



Digital Transformation and the New Technology Revolution

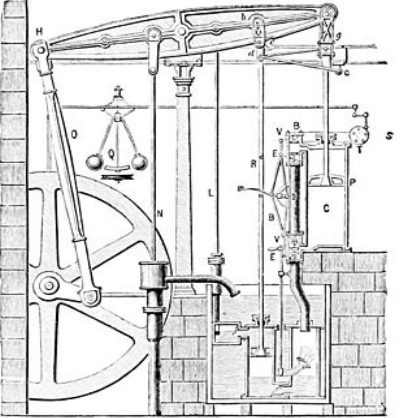
Marcos Ramírez Amoretti

Senior Associate Director Data Science and Technology

Lima – March 2019

Where are we and what's our heritage?

1st revolution



Mechanical Production

1784

2nd revolution



Mass Production

1870

3rd revolution



IT & Automation

1969

4th revolution

A composite image for the 4th revolution. It features a hand holding a smartphone in the foreground. In the background, there is a tall industrial tower. Overlaid on the scene are various icons representing Industry 4.0, including a cloud with a Wi-Fi symbol, a factory, a gear, and a person. The text 'Industry 4.0' is repeated multiple times in a curved path. The word 'shutterstock' is visible as a watermark.

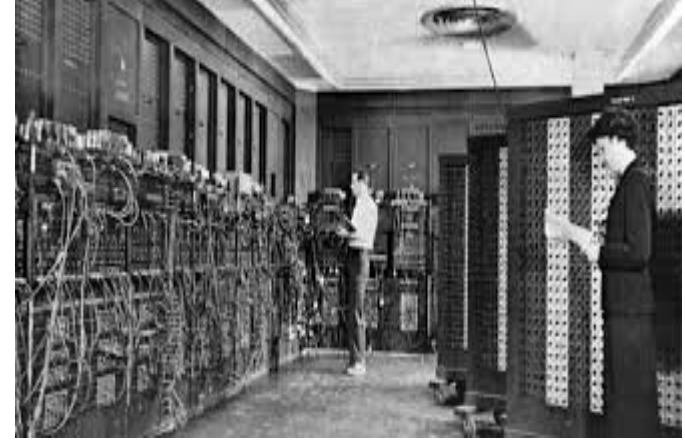
Cyber Physical Systems
Today

5th revolution



Future

Companies & technology



Vs

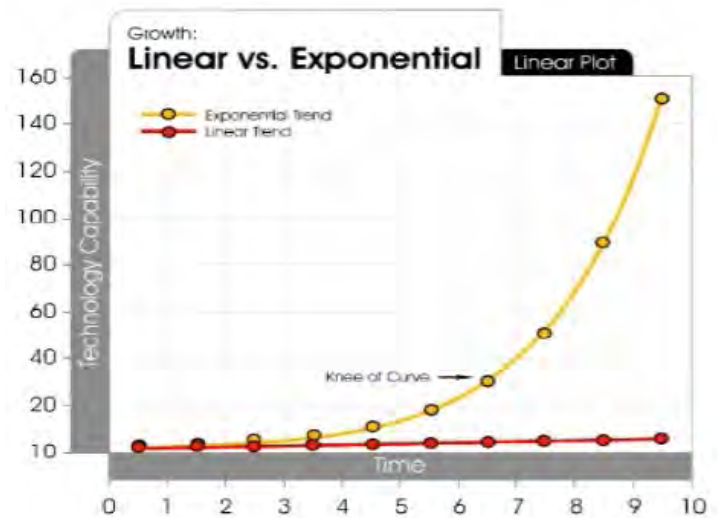


AI/Automation

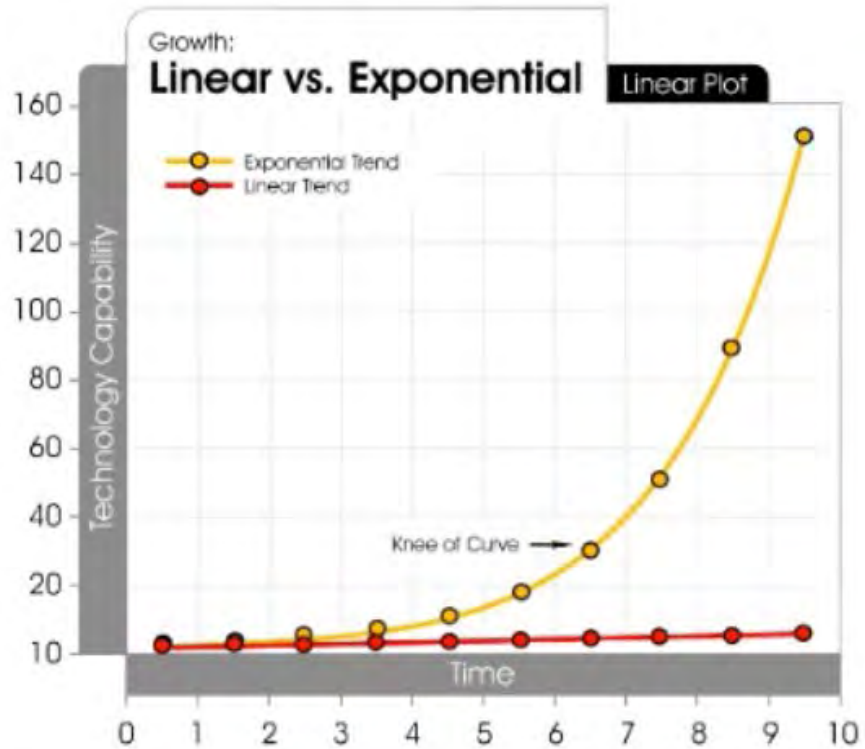


ACCORDING TO THE WEF

By 2020 Artificial intelligence
and automation will displace
5 million jobs



Fuente: Ray Kurzweil



Fuente: Ray Kurzweil



LINEAR



EXPONENTIAL



1996

MarketCap: **\$28B**

Employees: **140,000**



2012

Bankrupt

Employees: **17,000**



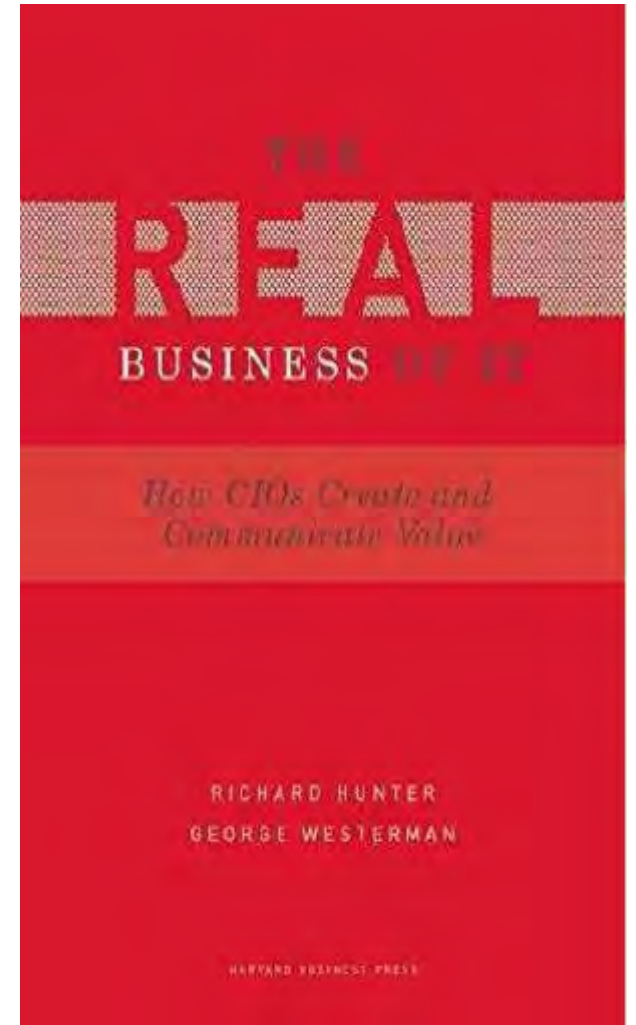
April 2012

MarketCap: **\$1B**

Employees: **13**

Digital Transformation?

- “Almost **80%** of the **CEOs** think **technology** will have **significant impact** or **reshape** their industry over the next 5 years. 56% of CEOs across all sectors predict a large existing player from another industry will move into their industry.
- “**Main disruptions** for their business in next 5 years are in this order: **technology change** (IA, Robotics, Blockchain...), new customer behaviors, regulation changes, increase number of competitors”



What are the key drivers?

Additive Manufacturing



Simulation



Internet of Things



Augmented reality



Systems Integration



Big Data & AI



Cloud Computing



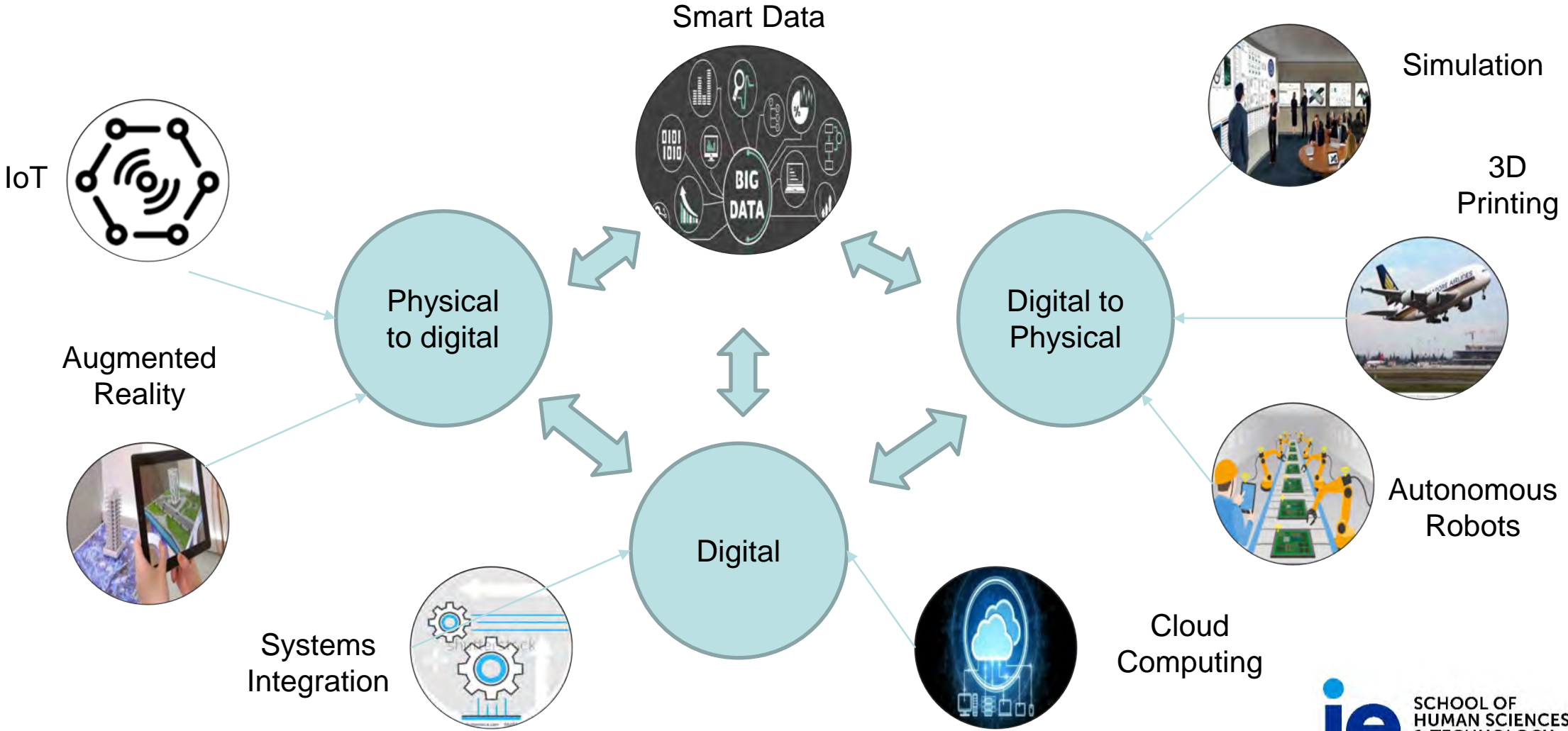
Autonomous Robots



Cybersecurity

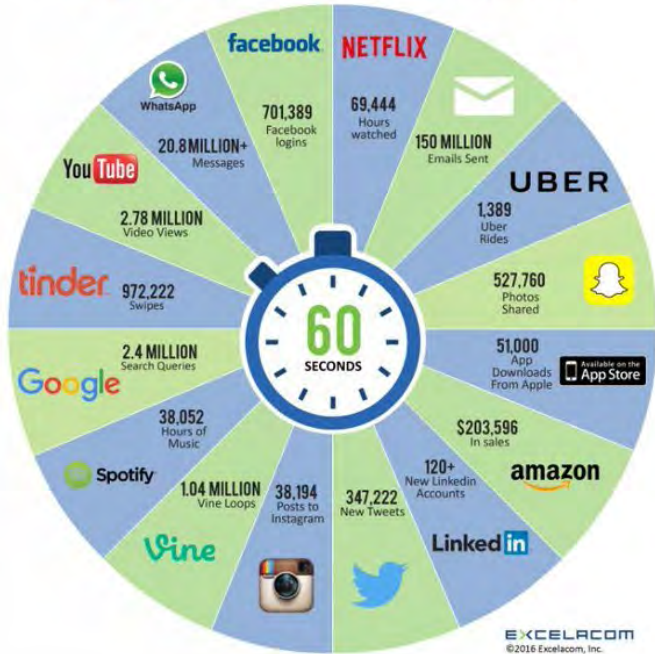


Digital ecosystem

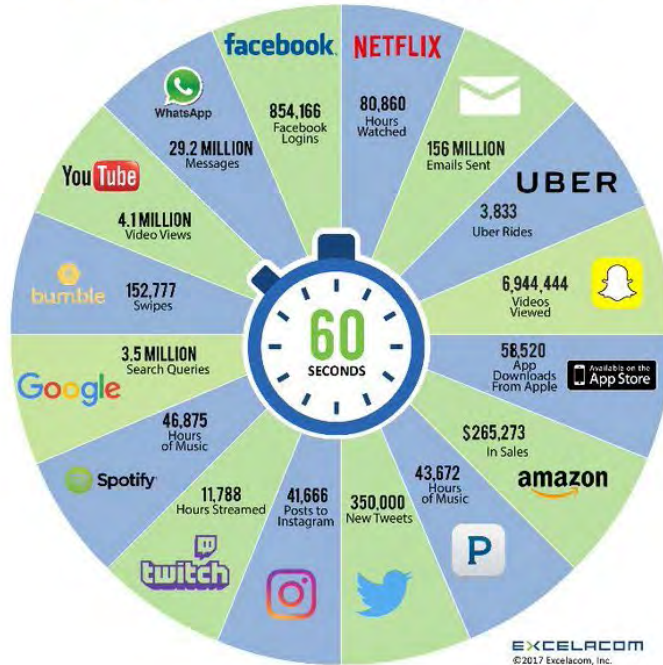


The power of Big Data

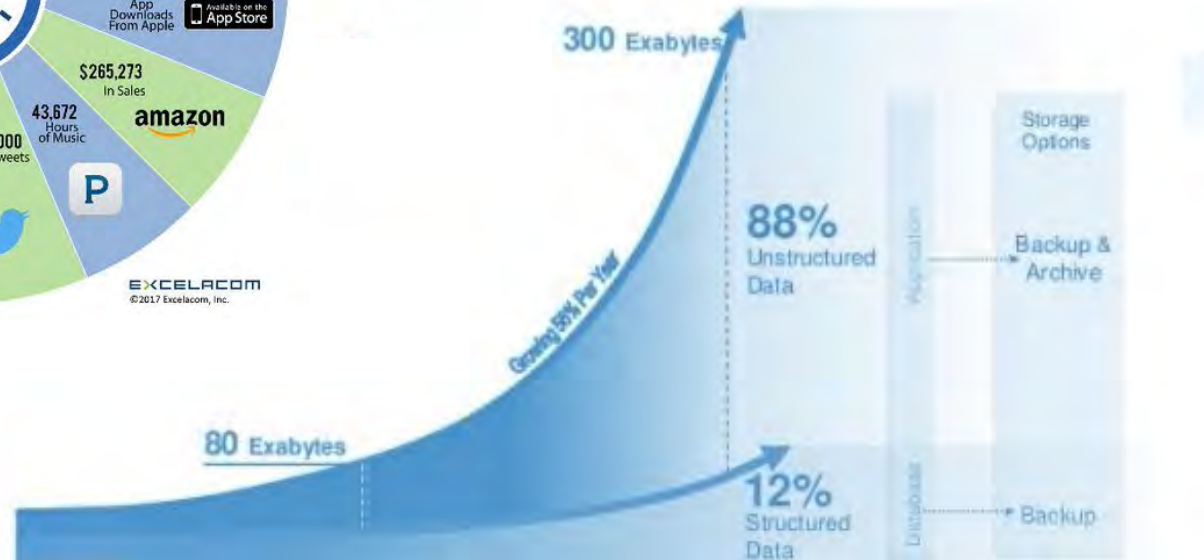
2016 What happens in an INTERNET MINUTE?



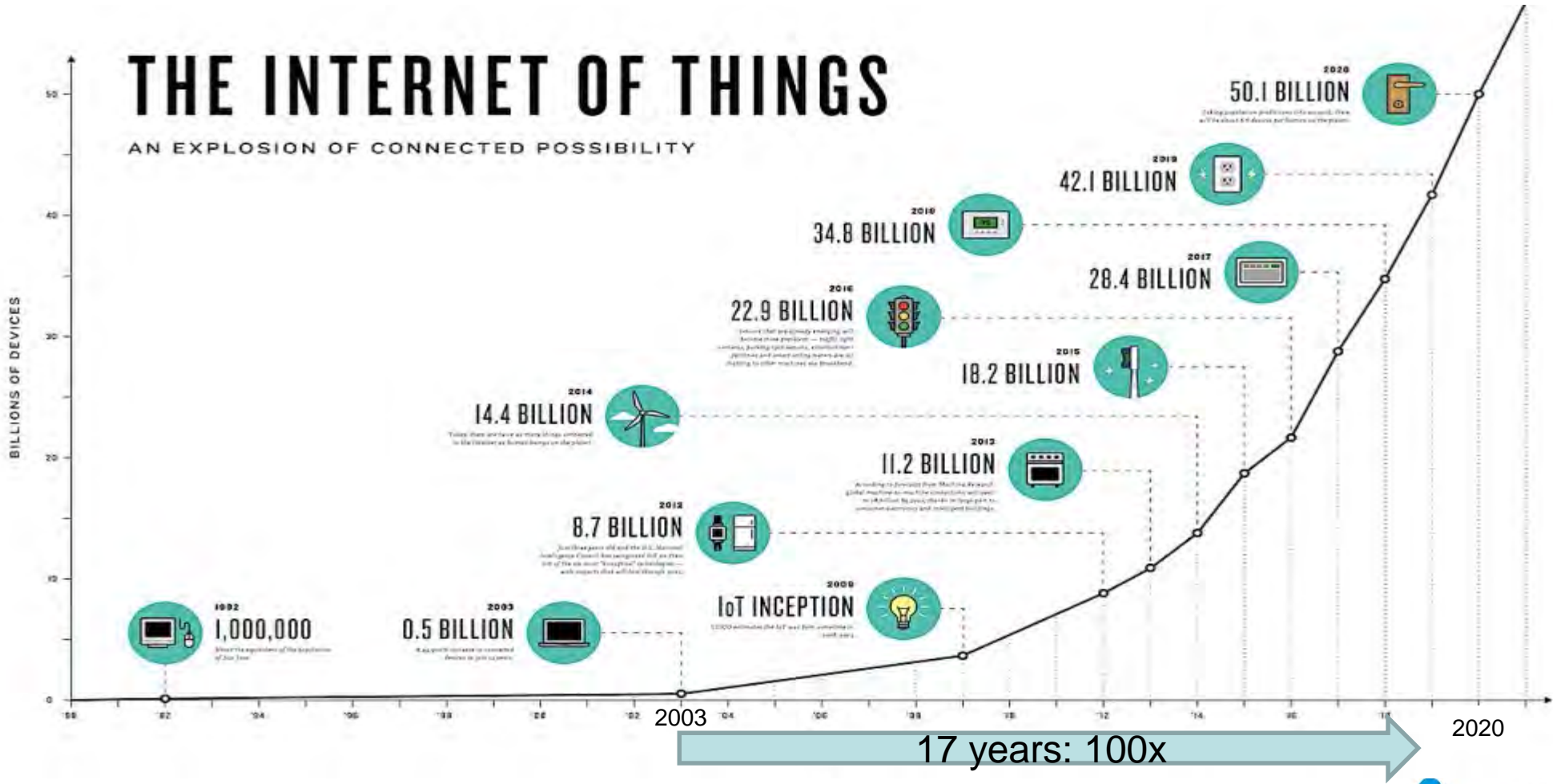
2017 What happens in an INTERNET MINUTE?



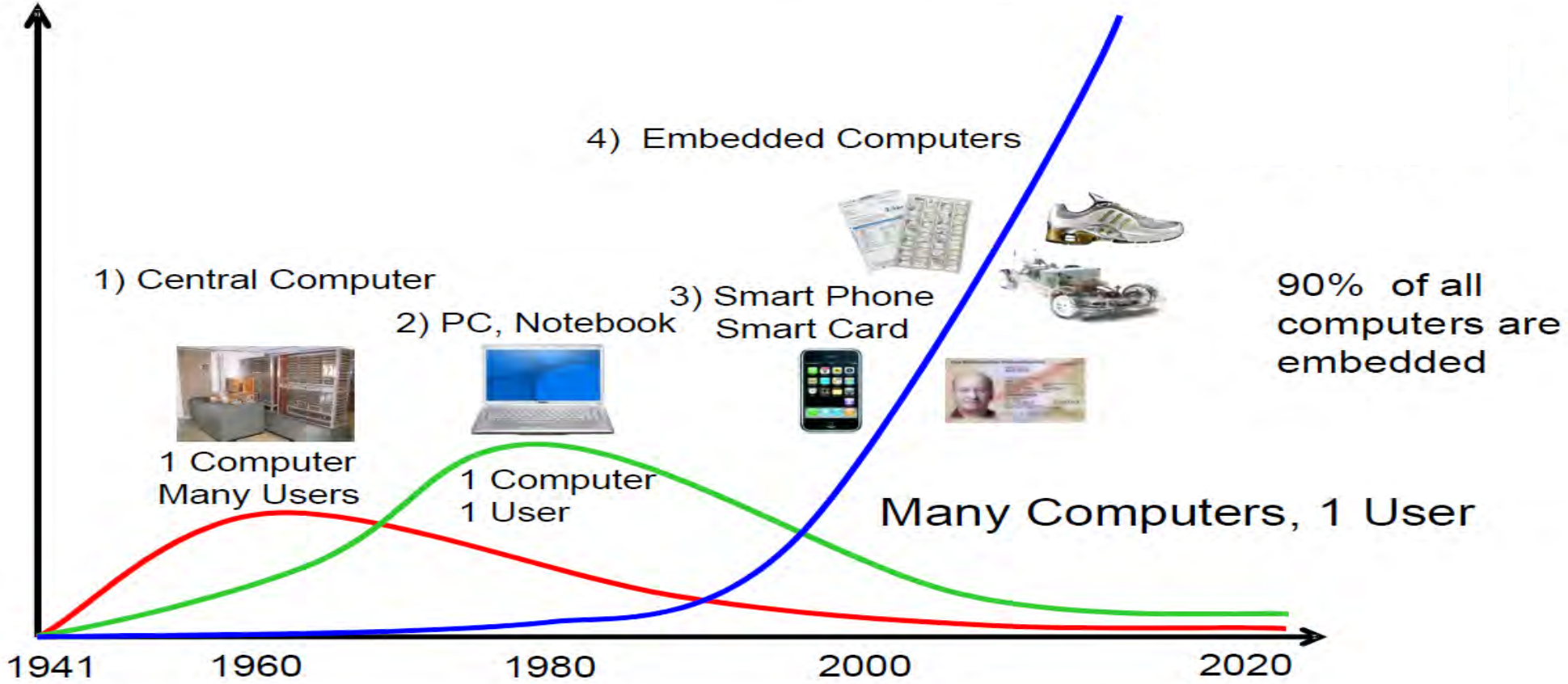
Big Data Growth



IoT and connected objects



Digital Improvement and Integration



6 Cyber Attacks Business Networks will Face in 2018

1 Malware

A malicious program installed on a PC. I.e. Trojans, worms, or adware.

18% come from clicking malicious links in emails.

2 Phishing

Uses social engineering to learn a user's password or personal data.

Equifax was a victim of this during a massive data breach in early 2017.

3 Brute Force Password Attacks

A computer tries every possible combination for a password until successful.

4 Denial of Service (DoS) Attacks

Overwhelms the network or servers with high volumes of traffic which disrupts all services.

5 Man in the Middle (MITM) Attacks

The hardest to find. Pretends to be the destination for the information, copies it all, and then passes the information on to the real destination.

6 Rogue software

Installs itself to do something that wasn't originally intended, often posing as something beneficial, like security software or a movie player.

LOGICAL FRONT

Cyber Attacks by the Numbers

43% of cyber attacks target small business*

64% of companies have experienced web-based attacks.

62% experienced phishing & social engineering attacks.

59% of companies experienced malicious code

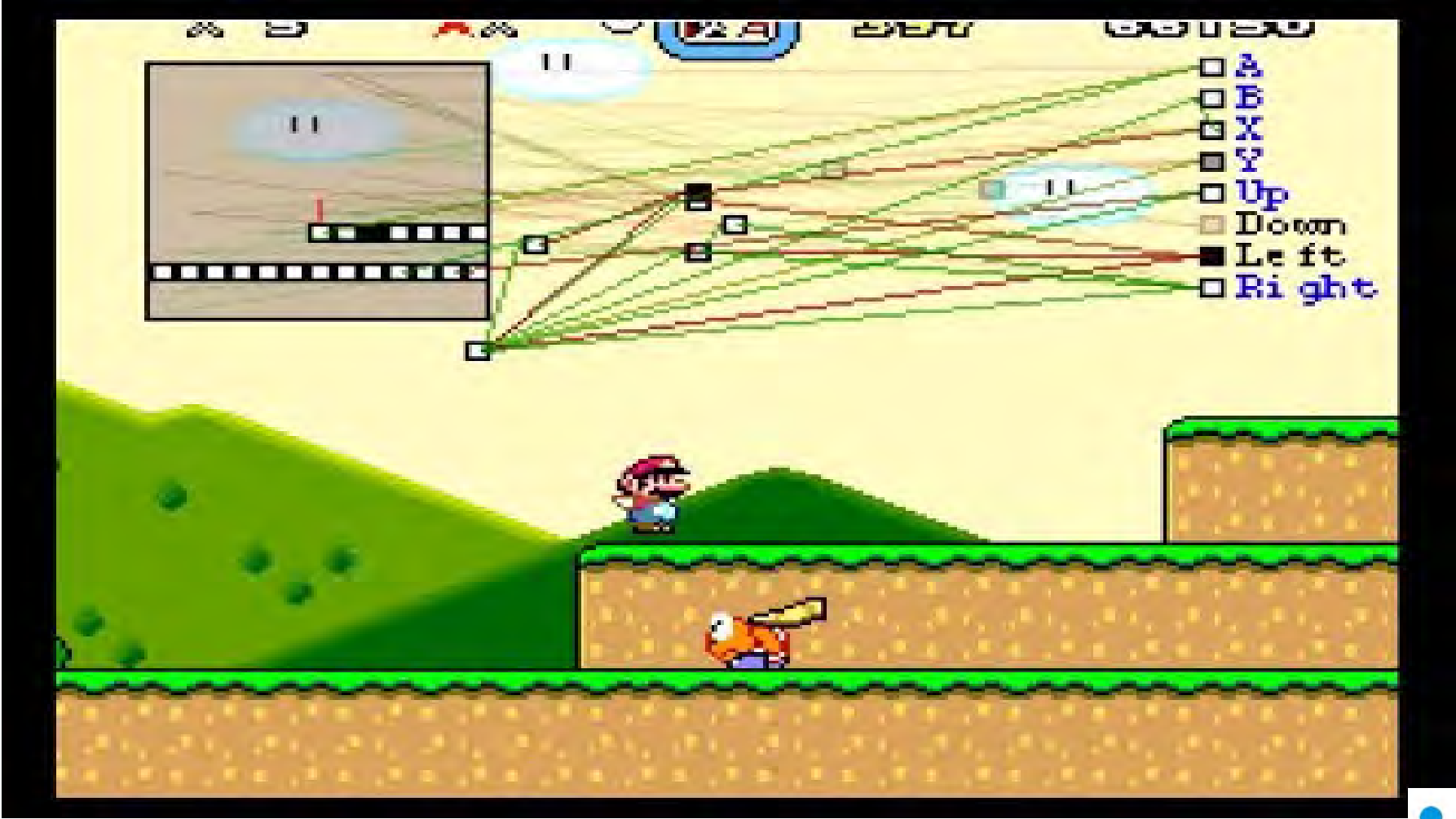
51% experienced denial of service attacks.

AI and the Power of Networks

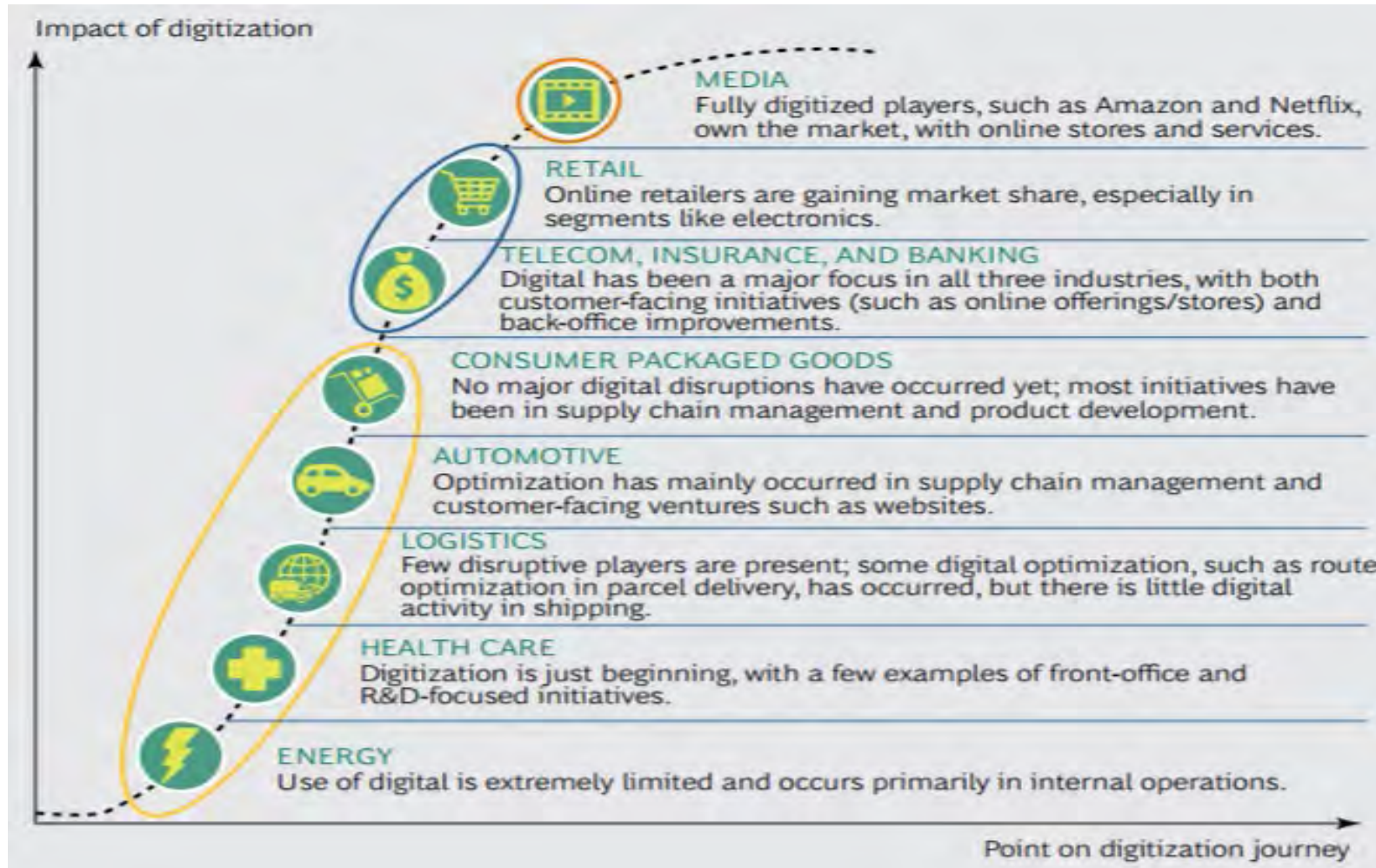
The background of the slide is a complex, abstract network visualization. It features a dark, almost black, background filled with a dense web of lines and nodes. The nodes are represented by small circles in various sizes and colors, primarily red and blue. The lines connecting these nodes are thin and also colored in red and blue, creating a vibrant, multi-colored web. The overall effect is one of a highly interconnected and dynamic network, symbolizing the power of networks in the context of AI.

SCHOOL OF
HUMAN SCIENCES
& TECHNOLOGY

Reinforcement Learning – Deep Learning



Technology is Impacting all Sectors

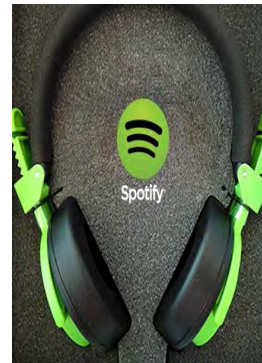


Government, Media & Automotion



Politics

Media &
Entertainment



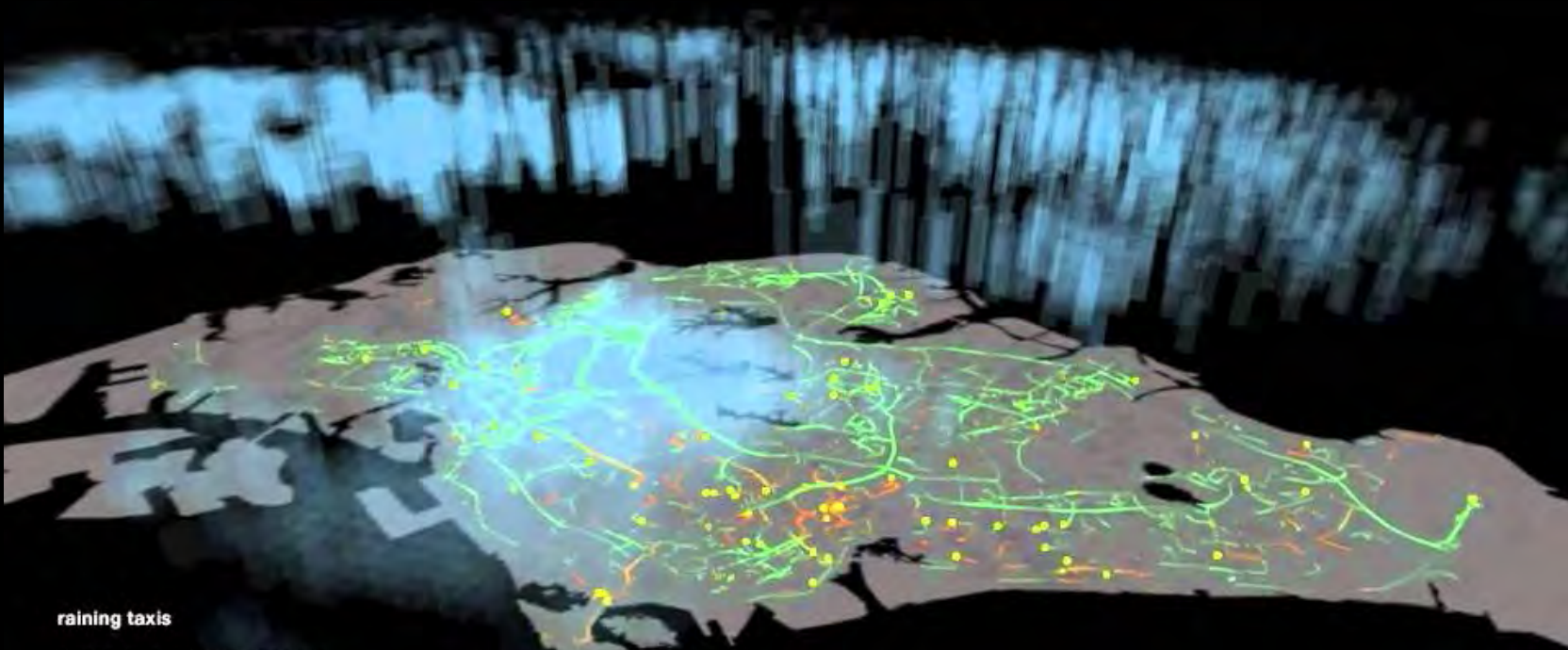
Automotive



Public Sector - Smart Cities – Live Singapore!



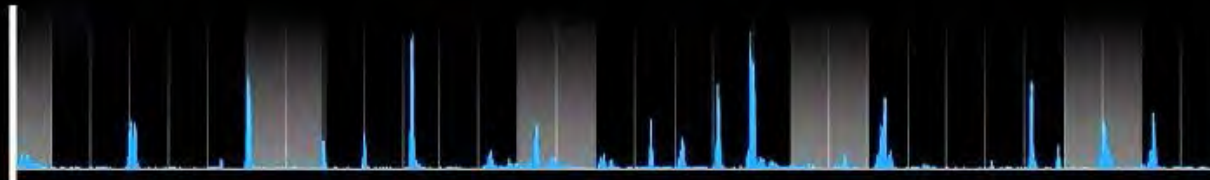
Public Sector - Smart Cities – Live Singapore!



raining taxis

singapore's mobility is heavily reliant on taxis, but what happens when it rains? getting hold of a cab is not the easiest thing in the world. we are exploring how our transportation system behaves by combining taxi and rainfall data, and investigating how in the future the system can streamline in order to better match taxi supply and demand.

*click and drag map to rotate,
click on timeline to move in time
swipe with two fingers to zoom*



data sources ComfortDelGro | NEA

01 august 2010 | 00:05

rain



free taxi



on-call taxi

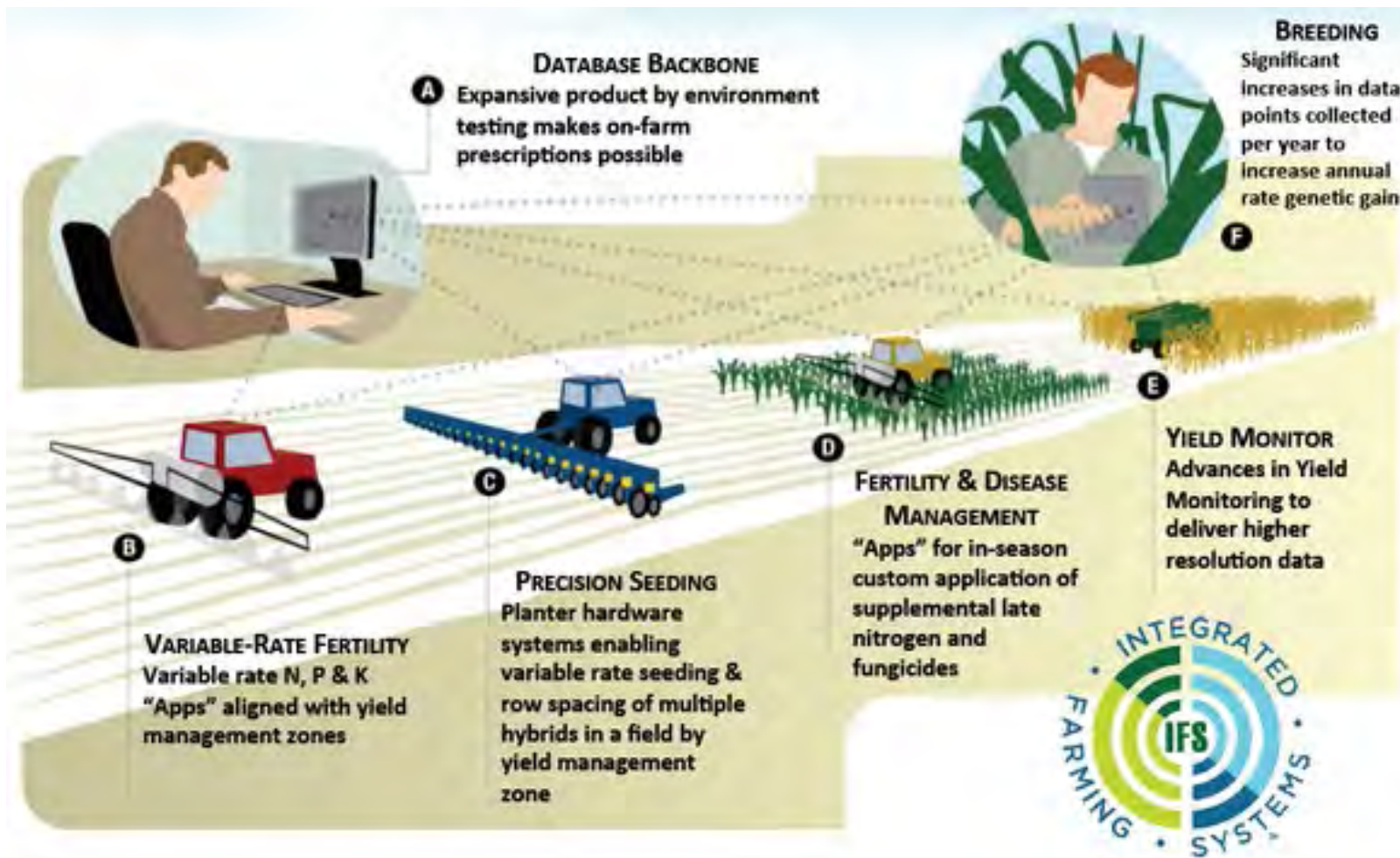


trip start



senseable city lab:::

Agriculture



Financial Services



Sports

Germany's Secret World Cup Weapon: Big Data

By Jack Rosenberger | Posted 07-18-2014 [Print](#) [Email](#)

If you're looking for inspiration when it comes to the use of big data analytics, look no further than Germany's national soccer team, winner of the 2014 World Cup.



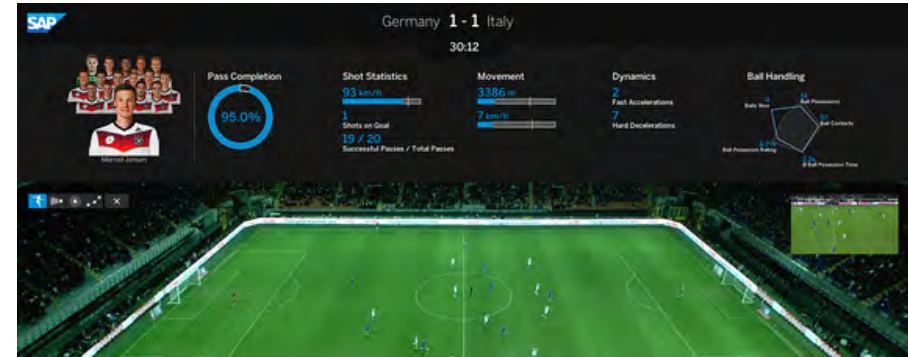
By Jack Rosenberger

A wing commander in the British Royal Air Force, Charles Reep has been credited with creating the first notational analysis system of soccer when, in 1950, he used a pencil and notebook to record the play between a pair of English soccer clubs. Today, Reep's toolkit seems fairly quaint, especially when it's compared to Match Insights, the enormous database developed by SAP and Germany's soccer team, which won the 2014 World Cup earlier this week, defeating Argentina 1-0 in extra time.

The story of how the German Football Association and SAP developed and used Match Insights for Germany's competitive advantage is both edifying and inspirational, whether or not you are a digital-ready CIO. While some details about the Match

Insights database have been publicly disclosed by the German coaches and SAP executives in press interviews, the types of data gathered by Germany team, the extent of the data gathered, and some particulars of its strategic usage on and of the pitch remain closely guarded secrets.

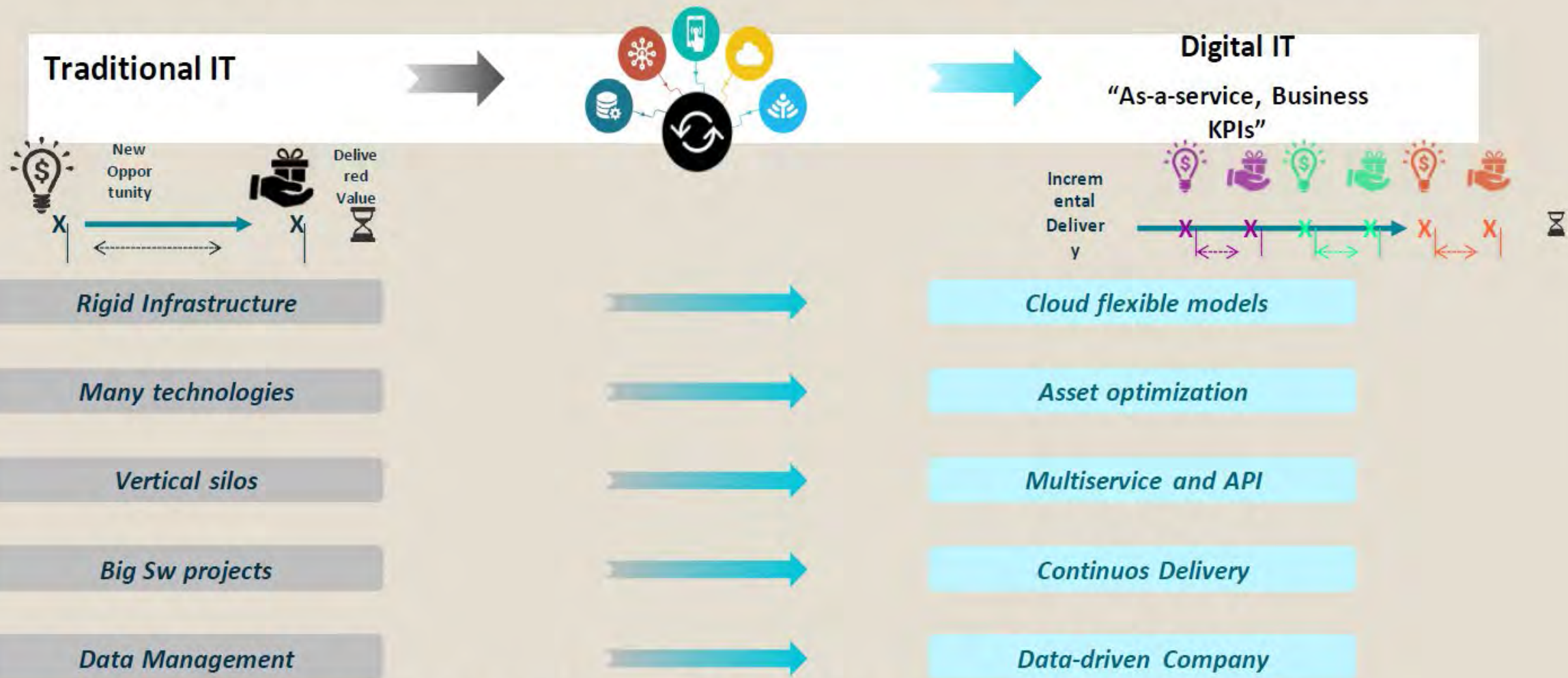
Technology originally developed to track missiles now track each player as they shoot, pass, and run across a football or basket court, recording each and every move **25 times a second**



Healthcare & Pharma



HUGE CHANGE IN TECHNOLOGY!



BUT PEOPLE IS EVEN MORE RELEVANT! **ie**

People are key to Digital Transformation!



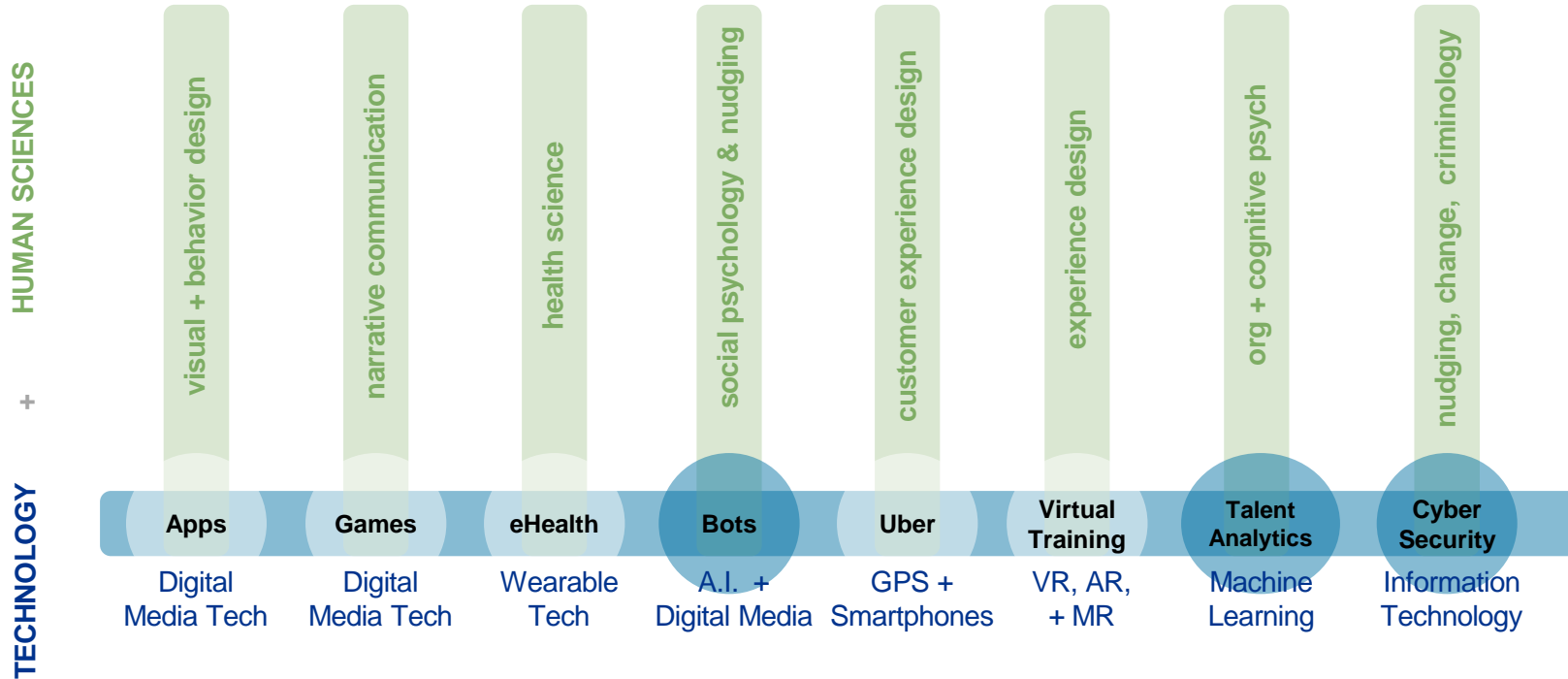
AI/Automation

And yet.....

There are currently
6 million jobs
left unfilled globally



human science + technology



Human Science → makes Technology smarter...

... and Technology → allows Humans to work and live better.

Jobs as micro-careers



A polar bear is shown walking on a small, irregularly shaped ice floe. The bear is facing left and is captured in mid-stride. The ice floe is surrounded by dark blue water, which is visible in several pools and channels. The overall scene suggests a melting ice environment, likely in the Arctic or Antarctic regions. The text "what to do about it?" is overlaid in white, bold, sans-serif font across the middle of the image.

what to do about it?

Focus on the attitude and the skills!



TOP 10 SKILLS IN 2020

1



Complex Problem Solving

2



Critical Thinking

3



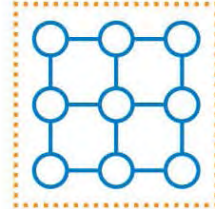
Creativity

4



People Management

5



Coordinating with Others

6



Emotional Intelligence

7



Judgement 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

SOURCE: WORLD ECONOMIC FORUM



DID YOU KNOW THAT BETWEEN 2016 and 2025

About **15 million** jobs requiring high educational attainment will be created, while low-qualified jobs will decline by more than **6 million**

Source | Eurostat

The Jobs Landscape in 2022

emerging
roles,
global
change
by 2022



Top 10 Emerging

1. Data Analysts and Scientists
2. AI and Machine Learning Specialists
3. General and Operations Managers
4. Software and Applications Developers and Analysts
5. Sales and Marketing Professionals
6. Big Data Specialists
7. Digital Transformation Specialists
8. New Technology Specialists
9. Organisational Development Specialists
10. Information Technology Services

declining
roles,
global
change
by 2022



Top 10 Declining

1. Data Entry Clerks
2. Accounting, Bookkeeping and Payroll Clerks
3. Administrative and Executive Secretaries
4. Assembly and Factory Workers
5. Client Information and Customer Service Workers
6. Business Services and Administration Managers
7. Accountants and Auditors
8. Material-Recording and Stock-Keeping Clerks
9. General and Operations Managers
10. Postal Service Clerks

Source: Future of Jobs Report 2018, World Economic Forum

SKILLS GAP

Projected 2020 labor demand and supply by skill level,¹
millions of workers

Share of total
% of demand (for shortages),
% of supply (for surpluses)



¹High-skill workers = college degree or higher; medium-skill workers = high school or vocational training only; low-skill workers = primary school or no education.

Source: National Bureau of Statistics of China; McKinsey Global Institute analysis

Career-focused, broad + multidisciplinary

cyber
analyst



experience
designer



data
scientist



reputation
strategist



talent
developer



digital
transformer



insights
analyst



who: profiles from
business, social
sciences, arts/design,
tech, engineering

what: design/redesign optimal human “experiences”
*hotel check-in, airport security, online shopping, store,
hospital waiting room, school admission process (!)...*

where: marketing, sales, operations, UX, customer service, ...

how: business process improvement, communication,
psychology, technology, innovation, HR/change management,

Takeaways

“Transformation” is key in Digital Transformation

Data Analytics is the source of competitive advantage

Human AND artificial better than Human vs. Artificial

Broad & Multidisciplinary Jobs

People are the key on Digital Transformation processes

Shortage of qualified professionals

Digital Transformation and the New Technology Revolution

Marcos Ramírez Amoretti

Senior Associate Director Data Science and Technology

Lima – March 2019



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