Toward the Extinction of Human Jobs

In the last decade the **Fourth Industrial Revolution** has caused a widespread disruption to labour markets, with enormous change in the skill sets needed to thrive this new landscape. Many sectors have seen a complete replacement of human labor by **machines**, **robots** and **automation**, with a parallel **increase in productivity**. Despite this, humans have been able to create and train for **new jobs**, adapting to this new world they did: jobs which concern intellectual charge and management or control positions; jobs which are performed – after many battles – in **shorter work days**, proving that it has been an impact on performances and on the well-being of workers. Thanks to the achievement of important milestones, such as the **Universal Basic Income**, now adopted by an increasingly number of countries worldwide, people have finally started to cultivate their passions and interests, dedicating themselves to the development of **cognitive and creative abilities**, without fearing that robots will cause their financial collapse – like many did just about 10 years ago.

Big and Fast

Data production is expanding at an astonishing pace, arriving nowadays to almost 200 zettabyte.

The huge amount of data combined with the increasing development of Machine Learning, have bring to a new paradigm of work, where efficiency and security are now ensured by AI.

The Growth of Global Data

1 petabyte 1,000 terabytes
1 exabyte 1,000 petabytes
1 zettabyte 1,000 exabytes

2025 195zb
2020 35zb
2015 7.9zb
2010 1.2zb
2005 0.5zb
2000 0.2zb

Trucks Need No Drivers

In US, truck driving is just a memory now.

In 2012 330,000 large trucks were involved in crashes that killed nearly 4,000 people (about 90% of those were caused by driver error). Today these numbers have drastically fallen thanks to the complete replacement with self-driving trucks.

Technology Penetration Phases
1. Passive autonomous driving
2. Limited driver substitution
3. Complete autonomous capability
4. Massive market penetration

A Machine Driven Business
100% Autonomous penetration

2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026

Worldwide Spending on Robotics

Personal
Commercial
Industrial
Military

$60b
$50b
$40b
$30b
$20b
$10b

2000, 2005, 2010, 2015, 2020, 2025

Bot Market

A convergence of falling prices and performance improvements have led to a rapid growth of the bot market. The cost of high-quality robots and components has dropped rapidly, while CPUs got faster, and application programming easier.

Main US Jobs in 2015

13.7% of total US jobs in 2015

Delivery Truck Drivers 1,330,000
Heavy Truck Drivers 1,797,700
Retail Salespersons 4,612,510
Food and Beverage Servers 4,731,800
Cashiers 3,478,420
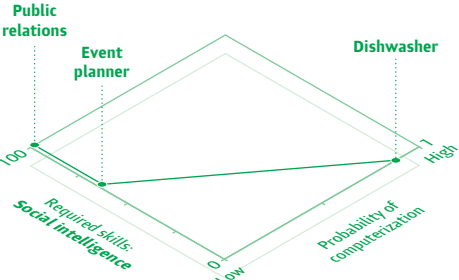**Office Clerks** 2,944,420

Once Upon a Time in US...

In 2015 there were almost 3.5 million professional truck drivers in the US and an additional 5.2 million people employed on the truck-driving industry: 8.7 million trucking-related jobs. It was one of the most-common occupations in that time, along with retail salesperson, cashier, food and beverage server, and office clerk. Together, these jobs employed 18.9 million people: nearly 13.7% percent of the labor force.
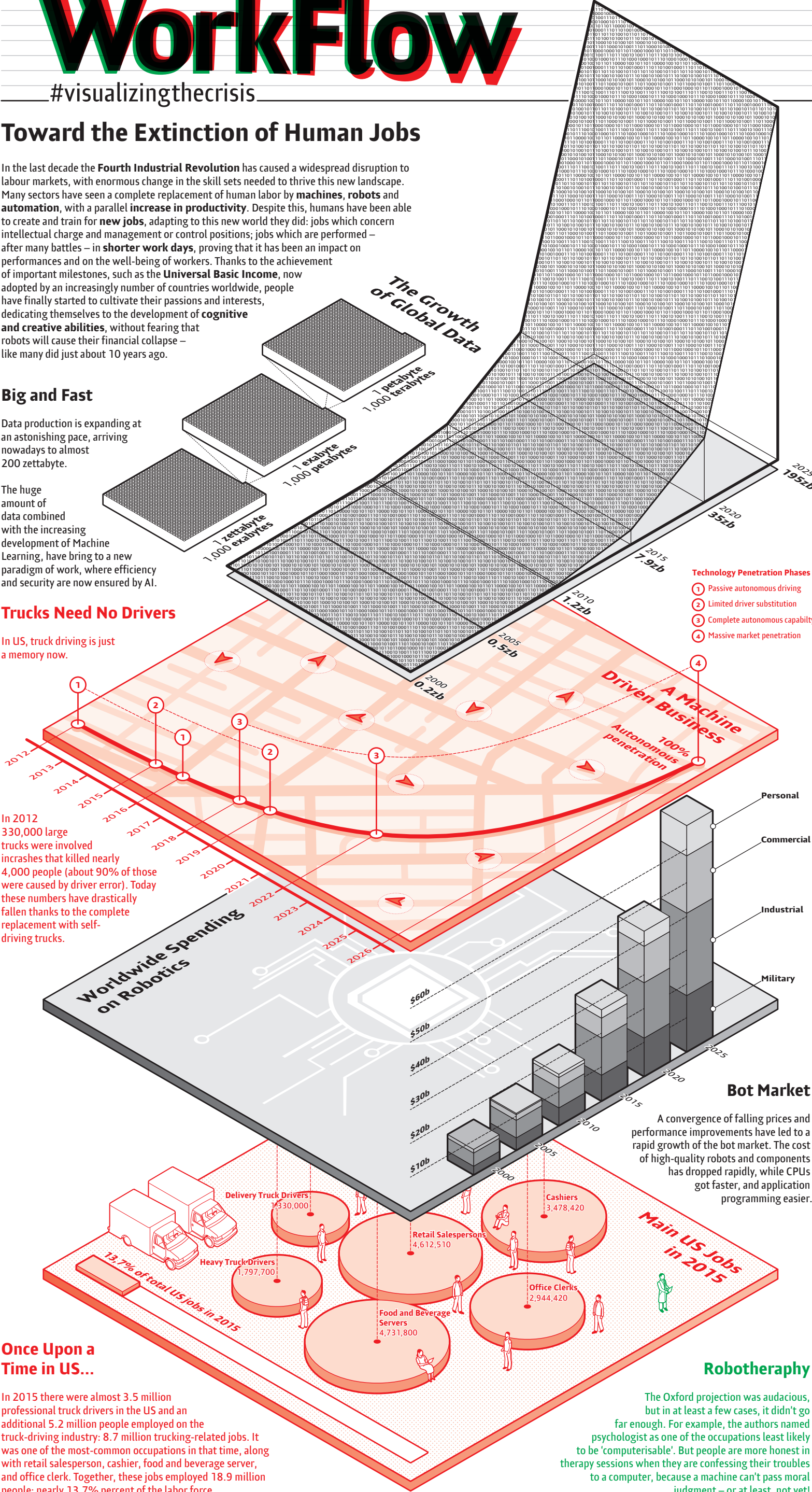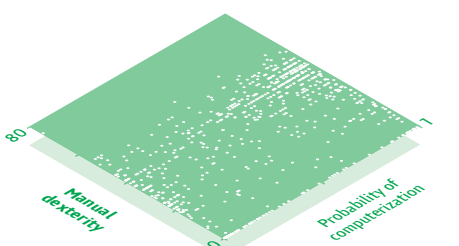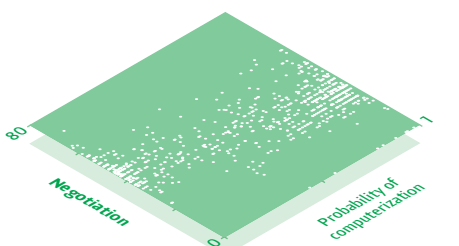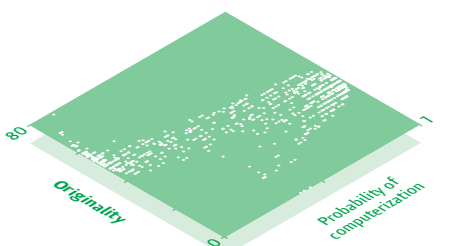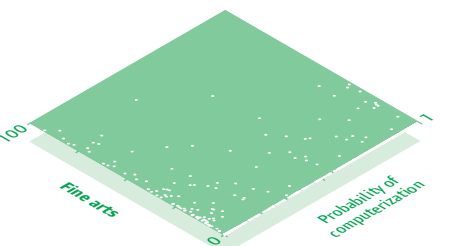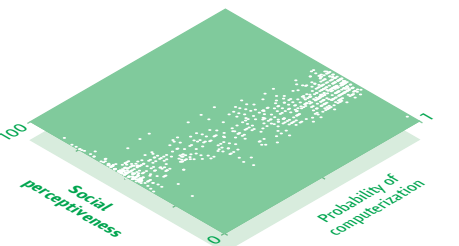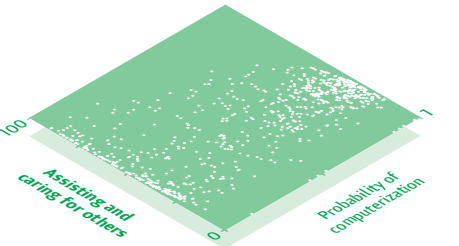
The Future of Employment According to Oxford University

In 2013, Oxford University researchers forecast that machines might be able to perform 47% of all US jobs in the following two decades. The authors examine how susceptible jobs are to computerisation, by implementing a novel methodology to estimate the probability of computerisation for 702 detailed occupations, using a Gaussian process classifier.

Sketch of how the probability of computerisation might vary as a function of bottleneck variables.

Public relations
Event planner
Dishwasher
High
Required skills: Social intelligence
Low
100
0
Probability of computerization

Distribution of occupational variables as a function of probability of computerizations. Each occupation is a unique point.

Assisting and caring for others — Probability of computerization (100 / 1)

Social perceptiveness — Probability of computerization (100 / 1)

Fine arts — Probability of computerization (100 / 1)

Originality — Probability of computerization (80 / 1)

Negotiation — Probability of computerization (80 / 1)

Manual dexterity — Probability of computerization (80 / 1)

Robotheraphy

The Oxford projection was audacious, but in at least a few cases, it didn't go far enough. For example, the authors named psychologist as one of the occupations least likely to be 'computerisable'. But people are more honest in therapy sessions when they are confessing their troubles to a computer, because a machine can't pass moral judgment – or at least, not yet!

Taking Big Steps

Ireland Has Joined the Six-Hour Club

Ireland has succeeded in obtaining the six-hour working day. After countries like Scandinavia, U.K. and large part of US, Ireland workers have switched to the six-hour working day for the same wage.
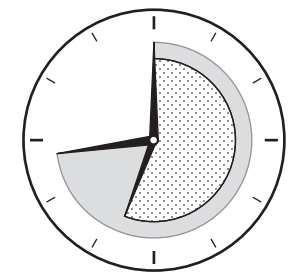
According to a Morgan McKinley survey 73% of Irish employees used to work longer than their contracted hours, but around 80% of them were not compensated for working in excess.

Six is a Magic Number — for Now

The standard working hours has now gone down to an average of 6 hours per day in the European Union. The evident results in the increase of productivity of people working fewer hours have led more and more companies to reduce the number of contracted hours, which is projected to decrease to 4 hours in the next 15 years.
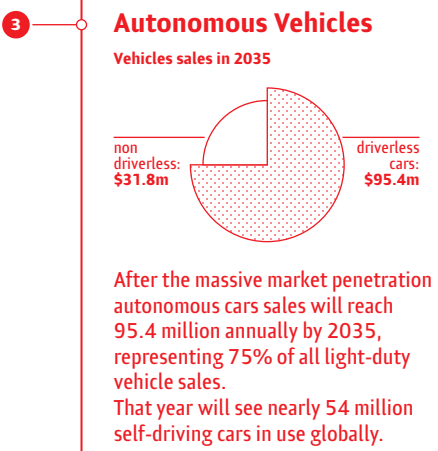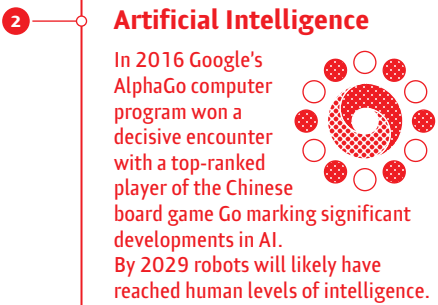
Standard Working Hours per Day in EU

It's not just the working hours: the number of people employed full-time jobs is gradually decreasing, causing a relentless rise of the unemployment rate.
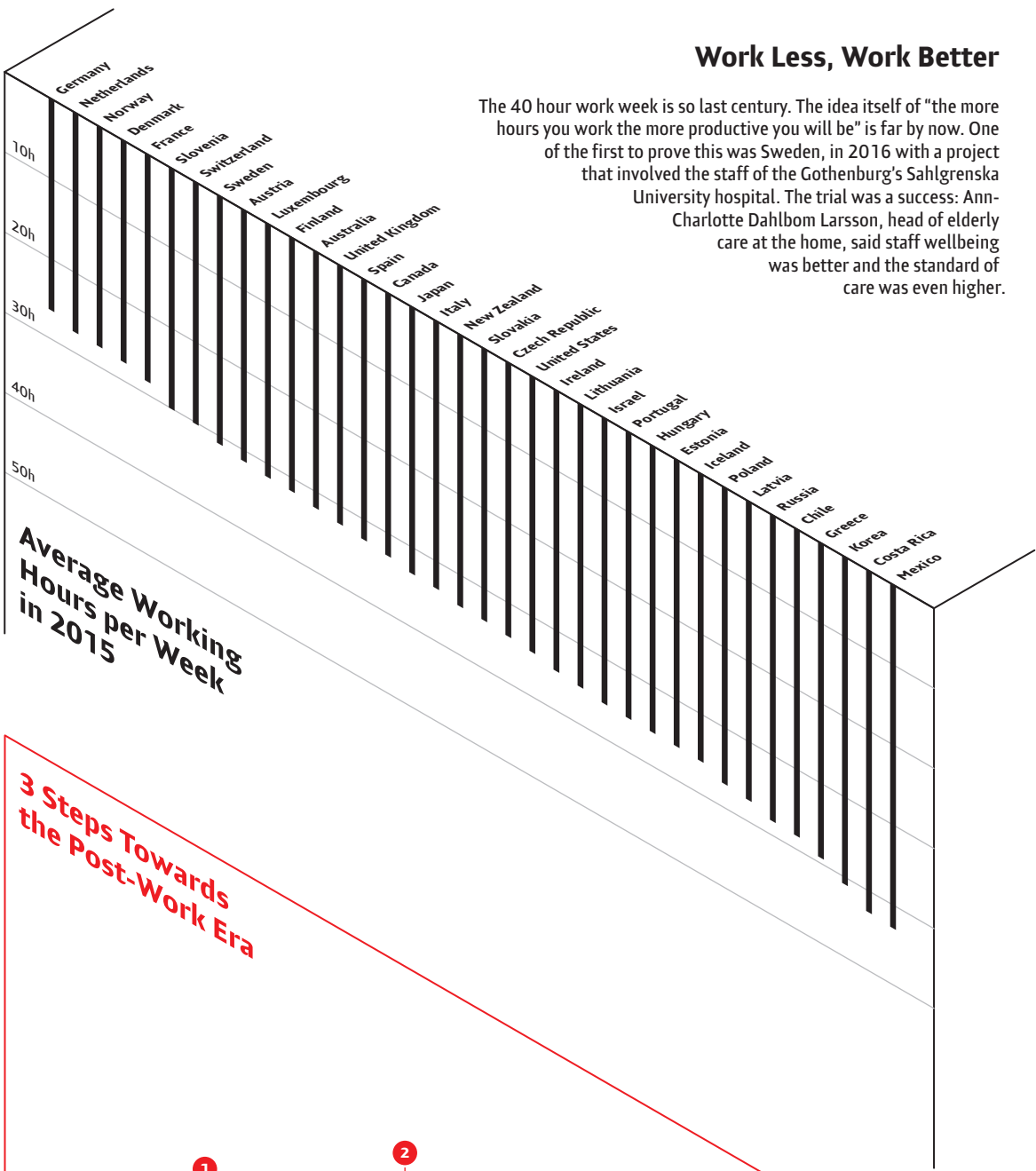
Tech Gives, Tech Takes

There will always be jobs in tech and science, but the skills needed to enter these industries are so specialized and difficult to attain that they won't save the masses from unemployment. Moreover, the biggest tech and science companies tend to employ a very small number of employees in relation to the revenues they generate. In 1964 the most valuable US company, AT&T, was worth $267 billion and employed 758,611 people. Google, in 2016, was worth $560 billion, but had only about 55,000 employees. Today Tesla, which employed just 10,000 people, worth $692 billion.

How We Got Here

1 Store Closures

Number of retail stores in UK

2013

2018

In UK the total number of retail store have fallen from 281,930 in 2013 to 220,000 in 2018. This caused job losses of around 316,000 in those 5 years. The share of online retail sales, instead, rose from 12.7% to 21.5%.

2 Artificial Intelligence

In 2016 Google's AlphaGo computer program won a decisive encounter with a top-ranked player of the Chinese board game Go marking significant developments in AI.
By 2029 robots will likely have reached human levels of intelligence.

3 Autonomous Vehicles

Vehicles sales in 2035

non driverless: $31.8m

driverless cars: $95.4m

After the massive market penetration autonomous cars sales will reach 95.4 million annually by 2035, representing 75% of all light-duty vehicle sales.
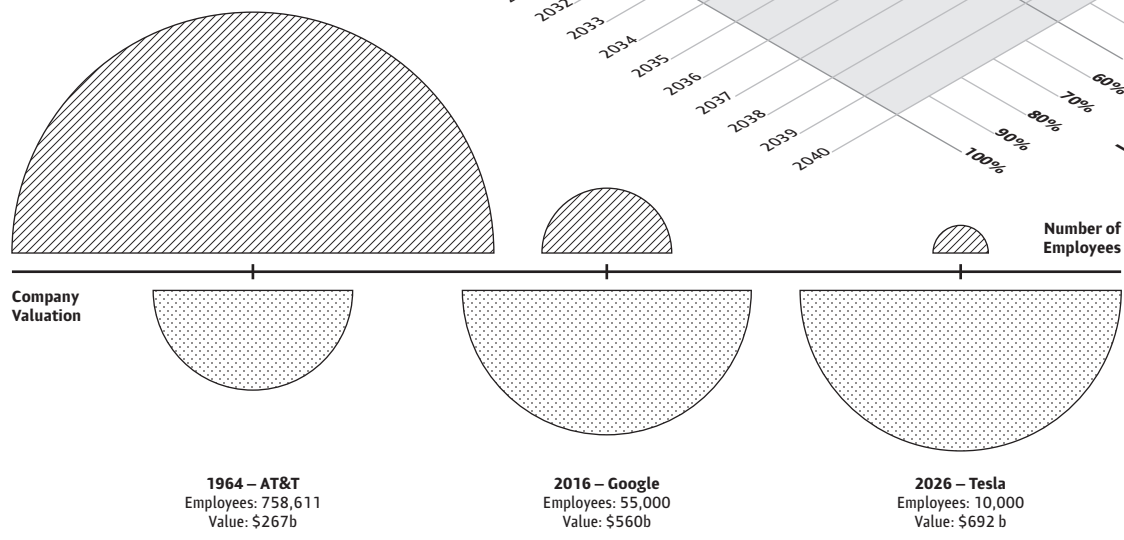That year will see nearly 54 million self-driving cars in use globally.

Work Less, Work Better

The 40 hour work week is so last century. The idea itself of "the more hours you work the more productive you will be" is far by now. One of the first to prove this was Sweden, in 2016 with a project that involved the staff of the Gothenburg's Sahlgrenska University hospital. The trial was a success: Ann-Charlotte Dahlbom Larsson, head of elderly care at the home, said staff wellbeing was better and the standard of care was even higher.

Average Working Hours per Week in 2015

Germany, Netherlands, Norway, Denmark, France, Slovenia, Switzerland, Sweden, Austria, Luxembourg, Finland, Australia, United Kingdom, Spain, Canada, Japan, Italy, New Zealand, Slovakia, Czech Republic, United States, Ireland, Lithuania, Israel, Portugal, Hungary, Estonia, Iceland, Poland, Latvia, Russia, Chile, Greece, Korea, Costa Rica, Mexico

10h / 20h / 30h / 40h / 50h

3 Steps Towards the Post-Work Era

Working Hours per day

8h / 7h / 6h / 5h / 4h / 3h / 2h / 1h

2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040

Percentage of Labor Force Employed

0 / 10% / 20% / 30% / 40% / 50% / 60% / 70% / 80% / 90% / 100%

Number of Employees

Company Valuation

1964 — AT&T
Employees: 758,611
Value: $267b

2016 — Google
Employees: 55,000
Value: $560b

2026 — Tesla
Employees: 10,000
Value: $692 b