



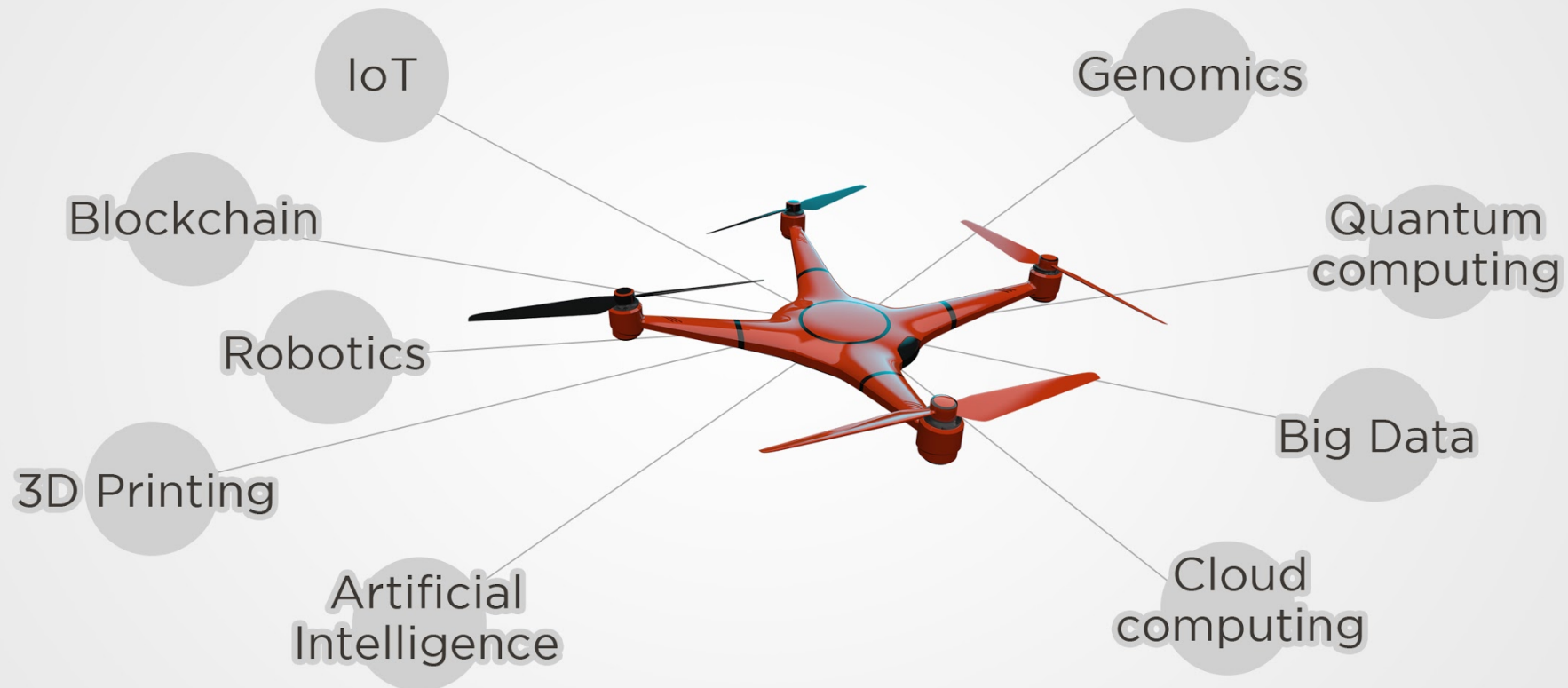
Industry 4.0 - Opportunities and Challenges for the Caribbean

“We stand on the brink of 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.”

Klaus Schwab

Founder & Executive Chairman,
World Economic Forum

The 4th industrial revolution





The new digital world

AGILITY

BLURRING SECTOR BOUNDARIES

TALENT AND CREATIVITY

INTERCONNECTIVITY AND DATA



Cheaper, faster, better, democratic, decentralized

Industries that have already been disrupted:

- Media – TV, radio, music, newspapers, advertising (youtube, spotify, itunes, twitter, google ads, facebook)
- Transportation (zipcar, uber, lyft → soon: autonomous vehicles)
- Employment (Linked In, Fiverr, Upwork, Facebook)
- University (Udacity)
- Accommodation (Airbnb)
- Retail (Amazon, Etsy)
- Movie theatres (Netflix, Amazon)



Caribbean 4.0

Industries that will be further disrupted, of importance to the Caribbean:

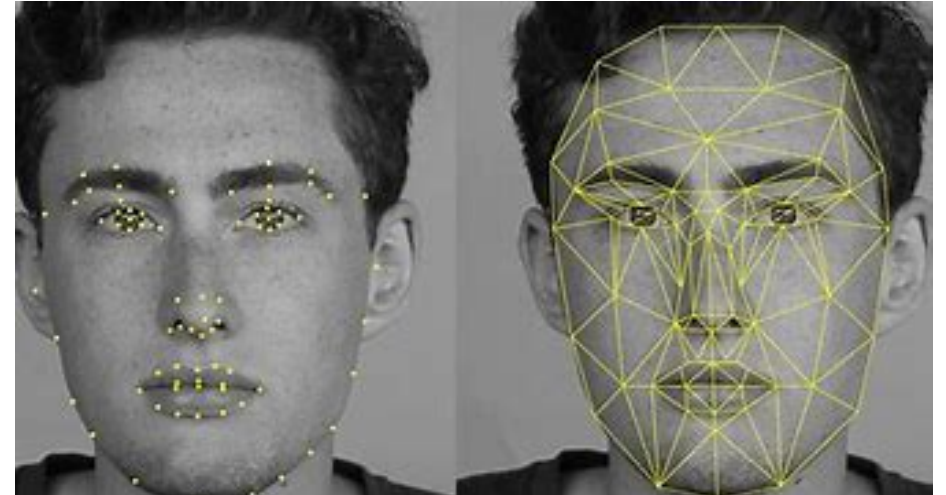
- Tourism - AR/VR/gamification, robotics
- Financial services - blockchain, fintech
- Music - blockchain for IP, AI
- Agriculture - big data, AI, robotics, IOT, gene editing, blockchain
- Business Process Outsourcing - AI
- Construction - BIM, 3D printing
- Retail, some creative industries - 3D printing
- Logistics - robotics, IOT
- Energy - blockchain



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Solution of public problems:

- Delivery of public services - cloud computing, AI, VR, AR
- Congestion - satellites, IOT, AI
- Crime - remote sensing, facial recognition, AI
- Health services - AI, gene editing
- Education - AR/VR, gamification

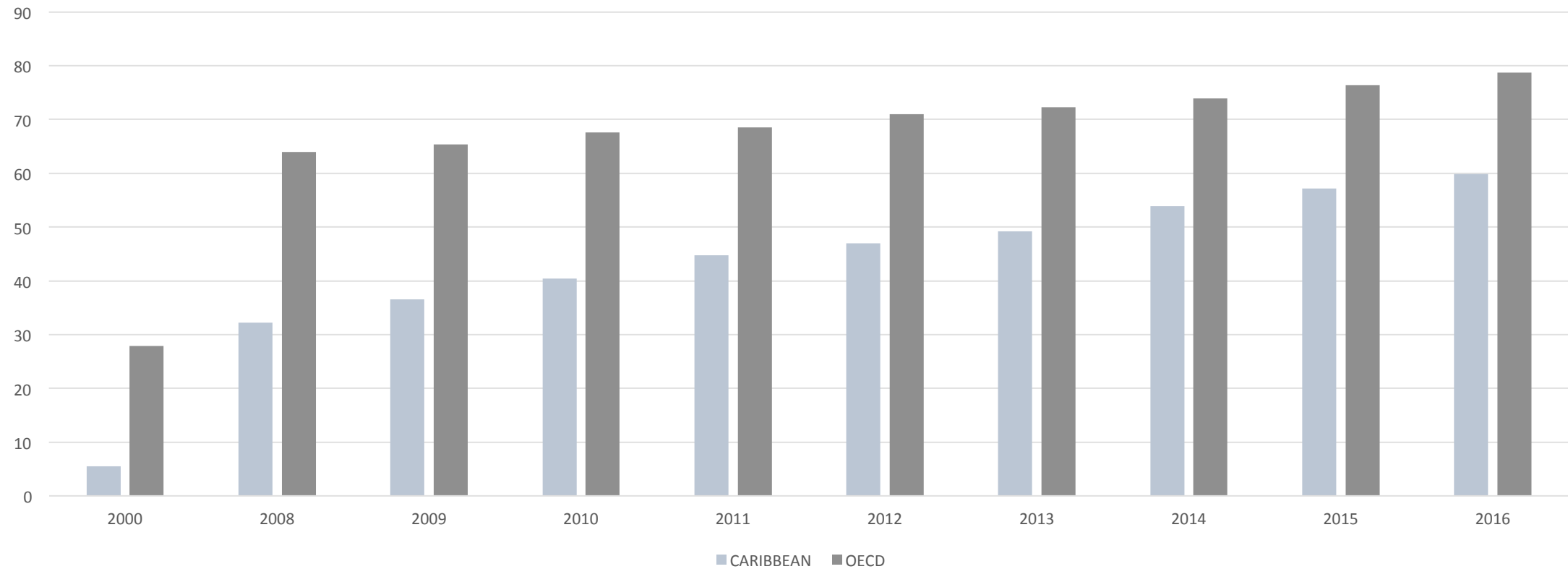


Implications

- **Adapt fast – or be disrupted:** capacity to absorb, use, recombine these technologies to invent new products/applications that can enhance the competitiveness of existing and future industries
- **Connectivity:** requires universal access, larger bandwidths → 5G, as well as access/affordable services
- **Talent:** requires more quantity, pervasive skills at all levels



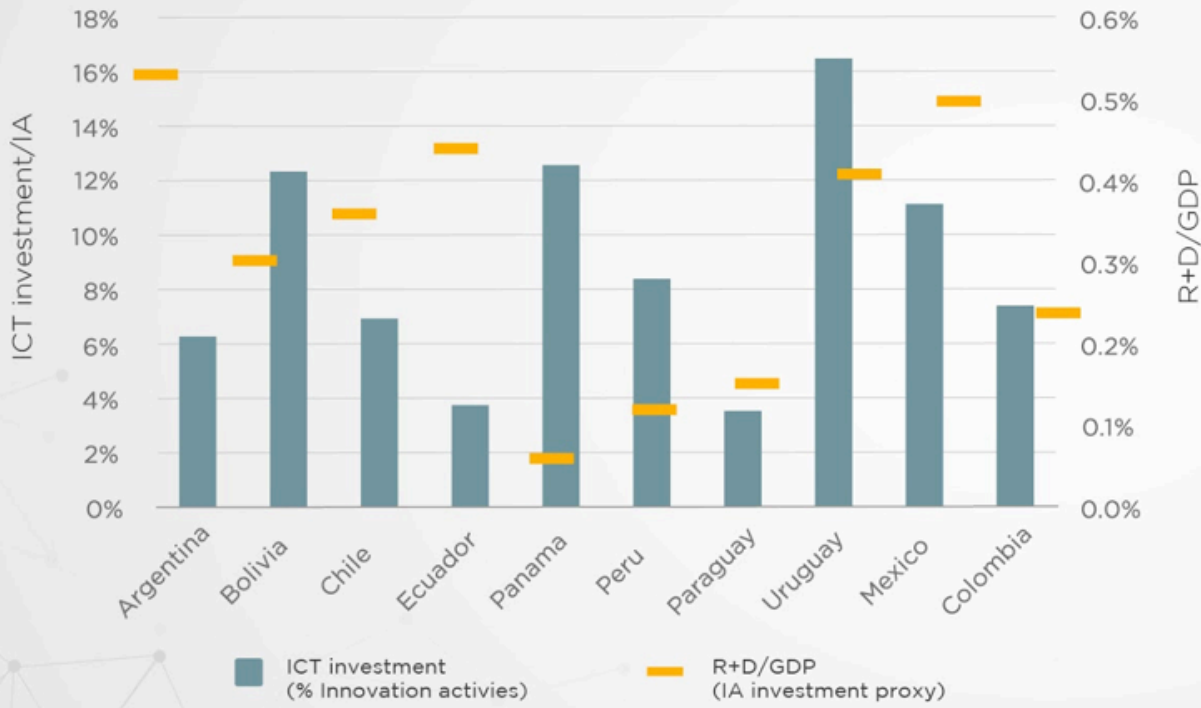
Internet Users, 2008 - 2016 (as % of total population)





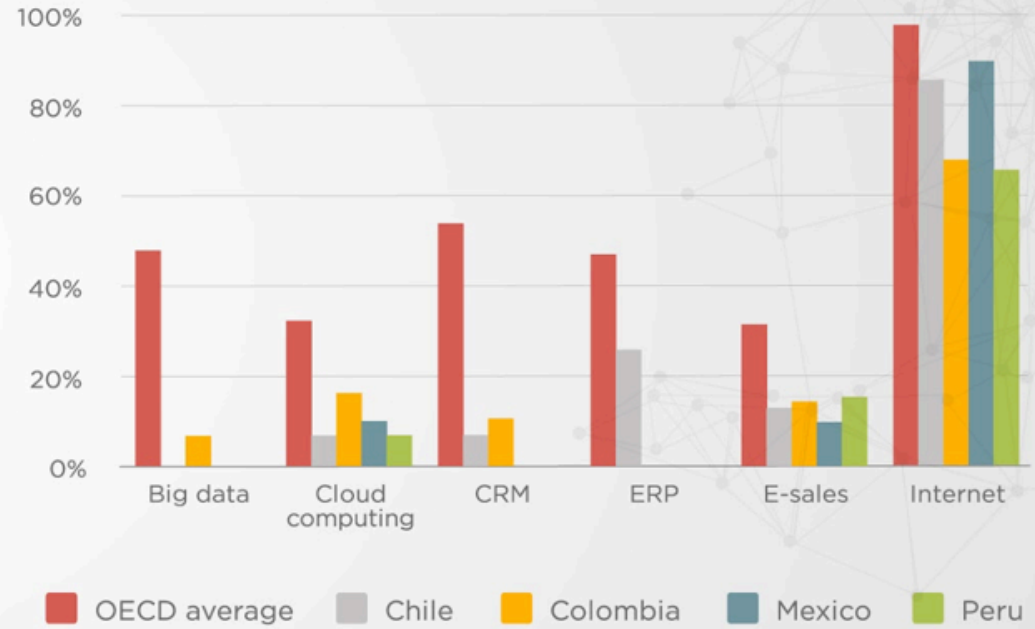
Low ICT investments and digital technology adoption in firms

ICT investment



Source: Own elaboration based on Innovation surveys

Digital technology usage by firms



Source: Own elaboration based on Innovation, ICT and firms surveys and OECD data

LAC current infrastructure vs connectivity requirements for applications 4.0

Main applications in the new digital industry

- Clean energy and transportation
- Public safety and emergency preparedness
- Advanced manufacturing
- Education and training technologies
- Health technologies
- Radar networks/meteorology/air traffic control
- 3D interactive video

Bandwidth
Range (Mbps)



LAC



2-3



6-18



38-74



38-74



38-74



38-74



77-148



Getting Tech ready

In 10 years time, 60 % of jobs will be completely new and based on ICT infrastructure – countries in the region need to get ready by:

- Building and improving upon existing infrastructure
- Increasing internet penetration
- Facilitating technology transfer in a wide range of sectors, from tourism to manufacturing
- Increasing education and training in the use of technologies, especially in the area of cybersecurity
- Encouraging investment and digital technology adoption in firms
- Moving towards Legislative Frameworks for Digital Identity, harmonized policy for use of digital data (at the regional level)



Thank you!

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Potential *Disruptors*

- Blockchain technology can benefit the agricultural sector and exports through product certification (origin, quality, authenticity), thus increasing value for niche market products such as cocoa. [Example – [EY Wine Blockchain solution](#)]
- Virtual Tourism – VR as a marketing platform in the tourism space, as well as income generation for local VR developers [Example - <https://www.dingole.com/projects/>]
- Global Services Sector - More jobs to be created in ICT and other high value areas (computer programmers, coders, app developers; data analysts; social media strategists; data scientists) that can be provided to companies abroad [Examples - <https://technewstt.com/pr-animation-scores/> ; <http://www.fullcircleanimation.com/showreel/>]
- Satellite based geo-positioning systems and sensors collecting big data to detect nutrients and water in soil, as well as the use of data applied to predictions to increase crop yields, leading to less food imports and increased exports

Potential Disruptors Cont'd

- Data and machine learning can be used to predict crimes and prevent them by identifying underlying correlations and causes. This can be done using crime-mapping platforms; smart lights; facial recognition software and CCTVs that cover blind spots and use high quality imagery; online storage and management of surveillance data etc.
- Artificial Intelligence can be utilized to manage Government processes such as tax management, predicting natural disasters and aiding in rescue efforts, auditing efficiency, etc.

Most existing jobs will disappear in 20 years! Implications for the Caribbean

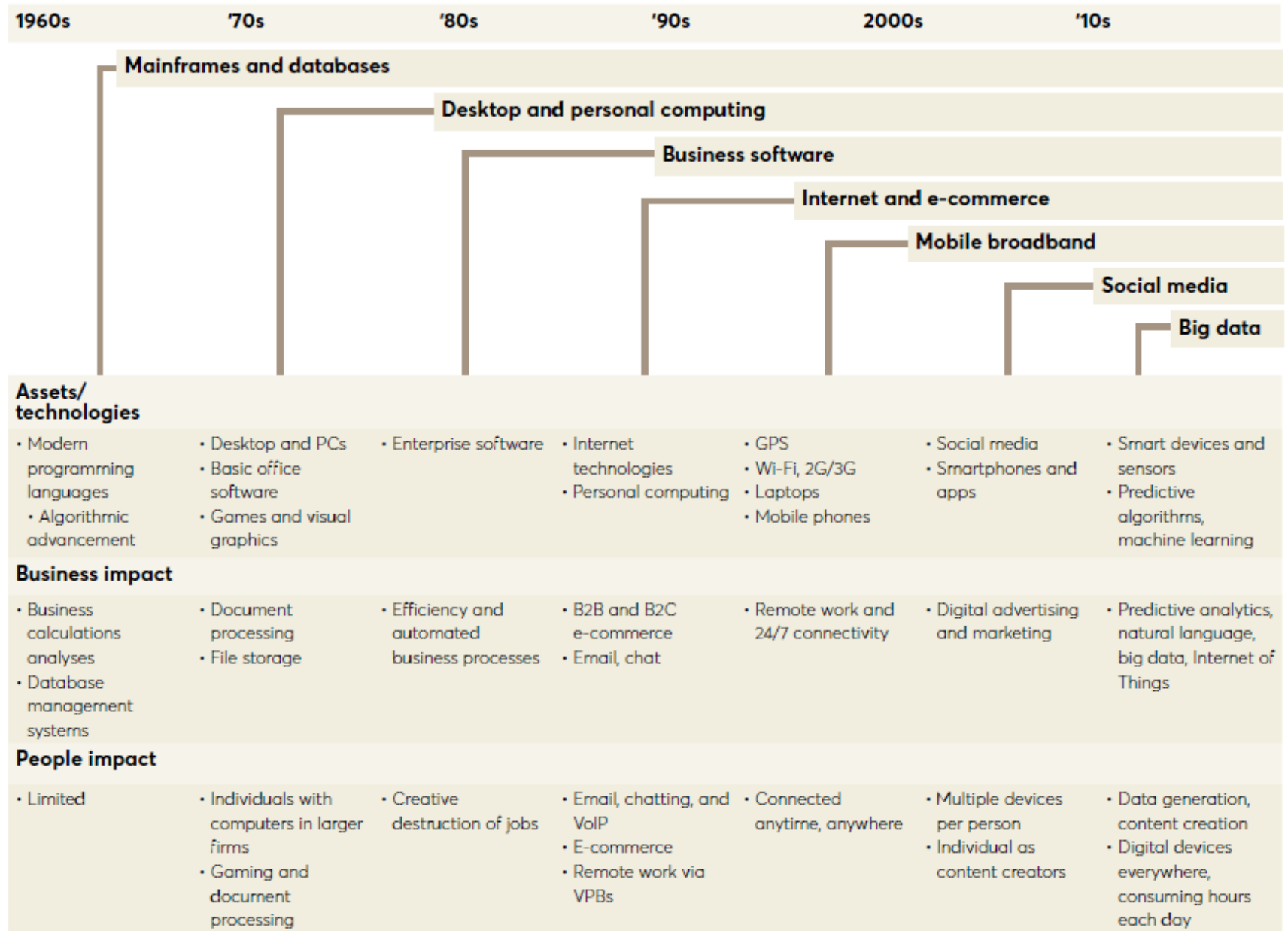
- Jobs will be replaced by computer and machine learning
- Almost all field of work will be affected, from cashiering to accounting.
- Jobs to be replaced (almost) totally by technology in the near term (next 10-15 years) – Cashiers, call-centres; manufacturing and assembly plant workers; drivers, construction workers, farmers; security workers; tellers
- Jobs to be displaced in the longer term (25-50 years) – Legal assistants; lawyers; accountants; land Surveyors; Finance Assistance; among others.

However, estimates of % of existing workforce at risk due to emerging tech **vary widely**

- Frey and Osborne (2013) – 47% of jobs could be eliminated by smart tech within 20 years
- McKinsey & Co. (2017) – 49% of the time we spend working could be eliminated by current tech
- PwC (2017) *Workforce of the Future* – 37% of respondents concerned about automation putting jobs at risk

More moderate analysts expect the a number of as yet unforeseen opportunities to same thing to come about, at the convergence of “STEMpathy” work (where the technical skills of science, technology, engineering, and math meet the humanistic skills of empathy and connection) → Impossible to predict where

ICT Trends



Source – McKinsey Global Institute (2015)