

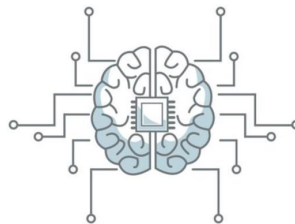
# ***THE NEW MODERN TIMES***

***INTELLIGENT MACHINES AND THE FUTURE OF WORK***

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**1.**

***DO YOU THINK YOUR JOB WILL BE  
REPLACED BY MACHINES IN THE  
NEXT TEN YEARS? WHY?***



**2.**

***WHAT CAN YOU, AS A HUMAN, DO  
BETTER THAN A MACHINE?***



**3.**

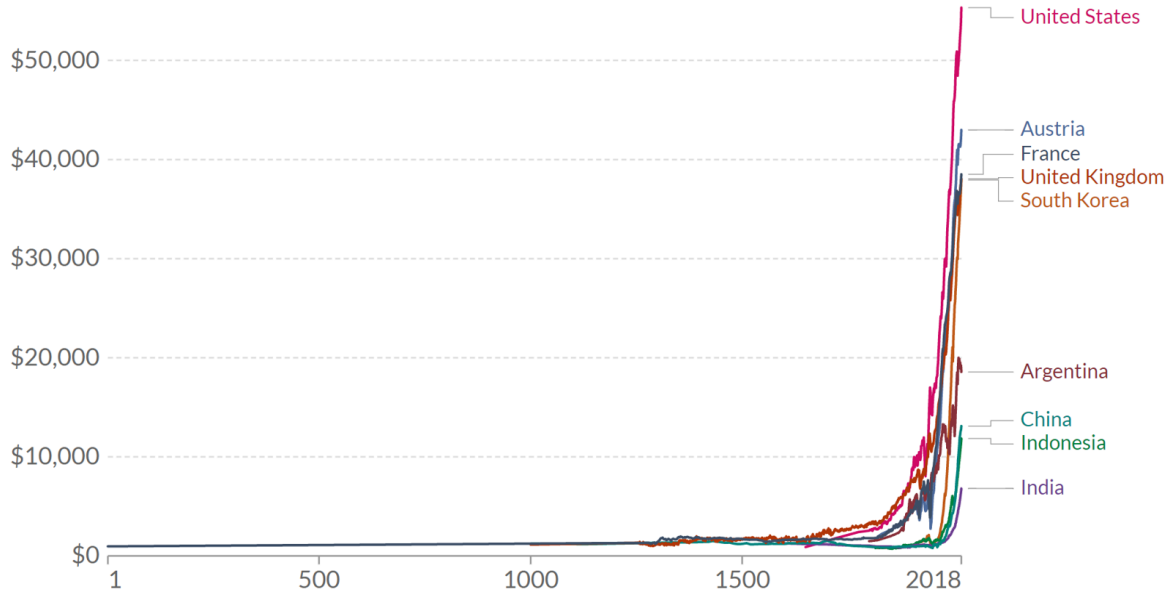
***THINK OF THREE ACTIONS THAT  
SOCIETY, BUSINESSES, AND  
POLICYMAKERS CAN TAKE TO FOSTER A  
BRIGHT, INCLUSIVE FUTURE OF WORK***

## ***COMMON NARRATIVES***

- |                                                                                                      |                                                                   |                         |
|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------|
| × <b>Question 1.</b>                                                                                 | × <b>Question 2.</b>                                              | × <b>Question 3.</b>    |
| × Yes, machines are getting smarter and surpassing human performance in a variety of (complex) tasks | × Well, I can be creative, have social relationships and the like | × Hmm... I have no idea |

## GDP per capita, 1 to 2018

GDP per capita adjusted for price changes over time (inflation) and price differences between countries – it is measured in international-\$ in 2011 prices.



Source: Maddison Project Database 2020 (Bolt and van Zanden (2020))

OurWorldInData.org/economic-growth • CC BY

# First industrial Revolution

18th/19th century **1.0**

1800

1850

1900

1950

2000

2050

**QUICK CHANGE OF PRODUCTION TECHNOLOGIES  
AND, ACCORDING TO THIS,  
NEW SOCIAL-ECONOMIC STRUCTURES**



# Second industrial Revolution

19th century **2.0**

1800

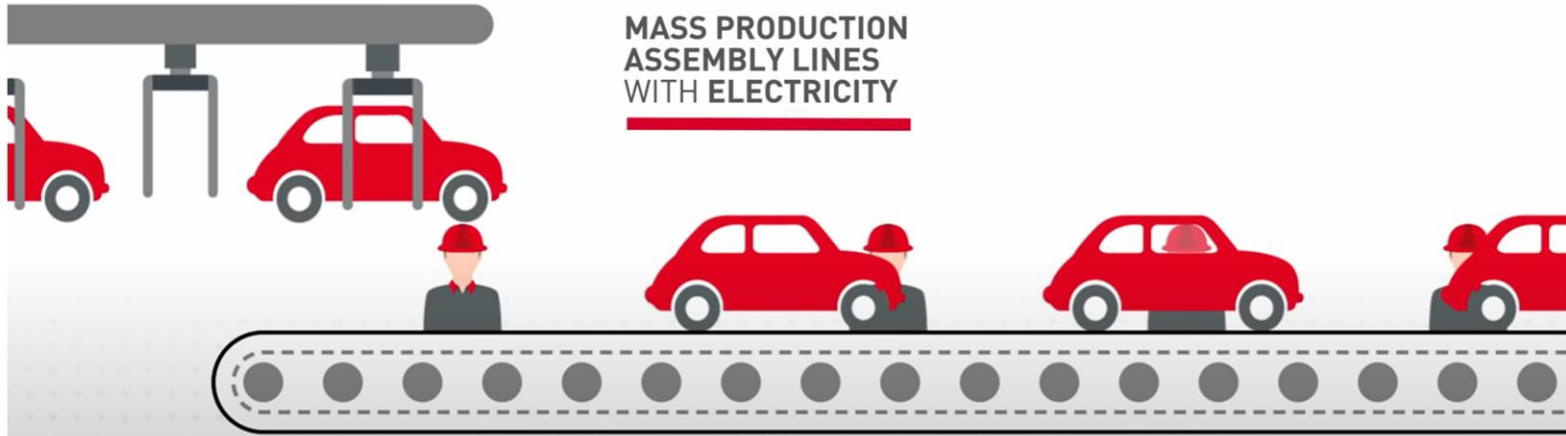
1850

1900

1950

2000

**MASS PRODUCTION  
ASSEMBLY LINES  
WITH ELECTRICITY**



# Third industrial Revolution

20th century **3.0**

1800

1850

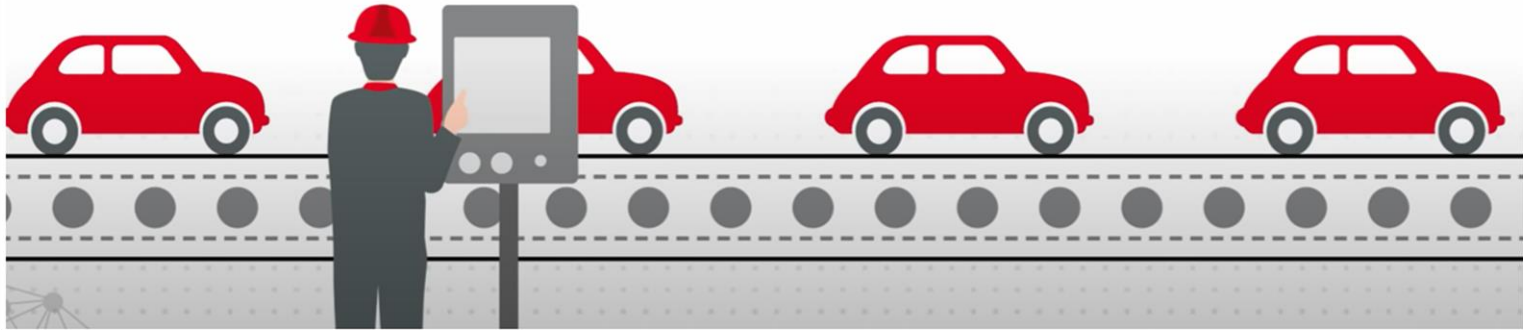
1900

1950

2000

2050

PARTIALLY AUTOMATED  
PRODUCTION USING  
ELECTRONICS AND IT



# Fourth industrial Revolution

Now **4.0**

1800

1850

1900

1950

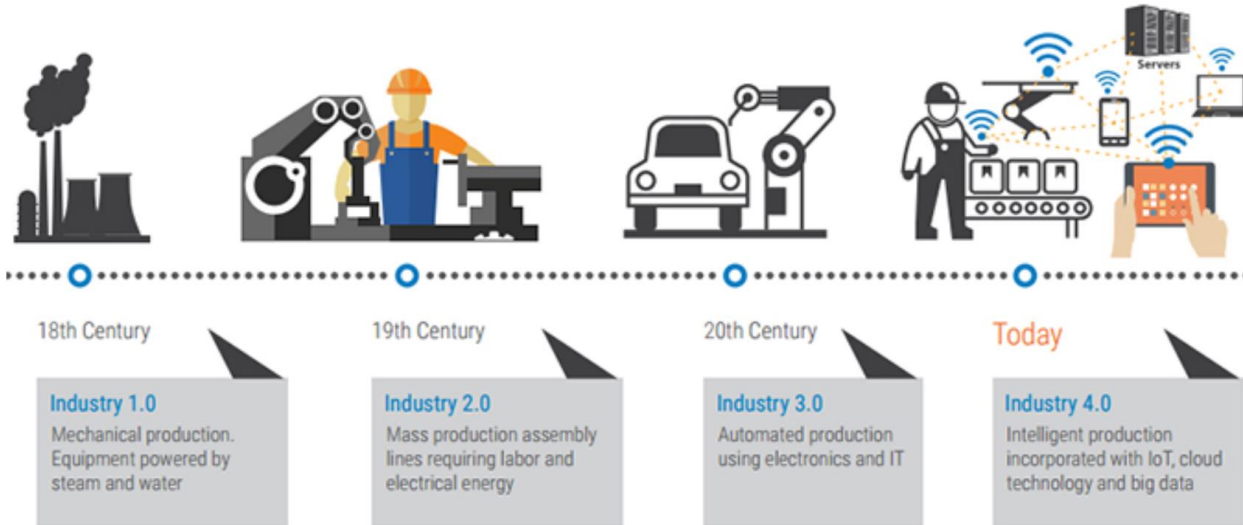
2000

2050

**CYBER-PHYSICAL SYSTEMS ARE INTELLIGENT,  
CONNECTED INDUSTRIAL PRODUCTION  
AND LOGISTICS UNITS  
WHO ARE ABLE TO COMMUNICATE TOGETHER**



# TWO CENTURIES IN ONE SHOT



CREDIT: CORPORATE WEB TECHNOLOGIES (2020)

# ***THE SECOND MACHINE AGE***

1. Production controlled by machines
2. Real-time
3. Individualisation



Uber



## ***WHAT EFFECTS***

- × **On the future of work**
  - × ↓ Manual hard work
  - × ↓ Repetitive, monotonous tasks
  - × Job replacement, new skillset, changes in remuneration
- × **On the organisation of work**
  - × ↓ Cost of labour
  - × ↑ Productivity
  - × Organisational changes and re-structuring

# ***WILL MACHINES TAKE OUR JOBS?***

Cognitive tasks vs. Manual tasks vs. Repetitive tasks

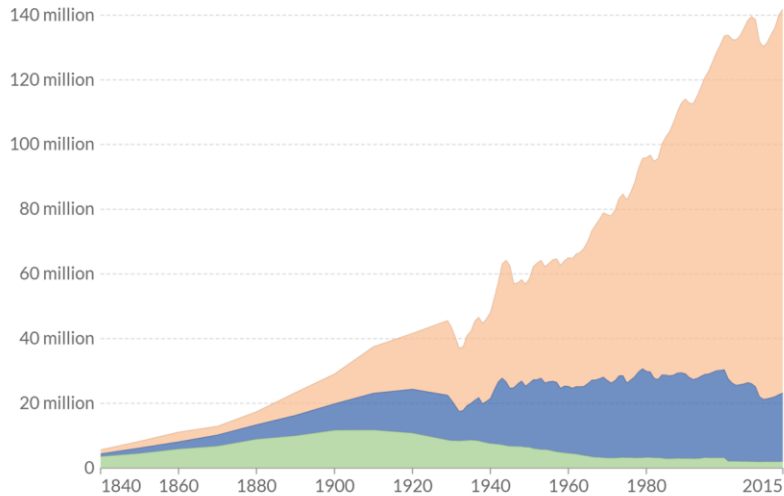
- × Previous waves of automation → Low skilled workers
- × Computerisation in the 80s → Job polarisation
- × Intelligent machines now → No clear-cut empirical evidence

We can safely predict a continuous movement of employees into the third service sector

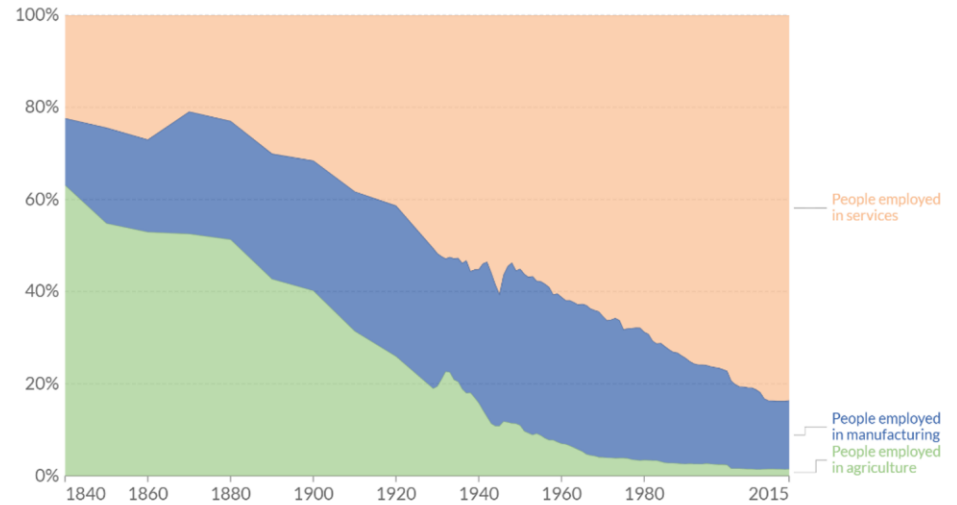
## Employment by economic sector, United States, 1840 to 2015

Number of people employed by economic sector.

Our World  
in Data



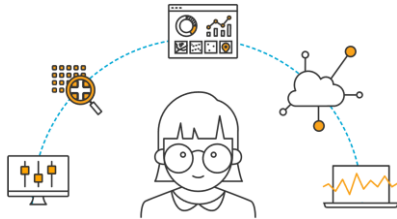
Source: Our World In Data based on Herrendorf et al. (2014)



# ***SOME JOBS WILL EMERGE***

- × Data scientists

e.g., data analytics,  
big data developers,  
data artists, etc.



- × Non-routine  
manual  
occupations

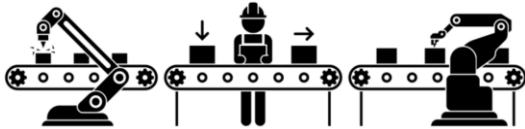


- × Crowd-workers  
and teaching  
professions



# ***SOME JOBS WILL DISAPPEAR***

- × High-routine manual occupations



- × Hard manual work



- × High-routine NOT manual occupations



## ***FOR SOME JOBS WE DON'T KNOW (YET)***

× Lawyers and judges

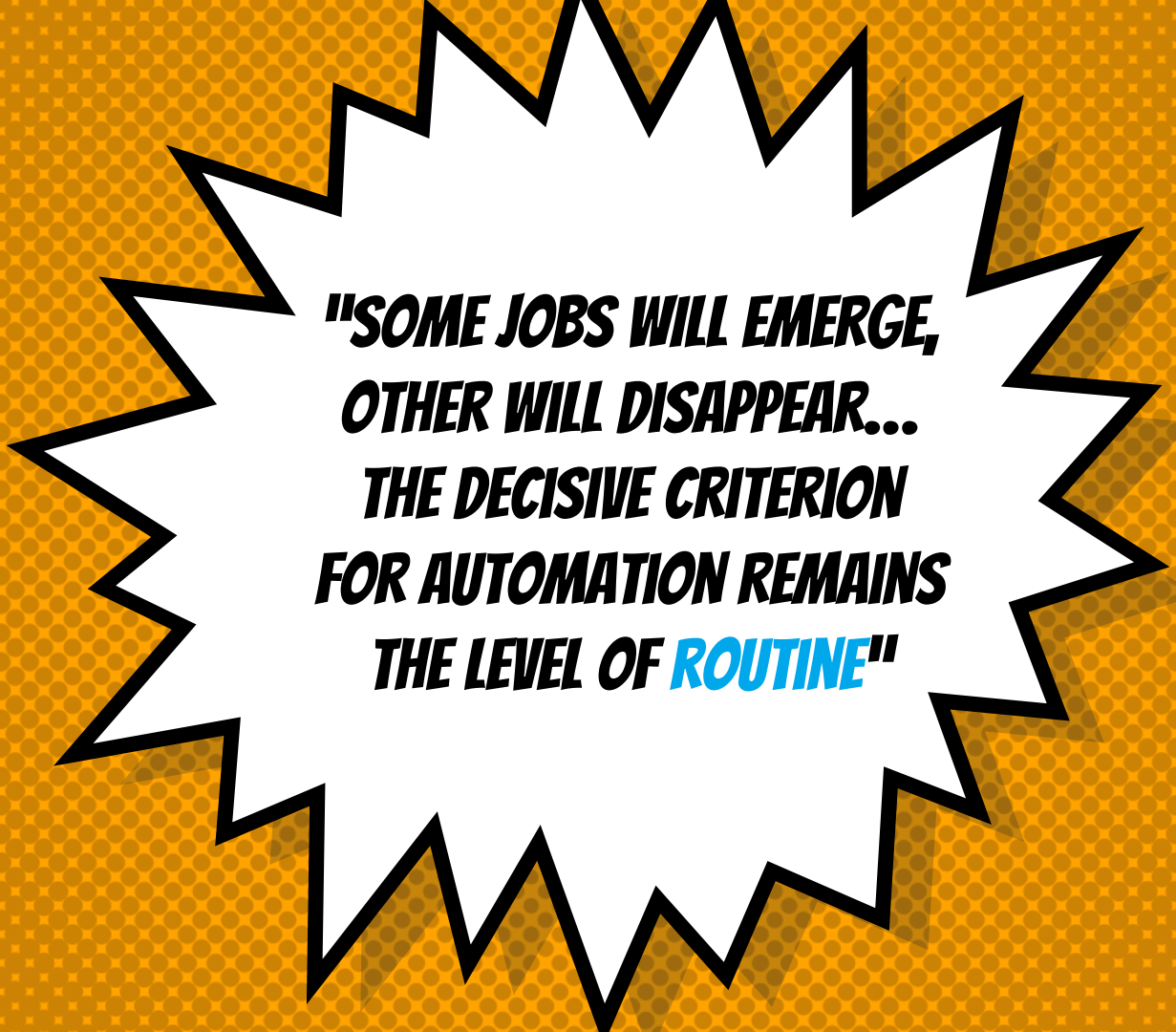


× Doctors and nursing staff



× Humanistic and artistic professions





***"SOME JOBS WILL EMERGE,  
OTHER WILL DISAPPEAR...  
THE DECISIVE CRITERION  
FOR AUTOMATION REMAINS  
THE LEVEL OF ROUTINE"***

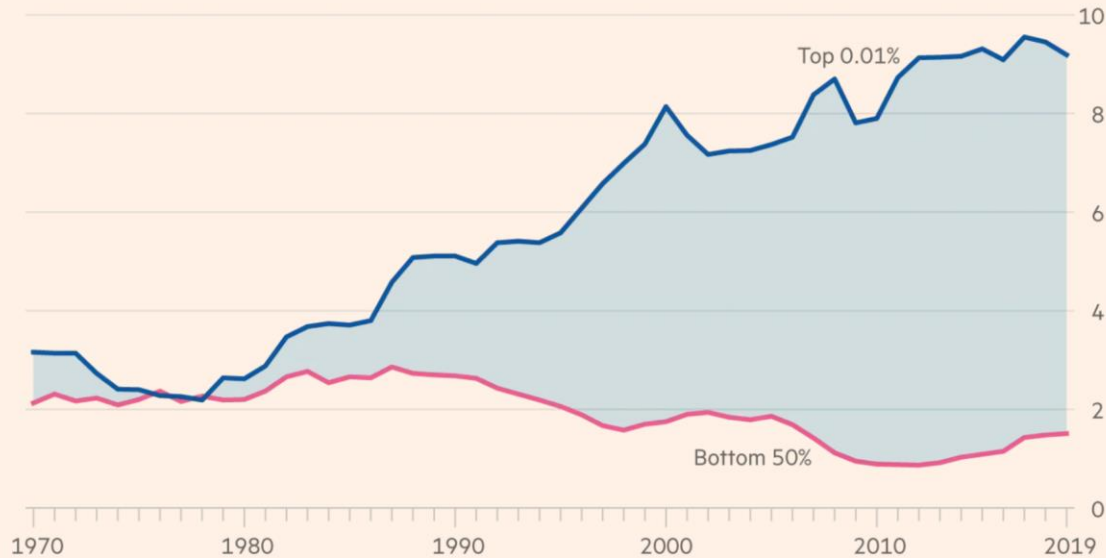
## ***WILL MACHINES BRING **INEQUALITY** IN THE JOB MARKET?***

- × Wage polarisation (?)
- × ↑ Gap between rich and poor
- × ↑ Super-rich people
- × Integration of untrained works and “old generation”

Yes, inequality seems to be increasing!

## Inequality has been rising in the US since the 1970s

Share of US net personal wealth (%) held by groups across the wealth distribution



Source: World Inequality Database

© FT



# **WHAT PUBLIC POLICY CAN DO**

## **Education system**

Schools and universities

*"should not teach the world as it was, but as it will be"*

## **Unconditional basic income**

Social security may compensate for the elimination of jobs

## **Maximum working hours**

Governments may reduce the maximum working hours by law

## **Tax for the use of machines**

Governments may introduce new forms of taxes (e.g. robot tax) to discourage the massive use of machines

## **Human quota**

Governments may introduce a kind of "human quotas" in different sectors

## **"Made by humans"**

Governments may introduce some sort of "made by humans" label for responsible consumption



**"INEQUALITY HAS BEEN  
INCREASING BUT *POLICY*  
CAN PLAY AN  
IMPORTANT ROLE"**

## ***WILL MACHINES CHANGE THE ORGANISATION OUR WORK?***

- × New organisational forms
- × Individual workplace
- × Individual working-time
- × Remuneration options
- × Health and safety issues

Yes... and many changes are already occurring!

## ***ORGANISATIONAL FORMS***

- × ↑ Job outsourcing and self-employment

e.g., Software and programming services



- x ↑ Virtual working groups

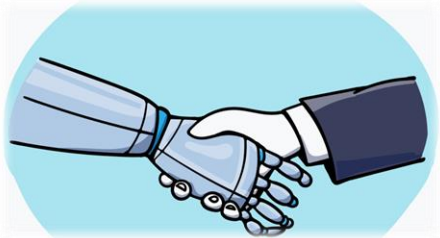


- × ↑ Inclusive work  
e.g. Integration of disabled people



# WORKPLACE

- × ↓ Spatial separation between humans and machines



- × “Latte macchiato” syndrome



- × ↓ Border between professional and private life



# ***WORKING-TIME***

× ↑ Flexibility



× “Always-ON”  
work culture



× Trust-based  
working hours



# REMUNERATION OPTIONS

- × ↓ Piece wage and extra-work allowances



- × ↑ Performance-linked payment



- × “Lump-sum” payment



# HEALTH AND SAFETY AT WORK

× ↓ Serious physical injuries



× ↑ Symptoms of poor posture



× ↑ Mental health disorders

e.g. social relations,  
job insecurity



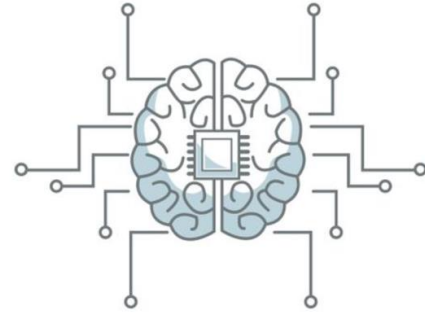


***"COVID19 HAS SPEEDED  
UP MANY OF THESE  
CHANGES"***

## ***COVID19 AND THE FUTURE OF WORK***

- × ↑ Job destruction – Automation accelerates and won't be reversed
- × ↓ Job creation – Social sector badly hit
- × ↓ Social contacts – “New normal” (?)
- × ↑ Wealth of digital entrepreneurs

# ***THANKS!***



Any questions?

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