checksum is:
2E-5F-63-78-A9-87


I want to add the following data to the block chain:
C1234-LOADED-GOT-171004
The new checksum is:
2E-5F-63-78-A9-87
I confirm that the new checksum is: 2E-5F-63-78-A9-87
I confirm that the new checksum is: 2E-5F-63-78-A9-87

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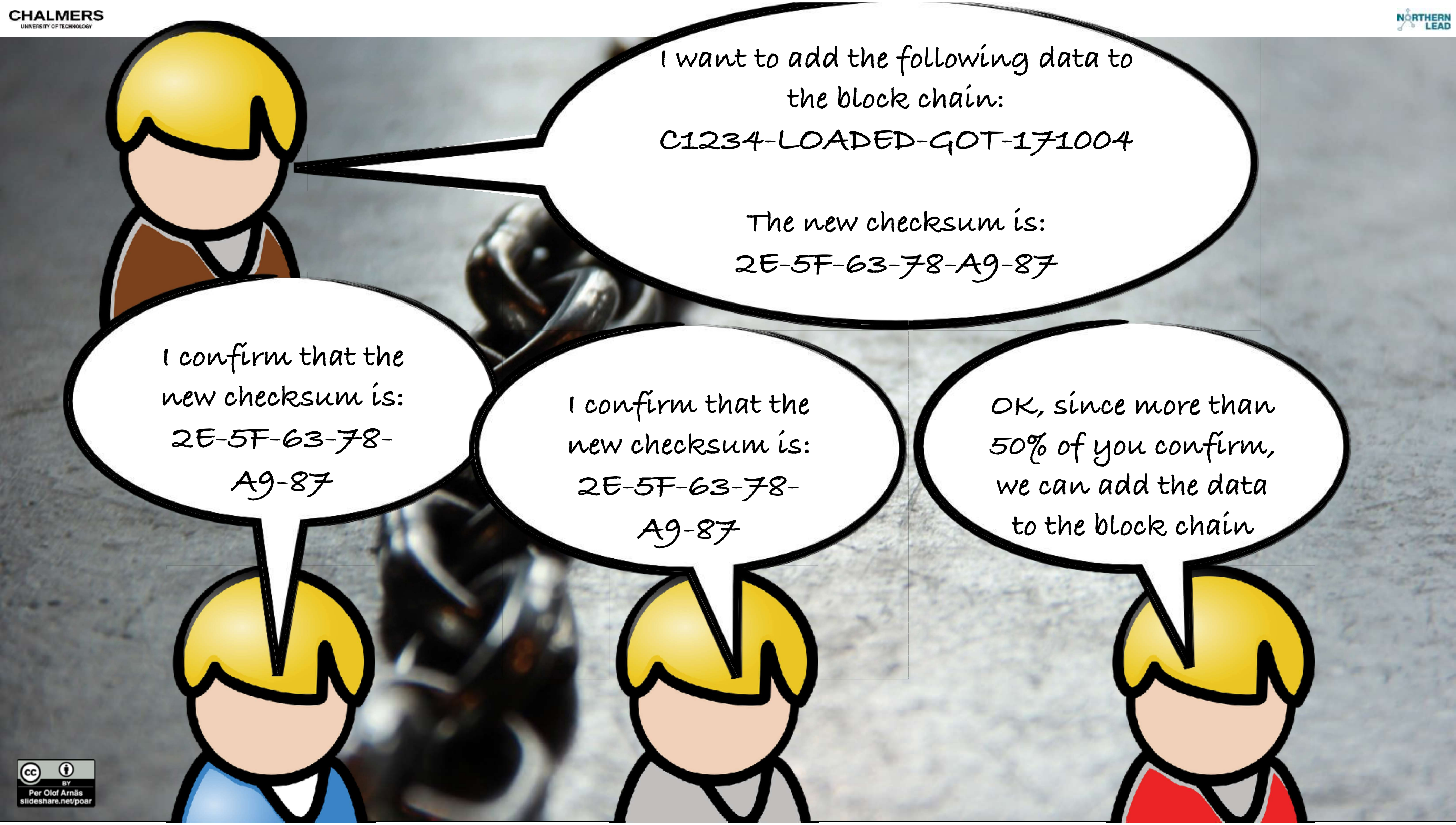
Per Olof Arnäs


I want to add the following data to the block chain: C1234-LOADED-GOT-171004

The new checksum is: 2E-5F-63-78-A9-87
I confirm that the new checksum is: 2E-5F-63-78-A9-87
I confirm that the new checksum is: 2E-5F-63-78-A9-87
OK, since more than 50% of you confirm, we can add the data to the block chain

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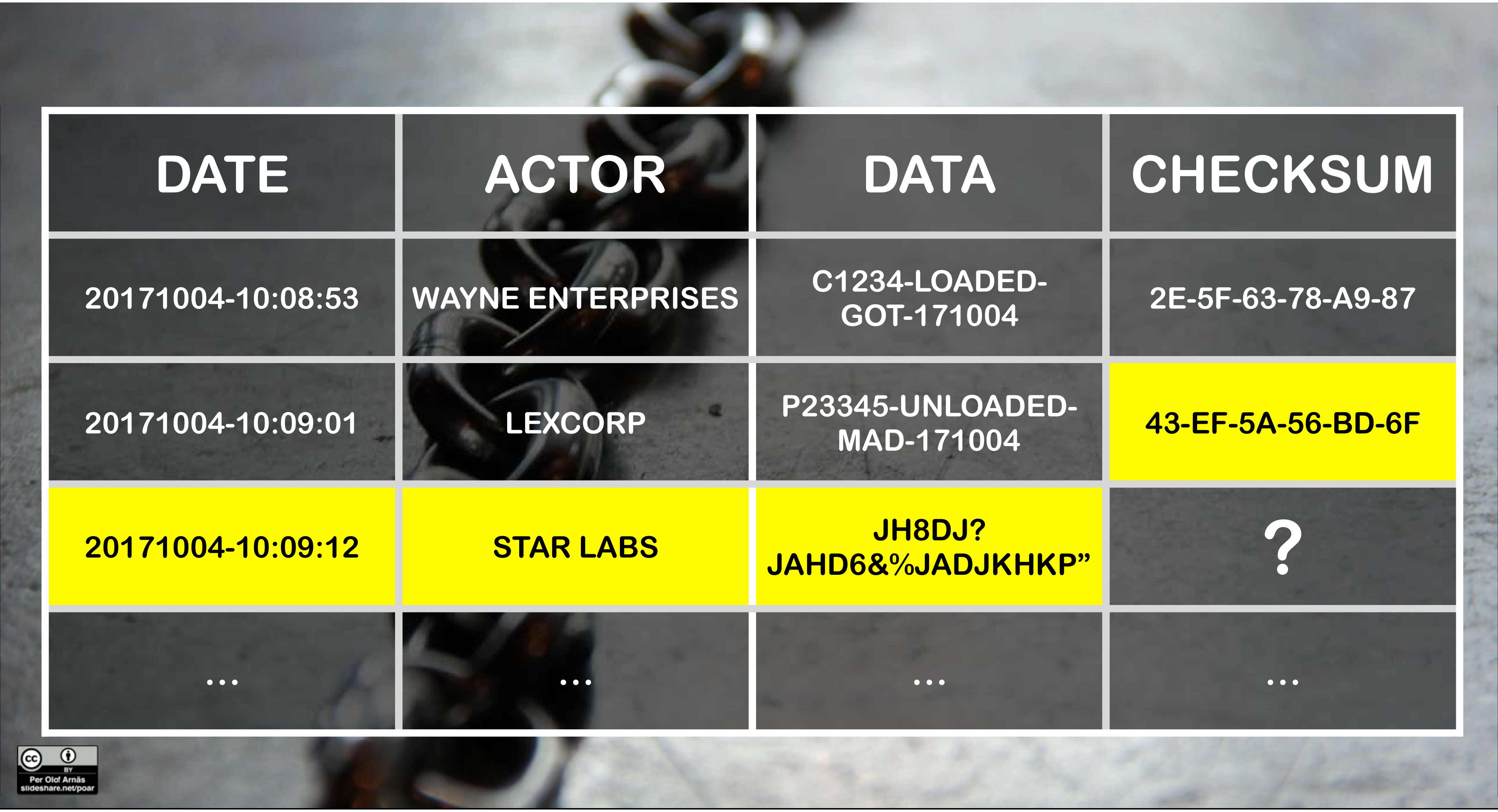
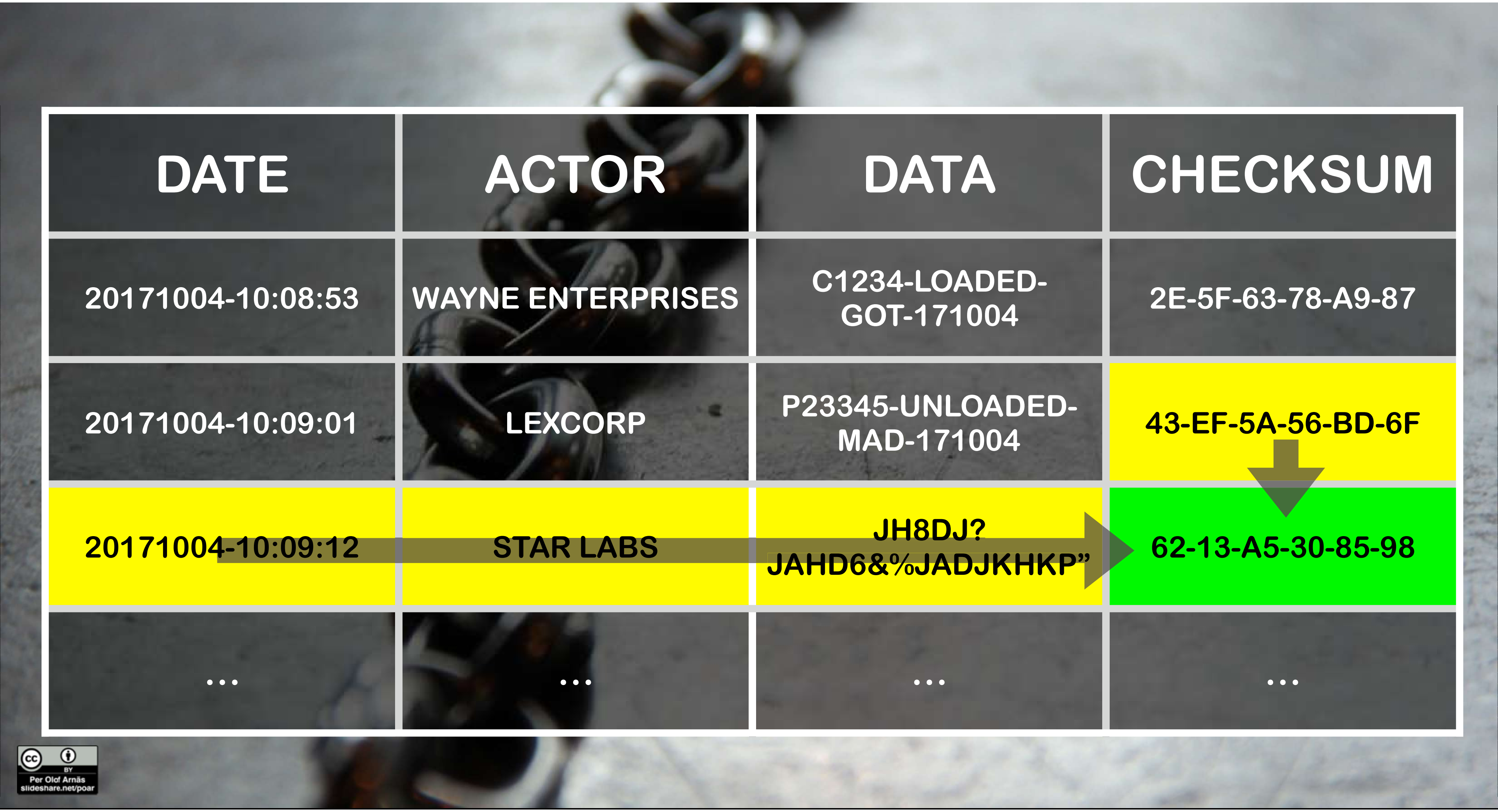
Per Olof Arnäs



DATE	ACTOR	DATA	CHECKSUM
20171004-10:08:53	WAYNE ENTERPRISES	C1234-LOADED-GOT-171004	2E-5F-63-78-A9-87
20171004-10:09:01	LEXCORP	P23345-UNLOADED-MAD-171004	43-EF-5A-56-BD-6F
20171004-10:09:12	STAR LABS	JH8DJ?JAHD6&%JADJKHKP”	?
…	…	…	…



DATE	ACTOR	DATA	CHECKSUM
20171004-10:08:53	WAYNE ENTERPRISES	C1234-LOADED-GOT-171004	2E-5F-63-78-A9-87
20171004-10:09:01	LEXCORP	P23345-UNLOADED-MAD-171004	43-EF-5A-56-BD-6F
20171004-10:09:12	STAR LABS	JH8DJ? JAHD6&%JADJKHKP”	62-13-A5-30-85-98
…	…	…	…

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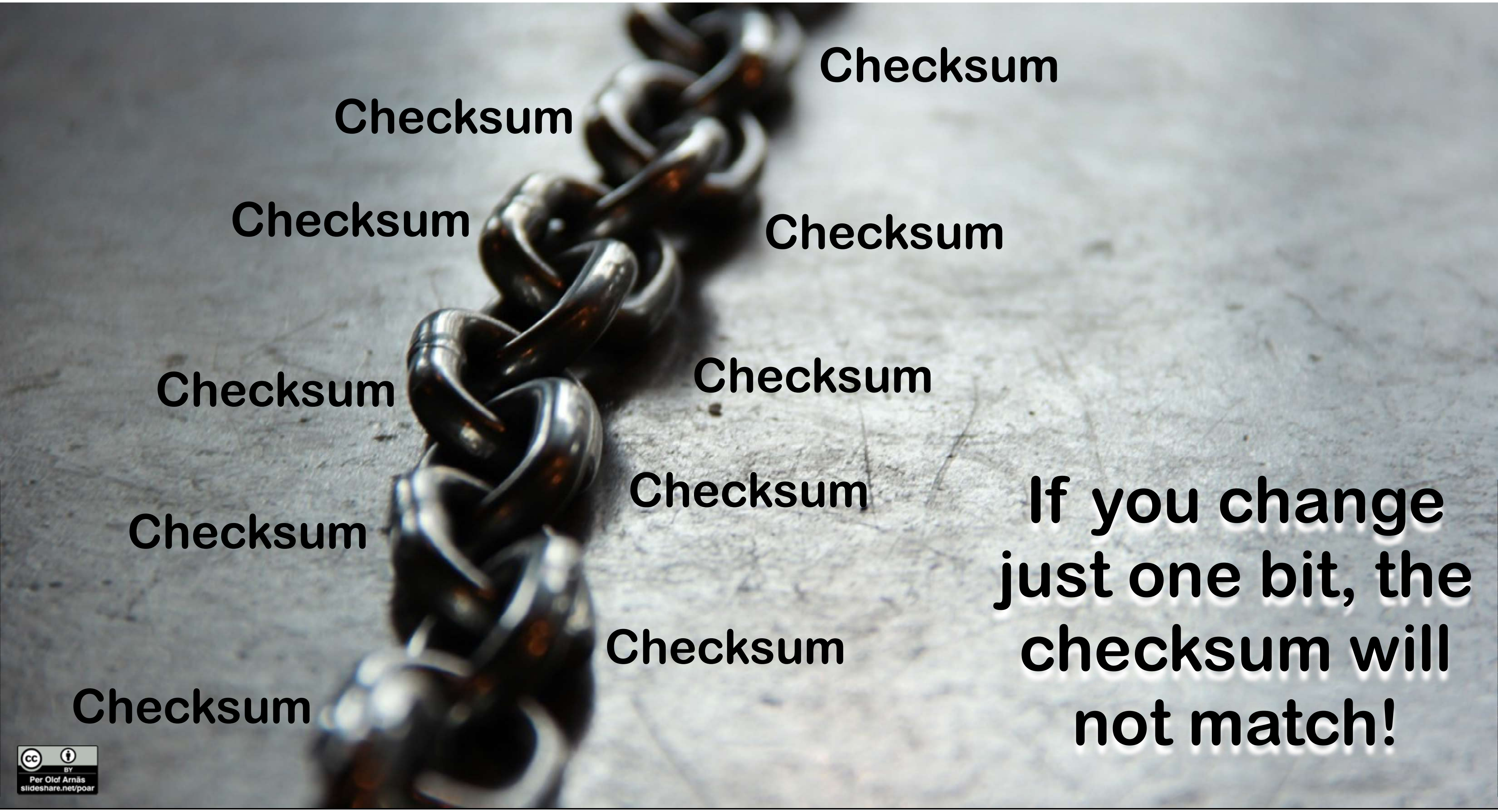


Checksum

Checksum

Checksum

Checksum

Checksum

Checksum

Checksum

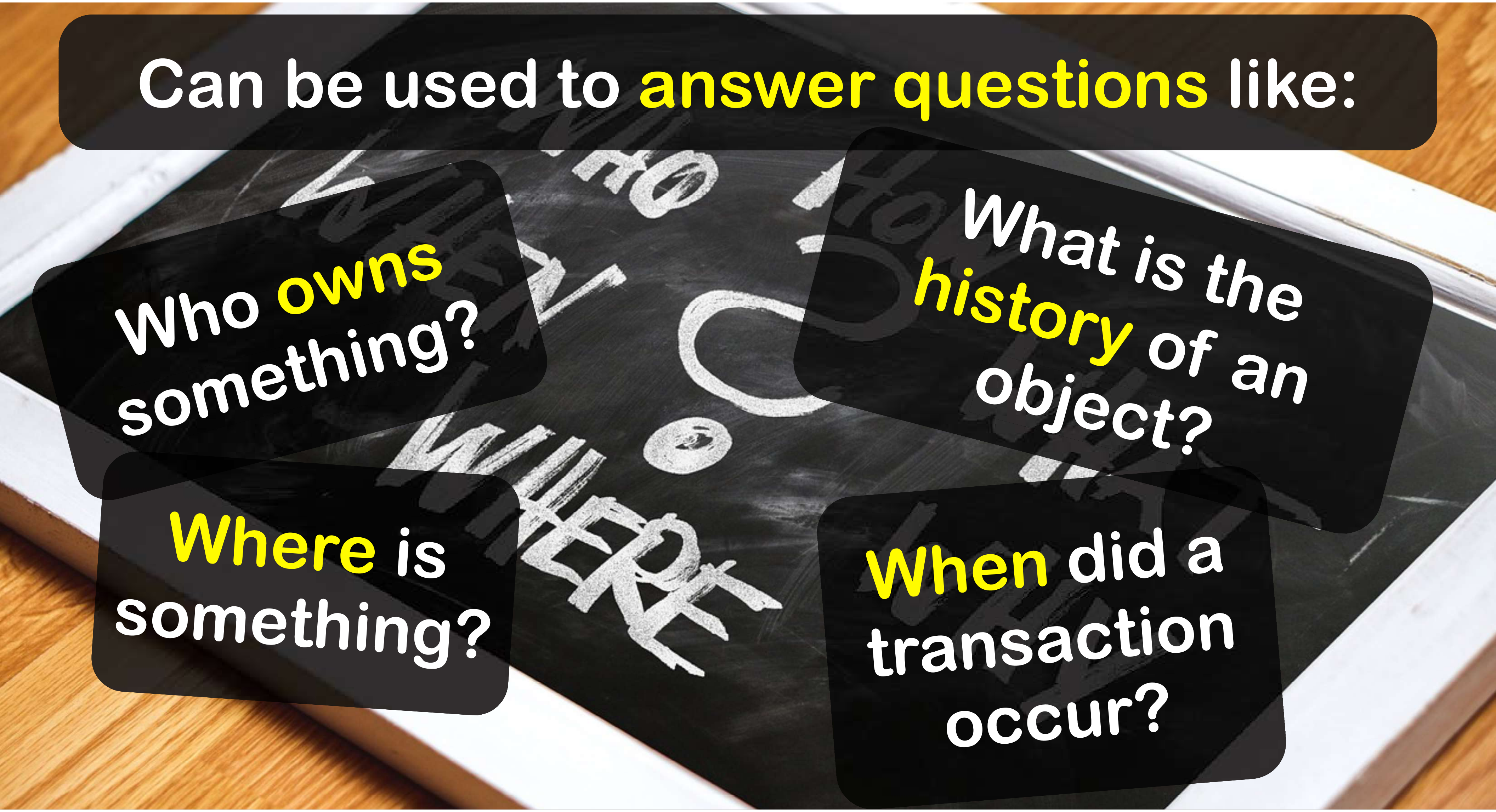
Checksum

Checksum

Checksum

If you change just one bit, the checksum will not match!

Can be used to answer questions like:



Who **owns** something?

What is the **history** of an object?

Where is something?

When did a transaction occur?

Integration of digital and physical worlds

More automation

"New" modes of transport

The sharing economy hits freight transport
(again and again...)

Real-time (data driven) decision making

Block chain technology

Records transactions and data among actors that do not trust each other

Fully decentralized

Servitization

Move up in the

Artificial intelligence

Reasoning

Learning

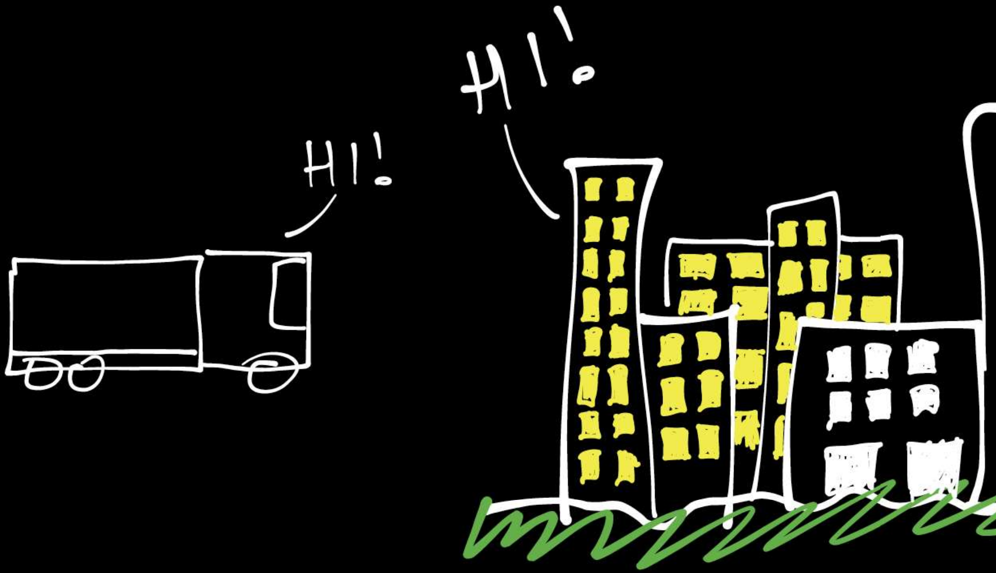
Creating

Electromobility

Tesla Semi

Smart Grid

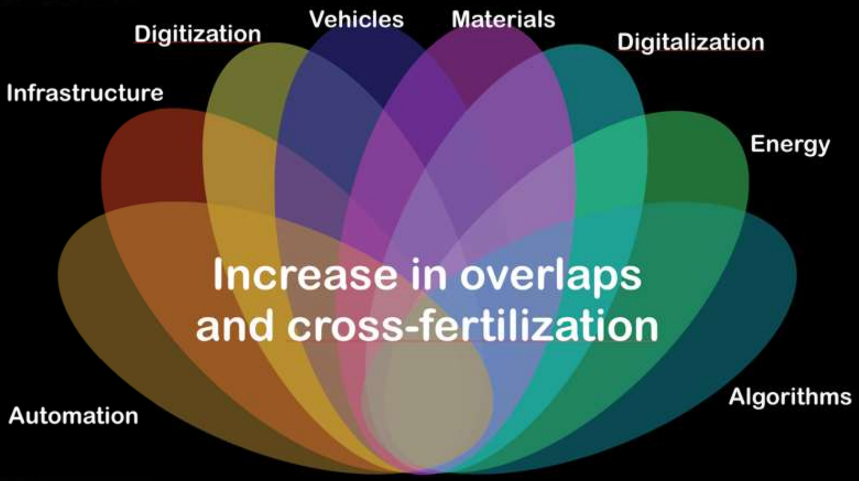
Einride T-Pod



It’s not business as usual.

Hello Kitty Darth Vader by JD Hancock on Flickr (CC-BY)

It’s not business as usual.

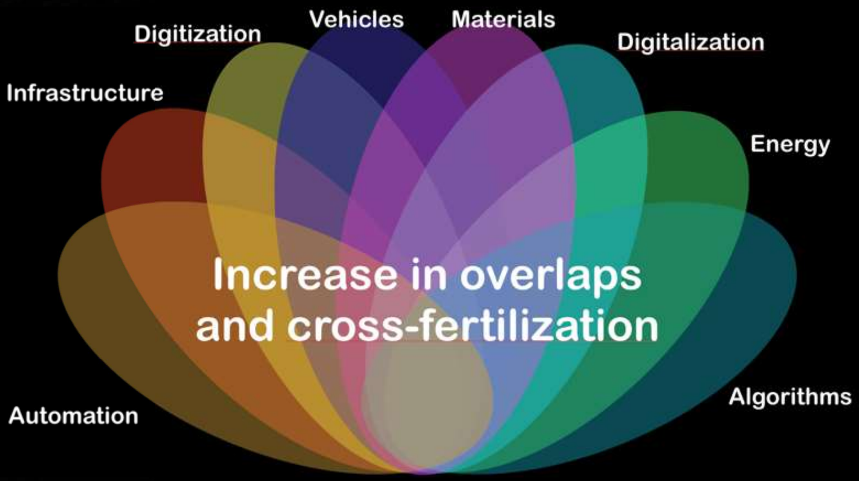

Digitization
Vehicles
Materials
Digitalization
Infrastructure
Energy
Increase in overlaps and cross-fertilization
Automation
Algorithms

There is no ’usual’ anymore.

cc BY
Per Olof Arnäs

Hello Kitty Darth Vader by JD Hancock on Flickr (CC-BY)

It’s not business as usual.

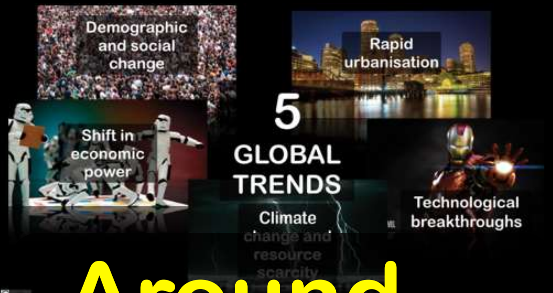

Digitization
Vehicles
Materials
Digitalization
Infrastructure
Energy
Increase in overlaps and cross-fertilization
Automation
Algorithms

There is no ’usual’ anymore.

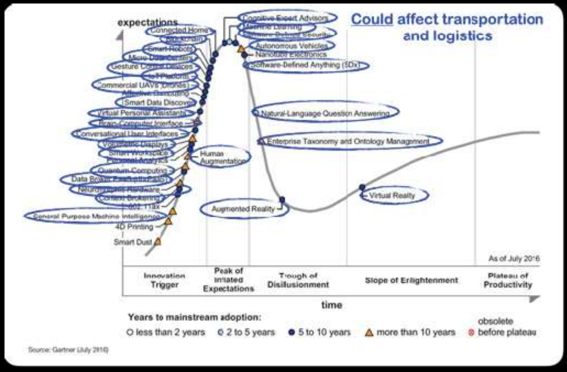
Get used to it.

Hello Kitty Darth Vader by JD Hancock on Flickr (CC-BY)

Things are happening...


Demographic and social change
Rapid urbanisation
5 GLOBAL TRENDS
Shift in economic power
Climate change and resource scarcity
Technological breakthroughs

Around...


Could affect transportation and logistics

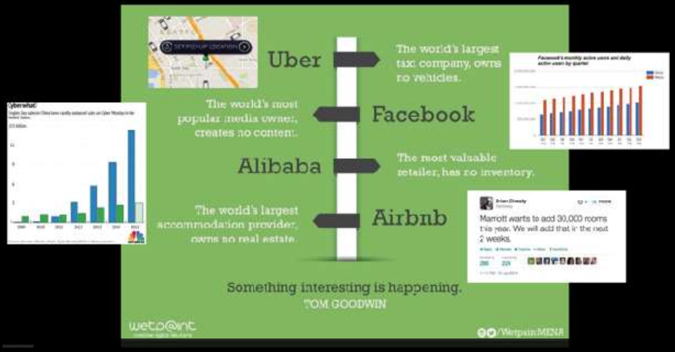
Source: Gartner (July 2016)

Digitization: Make analogue information digital

Digitalization: Increased use of digital technology

Both are important! (and interesting)

...to...


Uber — The world's largest taxi company, owns no vehicles.

Facebook — The world's most popular media owner, creates no content.

Alibaba — The most valuable retailer, has no inventory.

Airbnb — The world's largest accommodation provider, owns no real estate.

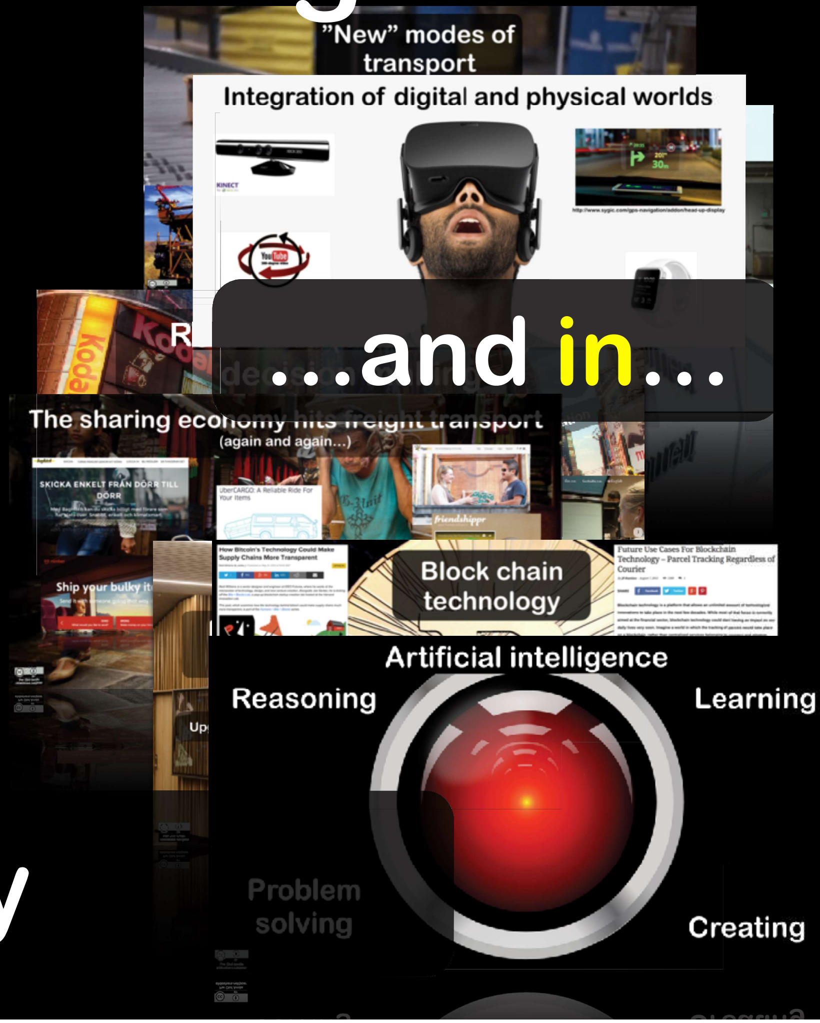
Something interesting is happening.
TOM GOODWIN

Marriott wants to add 30,000 rooms this year. We will add that in the next 2 weeks.

Cyberwhat
wetpoint
/WetpointMENA

...the industry

...and in...


”New” modes of transport

Integration of digital and physical worlds

The sharing economy hits freight transport
(again and again...)

SKICKA ENKELT FRÅN DÖRR TILL DÖRR

Block chain technology

How Bitcoin's Technology Could Make Supply Chains More Transparent

Future Use Cases For Blockchain Technology – Parcel Tracking Regardless of Courier

Artificial intelligence

KINECT
Ship your bulky it
friendshippr
Reasoning
Learning
Problem solving
Creating

CC BY
Per Olof Arnäs

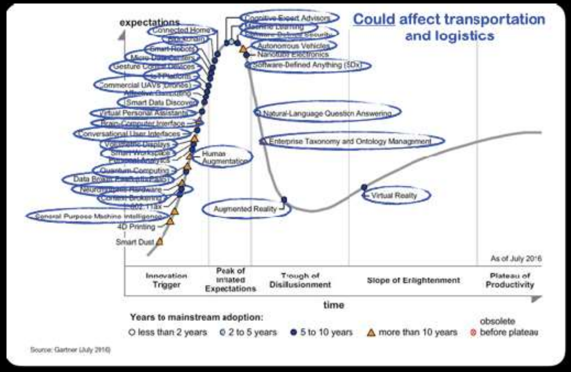
Demographic and social change
Rapid urbanisation
5 GLOBAL TRENDS
Shift in economic power
Climate change and resource scarcity
Technological breakthroughs

Digitization:

Digitalization:

Make analogue
Increased use of

LEARNING REACTION (PRO)ACTION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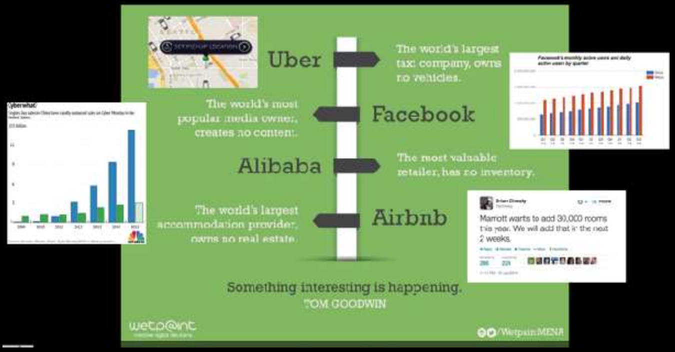
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TOM GOODWIN

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SET PICKUP LOCATION
Cyberwhat
Facebook's monthly active users and daily active users by quarter
wetpaint
/WetpaintMENA

”New” modes of transport

Integration of digital and physical worlds

The sharing economy hits freight transport
(again and again…)

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How Bitcoin's Technology Could Make Supply Chains More Transparent

Future Use Cases For Blockchain Technology – Parcel Tracking Regardless of Courier

Artificial intelligence

Reasoning

Learning

Problem solving

Creating

KINECT
SKICKA ENKELT FRÅN DÖRR TILL DÖRR
UberCARGO: A Reliable Ride For Your Items
friendshippr
Ship your bulky it
Up

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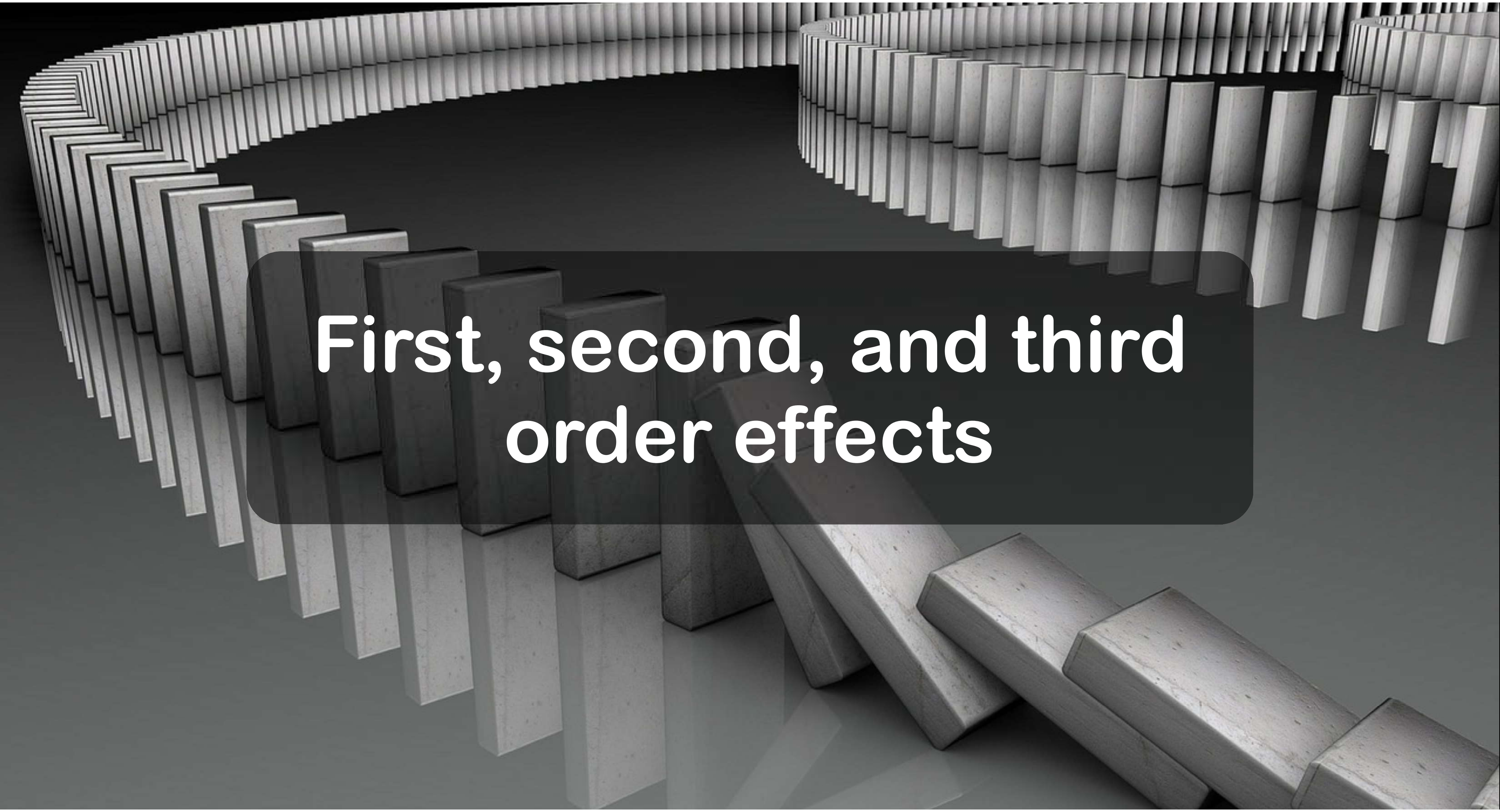
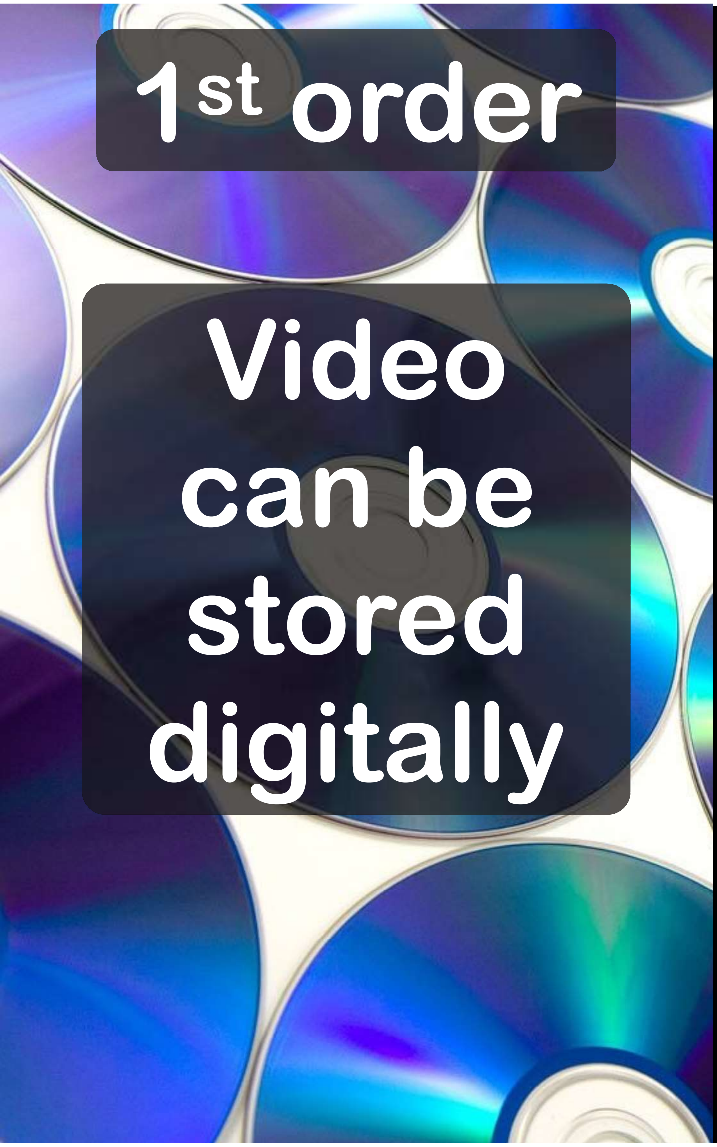
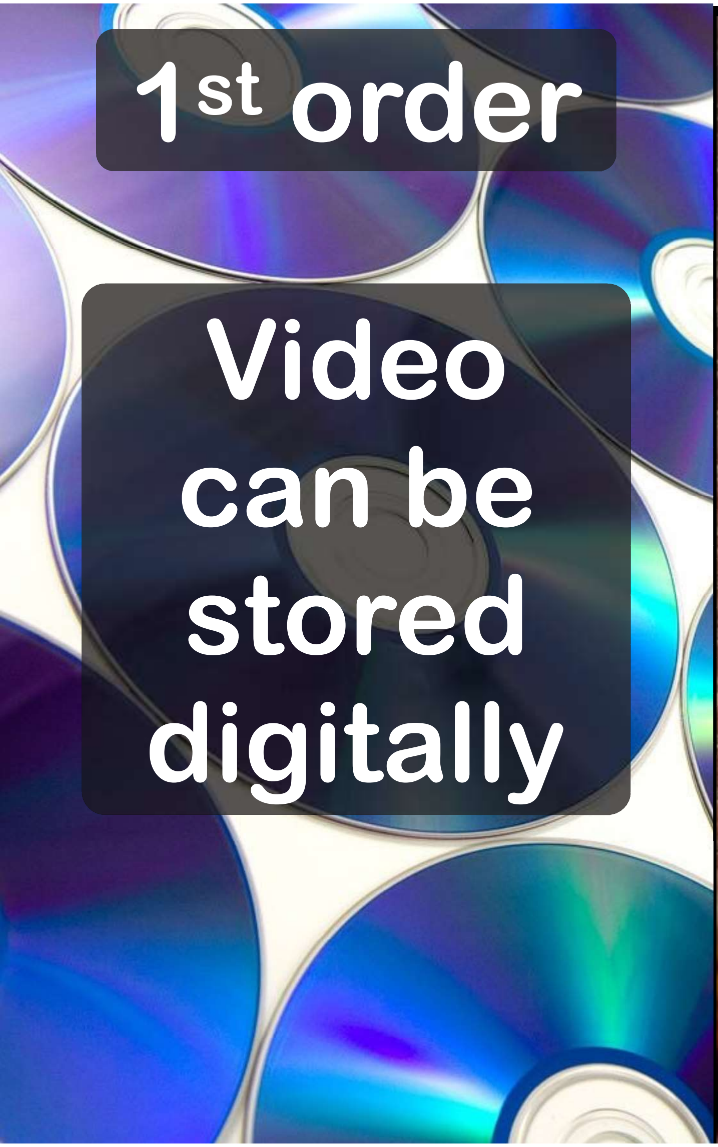


First, second, and third order effects



1st order

Video can be stored digitally

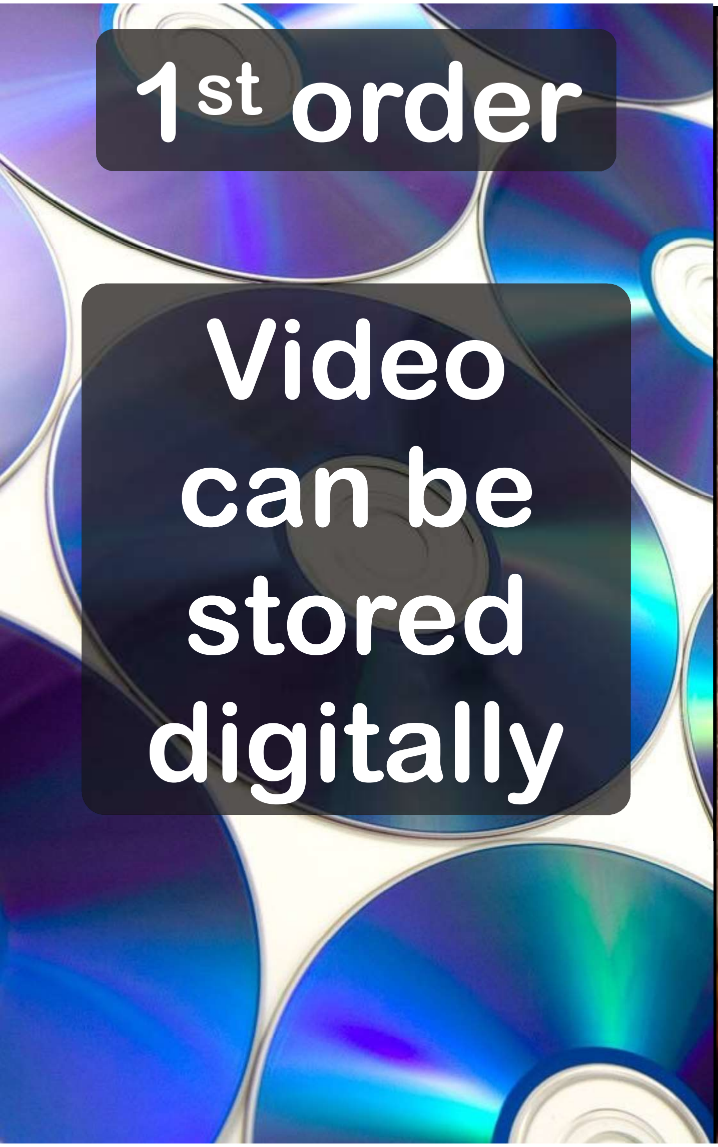


1st order

Video can be stored digitally

2nd order

Streaming instead of owning



1st order

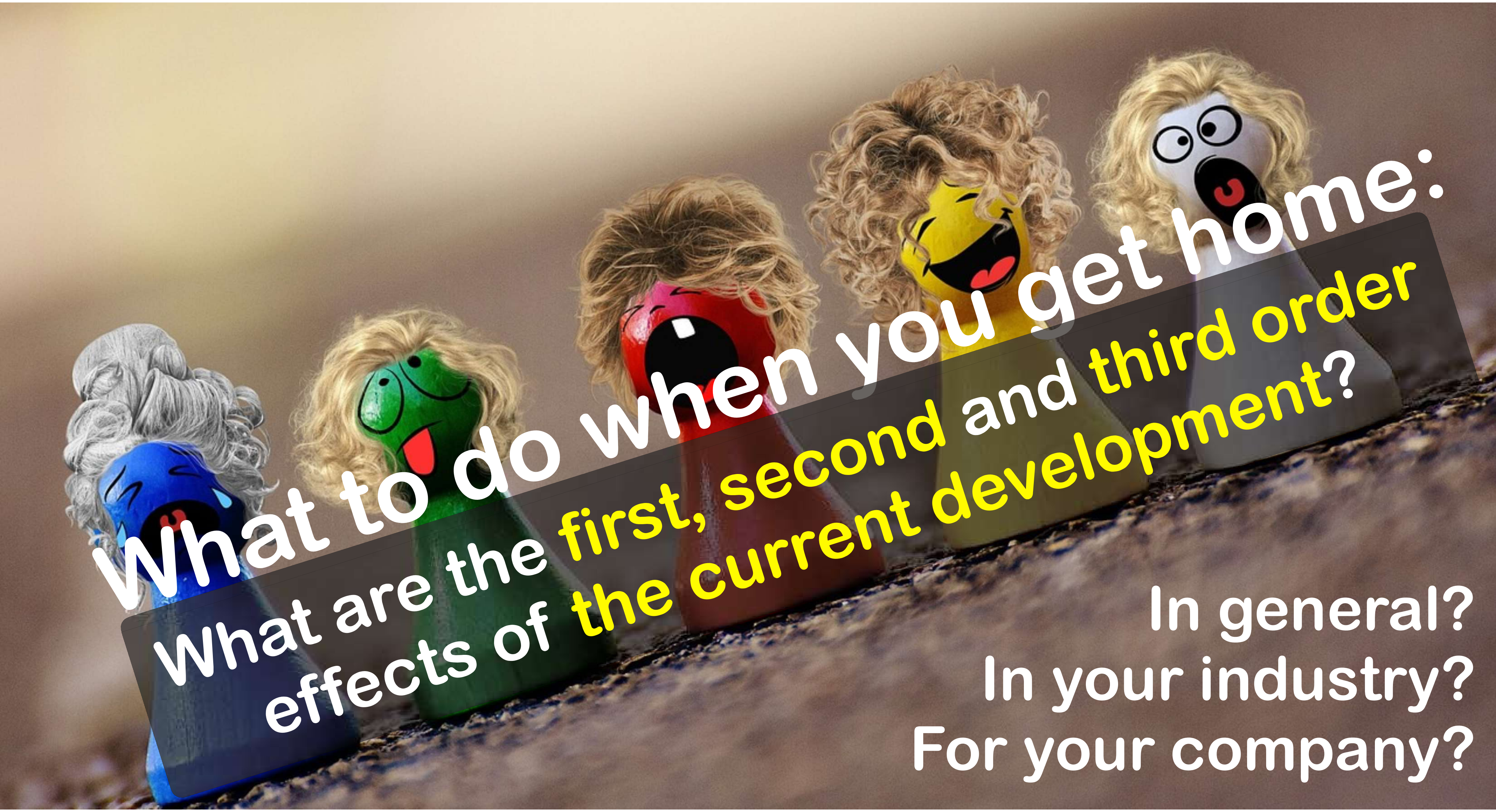
Video can be stored digitally

2nd order

Streaming instead of owning

3rd order

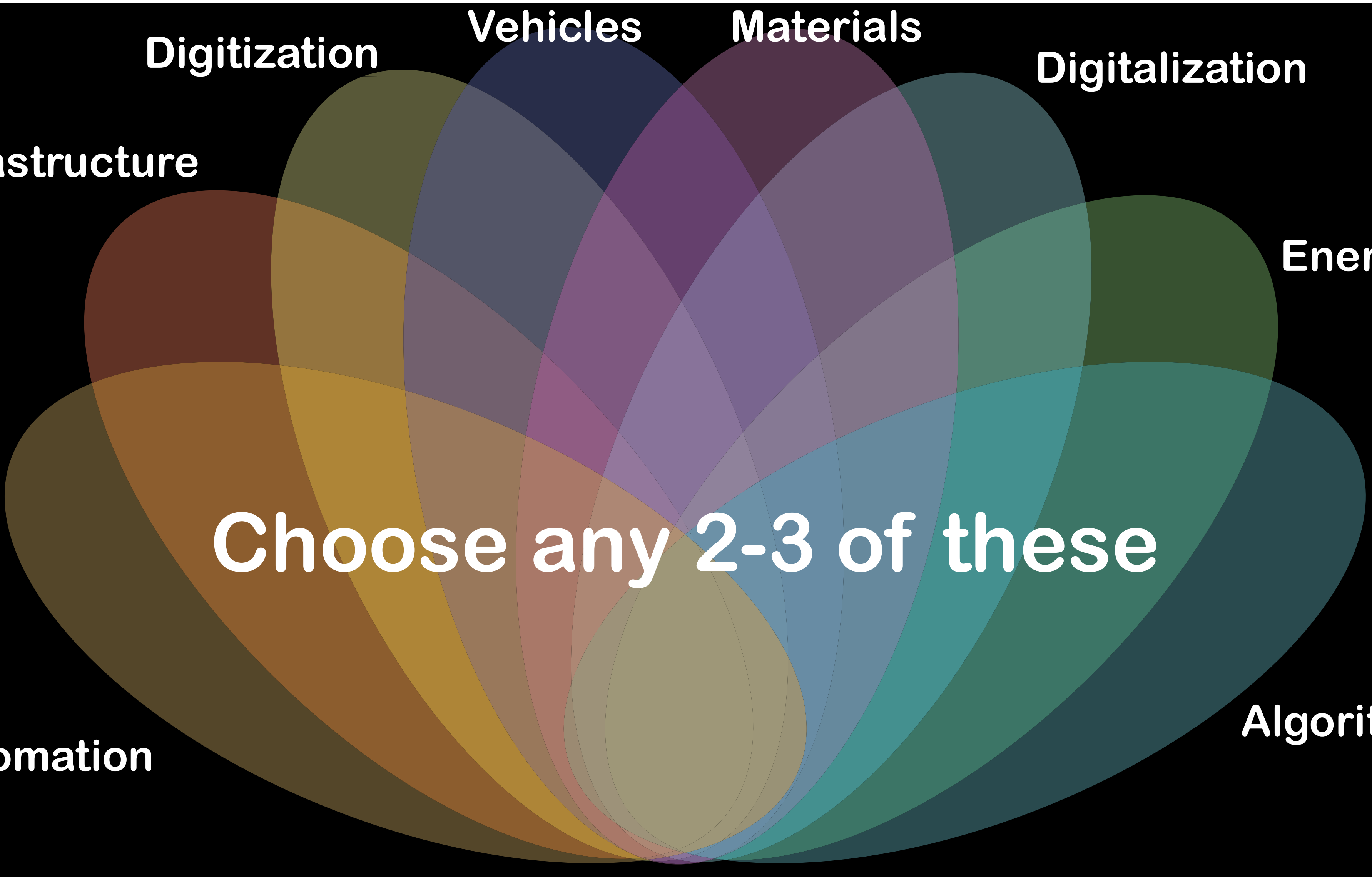
Binge-watching becomes a thing



What to do when you get home:

What are the first, second and third order effects of the current development?

In general?
In your industry?
For your company?



Infrastructure

Digitization

Vehicles

Materials

Digitalization

Energy

Automation

Algorithms

Choose any 2-3 of these

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Effects

	1st order	2nd order	3rd order
In general	?	?	?
In your industry	?	?	?
For your company	?	?	?

1st order

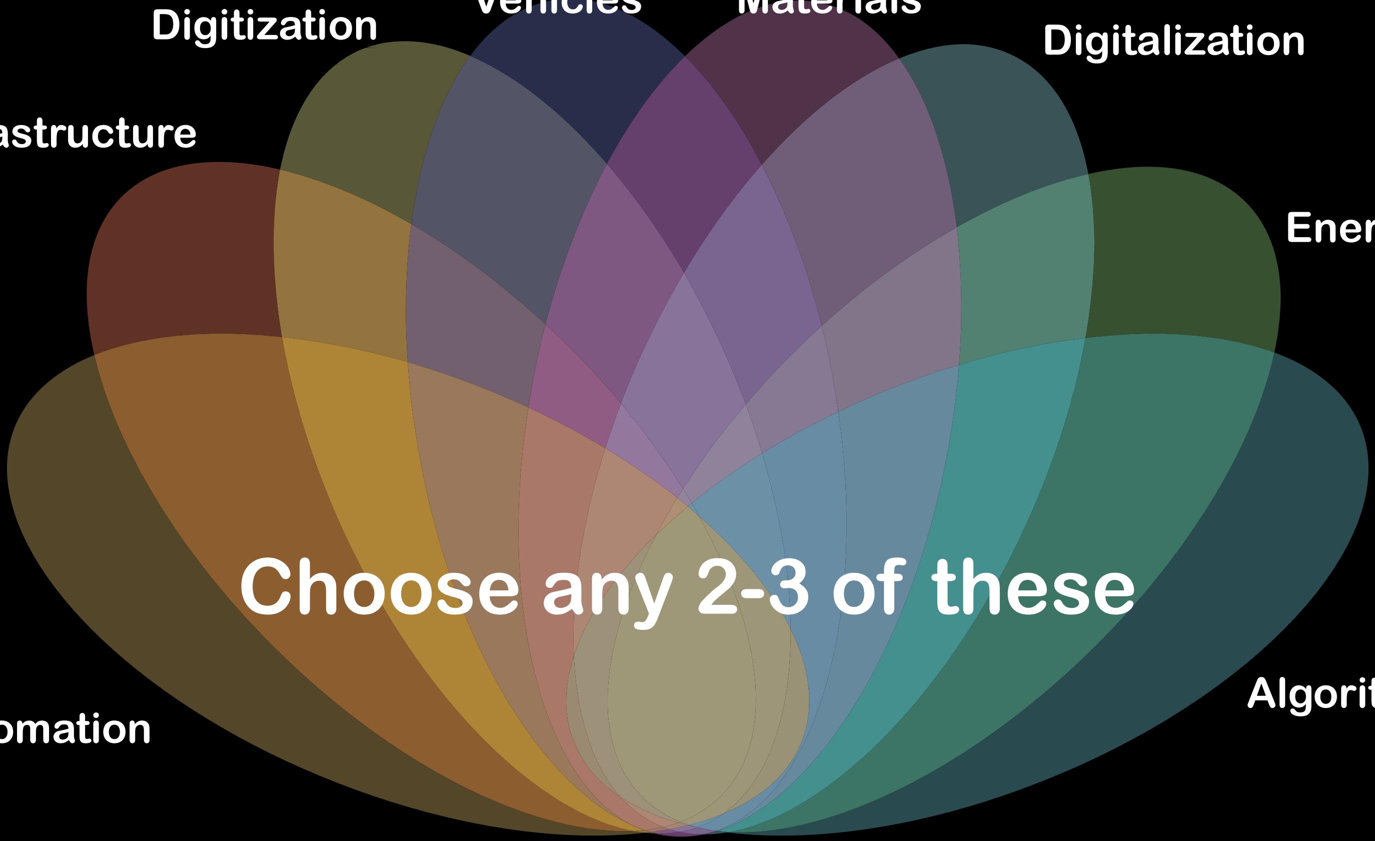
2nd order

3rd order

In general

In your industry

For your company



Infrastructure

Digitization

Vehicles

Materials

Digitalization

Energy

Algorithms

Automation

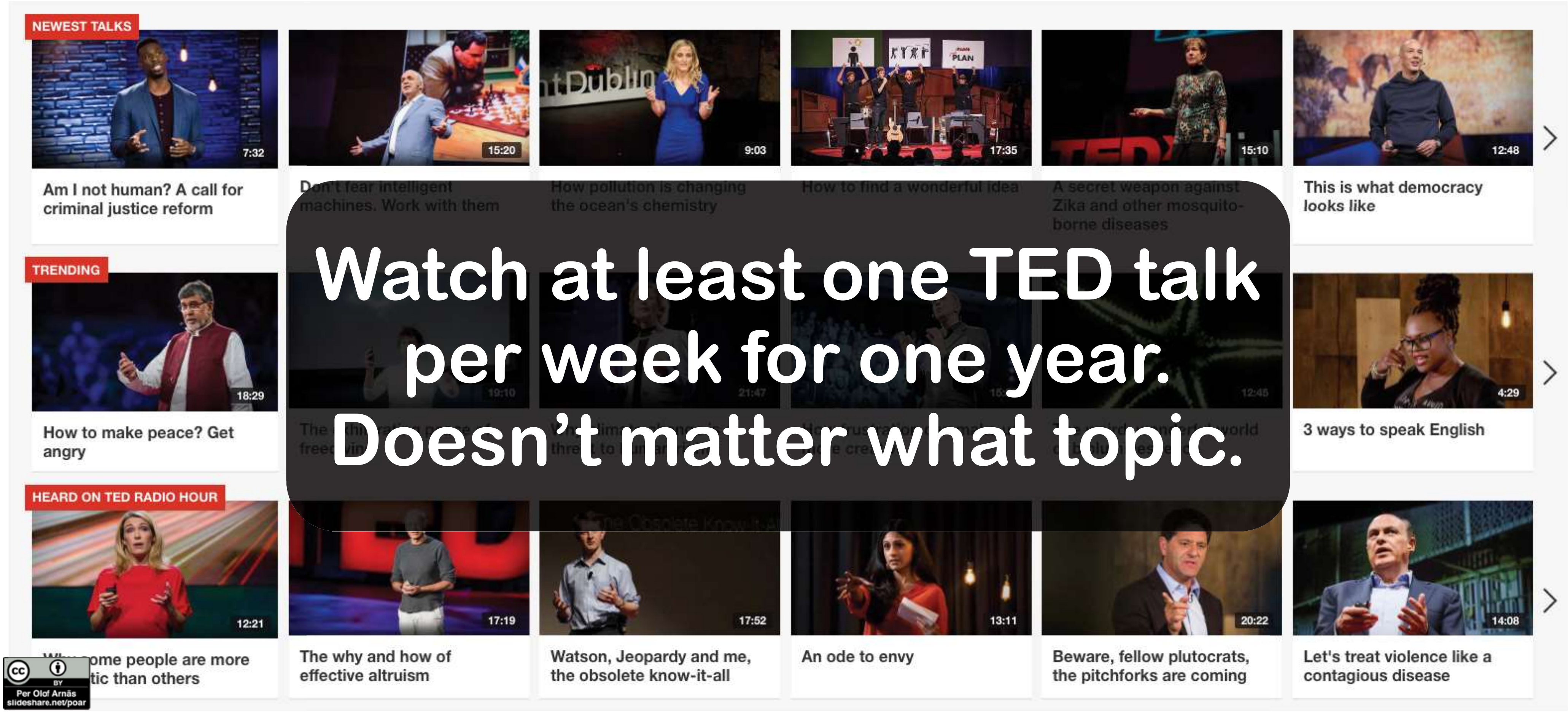
Choose any 2-3 of these

I have another challenge for you

CHALMERS
UNIVERSITY OF TECHNOLOGY

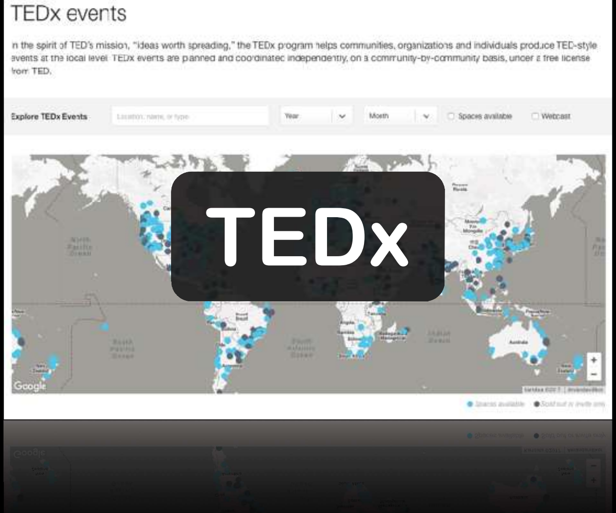
NORTHERN LEAD

TED Ideas worth spreading


NEWEST TALKS
7:32
Am I not human? A call for criminal justice reform
15:20
Don't fear intelligent machines. Work with them
9:03
How pollution is changing the ocean's chemistry
17:35
How to find a wonderful idea
15:10
A secret weapon against Zika and other mosquito-borne diseases
12:48
This is what democracy looks like
TRENDING
18:29
How to make peace? Get angry
19:10
21:47
12:45
4:29
3 ways to speak English
HEARD ON TED RADIO HOUR
12:21
ome people are more
tic than others
17:19
The why and how of effective altruism
17:52
Watson, Jeopardy and me, the obsolete know-it-all
13:11
An ode to envy
20:22
Beware, fellow plutocrats, the pitchforks are coming
14:08
Let's treat violence like a contagious disease

Watch at least one TED talk per week for one year. Doesn't matter what topic.

Attend at least one conference or seminar per year that is outside your field.

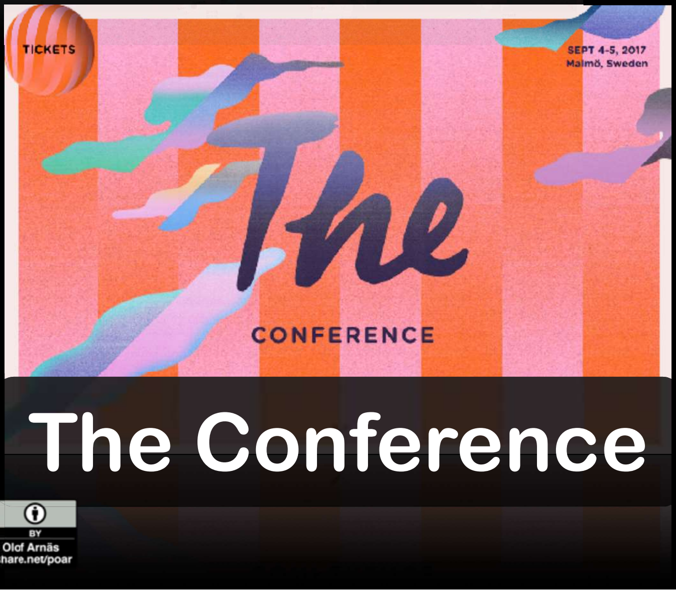


TEDx events

In the spirit of TED's mission, "ideas worth spreading," the TEDx program helps communities, organizations and individuals produce TED-style events at the local level. TEDx events are planned and coordinated independently, on a community-by-community basis, under a free license from TED.

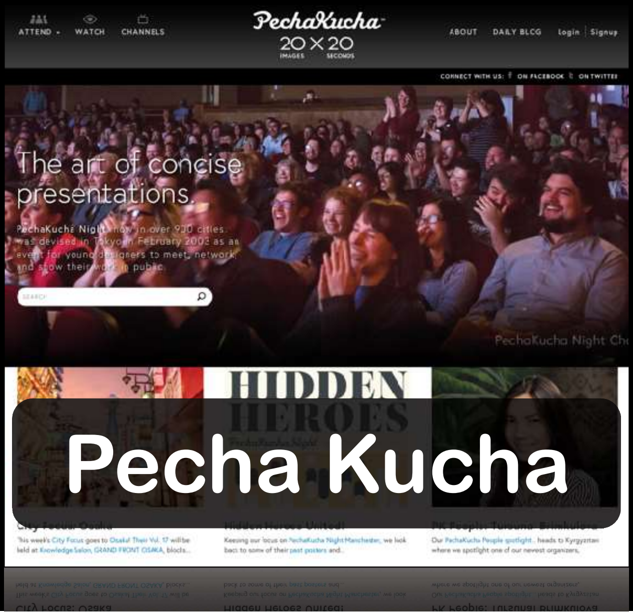
Explore TEDx Events
Location, name, or type
Year
Month
☐ Spaces available
☐ Webcast
Google

TEDx



TICKETS
SEPT 4-5, 2017
Malmö, Sweden
The
CONFERENCE

The Conference



ATTEND
WATCH
CHANNELS
PechaKucha
20×20
IMAGES
SECONDS
ABOUT
DAILY BLOG
Login
Signup
CONNECT WITH US: ON FACEBOOK ON TWITTER
SEARCH
PechaKucha Night Ch
HIDDEN
HEROES

The art of concise presentations.

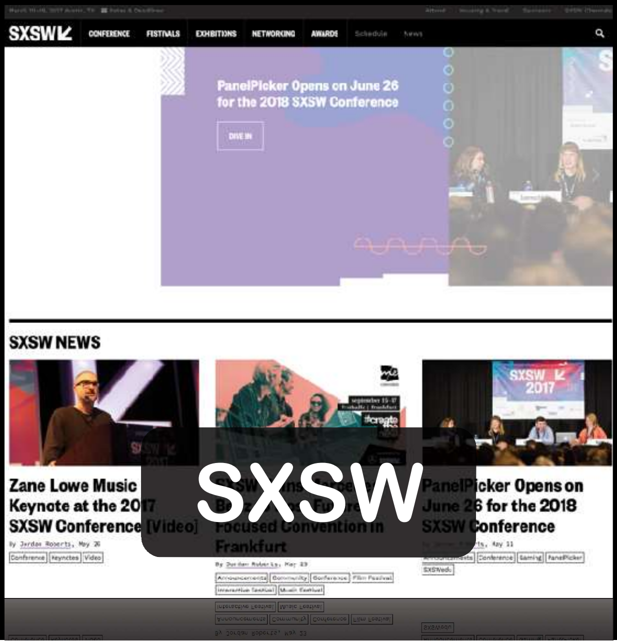
PechaKucha Night, now in over 900 cities, was devised in Tokyo in February 2003 as an event for young designers to meet, network, and show their work in public.

This week's City Focus goes to Osaka! Their Vol. 17 will be held at Knowledge Salon, GRAND FRONT OSAKA, blocks...

Keeping our focus on PechaKucha Night Manchester, we look back to some of their past posters and...

Our PechaKucha People spotlight... heads to Kyrgyzstan where we spotlight one of our newest organizers,

Pecha Kucha



SXSW
CONFERENCE
FESTIVALS
EXHIBITIONS
NETWORKING
AWARDS
Schedule
News
DIVE IN
SXSW 2017

PanelPicker Opens on June 26 for the 2018 SXSW Conference

SXSW NEWS

Zane Lowe Music Keynote at the 2017 SXSW Conference [Video]

By Jordan Roberts, May 26

Conference Keynotes Video

Focused Convention in Frankfurt

By Jordan Roberts, May 23

Announcements Community Conference Film Festival Interactive Festival Music Festival

PanelPicker Opens on June 26 for the 2018 SXSW Conference

May 11

Announcements Conference Gaming PanelPicker SXSWedu

SXSW

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NORTHERN LEAD

GIVING IT THE ATTENTION IT DESERVES
LOGISTICS ROCKS
A PODCAST BY PER OLOF ARNÄS AND GUESTS

New podcast to be launched during 2018

Meeting the Rockstars of Logistics

Some observations regarding the digital future of transportation

Per Olof Arnäs, PhD

Chalmers University of Technology
Service Management and Logistics
per-olof.arnas@chalmers.se
about.me/perolofarnas
Slides: slideshare.net/poar
@Dr_PO

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