AI, Education and Leadership

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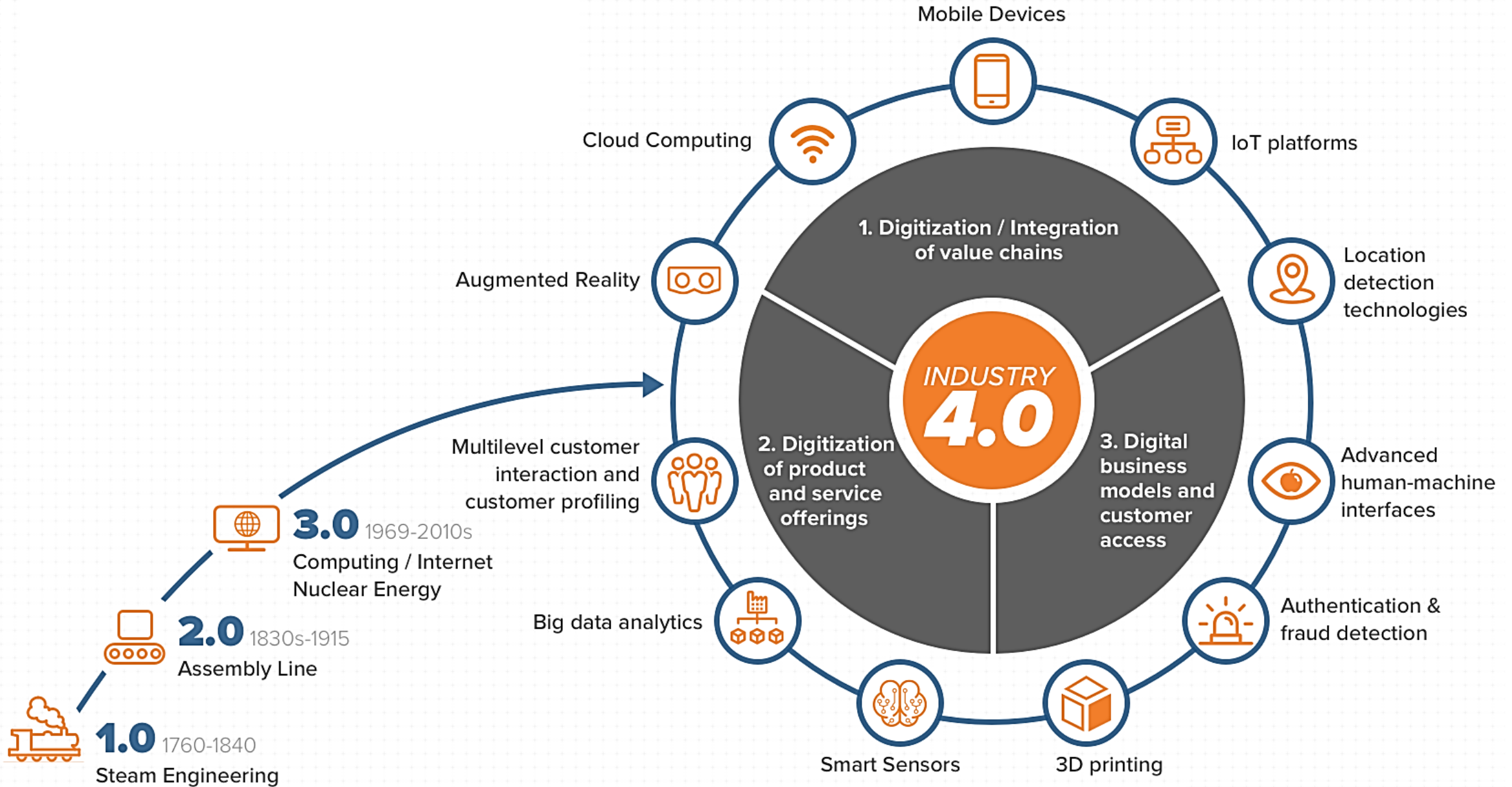
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Mobile Devices

IoT platforms

Cloud Computing

Augmented Reality

Location detection technologies

1. Digitization / Integration of value chains

INDUSTRY 4.0

2. Digitization of product and service offerings

3. Digital business models and customer access

Advanced human-machine interfaces

Multilevel customer interaction and customer profiling

Authentication & fraud detection

Big data analytics

3D printing

Smart Sensors

3.0 1969-2010s
Computing / Internet
Nuclear Energy

2.0 1830s-1915
Assembly Line

1.0 1760-1840
Steam Engineering

WHAT IS ARTIFICIAL INTELLIGENCE?

Machine Learning

Using sample data to train computer programs to recognize patterns based on algorithms.

Neural Networks

Computer systems designed to imitate the neurons in a brain.

Natural Language Processing

The ability to understand speech, as well as understand and analyze documents.

Robotics

Machines that can assist people without actual human involvement.

Artificial Intelligence

AI involves techniques that equip computers to emulate human behavior, enabling them to learn, make decisions, recognize patterns, and solve complex problems in a manner akin to human intelligence.
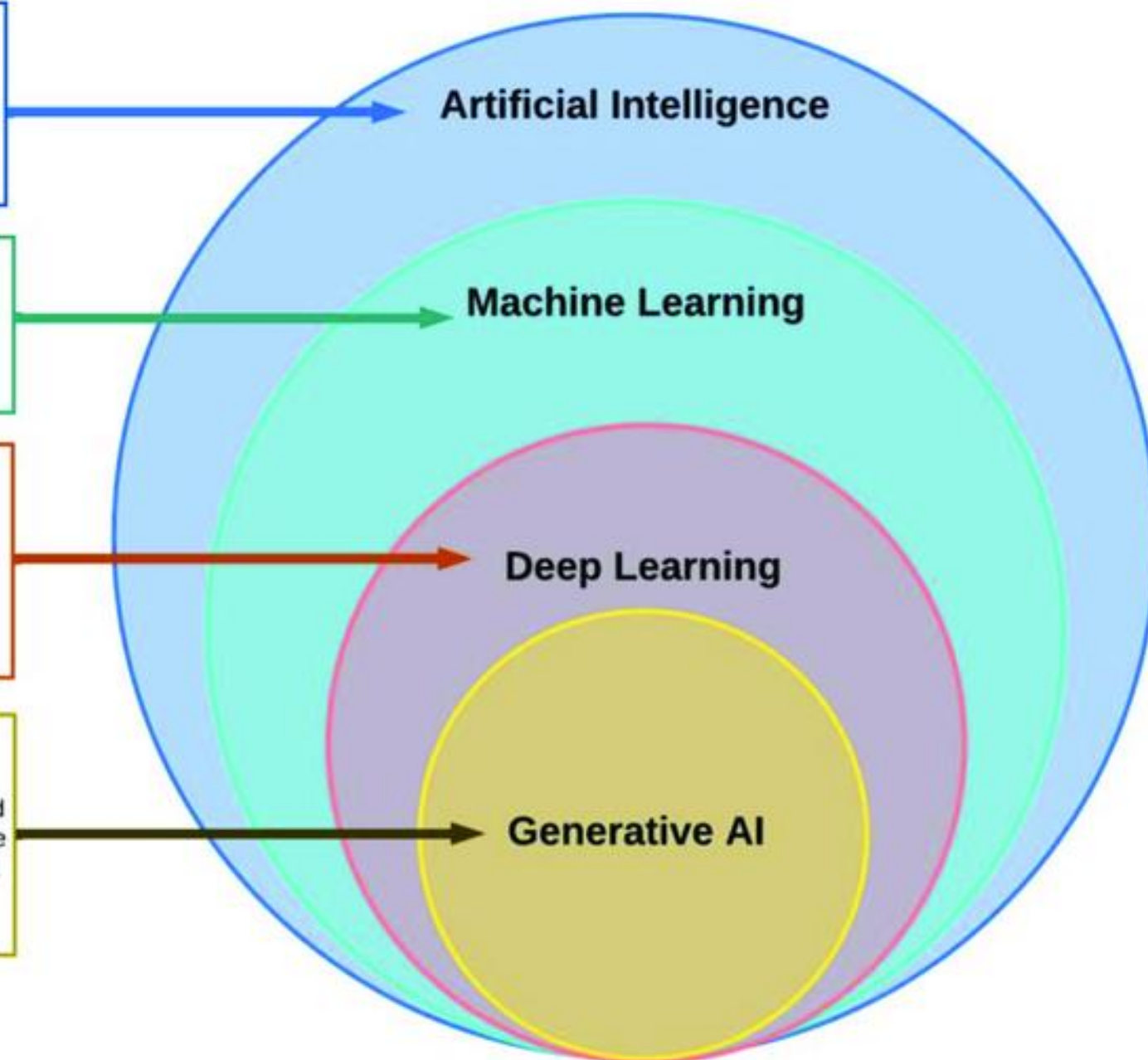
Machine Learning

ML is a subset of AI, uses advanced algorithms to detect patterns in large data sets, allowing machines to learn and adapt. ML algorithms use supervised or unsupervised learning methods.

Deep Learning

DL is a subset of ML which uses neural networks for in-depth data processing and analytical tasks. DL leverages multiple layers of artificial neural networks to extract high-level features from raw input data, simulating the way human brains perceive and understand the world.

Generative AI

Generative AI is a subset of DL models that generates content like text, images, or code based on provided input. Trained on vast data sets, these models detect patterns and create outputs without explicit instruction, using a mix of supervised and unsupervised learning.
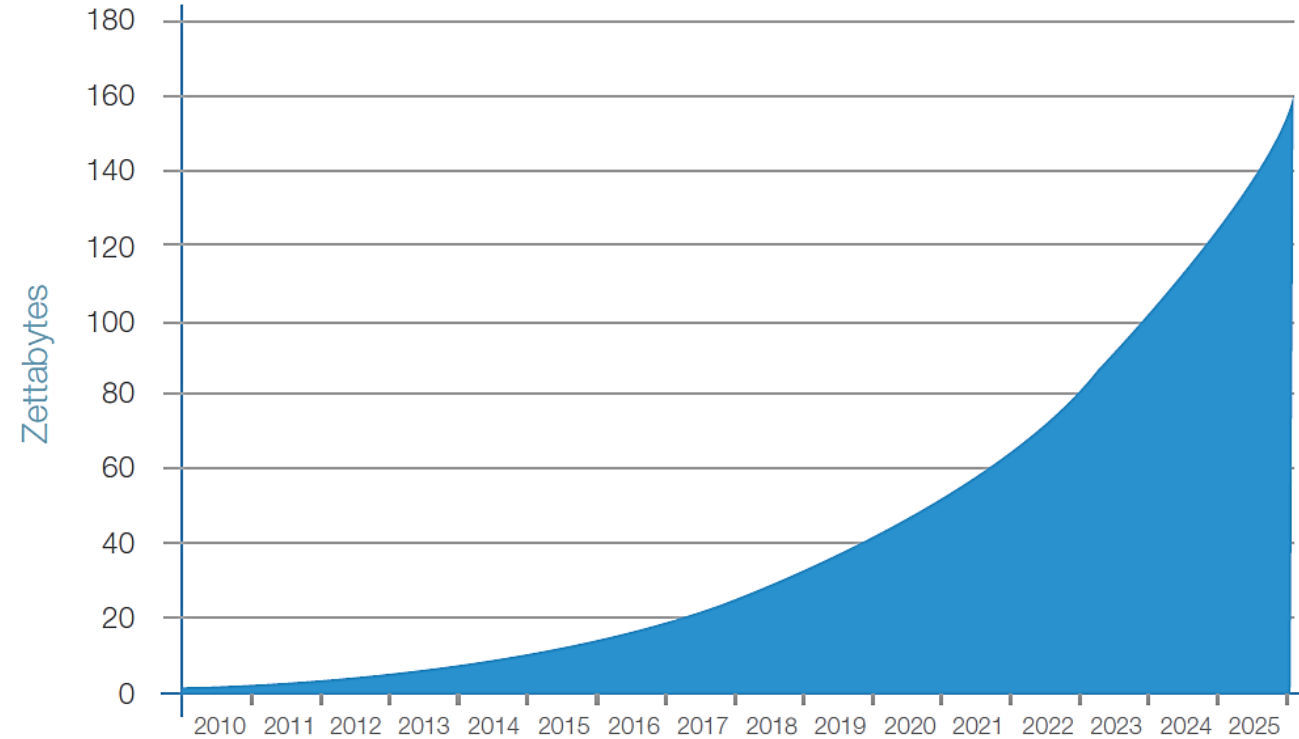
Artificial Intelligence

Machine Learning

Deep Learning

Generative AI

4IR and Data Growth – Feature/Causal Effect

- Forecasts **that by 2025 the** global datasphere will grow to 163 zettabytes / trillion gigabytes

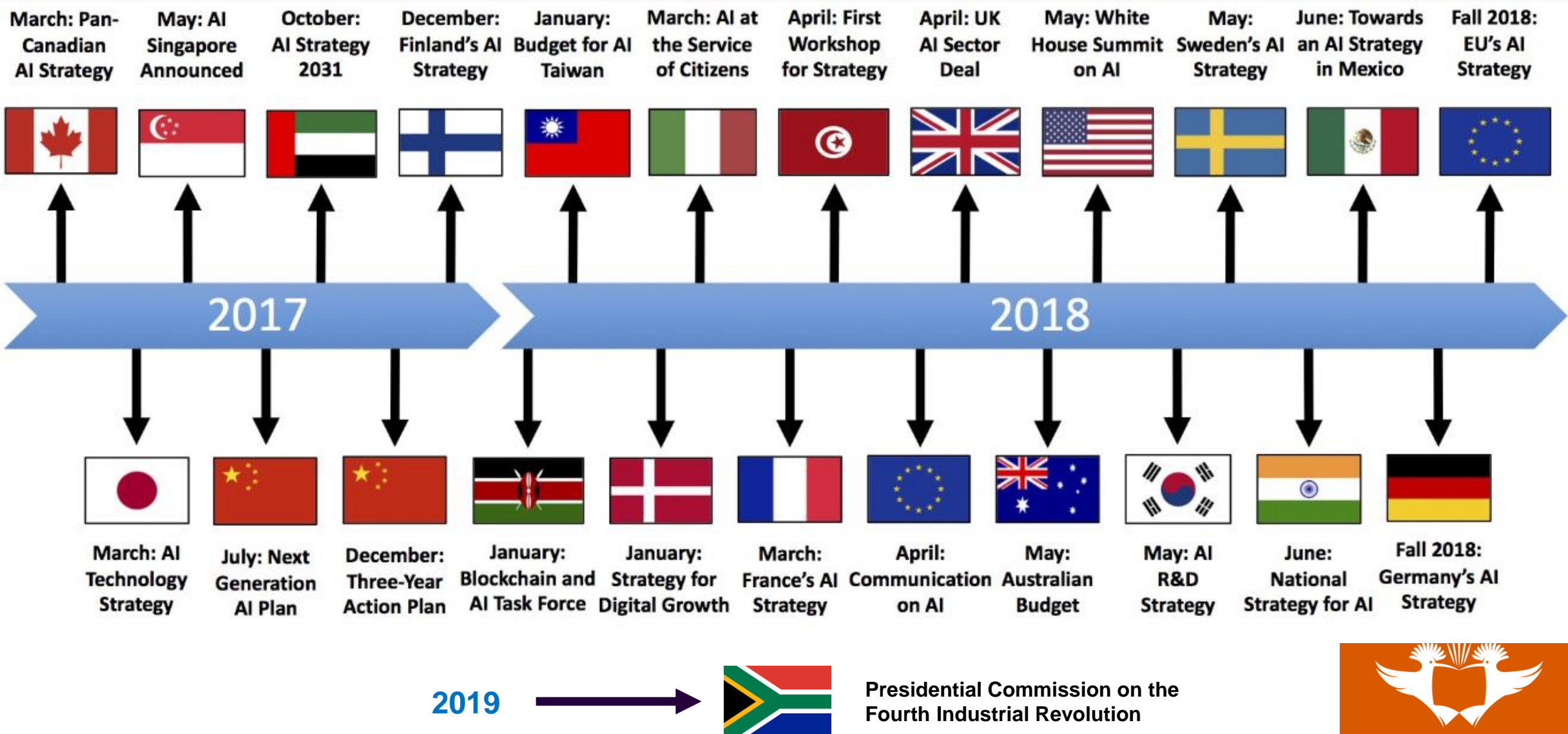...10^{21} or 1000000000000000000000

- Data sources consist of social media like Twitter and Facebook, emails, webpages, online searches – any activity on digital devices creates data

Annual Size of the Global Datasphere
(Source: IDC's Data Age 2025 study, sponsored by Seagate, 2017)

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Timeline of national AI strategies

2017

- March: Pan-Canadian AI Strategy
- May: AI Singapore Announced
- October: AI Strategy 2031
- December: Finland's AI Strategy
- March: AI Technology Strategy
- July: Next Generation AI Plan
- December: Three-Year Action Plan

2018

- January: Budget for AI Taiwan
- March: AI at the Service of Citizens
- April: First Workshop for Strategy
- April: UK AI Sector Deal
- May: White House Summit on AI
- May: Sweden's AI Strategy
- June: Towards an AI Strategy in Mexico
- Fall 2018: EU's AI Strategy
- January: Blockchain and AI Task Force
- January: Strategy for Digital Growth
- March: France's AI Strategy
- April: Communication on AI
- May: Australian Budget
- May: AI R&D Strategy
- June: National Strategy for AI
- Fall 2018: Germany's AI Strategy

2019 → Presidential Commission on the Fourth Industrial Revolution

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Some concerns with AI

- **Privacy**

- **Bias**

- **Security**

- **Explainability**

- **Accountability**

- **Deepfakes**

- **Exploitation of Intellectual Property**

AI Tools for Education

Intelligent tutoring systems – AutoTutor, SmartTutor

Automated grading and assessment – Gradescope, Cograder

Chatbots and virtual assistants

Curriculum planning

Interactive and learning games

Personalized learning

Smart Content Creation

Proctoring – The Invigilator

Language learning – Duo Lingo app

Way Forward

Quick Wins

off-the-shelf ML/AI products (with necessary adaptations)

- a voice interface to generate class notes – Audio Pen

- a tool to schedule internal meetings

- A tool to make meeting notes – Read.ai

Long Term Projects

long-term projects are more involved than quick wins

off-the-shelf technology generally doesn't suffice for long-term projects

Needs organizational skills or third party to develop AI products

AI is not the goal; rather, it should be the "enabler of the goal".

Education is the manifestation of perfection already existing in man.

SWAMI VIVEKANANDA

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" Education is the most powerful weapon we can use to change the world. "

~ Nelson Mandela

QuotesCosmos

NGIYaTHOKOZa!

ro livhuwa!

ke a leboga!

enKOSi!

dankie!

thank you!

vdo livhuwa!

inkomu!

ngiyabonga!

ke a leboha!

siyabonga!