The Future of Work

Ion MOLDOVEANU

May 2021

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PEGI 3

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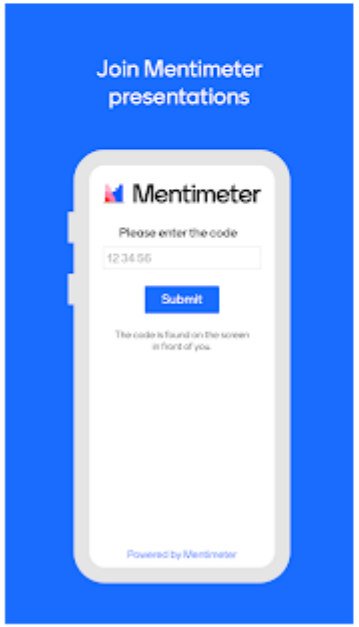
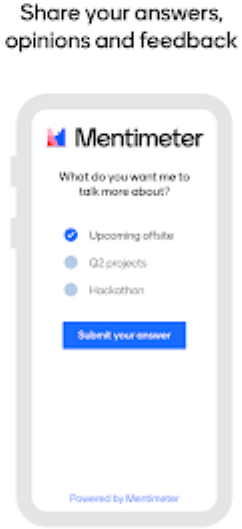
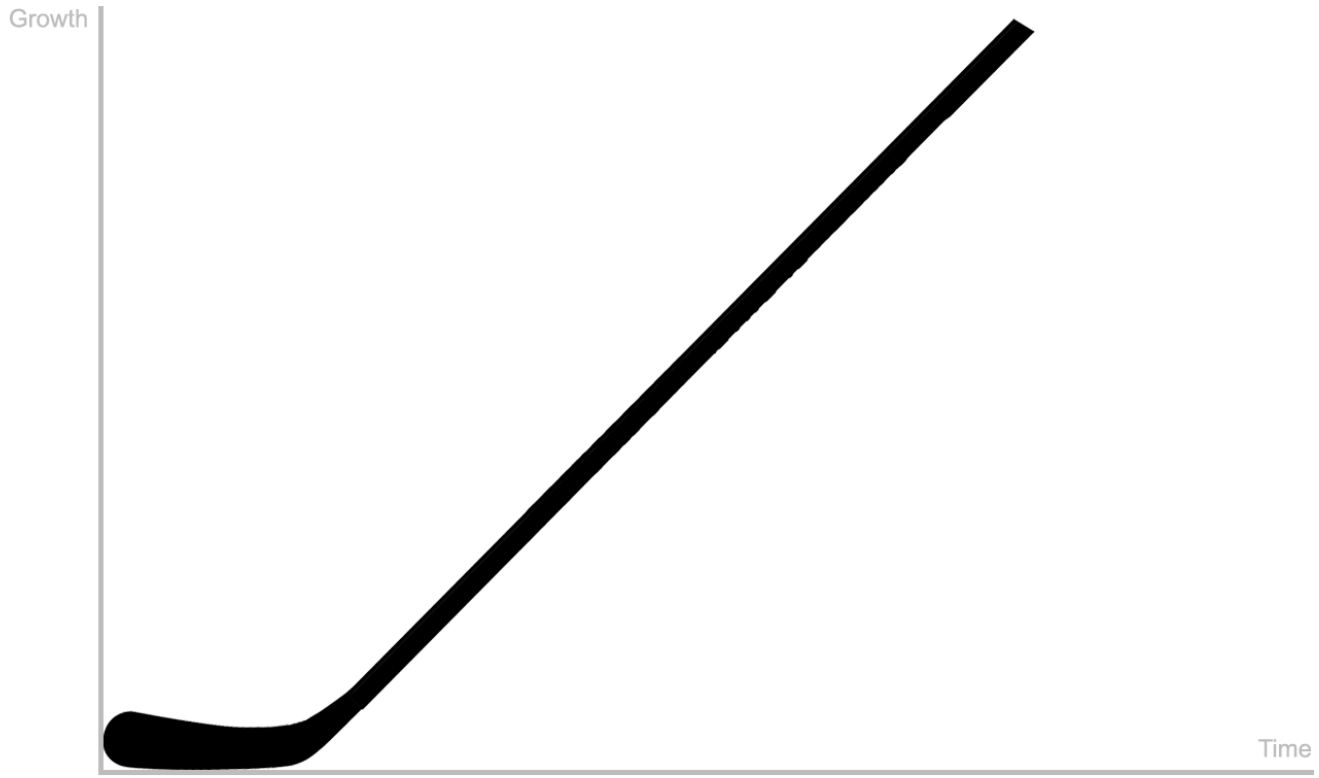


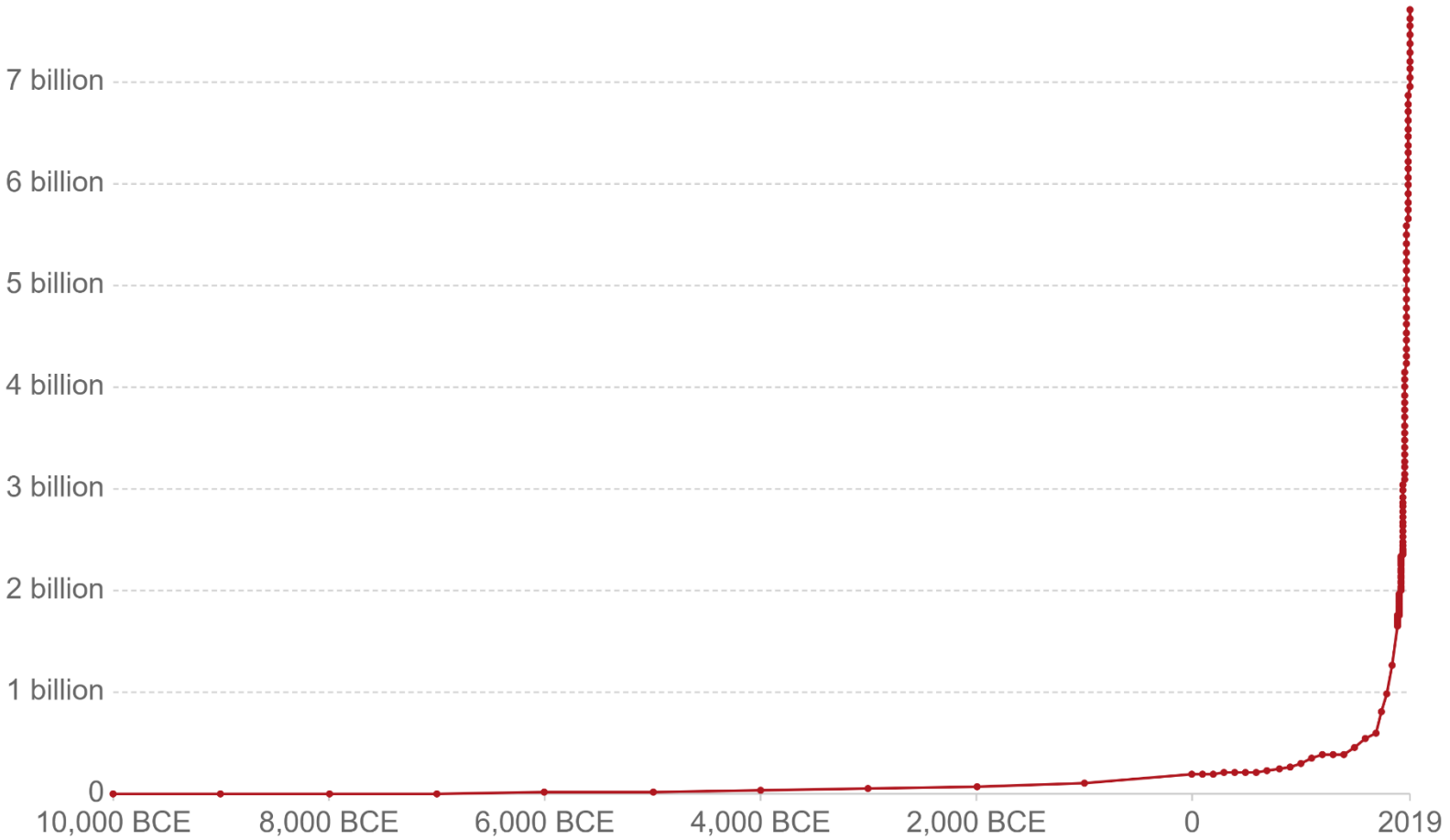


Digital Transformation

Hockey Stick Growth

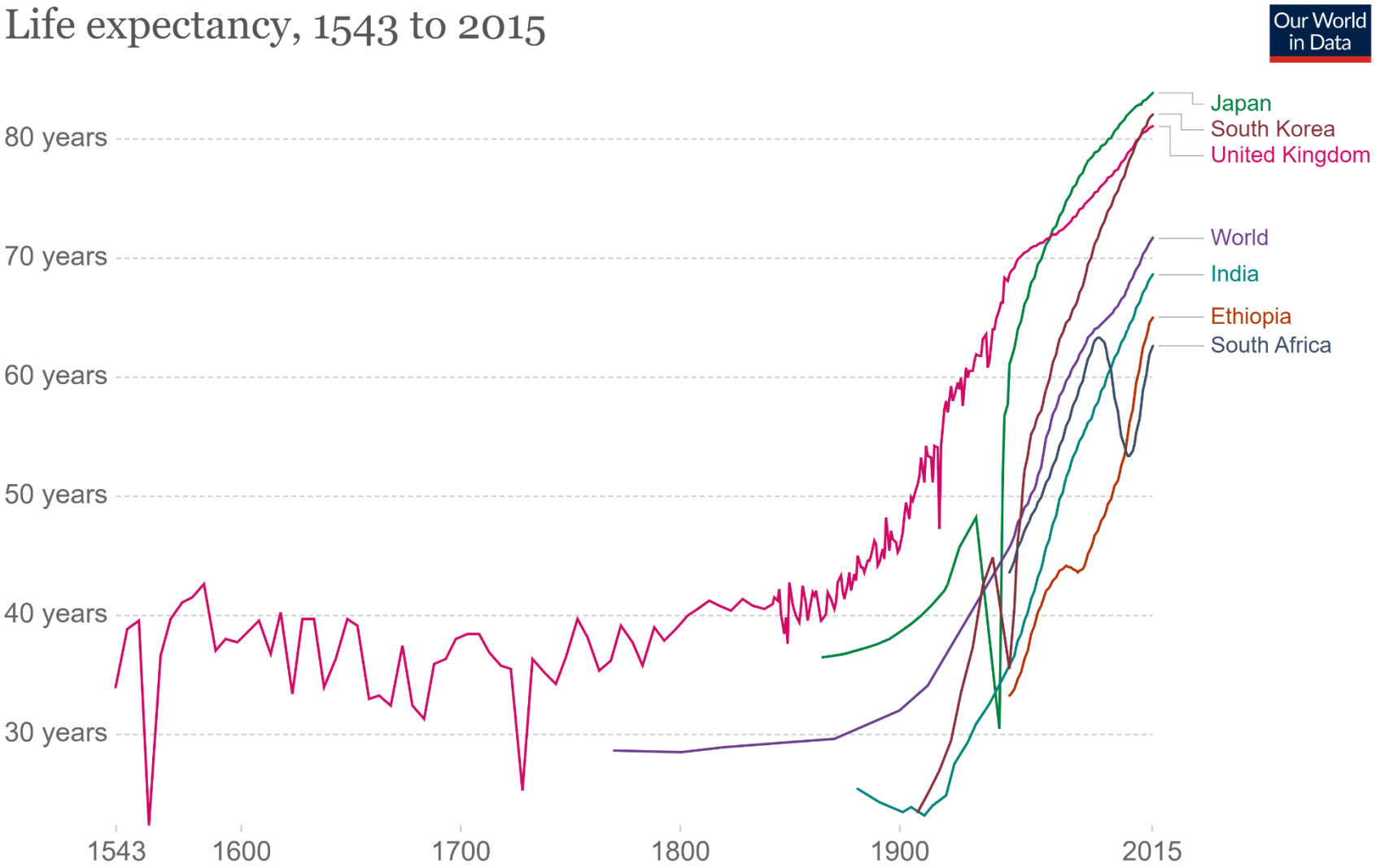


World population since 10,000 BCE (OurWorldInData series)



Source: History Database of the Global Environment (HYDE) (before 1900), UN Publication "The World at Six Billion" (1900-1940), UN World Population Prospects: 2019 Revision (1950-2019)
OurWorldInData.org/world-population-growth/ • CC BY

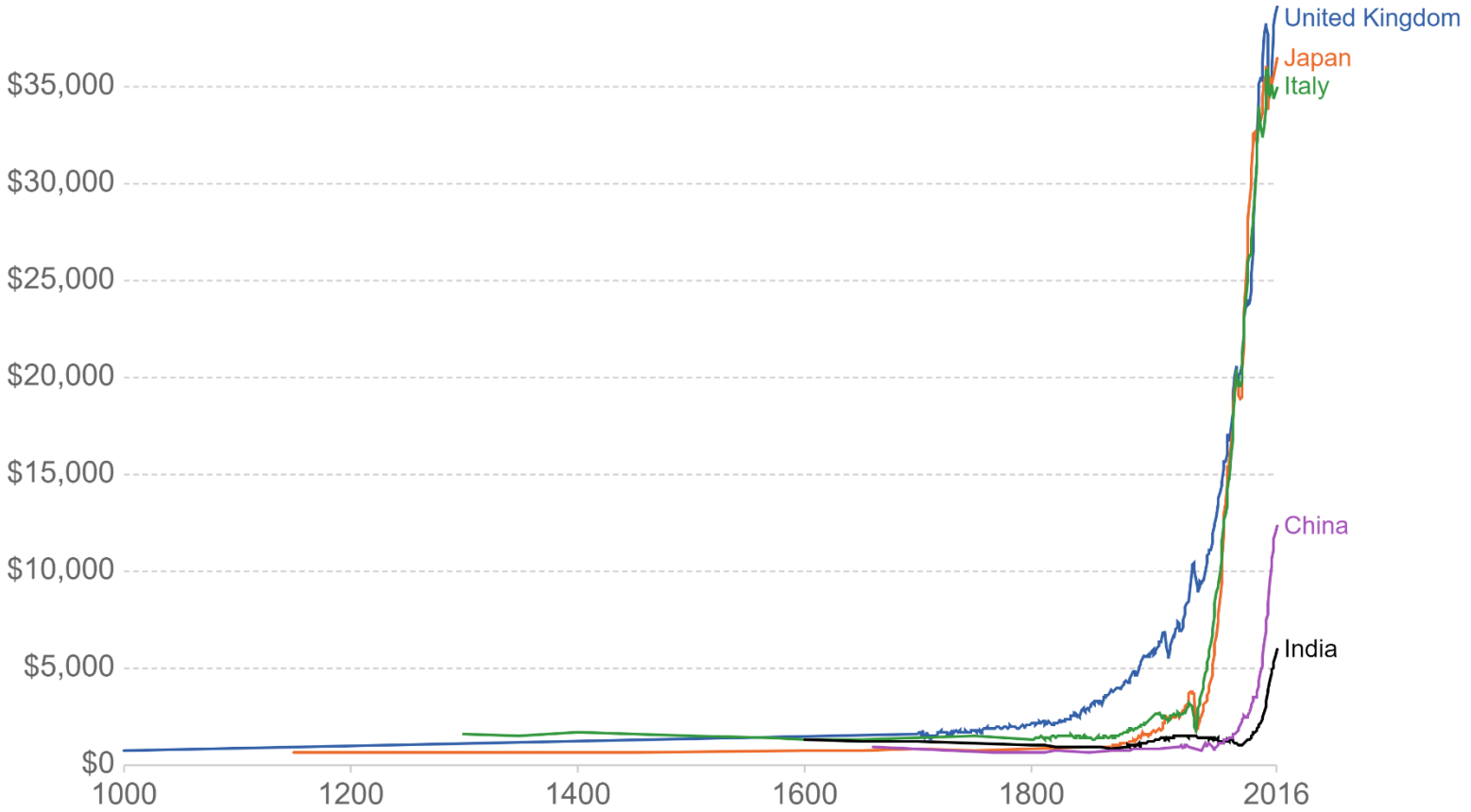
Life expectancy, 1543 to 2015



Source: Riley (2005), Clio Infra (2015), and UN Population Division (2019)
OurWorldInData.org/life-expectancy • CC BY
Note: Shown is period life expectancy at birth, the average number of years a newborn would live if the pattern of mortality in the given year were to stay the same throughout its life.

History's hockey stick: Worldwide historical real gross domestic product per capita (1000–2016)

Unit 1 'The capitalist revolution' in The CORE Team, The Economy. Available at: https://tinyco.re/19274920 [Figure 1.1a]



Source: Maddison Project Database (2018)

tinyco.re/19274920 • Powered by ourworldindata.org

Note: The units of measurement is 2011 US dollar which is used to compare Purchasing Power Parity and GDP across countries over time.

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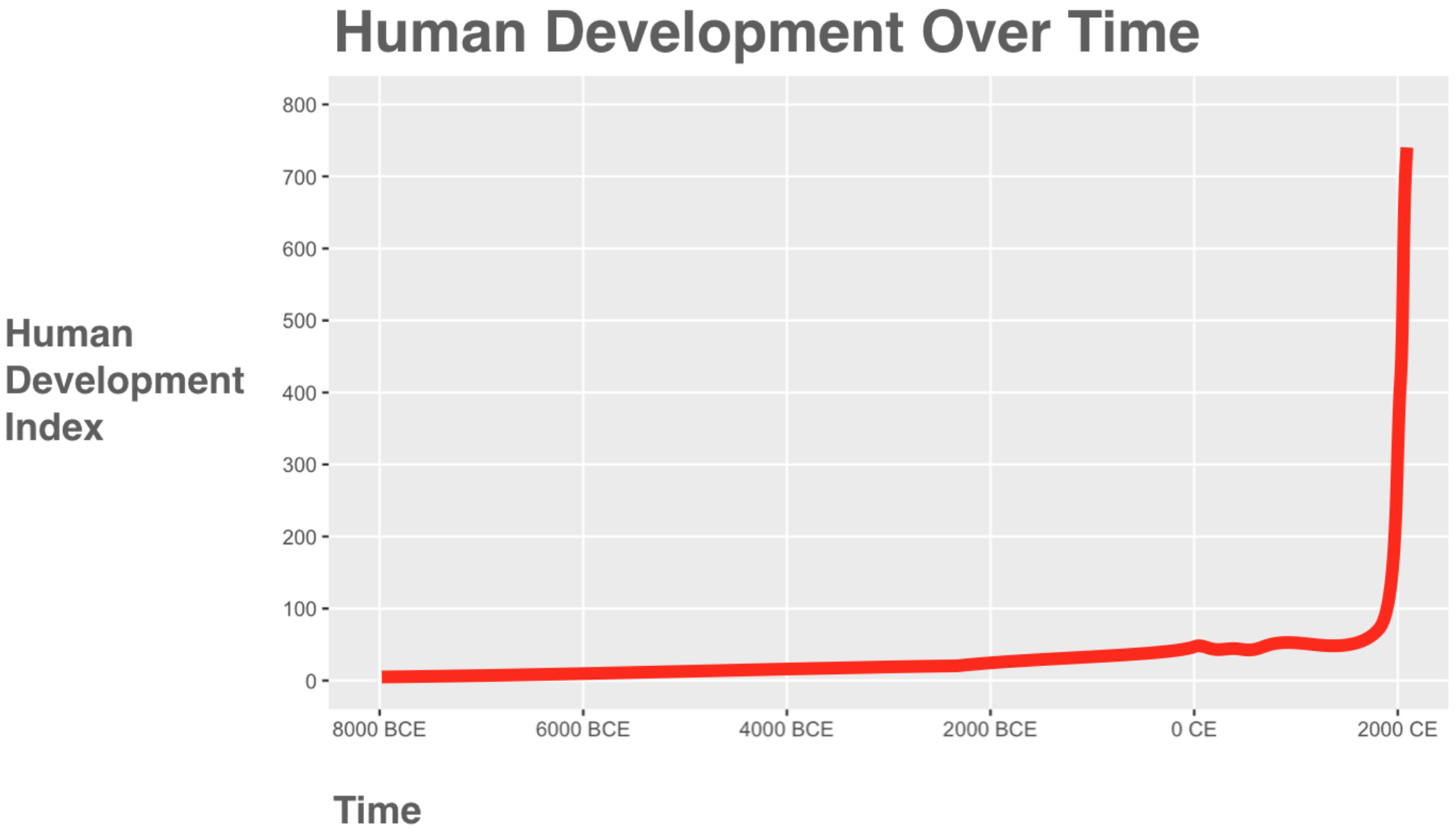
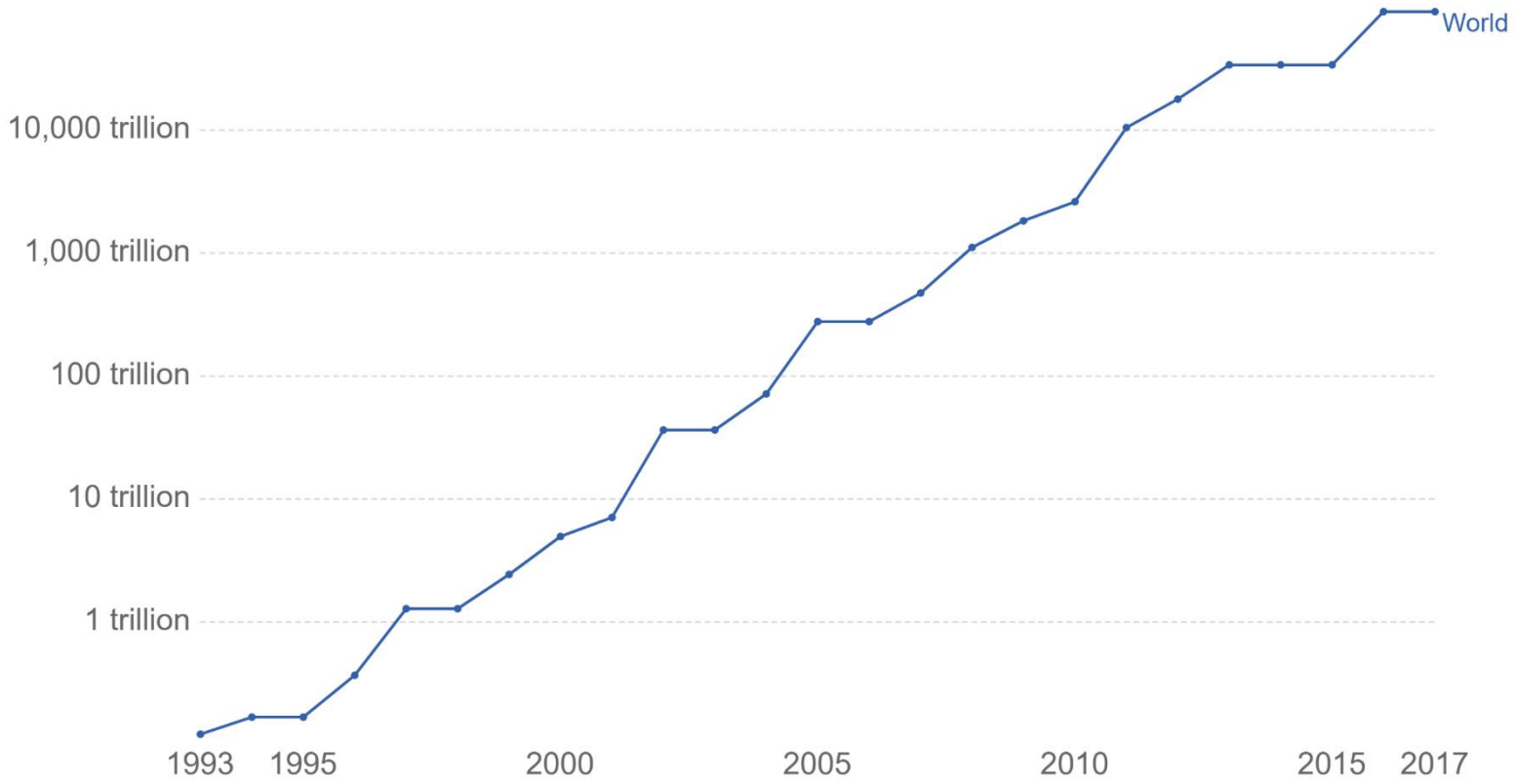


Brynjolfsson (2016), The Second Machine Age

Supercomputer Power (FLOPS)

The growth of supercomputer power, measured as the number of floating-point operations carried out per second (FLOPS) by the largest supercomputer in any given year. (FLOPS) is a measure of calculations per second for floating-point operations. Floating-point operations are needed for very large or very small real numbers, or computations that require a large dynamic range. It is therefore a more accurate measured than simply instructions per second.



Source: TOP500 Supercomputer Database

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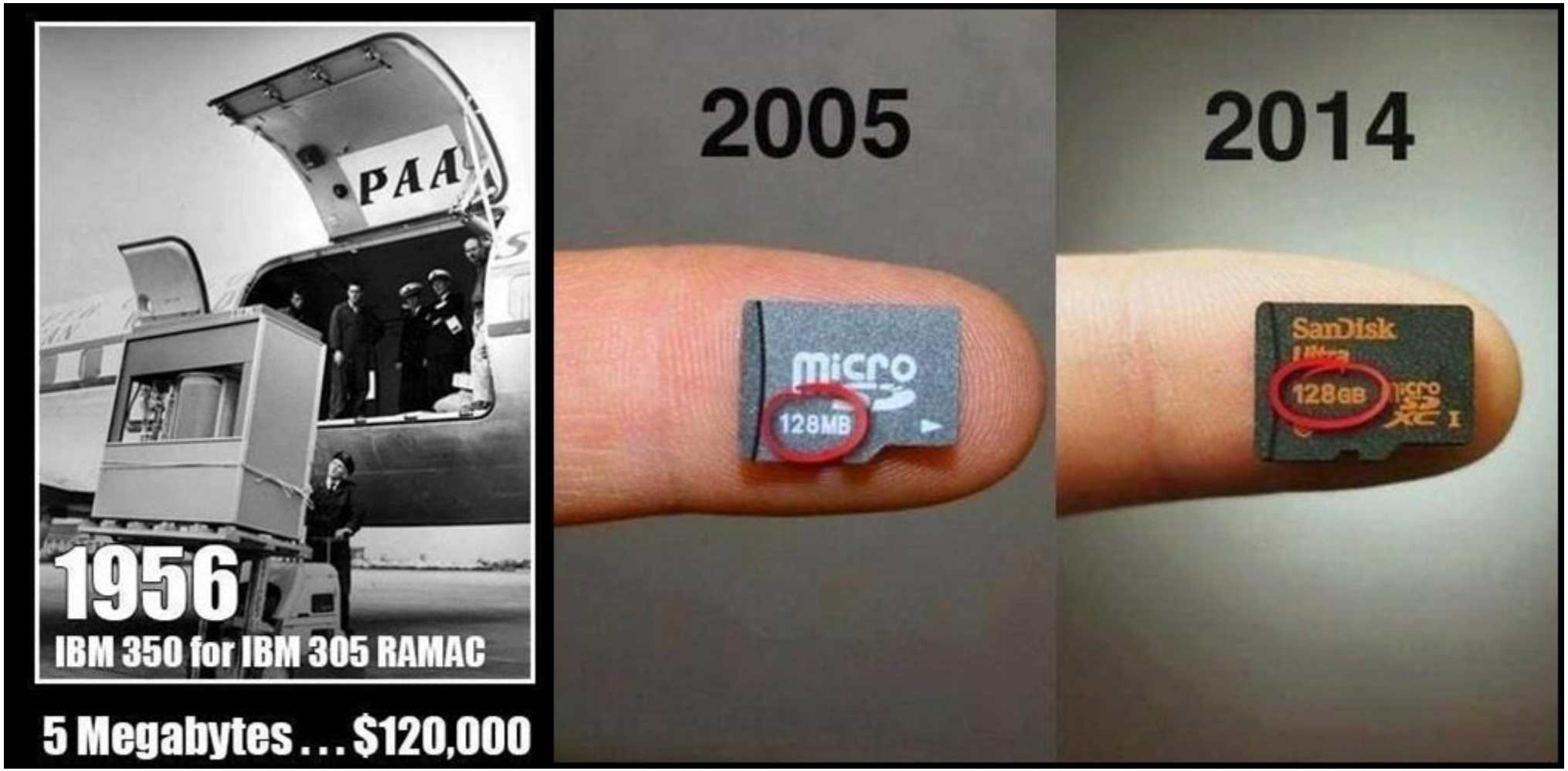
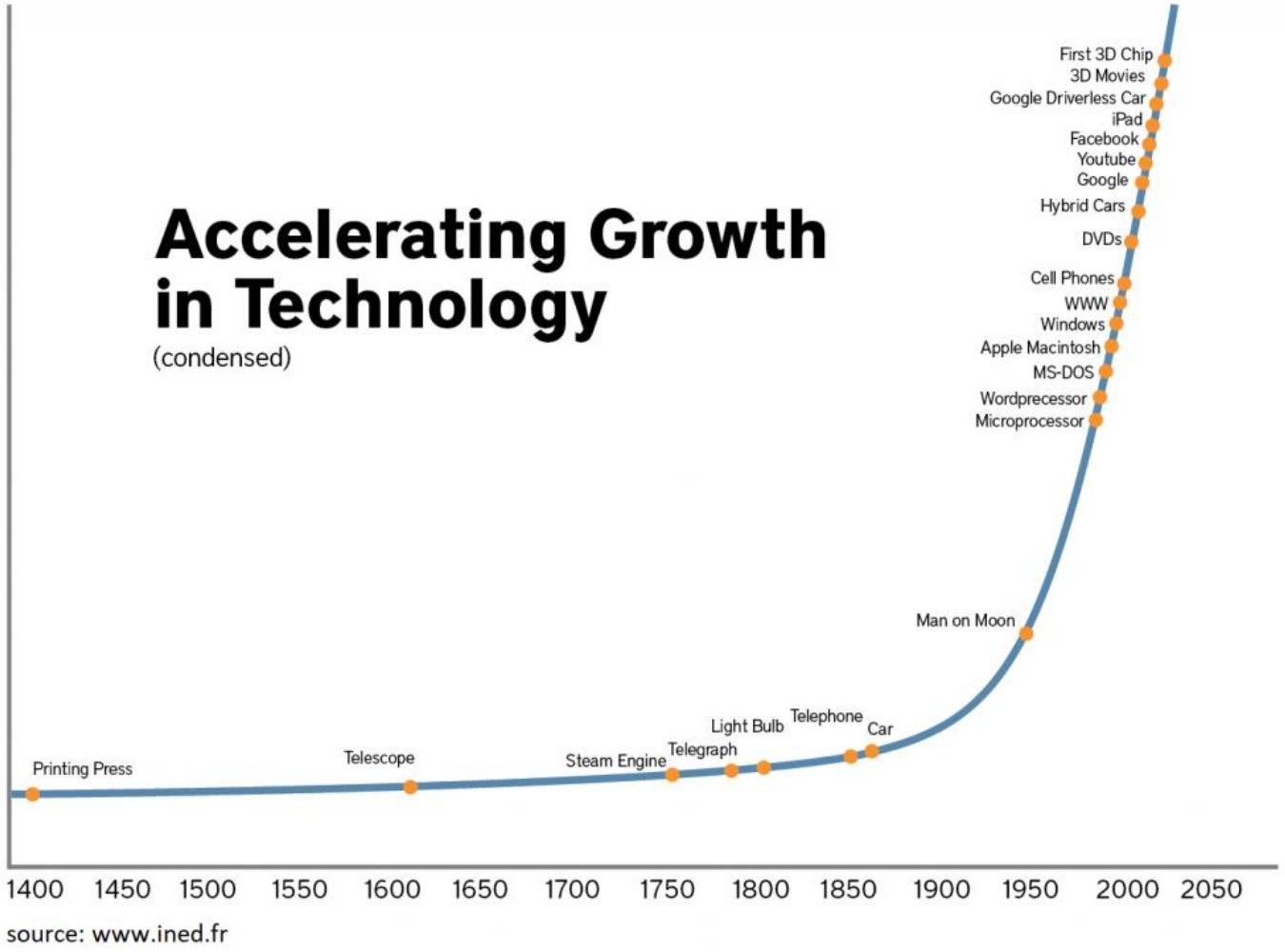
More's Low


1956
IBM 350 for IBM 305 RAMAC
5 Megabytes . . . $120,000
2005
micro
128MB
2014
SanDisk
128GB

Technological Singularity



Kurzweil (2008), The Singularity is Near

AI

Future of Work

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My History with IT

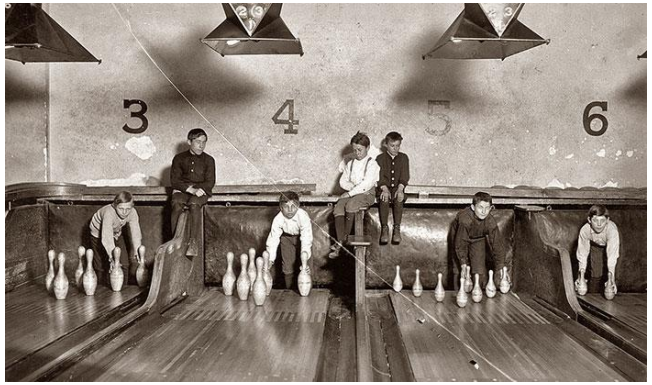
1985

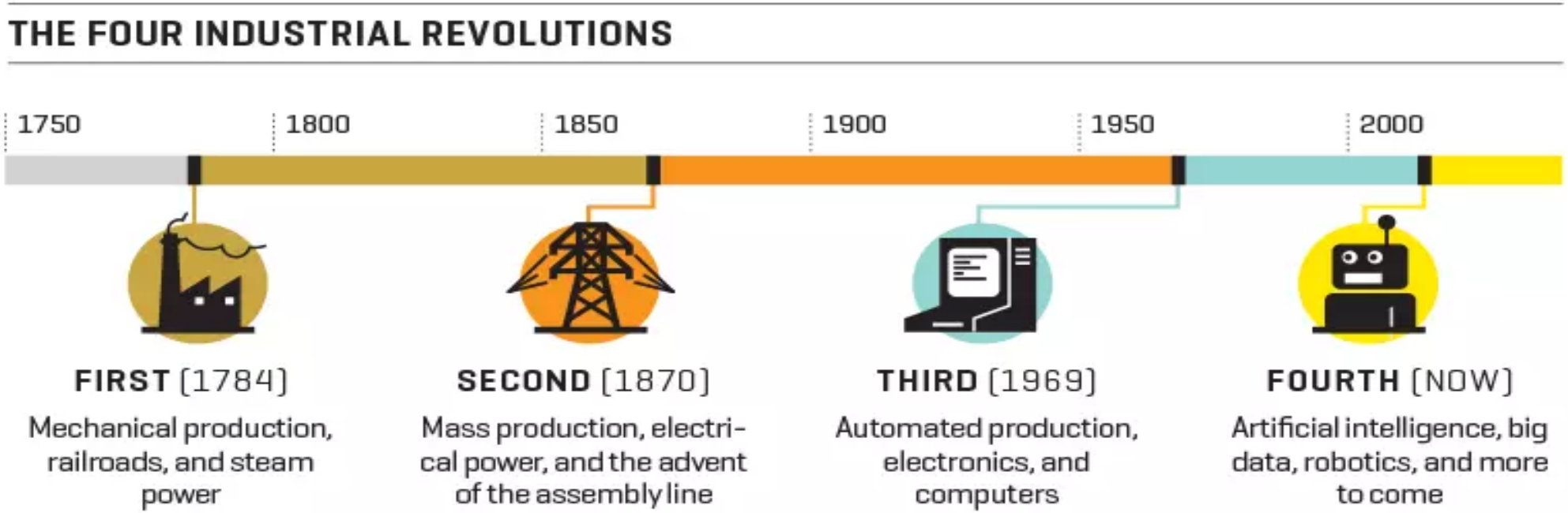
1990

1995

2020

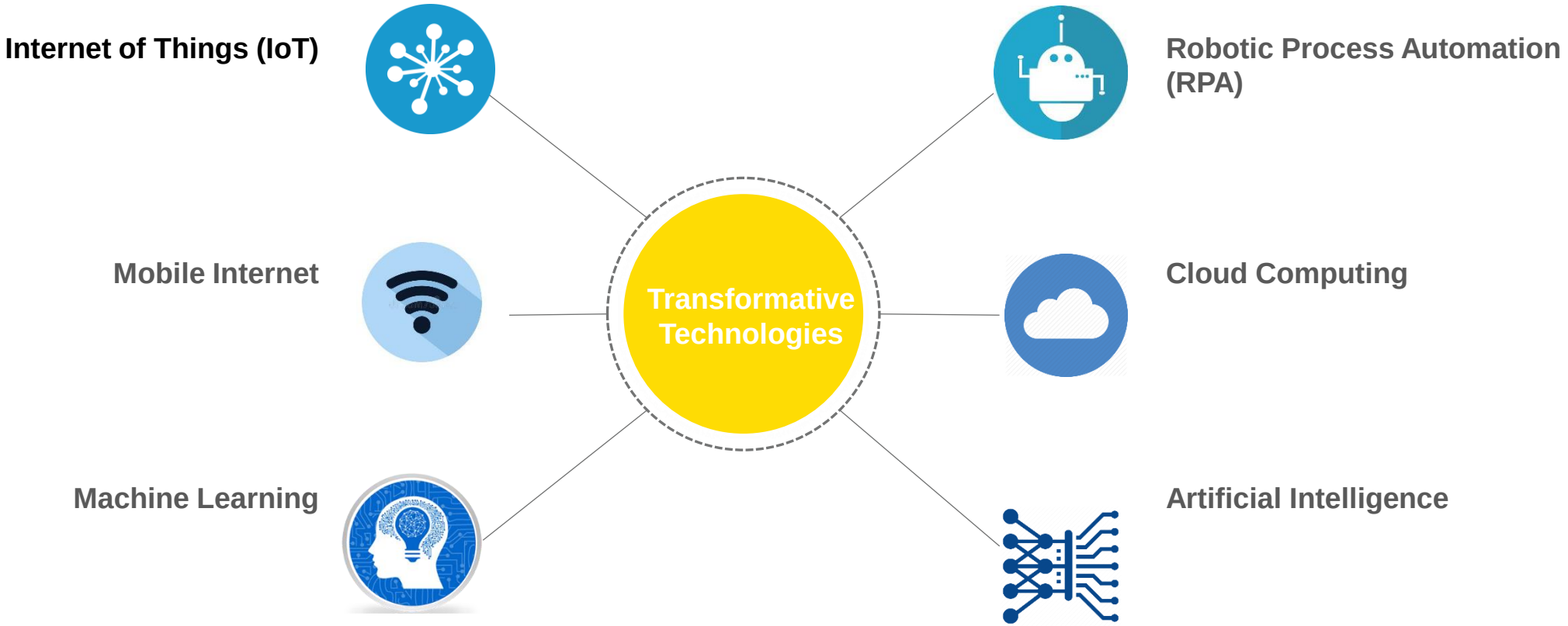
Lost Jobs



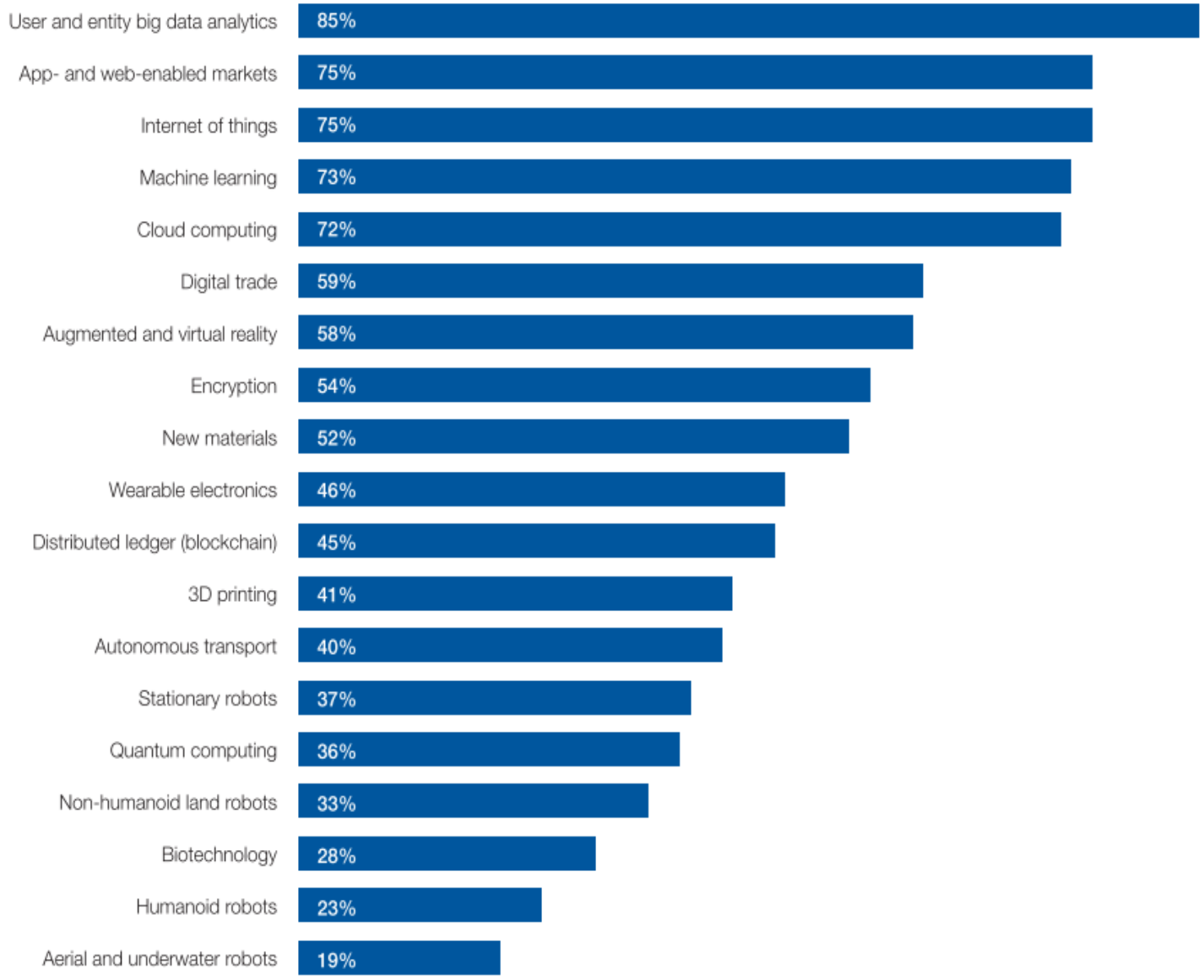


(Piccarozzi et al., 2018)

Digital Transformation



(Manyika et al., 2013)



Source: Future of Jobs Survey 2018, World Economic Forum.

Digital Transformation

Technologies driving change

Schwab, K. (2018). Insight Report: The Future of Jobs Report. *World Economic Forum*

Monday September 04, 2017 A Wally Robot
DO YOU WORRY THAT A ROBOT WILL SOMEDAY TAKE YOUR JOB?
NAH. NO ONE WILL BUILD A ROBOT THAT DOES NOTHING BUT DRINK COFFEE.
IT DOES NOTHING BUT DRINK COFFEE. IT CAN REPLACE 20% OF YOUR WORKFORCE.
I LIKE IT.
@ScottAdamsSays
Dilbert.com
© 2017 Scott Adams, Inc./Dist. by Andrews McMeel

The global shift to a future of work is defined by an ever-expanding cohort of new technologies, by new sectors and markets, by global economic systems that are more interconnected than in any other point in history, and by information that travels fast and spreads wide.

Schwab (2020), WEF The Future of Jobs Report

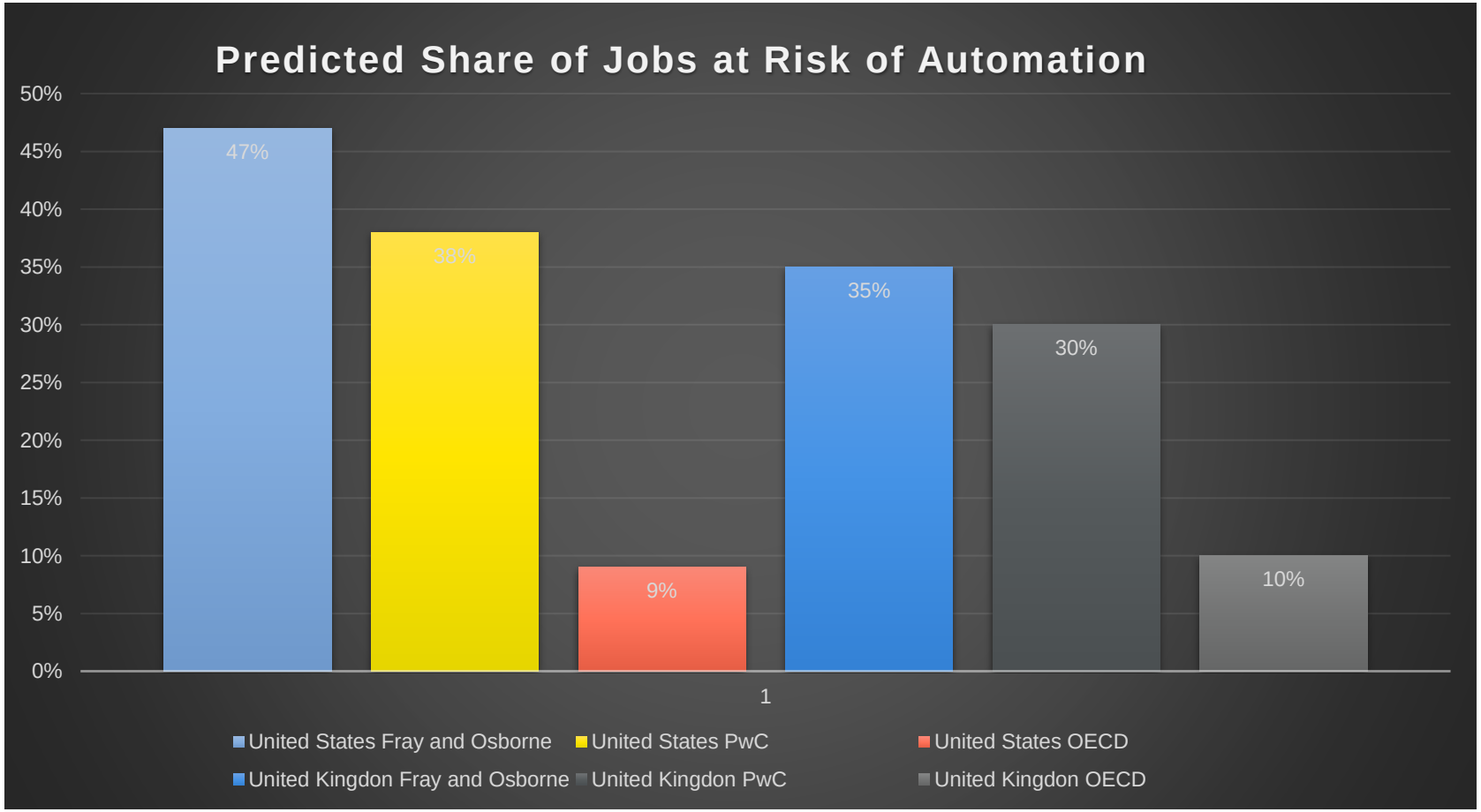
“Machines will be capable, within twenty years, of doing any work a man can do, and hence that new technologies would make many jobs obsolete” (Ernst et al., 2019)

“Automation and digitalization are unlikely to destroy large numbers of jobs. However, low qualified workers are likely to bear the brunt of the adjustment costs as the automatability” (OECD, 2016)

“High-speed mobile internet; artificial intelligence; widespread adoption of big data analytics; and cloud technology—are set to dominate the 2018–2022 period as drivers positively affecting business growth” (WEF, 2018)

“The nature of work will change, and millions of people will require new skills.” (McKinsey, 2013)

Predicted Share of Jobs at Risk of Automation



Statista (Loesche, 2017)

Jobs Lost and Jobs Gained

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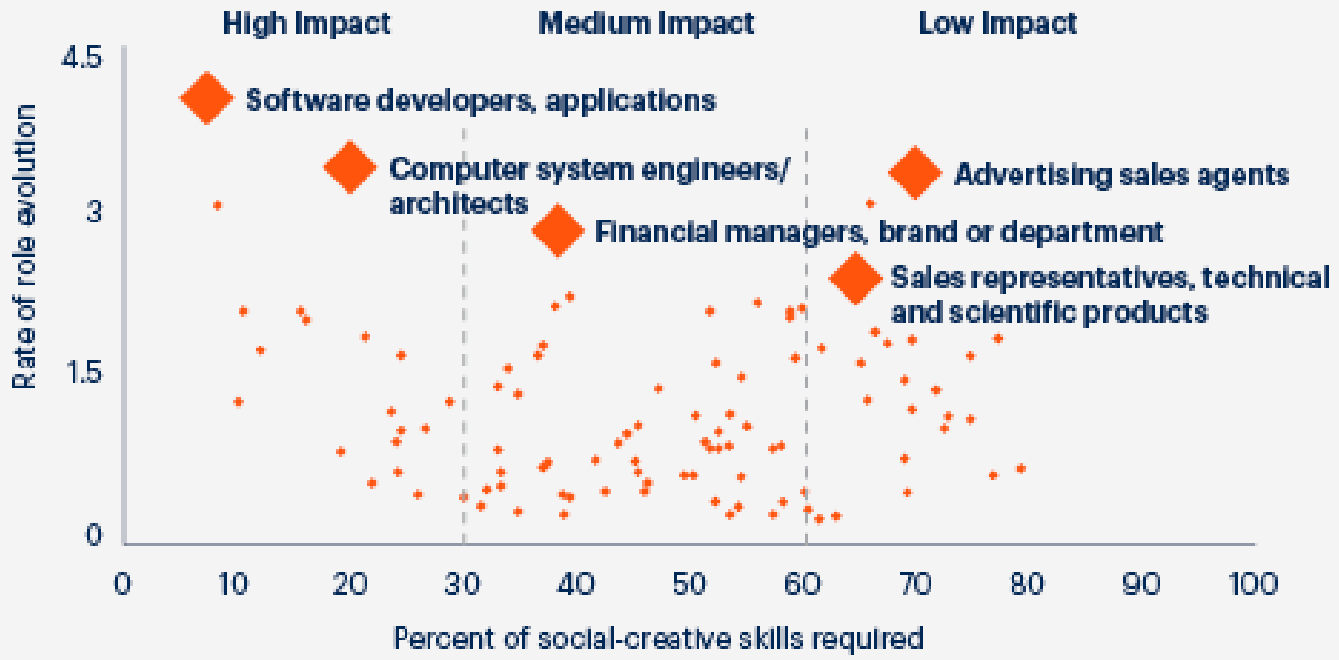
- *“The bank’s accountants who ‘spend a lot of the time basically being an abacus’ will need to find new things to do.”*
- ex - Deutsche Bank CEO John Cryan

Potential Impact of AI on the Top 100 Most In-Demand Roles



Source: Gartner

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Gartner.

Google DeepMind
Challenge Match
8 - 15 March 2016
AlphaGo
ALPHAGO
01:59:54
LEE SEDOL
01:59:02
AlphaGo
Lee Sedol

New and Redundant Roles

New Roles	Redundant Roles
Data Analysts and Scientists	Data Entry Clerks
AI and Machine Learning Specialists	Accounting, Bookkeeping and Payroll Clerks
General and Operations Managers	Administrative and Executive Secretaries
Big Data Specialists	Assembly and Factory Workers
Digital Transformation Specialists	Client Information and Customer Service Workers
Sales and Marketing Professionals	Business Services and Administration Managers

New Roles Redundant Roles

Schwab, K. (2018). Insight Report: The Future of Jobs Report. *World Economic Forum*

Jobs of the future

- Data Analysts and Scientists
- AI and Machine Learning Specialists
- Big Data Specialists Digital
- Digital Transformation Specialists
- Software and Applications Developers and Analysts
- Process Automation Specialists
- Information Security Analysts
- Training and Development Specialist

WEF The Future of Jobs Report

Jobs of the future II

Technology

- Machine-Learning Developer
- Robot Ethicist
- Gamification Designer
- Quantum Computer Programmer
- Ethical Hacker

Data

- Data Farmer
- Data Waste Recycler
- Data Commodities Broker

People

- AI Educator
- Cyborg Psychologist
- Lifelong Education Advisor
- Nostalgist

Business

- Trendwatcher
- AI Intellectual Property Negotiator
- Chief Ethics Officer

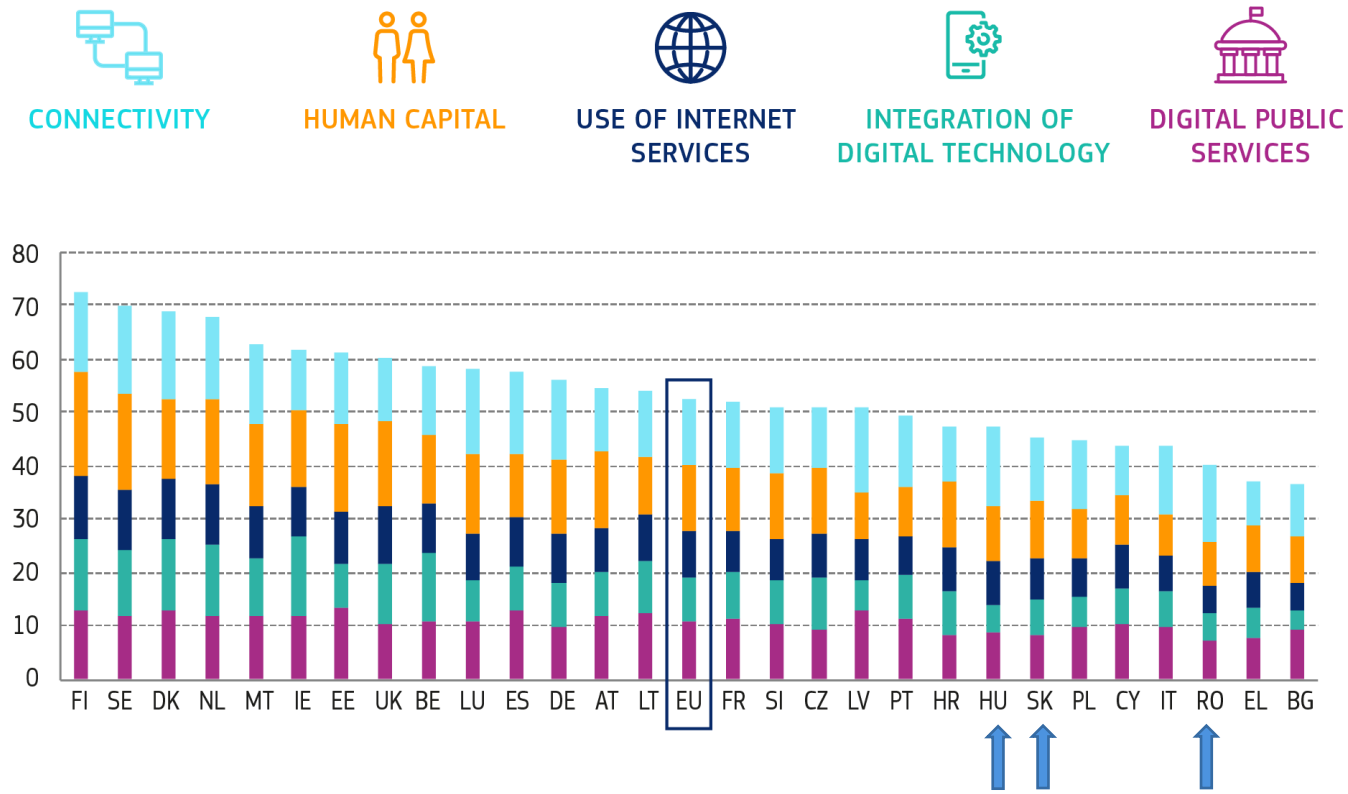
Skills Demand

- Technology design and prog
- Analytical thinking and innovation
- Active learning and learning strategies
- Creativity, originality and initiative
- Critical thinking and analysis
- Complex problem-solving
- Leadership and social influence
- Emotional intelligence

Schwab (2018), WEF The Future of Jobs Report

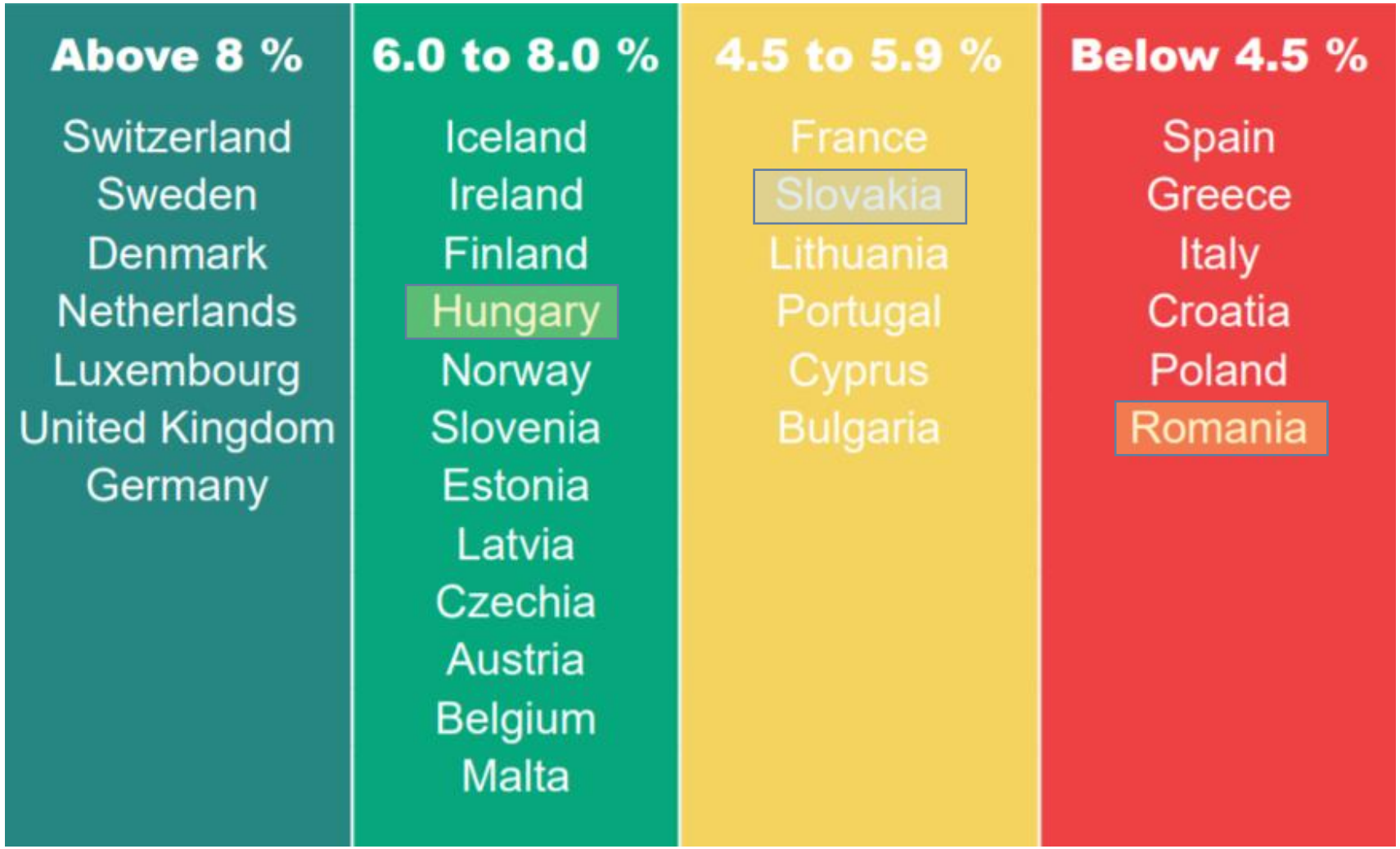
RO, HU, SK

Digital Transformation in Romania



(Eurostat, 2019)

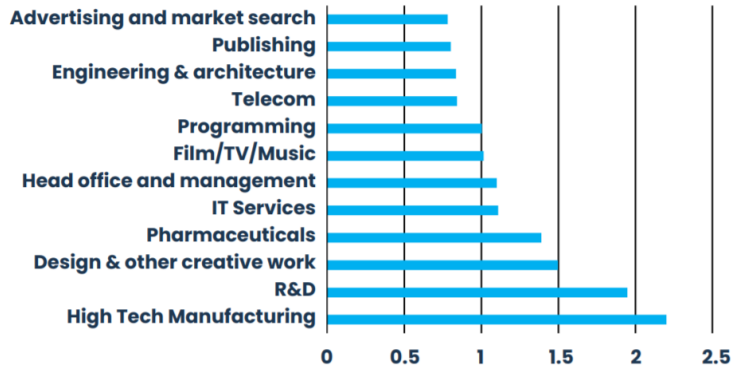
Share of workforce in Brain Business Jobs



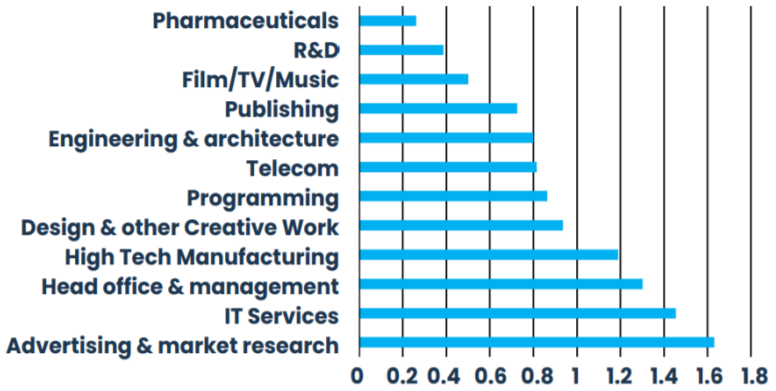
(ECEPER, 2020)

Share of workforce in Brain Business Jobs

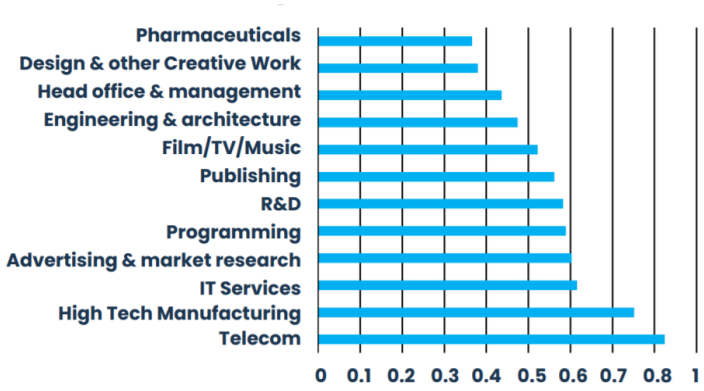
Hungary



Slovakia



Romania



* 1 = EU average

(ECEPER, 2021)

Hungary

- **Compared to the rest of Europe, Hungary is a top performer when it comes to high-tech manufacturing.**

Slovakia

- **The main strength is in IT-services, followed by advertising & market research and high- tech manufacturing. Head office & management is also a strength.**

Romania

- **600,000 jobs will be impacted by the new technologies in Romania. The jobs could contribute to an increase of local Gross Domestic Product (GDP) up to $66 billion by 2029" PwC.**
- **99 700 new Brain Business Jobs, 64% have been created in ICT. The main strength is in telecom, followed by high-tech manufacturing and IT services (ECEPR 2019).**

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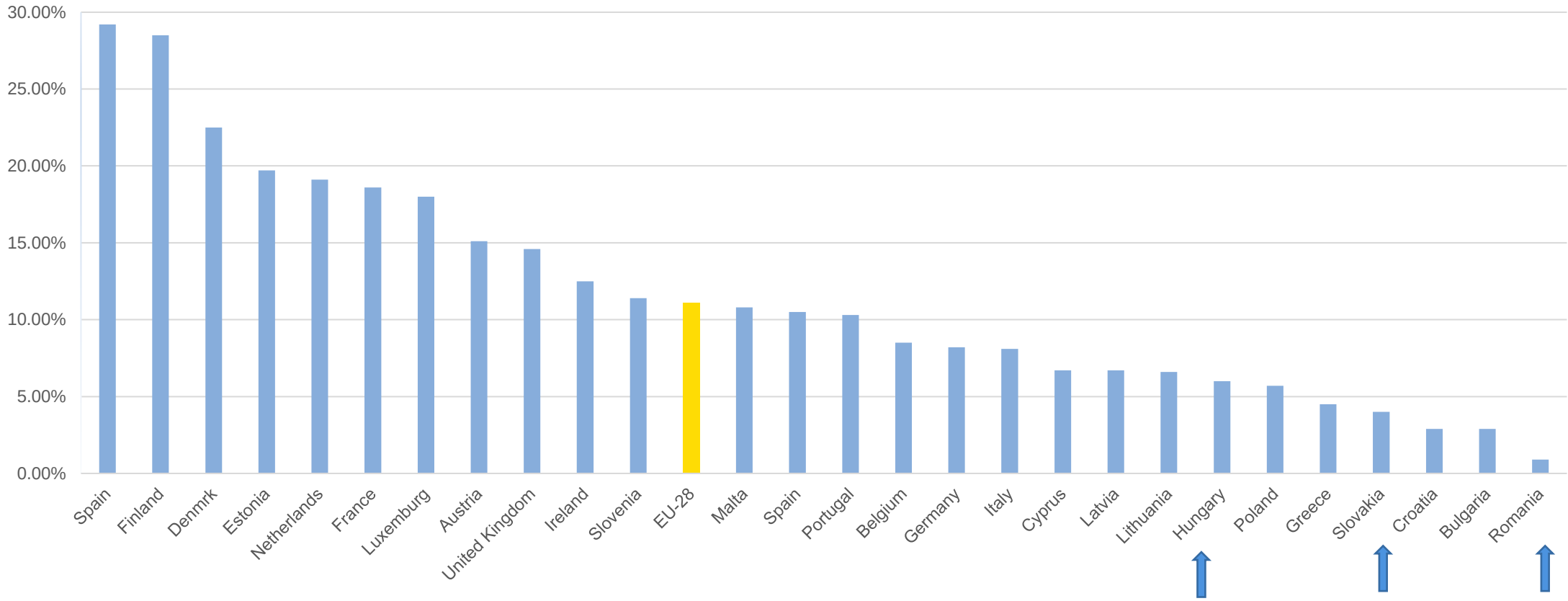
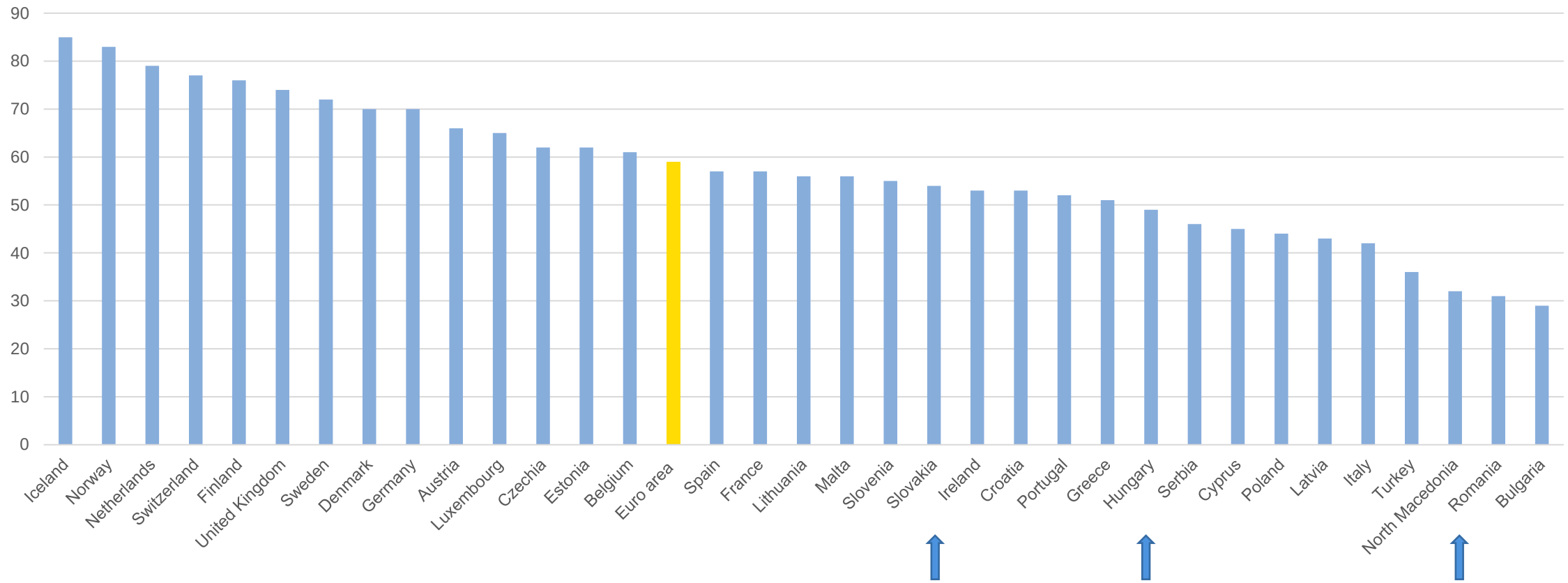
(ECEPER, 2020)

Adult Participation in Lifelong Learning



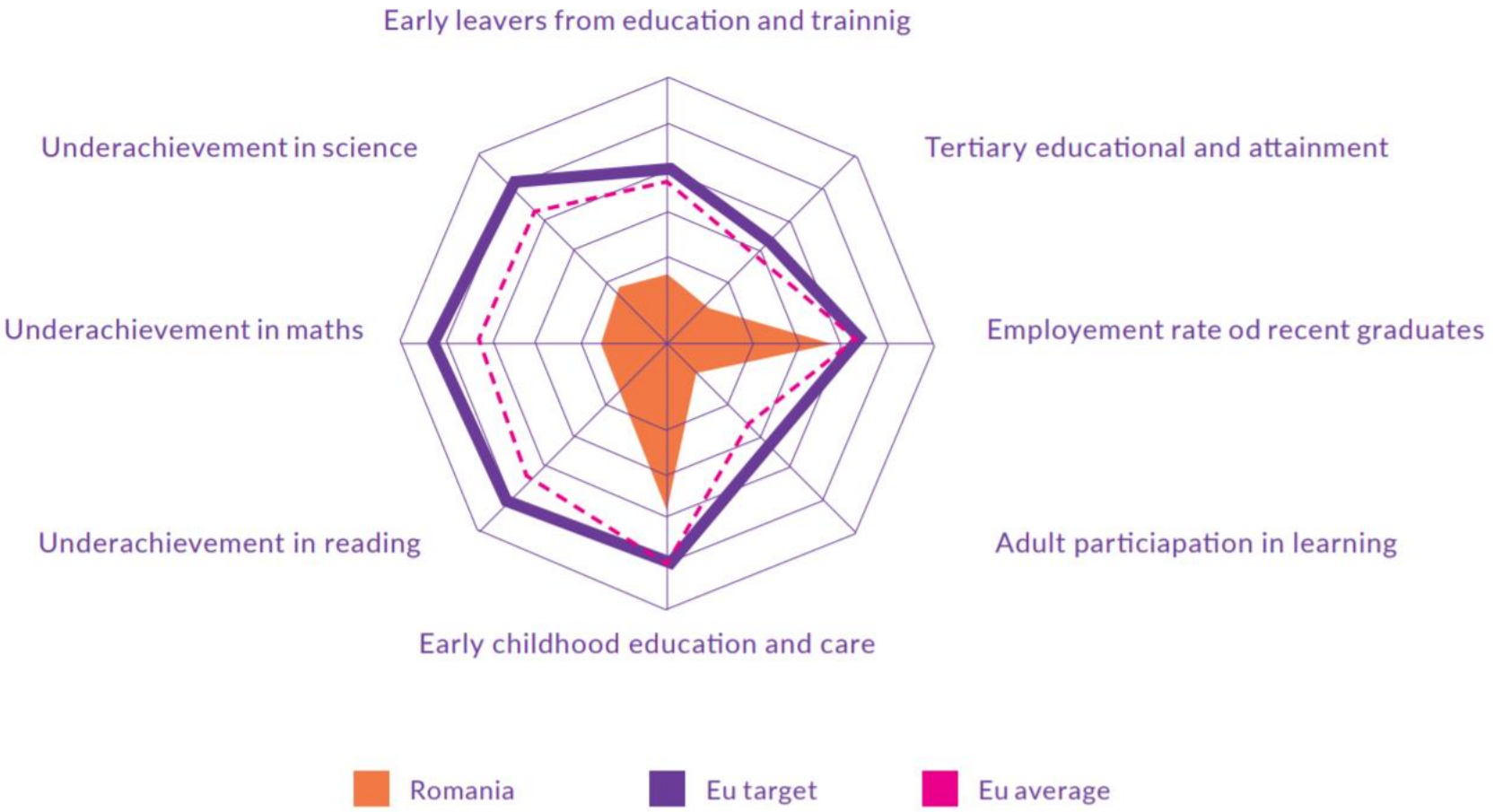
(Eurostat, 2018)

Share of Young People with Basic Digital Skills



(Eurostat, 2019)

Adult Learning Strategies



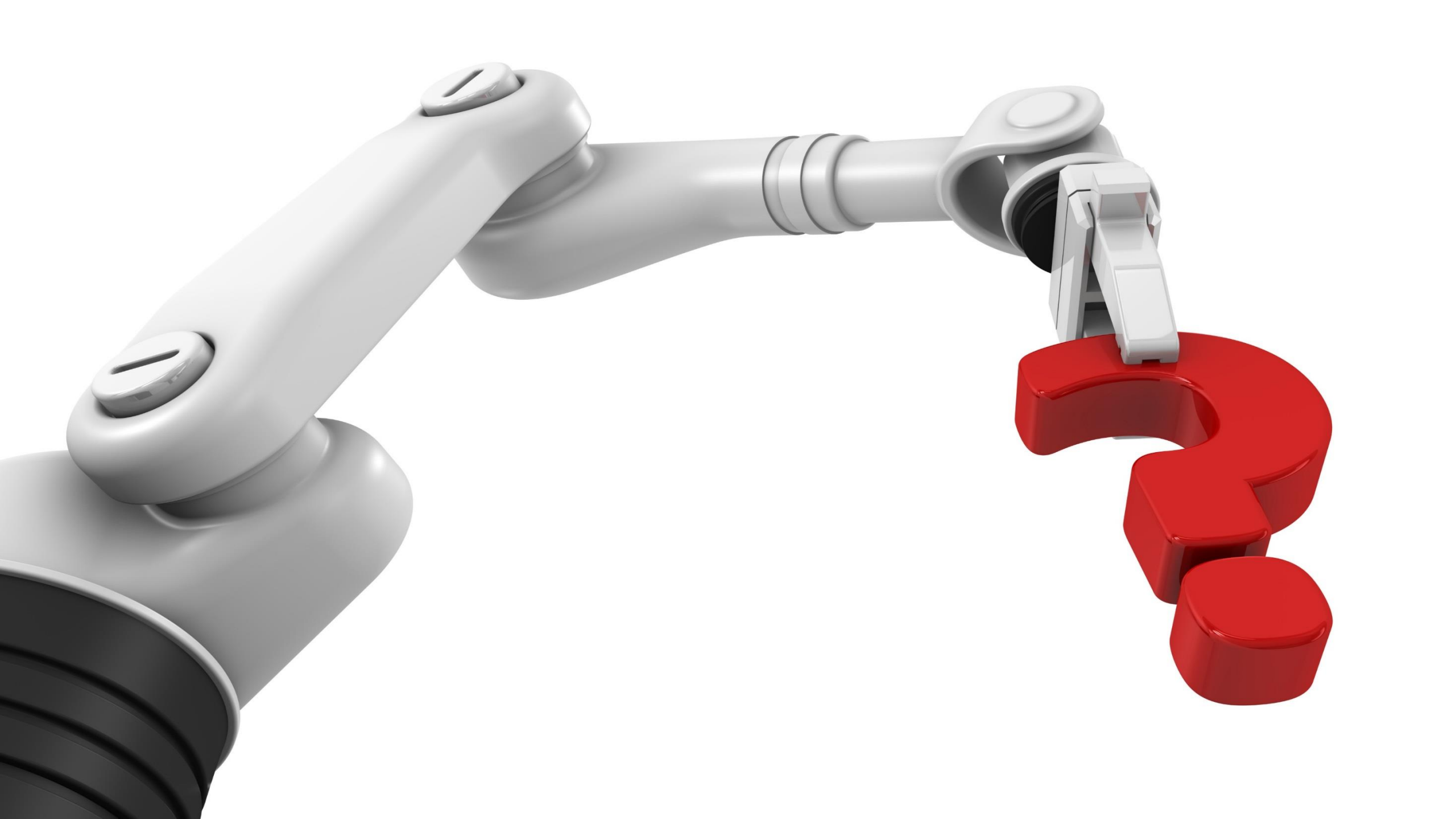
(Erasmus, 2019)

The minute that you're not learning I believe you're dead.

Jack Nicholson

References

- **The Singularity is Near,** Ray Kurzweil
- **The Second Machine Age,** Erik Brynjolfsson
- **The Future of Jobs Report 2020**, World Economic Forum
- **Jobs Lost, Job Gained: Workforce Transitions in Time of Automation,** McKinsey
- **The Risk of Automation for Jobs in OECD Countries,** McKinsey
- **100 Jobs of the Future,** Ford
- **The Geography of Europe's Brain Business Jobs: 2020 Index**, ECEPR



Thank You