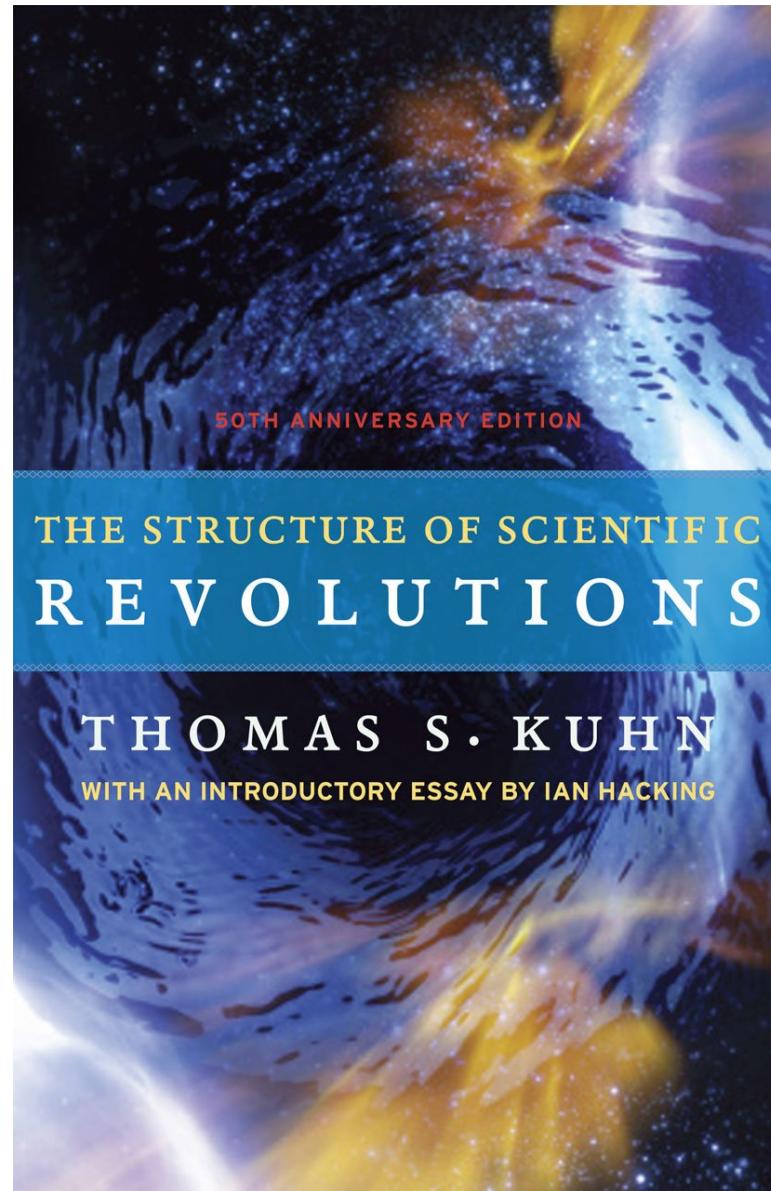
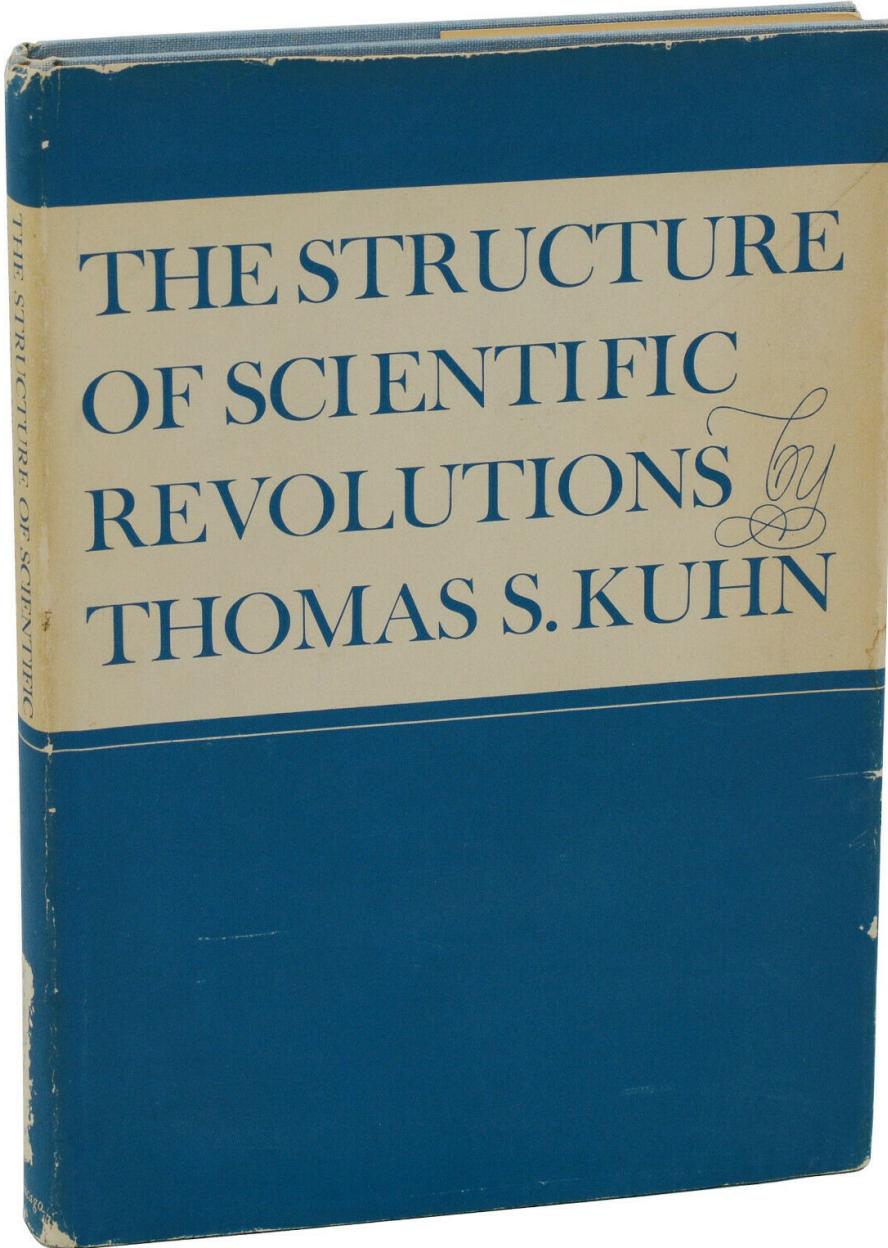


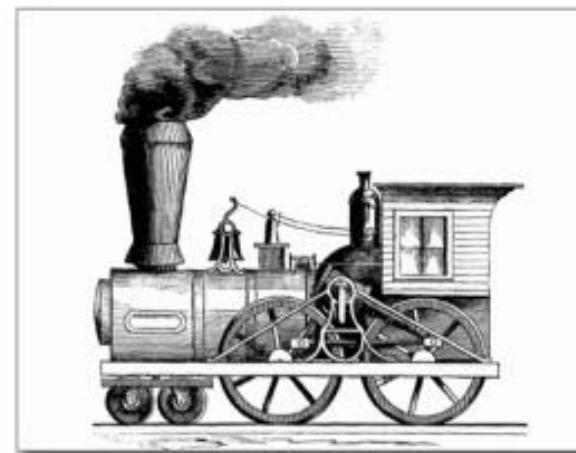
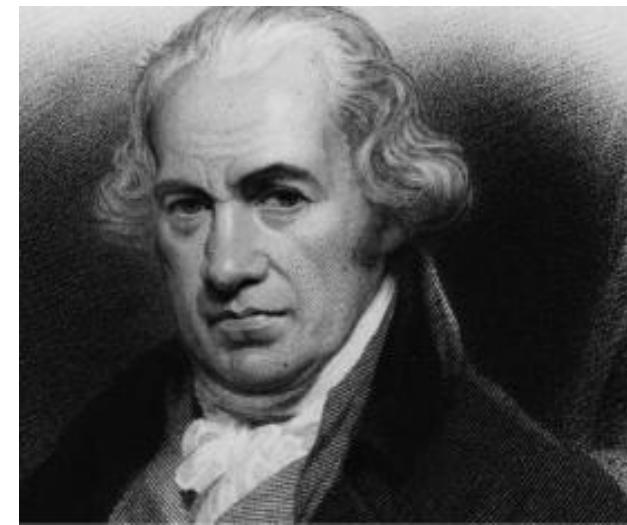
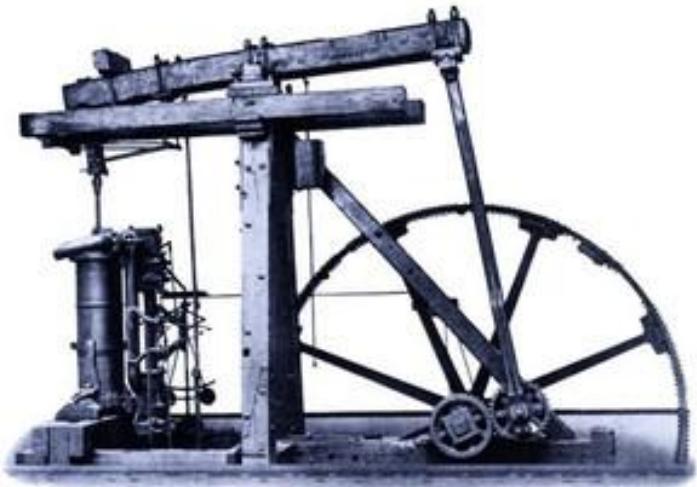
*Jump into the 21<sup>st</sup> Century*

# Hybrid Reality

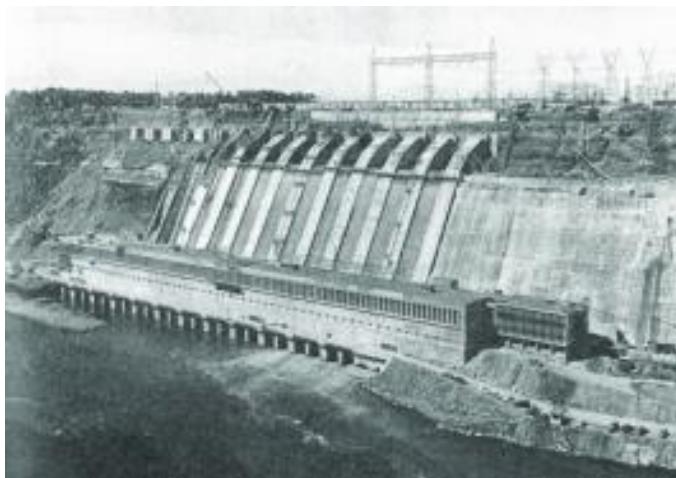
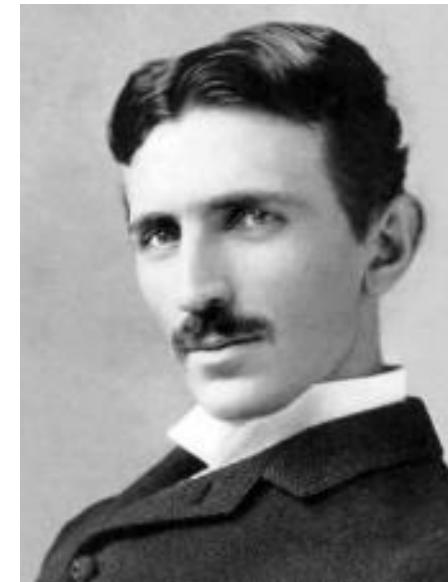
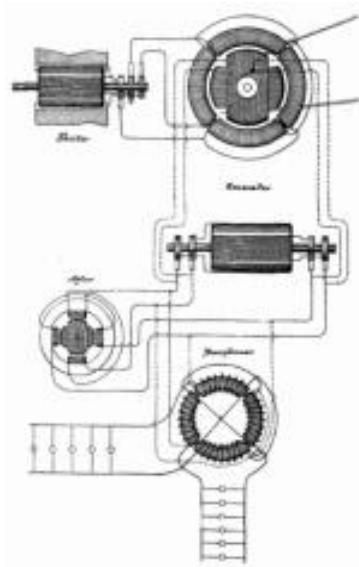




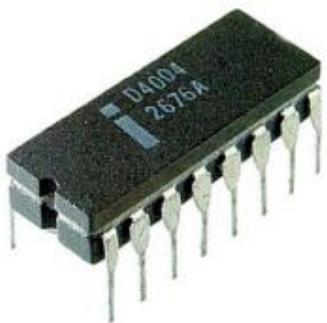
# 1. Industrial Revolution



## 2. Industrial Revolution



### 3. Industrial Revolution



1971.

2015.



## 4. Industrial Revolution



### 1st Industrial Revolution **WATER & STEAM**

Steam and water power replace human and animal power with machines.



### 2nd Industrial Revolution **ELECTRICITY**

Electricity, internal combustion engines, airplanes, telephones, cars, radio, and mass production.



### 3rd Industrial Revolution **AUTOMATION**

Electronics, the internet and IT used to further the automation of mass production.



### 4th Industrial Revolution **CYBER-PHYSICAL SYSTEMS**

Driverless cars, smart robotics, materials that are lighter and tougher, and a manufacturing process built around 3D printing.



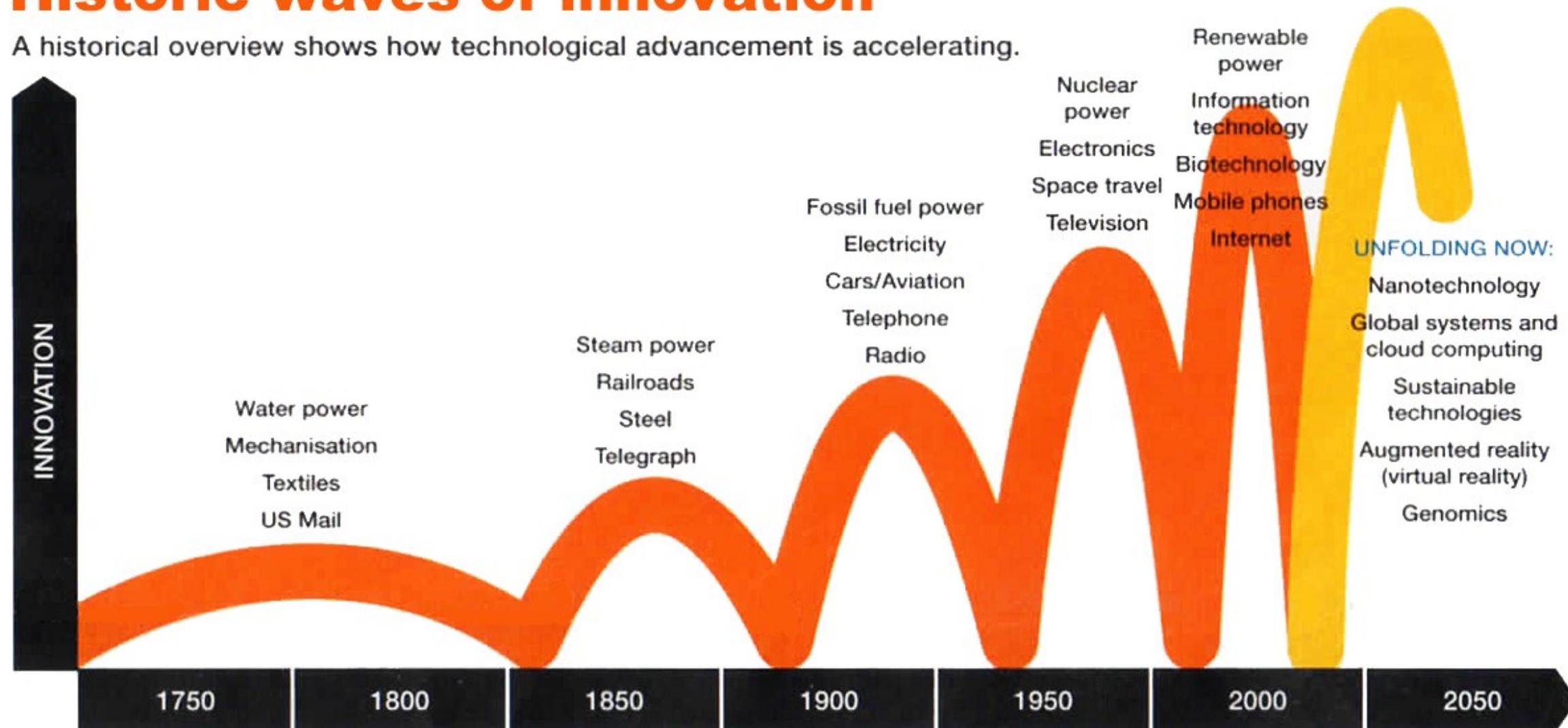
## **Klaus Martin Schwab**

We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society.



# Historic waves of innovation

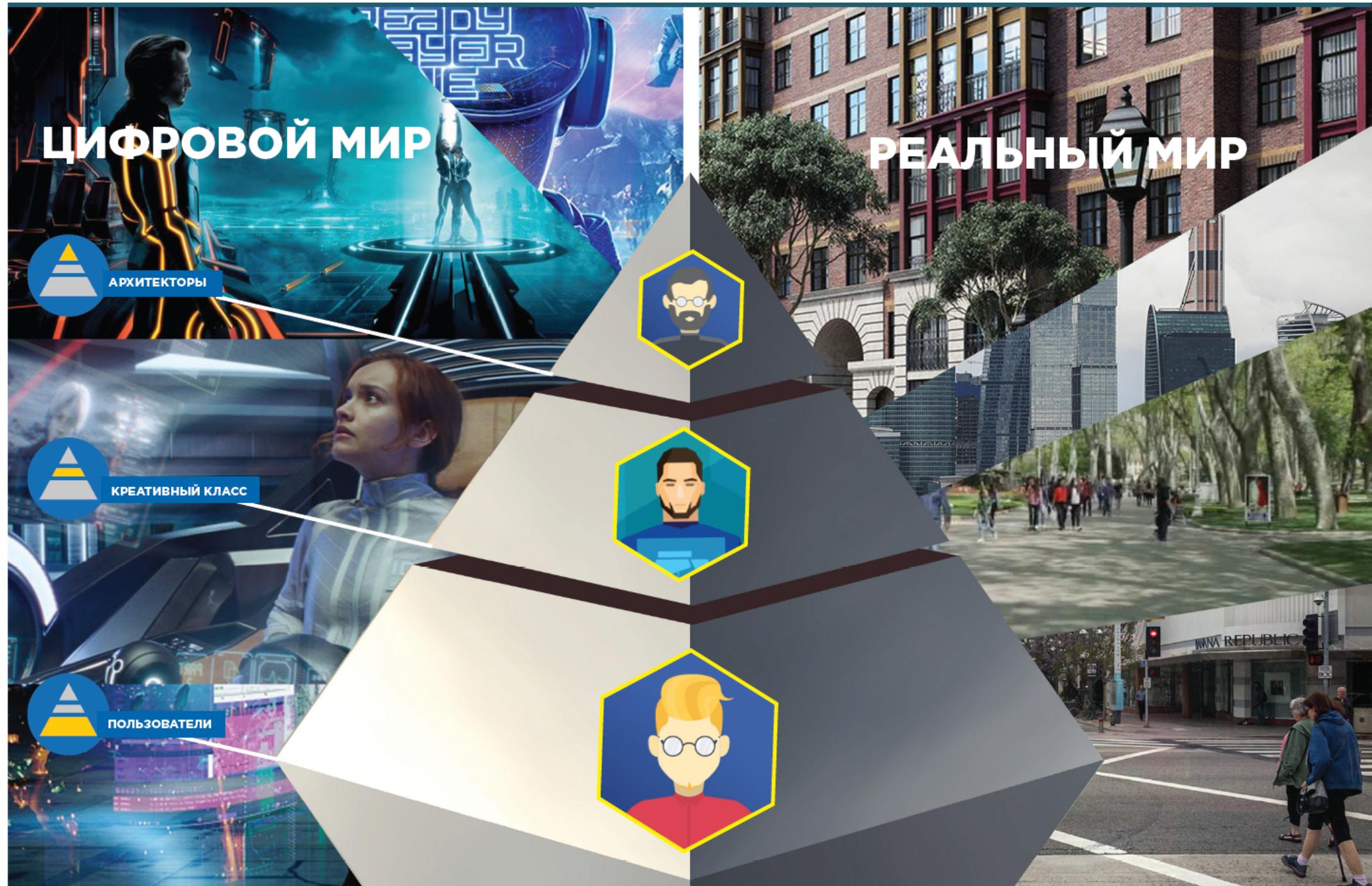
A historical overview shows how technological advancement is accelerating.

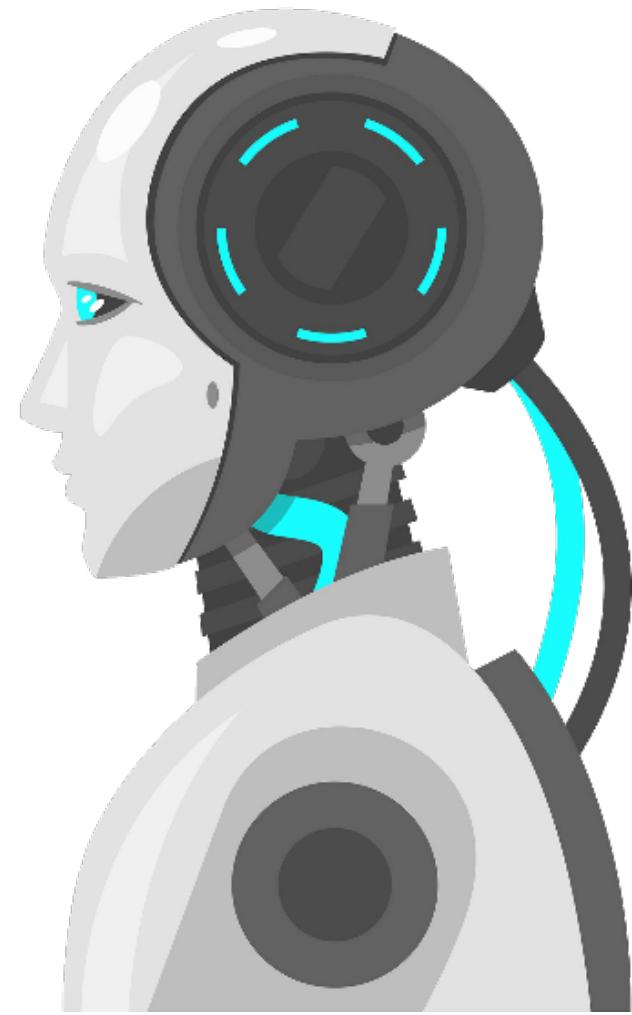


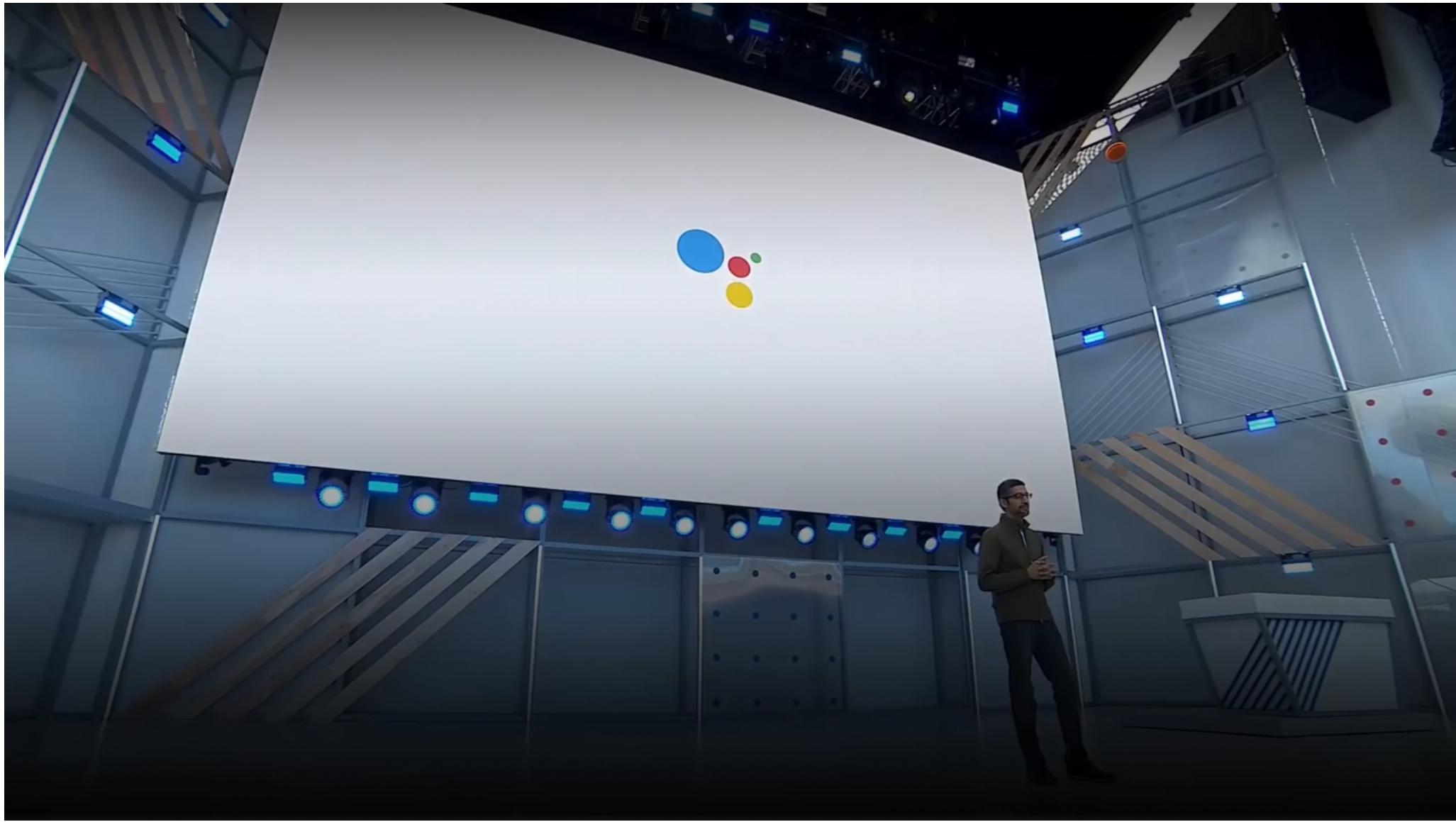
ADAPTED FROM WAVES OF INNOVATION MODEL, THE NATURAL ADVANTAGE OF NATIONS, K. HARGROVES AND M. SMITH, (2005)

# OrgOrgChart

Autodesk Research

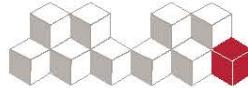






# The Essential Eight technologies and how they can be applied

## Blockchain



Distributed electronic ledger that uses software algorithms to record and confirm transactions with reliability and anonymity. The record of events is shared between many parties and information once entered cannot be altered, as the downstream chain reinforces upstream transactions.

### Example Use Cases

- Identity management
- Voting
- Peer to peer transactions
- Supply chain management
- Smart contracting
- Provenance / traceability
- Asset registration / ownership
- Trade finance
- Record management

## Drones

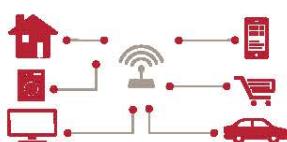


Air- or water-based devices and vehicles, for example, Unmanned Aerial Vehicles (UAV), that fly or move without an onboard human pilot. Drones can operate autonomously (via on-board computers) on a predefined flight plan or be controlled remotely.

### Example Use Cases

- Insurance claim validation
- Precision farming
- Infrastructure inspections
- Railway safety
- Cargo delivery
- Construction site management
- Forestry management
- Facility inspection (wind turbine, oil rig, etc)

## Internet of Things (IoT)

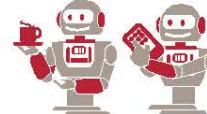


Network of objects – devices, vehicles, etc. – embedded with sensors, software, network connectivity and compute capability, that can collect and exchange data over the Internet. IoT enables devices to be connected and remotely monitored or controlled. The term IoT has come to represent any device that is now “connected” and accessible via a network connection. The Industrial IoT is a subset of IoT and refers to its use in manufacturing and industrial sectors.

### Example Use Cases

- Inventory and material tracking
- Real-time asset monitoring
- Connected operational intelligence
- Customer self-service
- Usage and performance benchmarking
- Data integration and analytics
- Connected service parts management
- Remote service
- Real time market insights
- Flexible billing and pricing models

## Robots

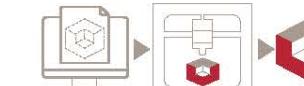


Electro-mechanical machines or virtual agents that automate, augment or assist human activities, autonomously or according to a set of instructions – often a computer program.

### Example Use Cases

- Manufacturing
- Hazardous industries
- Hotels and tourism
- Service industry
- Automation of predictable tasks
- Data management

## 3D Printing



Additive manufacturing techniques used to create three-dimensional objects based on digital models by layering or “printing” successive layers of material. 3D printing relies on innovative “inks” including plastic, and more recently, glass and wood.

### Example Use Cases

- Healthcare and smart medical devices
- Tools and end use parts
- Prototyping
- Bridge manufacturing
- Supply chain optimization
- Customized products
- Remote location production

## Virtual reality (VR)



Computer-generated simulation of a three dimensional image or a complete environment, within a defined and contained space, that viewers can interact with in realistic ways. VR is intended to be an immersive experience and typically requires equipment, most commonly a helmet/headset.

### Example Use Cases

- Immersive journalism
- Virtual workplaces
- Manufacturing/product design
- Architecture & construction
- Education&training
- Big data management
- Entertainment
- Healthcare
- Merchandising

## Augmented Reality (AR)

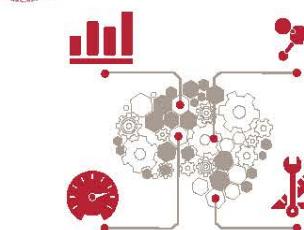


Addition of information or visuals to the physical world, via a graphics and/or audio overlay, to improve the user experience for a task or a product. This “augmentation” of the real world is achieved via supplemental devices that render and display said information.

### Example Use Cases

- Virtual showrooms
- Education
- Travel and tourism
- Gaming
- Printing and advertisers
- Retail environments
- Marketing

## Artificial intelligence (AI)



Software algorithms that are capable of performing tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making and language translation. AI is an “umbrella” concept that is made up of numerous subfields, such as machine learning, which focuses on the development of programs that can teach themselves to learn, understand, reason, plan, and act (i.e. become more intelligent) when exposed to new data in the right quantities.

### Example Use Cases

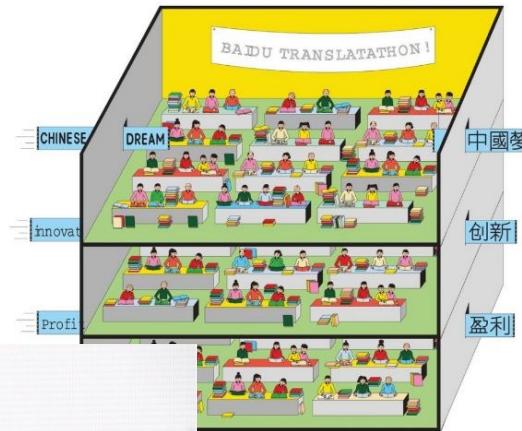
- Managing personal finances
- Trading systems
- Real time fraud and risk management
- Automated virtual assistants
- Underwriting loans and insurance
- Customer support, transactions and helpdesks
- Data analysis and advanced analytics

# The Mobile Internet Is Over. Baidu Goes All In on AI

The Chinese company has more than 1,300 people working on tech like deep learning.

Bloomberg News

16 March 2017, 21:52 GMT+8 Updated on 17 March 2017, 08:27 GMT+8



Mobile first to AI first



e

## Alibaba is spending \$15 billion on researching quantum computing, AI, and more

The e-commerce giant looks overseas for R&D to move beyond its roots

by James Vincent | @jvincent | Oct 11, 2017, 10:58am EDT

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Alibaba founder and CEO Jack Ma | Photo by Wang He/Getty Images



NOW TRENDING



iPhone X 'notch remover' now available in App Store

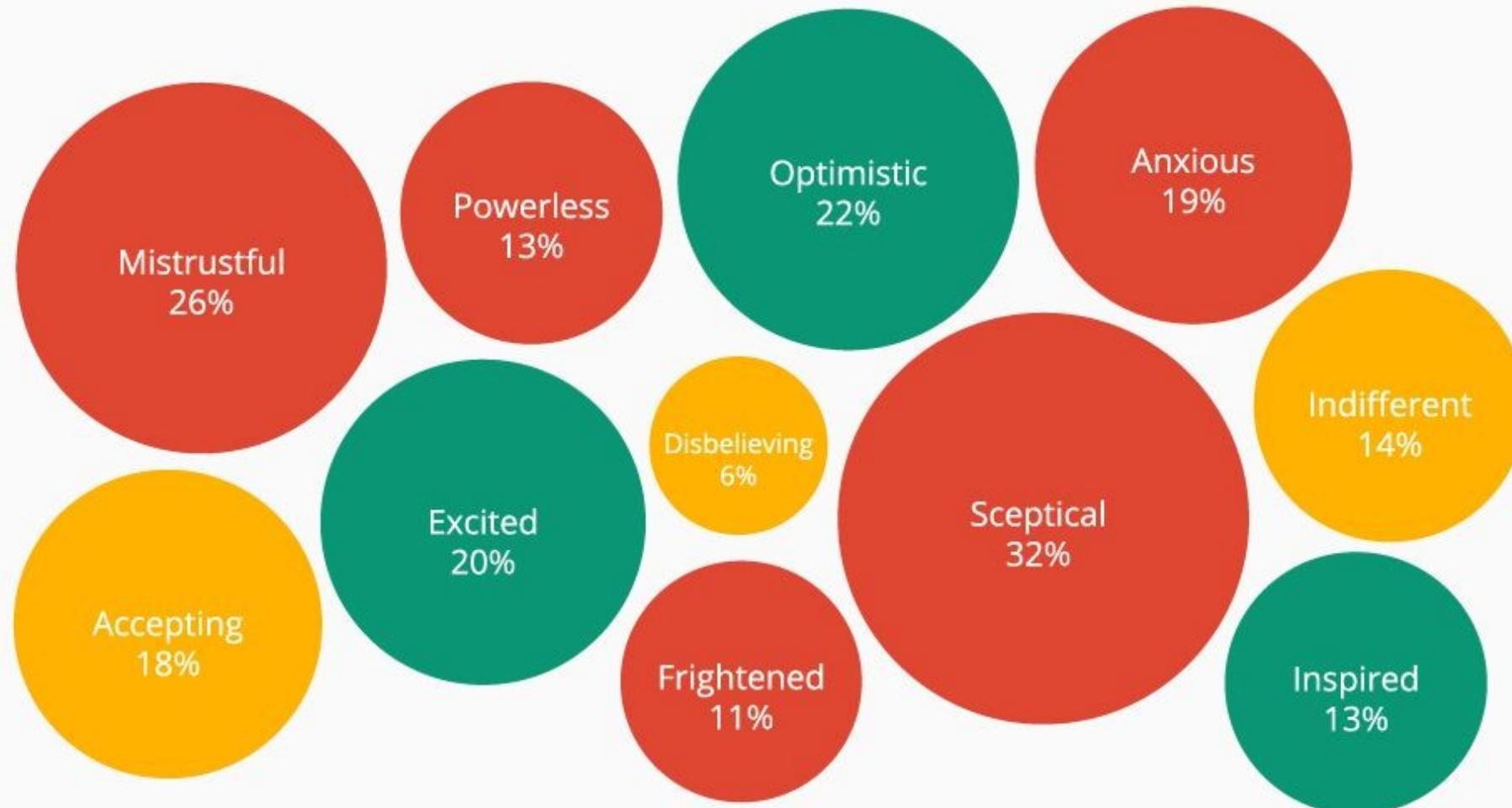
# The Future Of A.I.

Forecasted cumulative global artificial intelligence revenue 2016-2025, by use case (U.S. dollars)



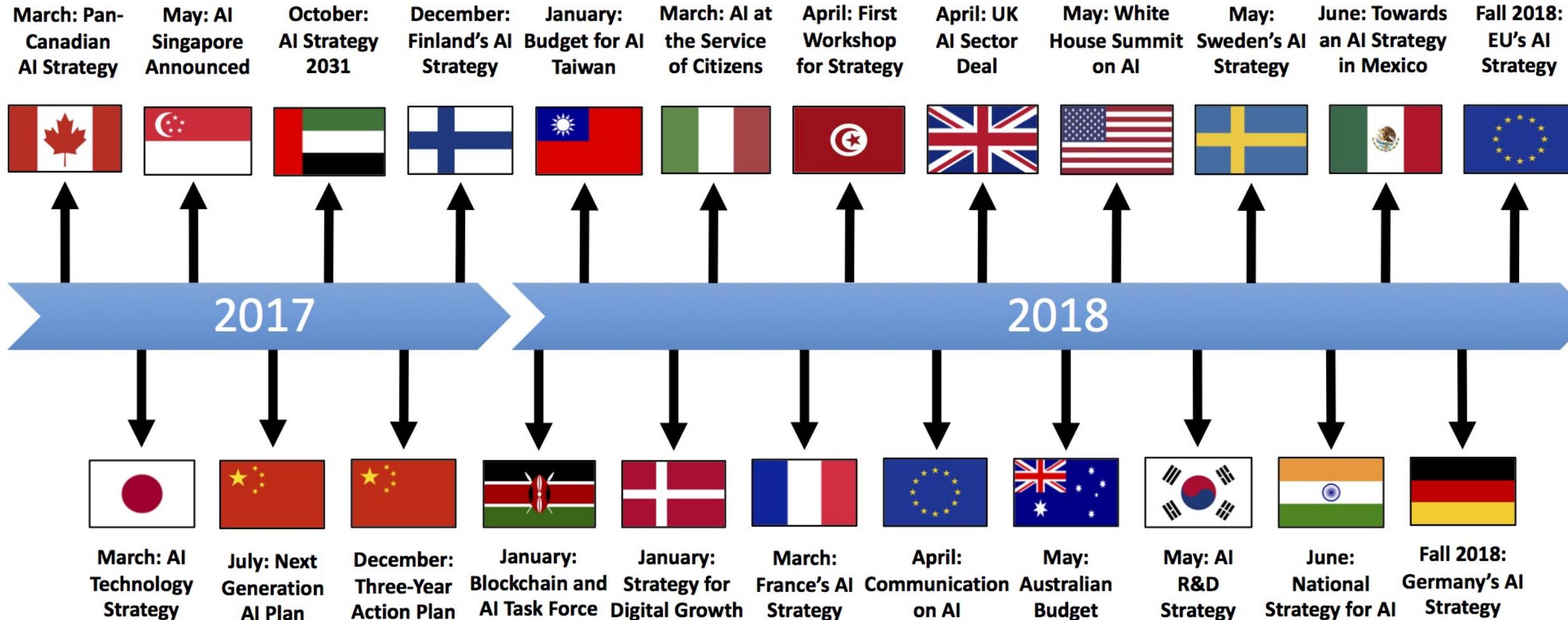
# Artificial Intelligence: Blessing or Curse?

% of adults in Great Britain who feel the following ways about artificial intelligence





# Artificial Intelligence Strategies



# The Asian Express

December 15, 2017



# China Has a New Three-Year Plan to Rule AI

**"India had lost its chance at industrial revolution...**

**China is way ahead of India in a lot of areas but the government does not want to miss the bus this time when it comes to research and adoption of cutting-edge technologies...**

**Apart from manufacturing and information technology, we should pay attention to new and evolving sectors such as ARTIFICIAL INTELLIGENCE....**

**This will showcase that one-sixth of the human population is fully committed to contributing to new tech."**





---

**"CONTINUED AMERICAN LEADERSHIP IN ARTIFICIAL INTELLIGENCE  
IS OF PARAMOUNT IMPORTANCE TO MAINTAINING THE  
ECONOMIC AND NATIONAL SECURITY OF THE UNITED STATES."**

---

PRESIDENT DONALD J. TRUMP

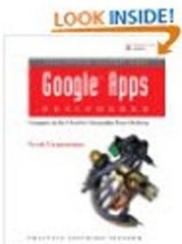
**On February 11, 2019, President Trump signed the Executive Order on  
Maintaining American Leadership in AI**

# Age of Personalization



## Recommended for You

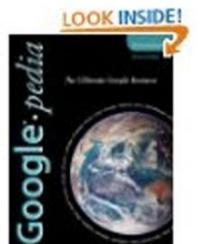
Amazon.com has new recommendations for you based on items you purchased or told us you own.



[Google Apps Deciphered: Compute in the Cloud to Streamline Your Desktop](#)



[Google Apps Administrator Guide: A Private-Label Web Workspace](#)



[Googlepedia: The Ultimate Google Resource \(3rd Edition\)](#)

## PERVASIVE PERSONALIZATION

Merchants selling on Tmall and Taobao are able to personalize their virtual storefronts for individual visitors, offering real-time, tailored product recommendations based on purchase histories, age, gender, geographic locations and a host of other data points.

6.7

billion

personalized shopping pages were generated by merchants on Taobao and Tmall last year during Alibaba's huge 24-hour online sale, the 11.11 Shopping Festival.



There was a  
**20%**  
higher  
conversion rate  
on personalized  
landing pages during  
11.11 compared with  
non-personalized  
pages.



# House of Cards

★★★★★ 2013 TV-MA 1 Season HD 51

Sharks gliding ominously beneath the surface of the water? They're a lot less menacing than this Congressman.



This winner of three Emmys, including Outstanding Directing for David Fincher, stars Kevin Spacey and Robin Wright.



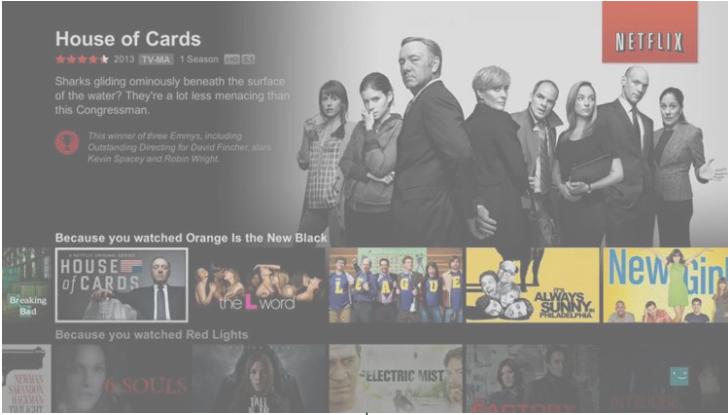
NETFLIX

Because you watched Orange Is the New Black



Because you watched Red Lights





How much data do we process to have a personalized Netflix for everyone?

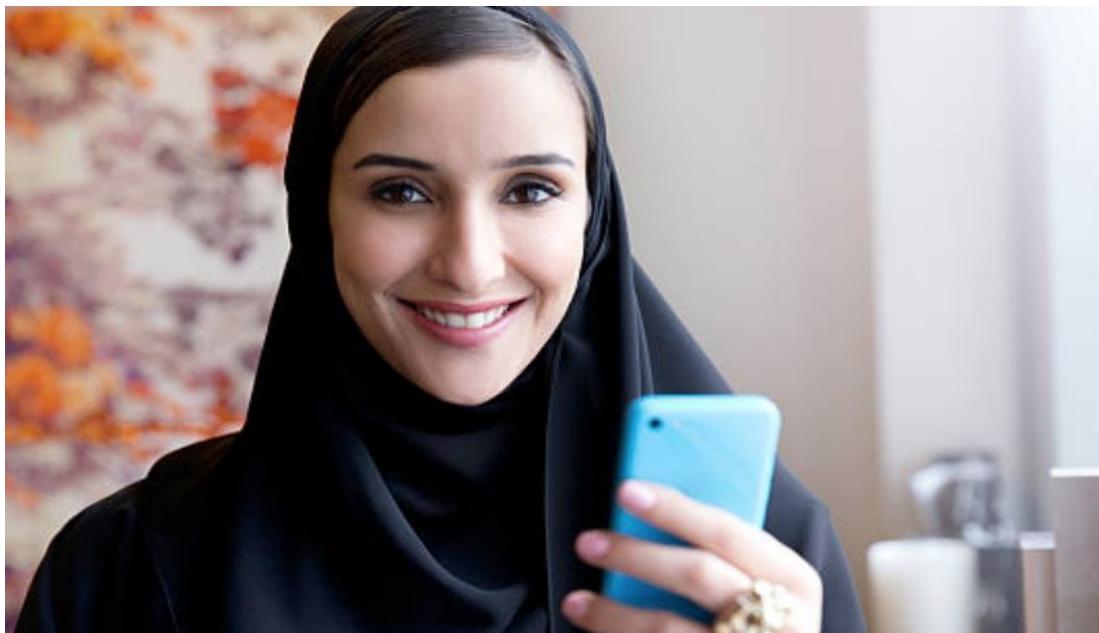
- **100M+ active members**
- **125M hours/ day**
- **190 countries with unique catalogs**
- **450B unique events/day**
- **700+ Kafka topics**



Image credit: <http://www.bigwisdom.net/>



# Personalized real-time data on interests and context for citizens



**FATIMA**

35–45 yrs

Married

Has children

Housewife

The image shows a smartphone displaying a navigation app with directions from 'My Location' to '15 13 B Street Dubai' via '3rd St' (11 mins, 3.5 km). Below the map are buttons for 'E-TICKET', 'NEXT', and 'Car Park'. A tablet to the right displays an 'E-TICKET' with a QR code and a 'NEXT' app showing a scooter at 'NTU Scooter Park 1' in 2 mins. Red lines connect the 'E-TICKET' button on the phone to the QR code on the tablet, and the 'NEXT' app on the phone to the 'NEXT' app on the tablet. In the bottom right corner, a woman is shown doing a warrior yoga pose.

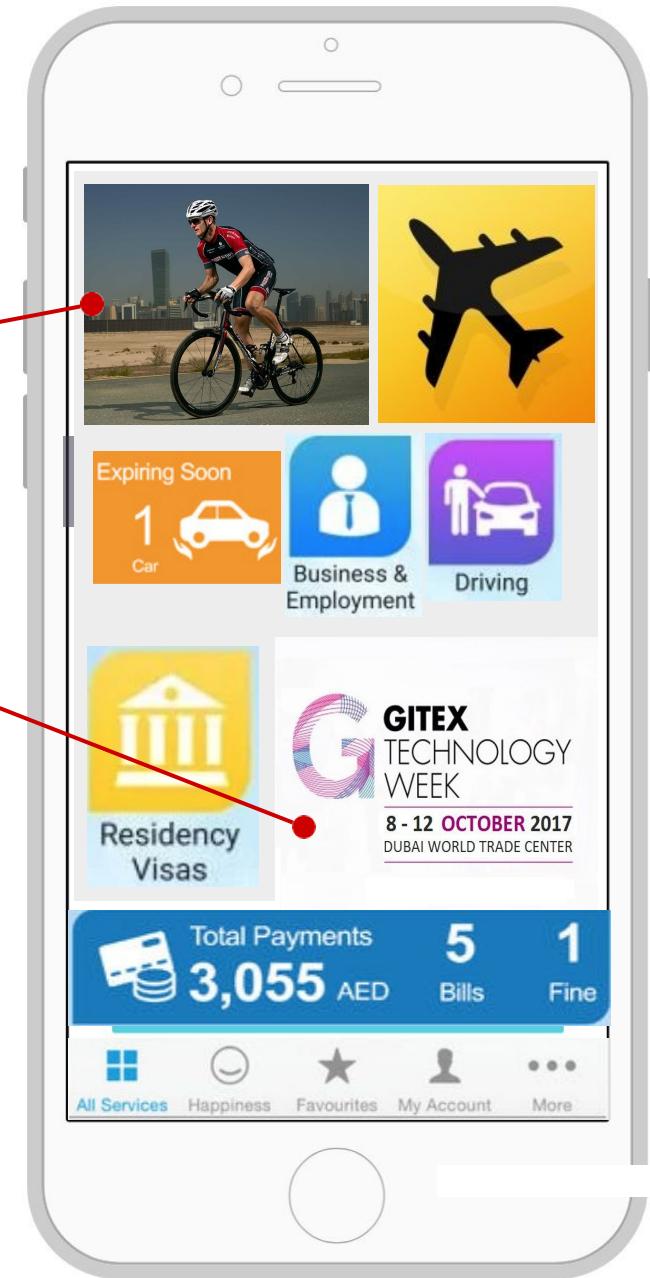
# Information about interesting events and programs



**RASHID**

20 – 30 yrs

Single  
Entrepreneur  
Active Lifestyle



**Data is the new Oil....  
and AI is its new mind**



*It is expected that the number of city residents will double by 2050 to more than 6 billion*



***300-400 million Chinese will move to cities in 15 years***

# 1

## Smart Energy

- High use of sustainable energy sources
- Smart grid systems to efficiently distribute power

# 2

## Smart Citizen

- High use of public transport
- Full penetration of sanitation
- Waste recycling across all sectors

# 3

## Smart Healthcare

- Integrated health information across the city
- Cloud computing models used in most healthcare organisations

# 4

## Smart Governance

- Inter-ministerial commitment to Sustainable Development
- Open sharing of city meta-data for increased use of smart apps

# 5

## Smart Buildings

- Use of building certification schemes
- Use of smart power/water meters
- Efficient lighting
- Connections for the Internet of Things

# 6

## Smart Mobility

- Multi-mode public transport
- Real-time transport/traffic information via signs, mobile apps, internet

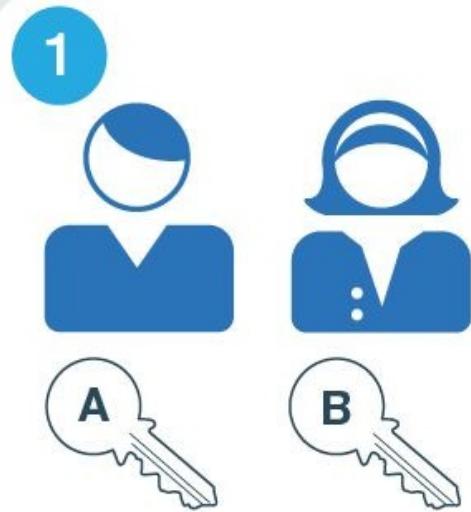
# 7

## Smart Technology

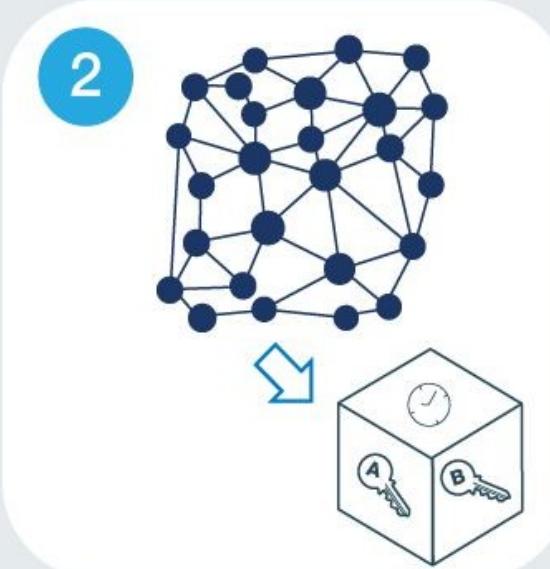
- High broadband/wifi penetration and speeds
- Homes incorporating smart appliances

# Credibility and Transparency

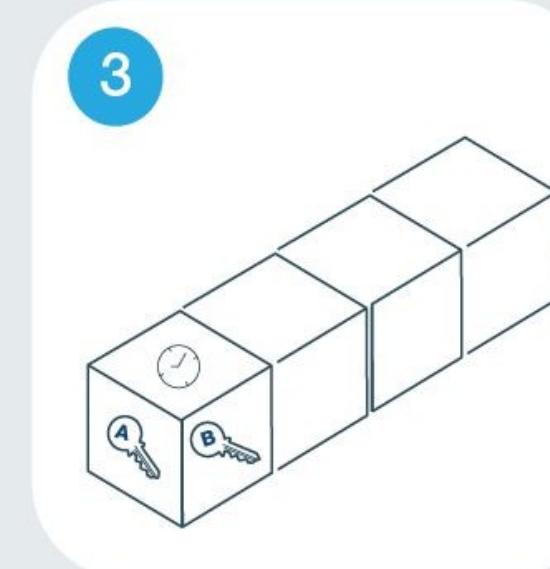
# How to create a blockchain transaction



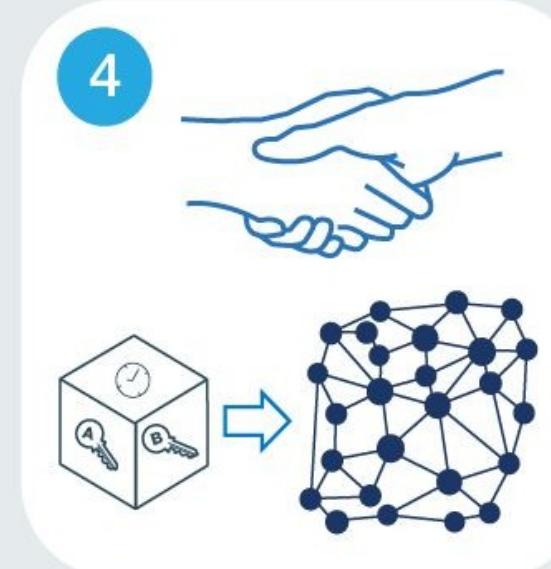
When 2 parties initiate a transaction, blockchain assigns an encryption



Blockchain verifies the transaction and creates a block



The new block is appended to the blockchain



The blockchain transaction is now complete and the ledger is updated



Farm



Shipping  
Container



Factory Floor



Store Shelf

Supply Chain News

# World's Largest Mining Company to Use Blockchain for Supply Chain Management



# Chinese insurer ZhongAn plans blockchain chicken coup

Poultry-tracking ledger technology can improve country's food safety, says chief



Blockchain plan hatched: China has been repeatedly rocked by scandals in which dangerous food products have made it on to supermarket shelves © AFP

**Dark side of the Moon...**



Facebook  
The Cambridge  
Analytica Files

Paul Lewis in San Francisco

Twitter @PaulLewis Email

Tue 20 Mar 2018 11.46 GMT



27,817

## 'Utterly horrifying': ex-Facebook insider says covert data harvesting was routine



▲ Sandy Parakilas in San Francisco. 'It has been painful watching. Because I know that they could have prevented it.' Photograph: Robert Gumpert

Advertisement

# The General Data Protection Regulation



Article 22: "Automated individual decision-making, including profiling"

# How Artificial Intelligence Will Redefine Management

by **Vegard Kolbjørnsrud**, **Richard Amico**, and **Robert J. Thomas**

NOVEMBER 02, 2016

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 +  
SAVE

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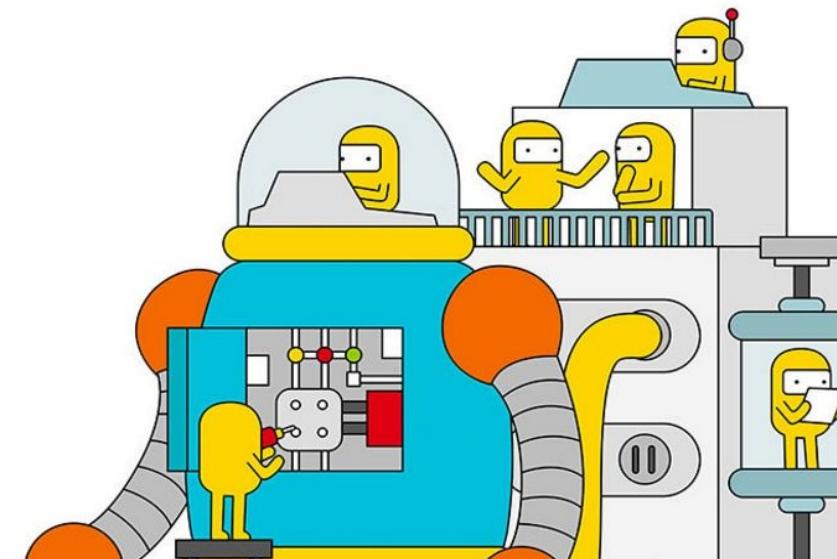
 7  
COMMENT

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TEXT SIZE

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**\$8.95**  
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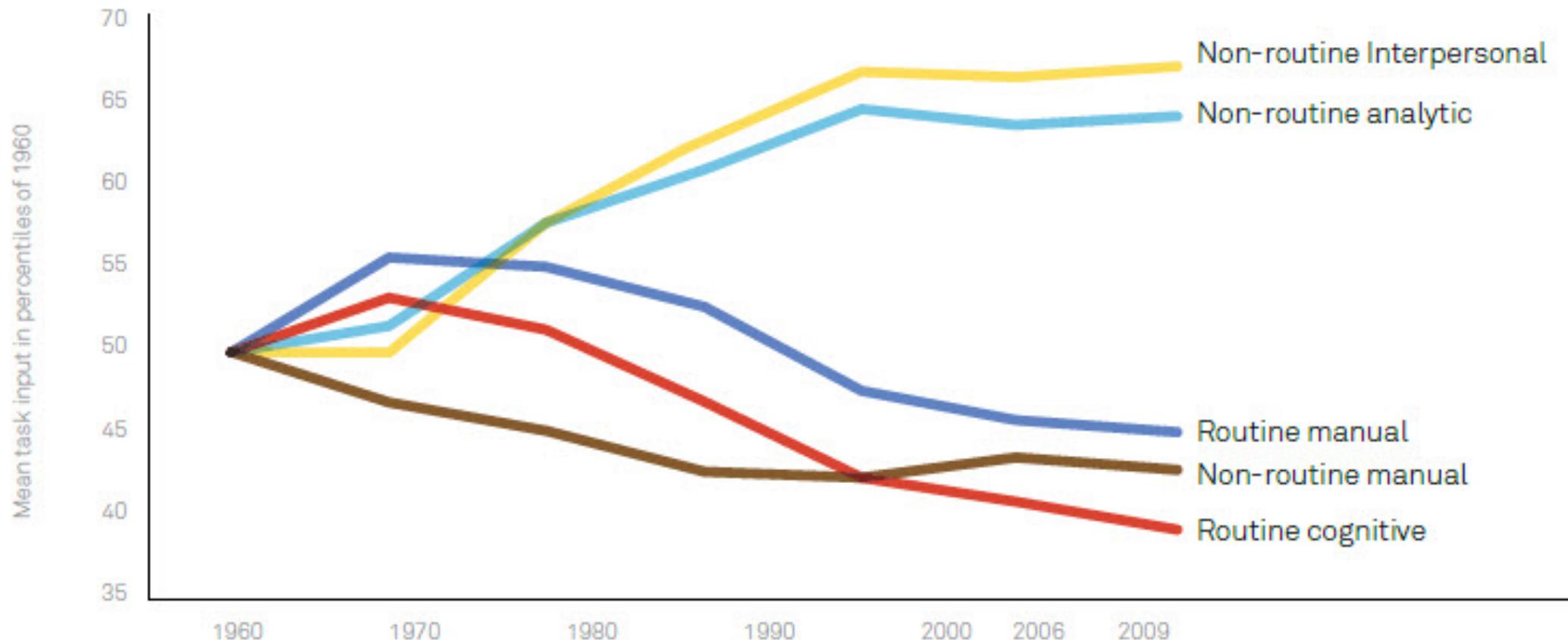
- 1: Leave administration at AI level**
- 2: Focus on solving the problem**
- 3: Treat machines with artificial intelligence as "Colleagues"**
- 4: Work as a designer**



Managers use their knowledge of organizational history and culture, as well as empathy and ethical reflection.

Figure 1

## Non-routine Tasks on the Rise in the U.S. Labor Market



Source: David H. Autor and Brendan M. Price. "The Changing Task Composition of the US Labor Market: an Update of Autor, Levy and Murnane (2003)". MIT Mimeo, Massachusetts Institute of Technology, 2013.

# Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity

