

Future of AI

A person is seen from behind, sitting at a desk in a dimly lit library. The desk has a laptop and several open books. In the background, tall bookshelves are filled with books. A large, glowing blue globe is the central focus, surrounded by intricate digital data visualizations, including network lines and floating particles. The overall atmosphere is futuristic and intellectual.

November 11th, 2023

12 years of experience in Artificial Intelligence as a practitioner



Knowledge mgmt consulting @Harvard,
@WorldBank, @MIT, @Stanford



R&D at MIT for foundation of patented
Merlin AI Model



1000's of hours of AI R&D



Know the problem as an AI
practitioner from ground up

In the Arena as a Practitioner

ANTHROPIC

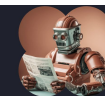


Llama 2



Augmented Shelf
Digest

November 02 - November 08, 2023





Approach

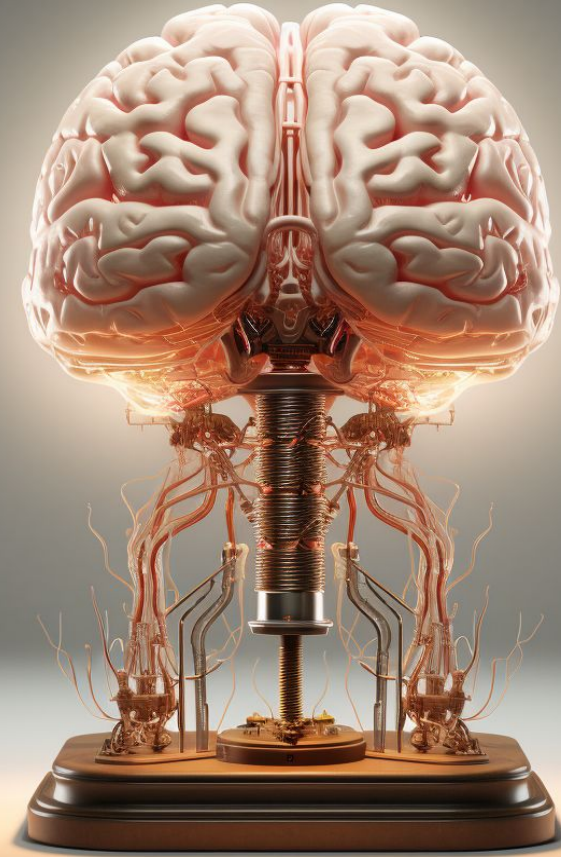
I have focused on bringing attention to the positive aspects of the era we're in



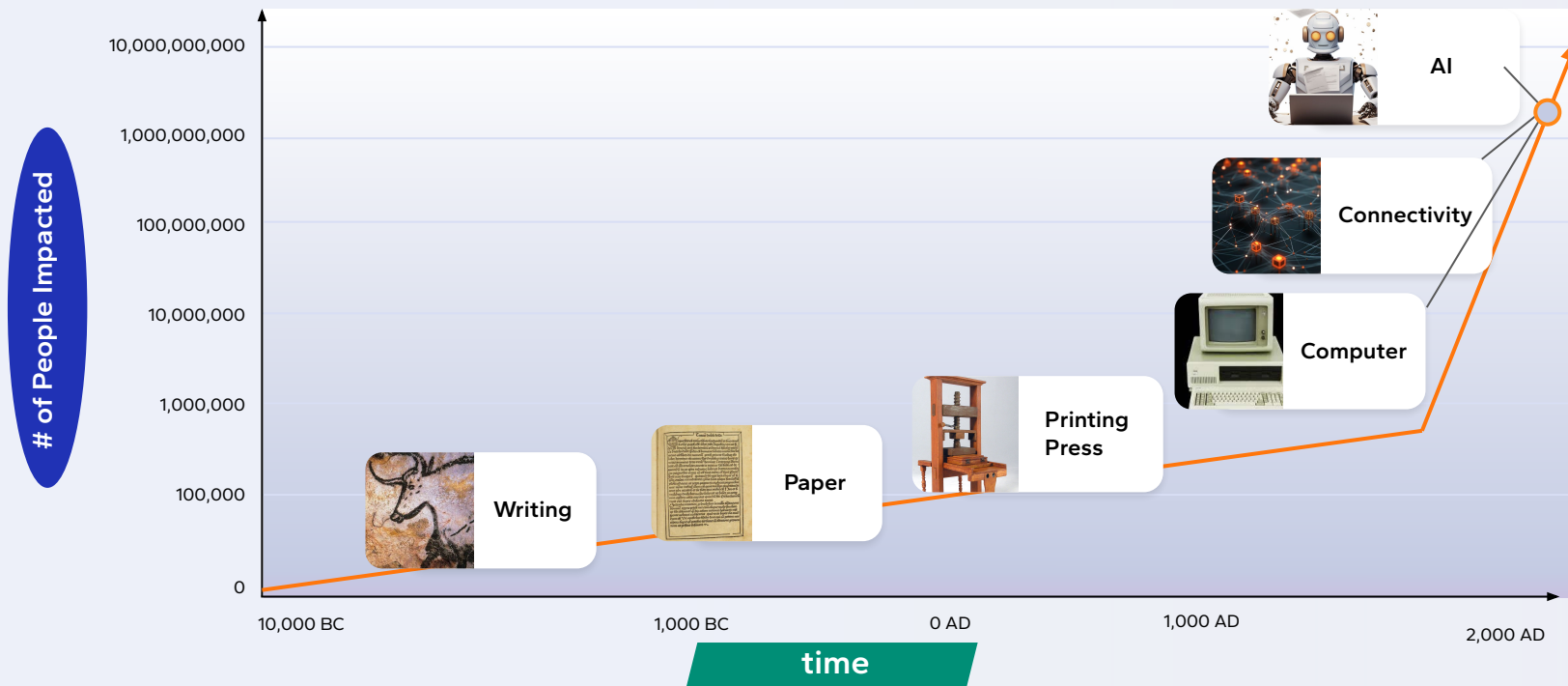
Key Topics

- History of Technology Evolution
- Breakthrough Moment in Human History
- Convergence of Technologies
- Acceleration & Rapid Change
- What we can do

Brief History of Technological Revolution



The beginning of the technology revolution started 1,000's of years ago. This was the beginning the augmentation of our ability to think, create, build, communicate & manifest



The 5 macro trends(*created by humanity*) driving change

Artificial
Intelligence



Big Data



Global Connectivity



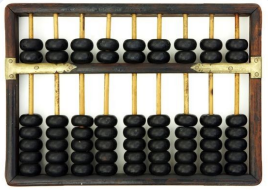
Cloud Computing



Computerization



Evolution of Computers



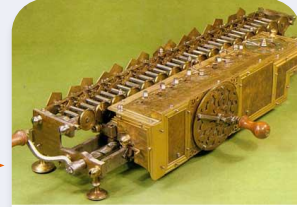
Abacus
(3000 BC)



Napier Bones
(1617)



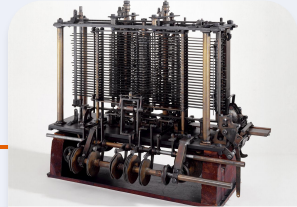
Pascaline
(1642)



Leibniz Wheel
(1685)



Jacquard Loom
(1804)



Analytical Engine
(1833)



Census Machine
(1889)



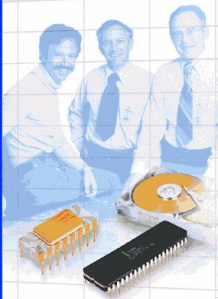
Mark I
(1944)

intel.

revolution in evolution

Highlights from the Journey to 1 Billion PCs

1,000,000,000
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800,000,000
700,000,000
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200,000,000
100,000,000



1981 - IBM introduces its first personal computer featuring the Intel® 8088 microprocessor. It sparked the PC revolution and set industry standards that still exist today. The IBM platform enabled hardware makers and software programmers to develop programs and add-on accessories. Until then, most PCs had been custom and proprietary.



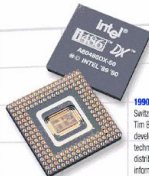
1982 - Lotus Development Corporation introduces Lotus 1-2-3, which becomes a best-seller application.



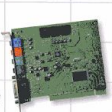
1984 - Apple introduces the Macintosh with a GUI. A graphical user interface that provides visual representation for what was previously lines of DOS code, making PCs more usable for non-technical people.



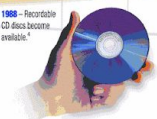
1985 - Intel introduces the 386™ microprocessor featuring 275,000 transistors - more than 10x times as many as the original 4004. The 386™ microprocessor was the first processor designed specifically for a mobile computer.



1990 - In Geneva, Switzerland, Tim Berners-Lee develops a new technique for distributing information on the internet, eventually called the World Wide Web.



1989 - The number of PCs shipped worldwide reaches nearly 120 million.*



1988 - Recordable CD discs become available.*

1986 - Microsoft ships the Windows® operating system with a graphical user interface. America Online is founded!

1989 - The number of PCs shipped worldwide reaches nearly 64 million and a 15-year period of continuous growth begins.*

1991 - Toshiba introduces the T1000 laptop PC, making portable computing more widely available.

1991 - Creative Labs introduces a Multimedia Logitech® K7 combining a CD-ROM drive, Sound Blaster® Pro board, speakers, and multimedia software.

1992 - The number of PCs shipped worldwide reaches 202 million.*



1993 - Intel introduces the Pentium® processor and Microsoft® introduces Windows® 3.1, providing a solid multimedia platform for consumer games and learning applications. Increased processing capabilities, coupled with the availability of affordable CD-ROM drives and sound cards, usher in multimedia on the PC.



1996 - The Digital Versatile Disc (DVD) enters the Consumer Electronics Show. Fujitsu introduces the technology into the IBM Thinkpad series, powered by the Pentium® processor.†



1995 - Microsoft launches Windows® 95 and its browser Internet Explorer. Selling more than 1 million copies in the first four days, the operating system helps more PCs into more than 250 million businesses, homes, and schools around the world.*

1996 - The first 3-D graphics accelerators being advanced PC gaming to the home! Approximately 40 million people are connected to the Internet, and more than 1 million dollars change hands online!†

1997 - Intel introduces the Pentium® III processor and the number of PCs shipped worldwide reaches more than 487 million.*



1998 - Microsoft launches Windows® 98 and its browser Internet Explorer. Selling more than 1 million copies in the first four days, the operating system helps more PCs into more than 250 million businesses, homes, and schools around the world.*

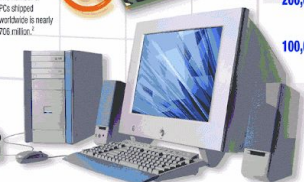
1999 - The number of PCs shipped worldwide reaches nearly 600 million.*

2000 - Intel introduces the Pentium® 4 processor and an estimated 400 million people worldwide are connected to the Internet by the end of the year - more than double the number of people connected in September 1999.†



2001 - 20th anniversary of IBM's first personal computer. Microsoft introduces the Windows® XP operating system. Nearly half a billion people around the world have access to the Internet from their homes.†

2002 - Intel introduces the Mobile™ Pentium® 4 Processor-M, bringing desktop performance to the laptop PC. The PC industry ships the 1 billionth PC, according to industry analyst firm Gartner Dataquest.†



2007-2008 - The number of PCs shipped worldwide may reach 2 billion, according to industry analyst firm Gartner Dataquest.†

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1971 - Intel, founded by Robert Noyce, Gordon Moore, and Andy Grove, introduces the world's first microprocessor and calls it the Intel® 4004.

1974 - Intel introduces the 8008 microprocessor, which was used in the first commercially successful personal computer - the Altair® 4004.

1976 - Apple Computer, Inc. releases the Apple I, the first single circuit board personal computer - the Altair® 4004. The following year, the company introduces the Apple II. First for a personal computer, the Apple II featured custom graphics.†

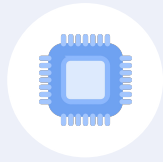


*www.intel.com/about-us
†Gartner Dataquest
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†The Bureau of Economic Analysis, 3/2/08
†The Internet Surveys, 12/03
†Consumer Electronics Association
www.ces-association.org

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The crown jewel of computerization is the evolution, specialization and mass production of the microchip



GPU (Graphics Processing Unit)



DSP (Digital Signal Processor)



CPU (Central Processing Unit)



NPU (Neural Processing Unit)



ASIC (Application-Specific Integrated Circuit)



VPU (Vision Processing Unit)



FPGA (Field-Programmable Gate Array)



IPU (Intelligence Processing Unit)



TPU (Tensor Processing Unit)

Etc...

The *microchip* is the *foundational building block* on which all digital devices, data and AI is built.



Movement from physical hardware to the cloud enabled any type of computing resource to be instantly accessed faster, cheaper and at scale



GPU (Graphics Processing Unit)



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Etc...

Precloud

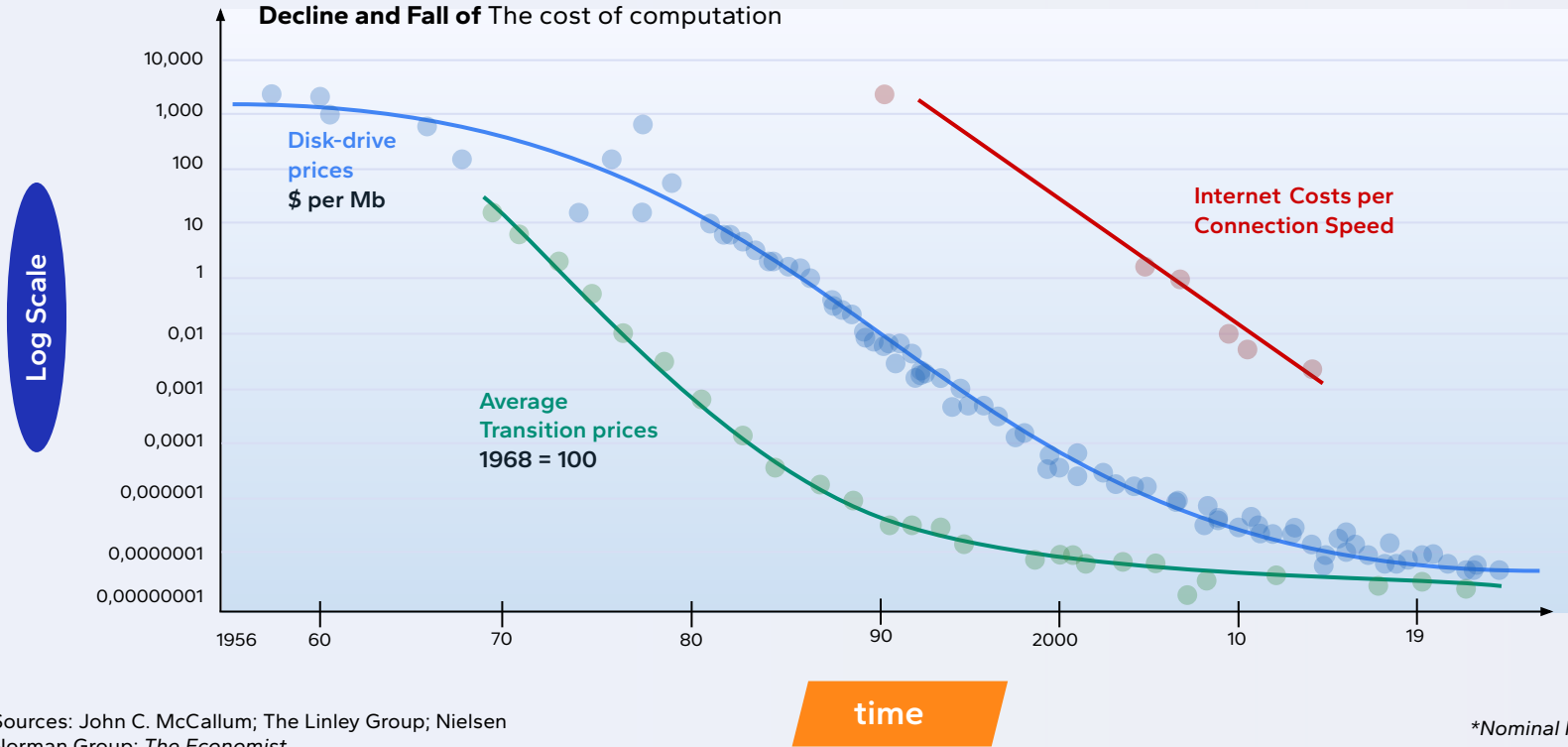
Hardware would take *weeks* to setup and cost *\$10,000's*



Now

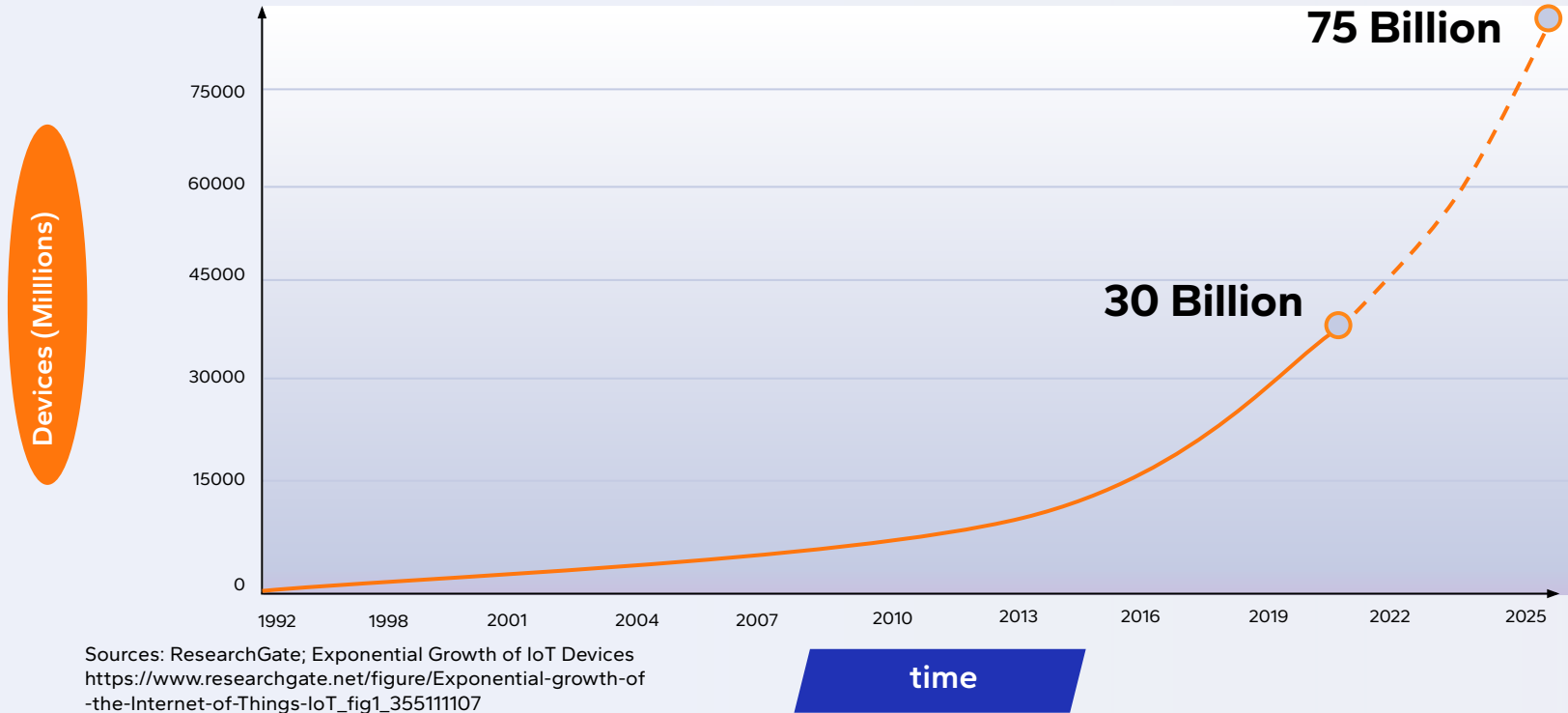
Cloud environments can take *hours* for *\$1,000's*

And the costs to create and maintain the computing infrastructure are exponentially decreasing



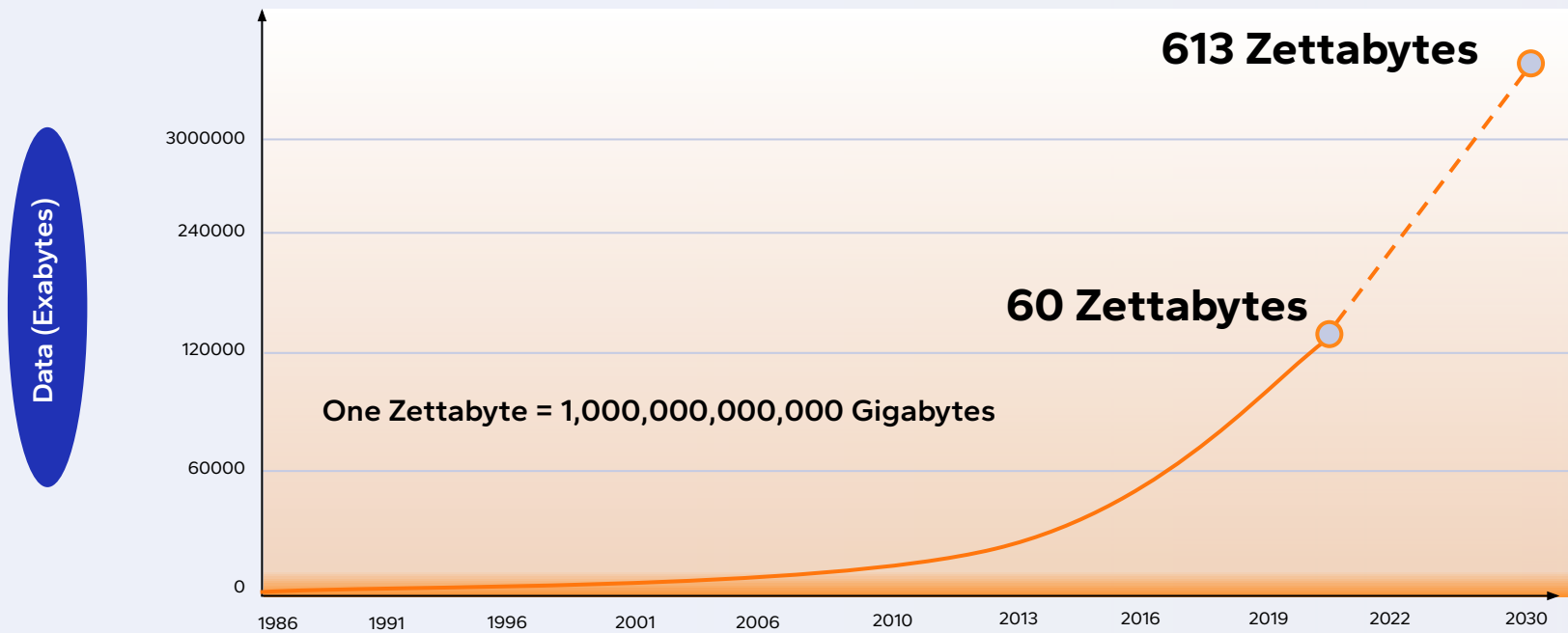
Sources: John C. McCallum; The Linley Group; Nielsen Norman Group; *The Economist*

This has led to the acceleration of mobile, connected devices.



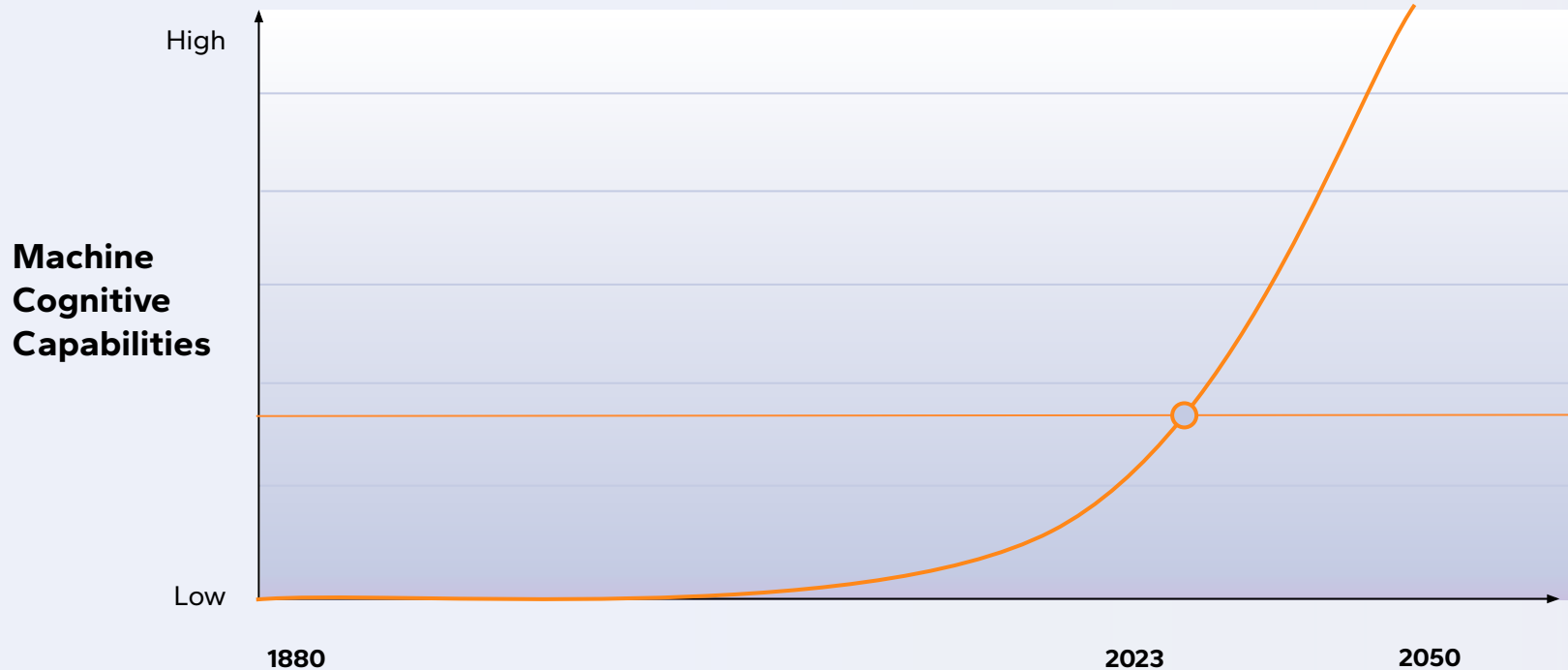
Sources: ResearchGate; Exponential Growth of IoT Devices
https://www.researchgate.net/figure/Exponential-growth-of-the-Internet-of-Things-IoT_fig1_355111107

The exponential increase in the amount of connected devices has led to the exponential increase in the amount of data created.



Source: Global CIO, Five Trends in Enterprise Data 2023
<https://globalcio.com/articles/main/five-trends-in-enterprise-data-2023/>

With exponentially increasing computing power, devices and data the ability to process, pattern match and understand that data accelerated.



This leads us to our current age of AI

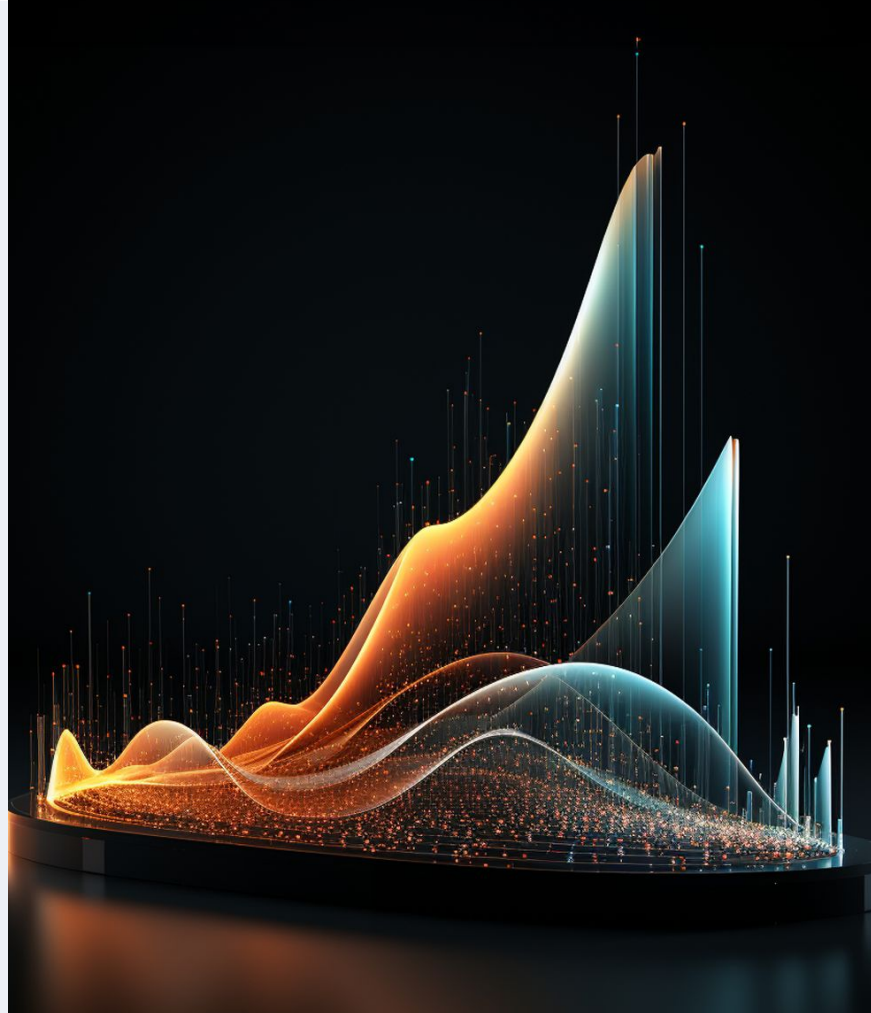
Artificial intelligence is the wide range of “intelligent” behaviors that are modeled and derived from data



We are still on the sharp part of the exponential curve on these larger macro forces

- Exponentially lowering price of compute
- Exponentially increasing speed of compute
- Exponentially lowering price of storage
- Exponentially lowering price of energy
- Size and sophistication of LLMs are exponentially increasing

This is not a hype curve but rather a fundamental shift in human civilization



The AI Revolution Begins



2023 was the Breakthrough Year



Models neared human performance in writing, summarization, sensory perception, etc, the first time



LLM's became the fastest adopted technology in human history



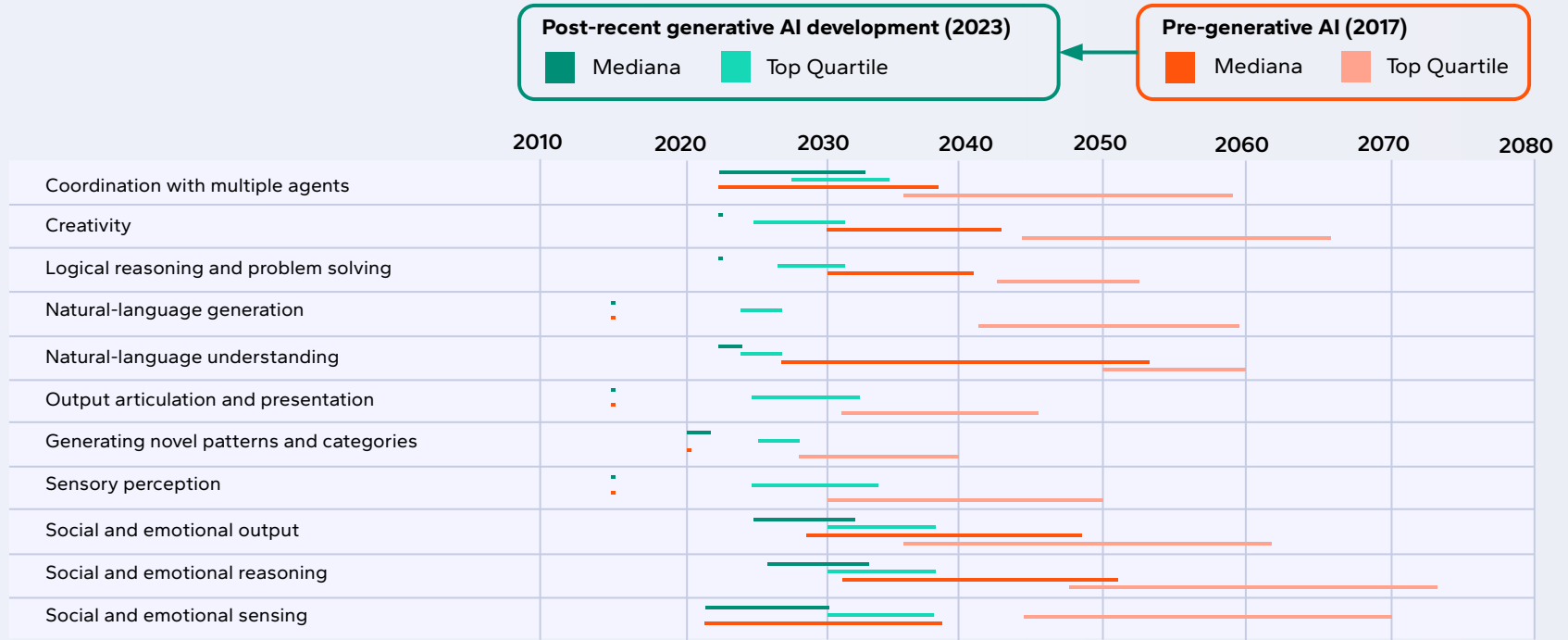
Crossed cost threshold for affordability & adoption



All forecasts on AI's impact got radically reduced

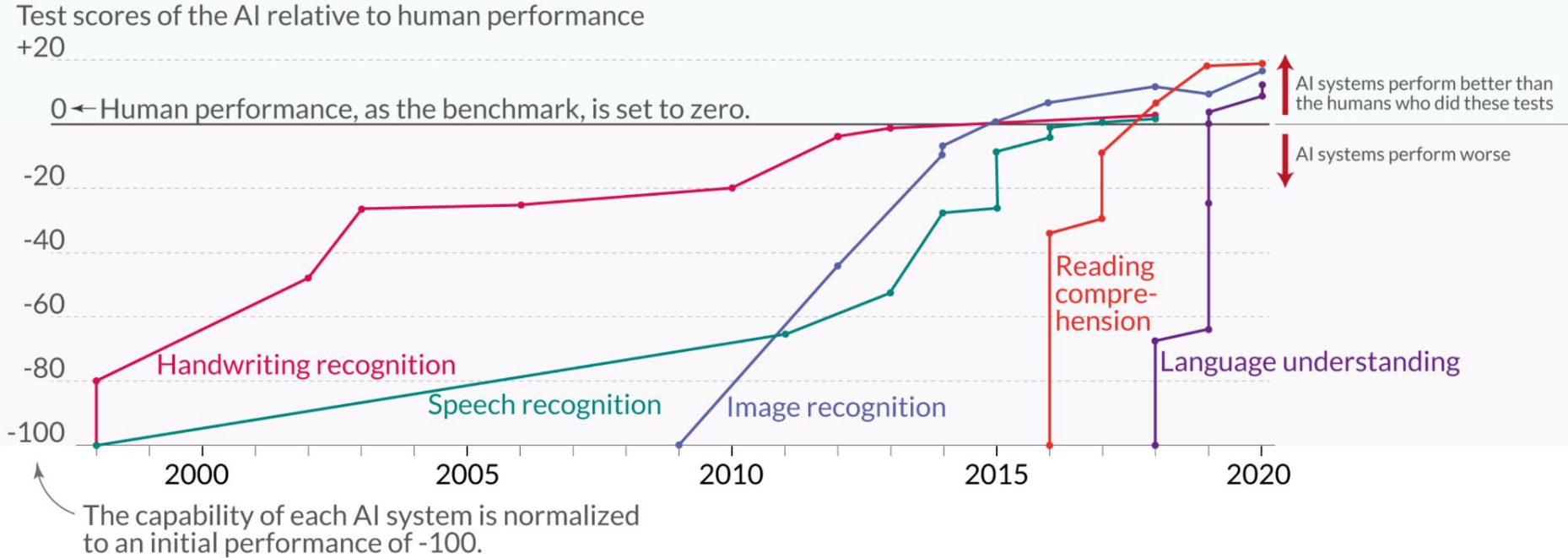
In 2023, the road to human-level performance got radically shorter

Estimated range for technology to achieve human-level performance, by technical capability



Source: What's the Future of Generative AI in 15 charts, McKinsey, 2023

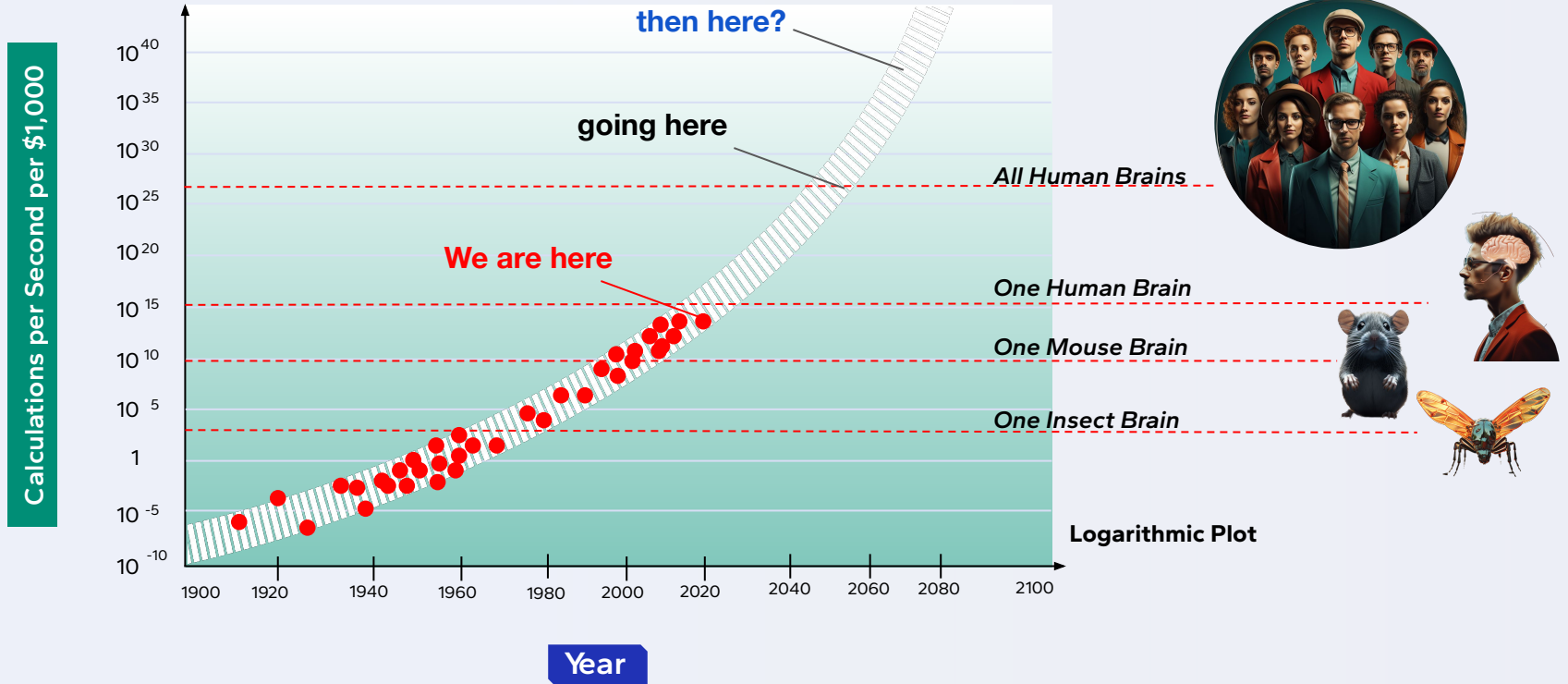
And some areas have already passed human performance



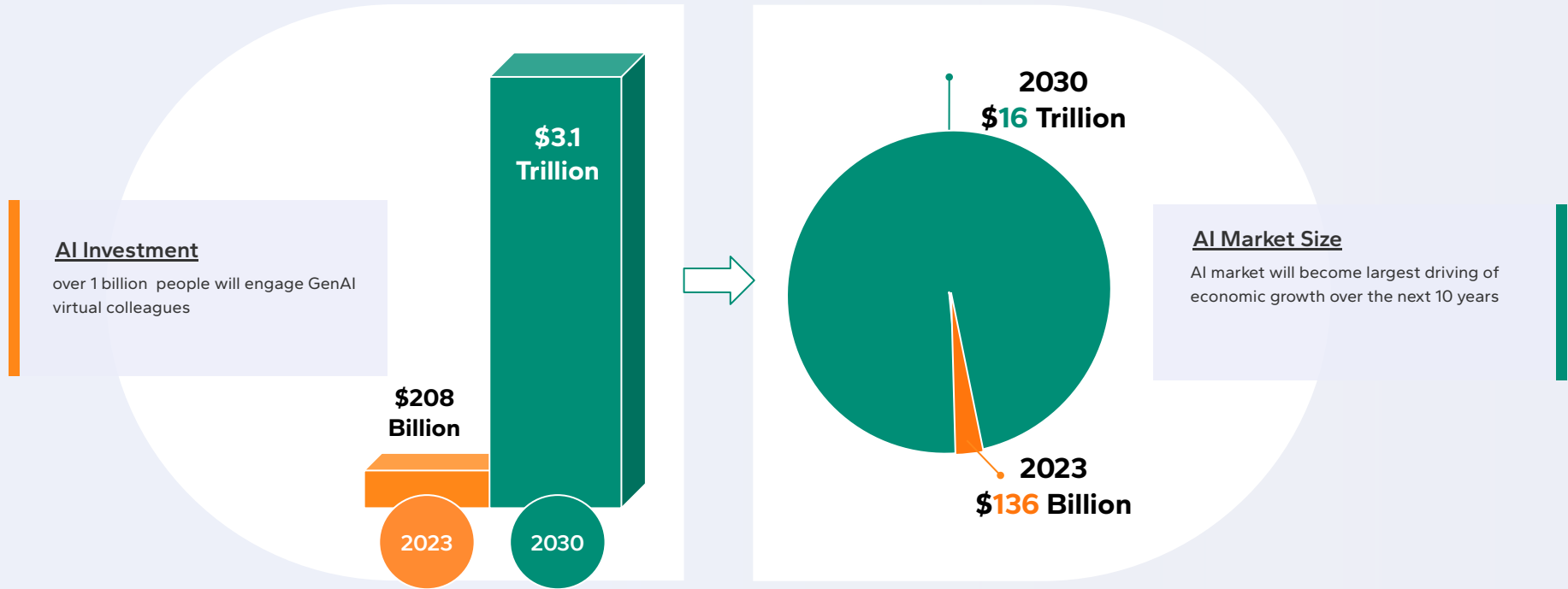
Data source: Kiela et al. (2021) – Dynabench: Rethinking Benchmarking in NLP
OurWorldinData.org – Research and data to make progress against the world's largest problems.

Licensed under CC-BY by the author Max Roser

And we're just beginning. At some point there will be an AI that has the computation power of all humanity combined



\$3 Trillion will be invested into AI contributing \$16 Trillion to the global economy by 2030



Sources:

Rekor Systems. (2023, August 18). AI could become a trillion-dollar industry by 2028. **Yahoo Finance**.

Baystreet via QuoteMedia. (2023, September 7). Potential \$3.1 trillion market by 2030. **InvestorsObserver**.

Rudnitsky, J. (2023, June 1). ChatGPT to fuel \$1.3 trillion AI market by 2032. **Bloomberg**.

(2023). AI Market to hit \$1.87 trillion by 2030. **Finbold**.

Future of Artificial Intelligence: Exploring Plausible "What If" Futures Author(s): Gartner, Inc. Publication Date: 2023 Publisher: **Gartner**

Gartner, Inc. (2023). Magic Quadrant for Cloud Database Management Systems for Operational Use Cases. **Gartner**.

Additionally



GPT Turbo (announced this week) marks the beginning of autonomous agents which will be able to create; websites, software prototypes, commercials, movies and more **without** human intervention



There will be **8.4 billion** AI-autonomous agents or "assistants" in the world by 2024, which will surpasses the total global population. They will begin to replace routine human tasks.



Nvidia predicts AI models will be 1,000,000X more powerful than they are today within 10 years

"If a computer is a **bicycle** for our minds then AI is the equivalent of a **supersonic jet**."

A futuristic landscape featuring a winding road that leads towards a city of tall, spire-like buildings. The scene is set against a bright blue sky with scattered white clouds. The foreground is a lush green field with small, rounded bushes. The road is a smooth, light-colored surface with white lane markings. The buildings in the background are tall, thin, and have a crystalline or metallic appearance, resembling a futuristic cityscape. The overall atmosphere is one of advanced technology and a bright, optimistic future.

5 Drivers are Accelerating the Convergence of Technology

The 5 macro forces are accelerating technological advancements and enabling new innovations & breakthroughs



IoT

- Intelligent wearables
- Intelligent homes
- Intelligent medical devices

Smarter, more connected, self maintaining and communicating physical devices.



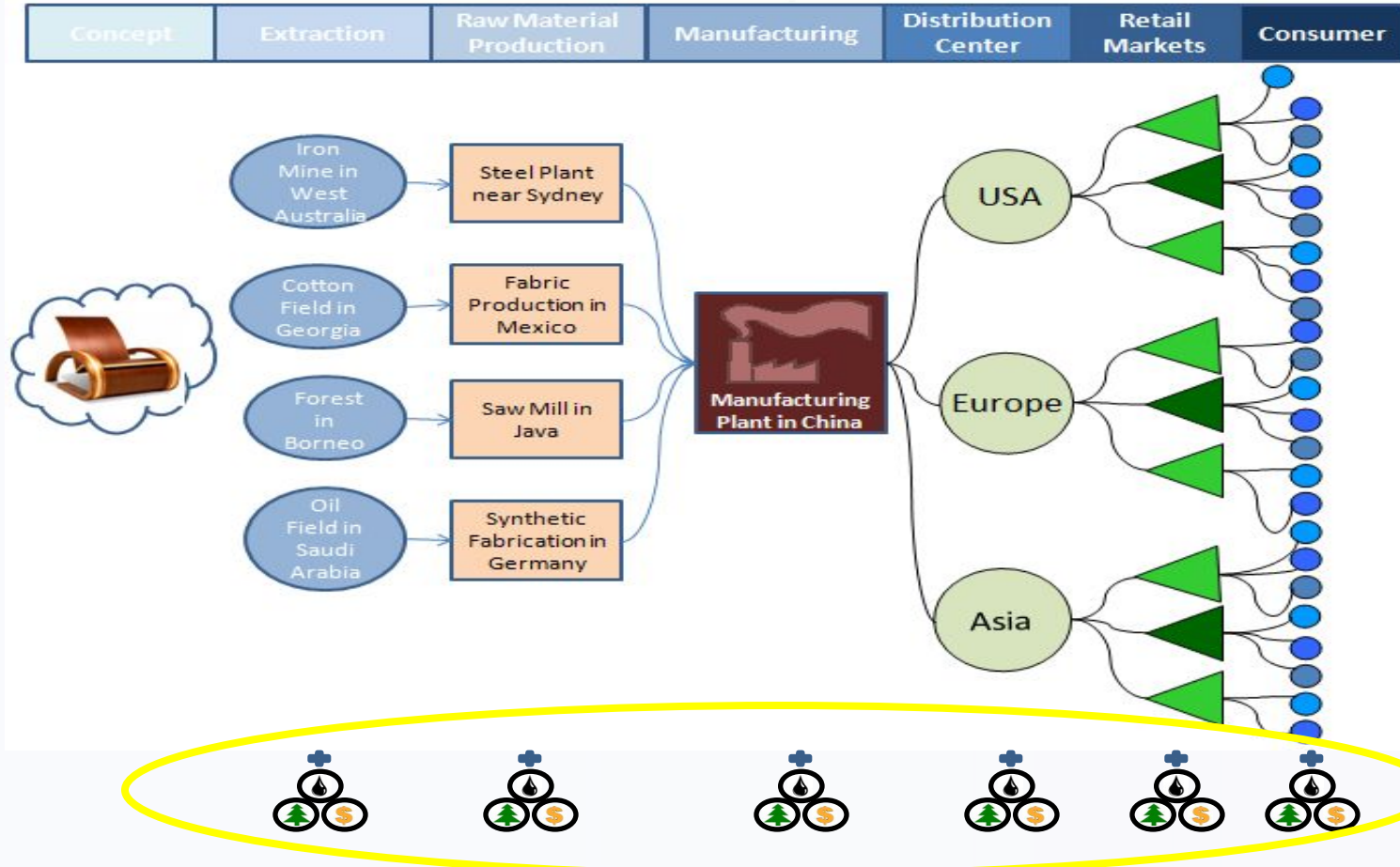
Decentralized Fabrication

- 3D Printing
- Material Science
- Generative Design
- [4D Printing](#)

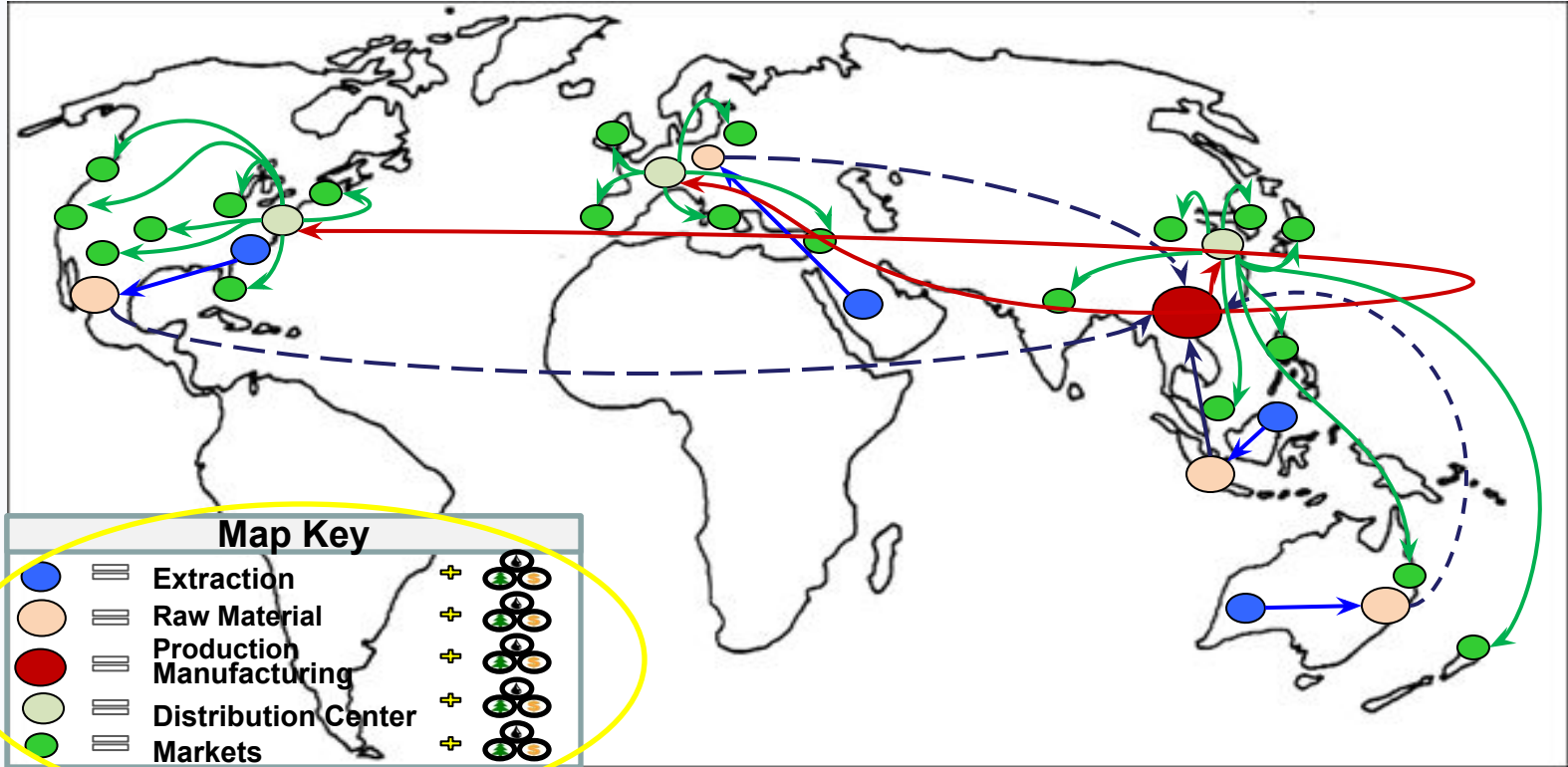
Decentralization, acceleration and diversification of manufacturing. Major breakthrough for environment & sustainability movements



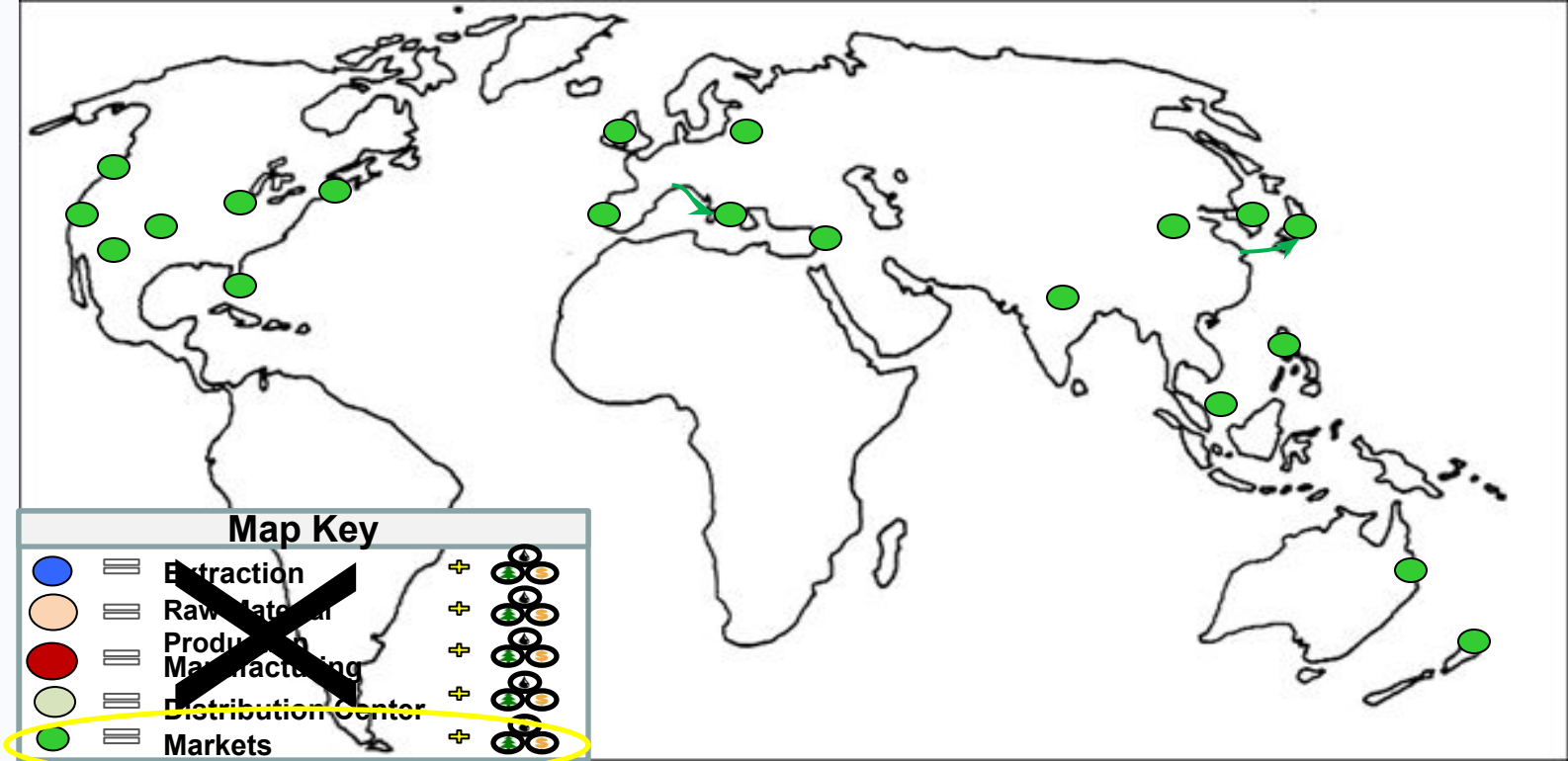
Industrial Era Production Process



Industrial Era Distribution System



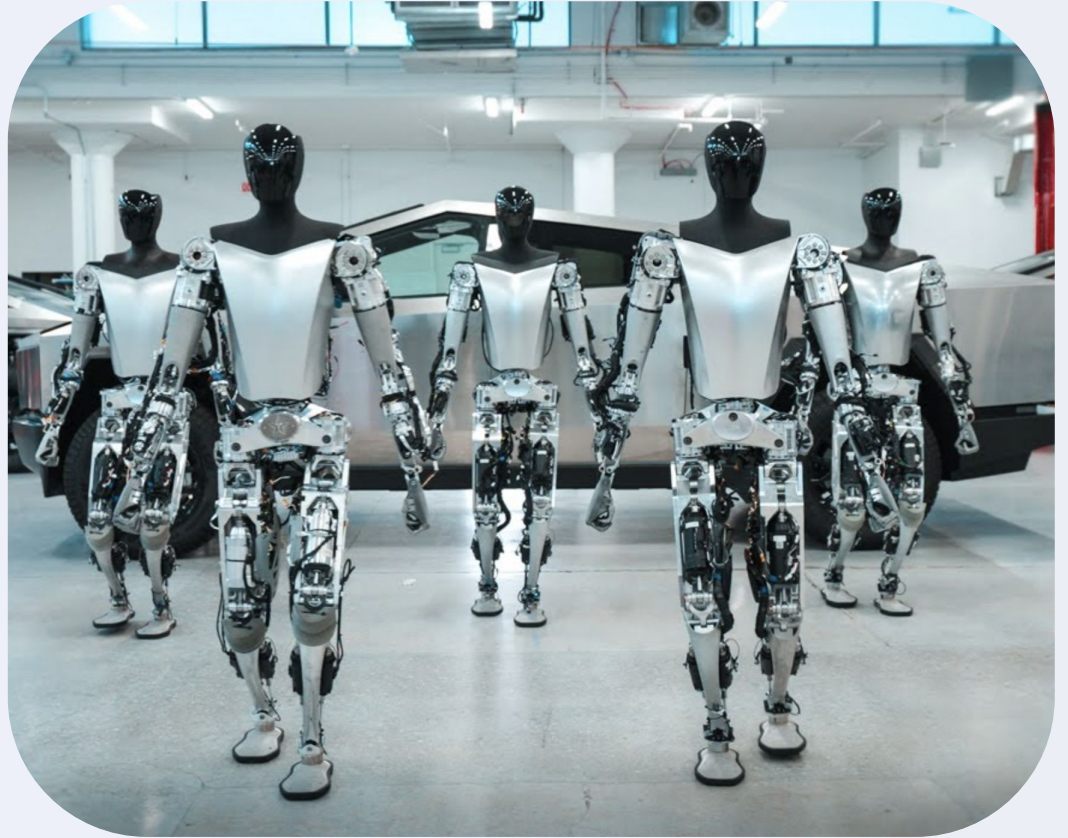
Emerging Era Distribution System



Robotics

- Self driving vehicles
- Drone transportation
- Labor force enhancement

Proliferation of intelligence in all aspects of the physical world. For example, universal access to cheap surgery



Capability Acceleration

- Create more, faster
- Accelerated learning
- AI Assistants - create websites, software, marketing materials, commercials, movies, etc. without human intervention

This marks the augmentation
of human potential



Brain Machine Interface (BMI)

- Path to overcome parkinson, alzheimer's, dementia
- Augment brain capabilities
- Enabling new capabilities

Universal improvements to humanity's brain & mental function



Biotech/ Genetics

- Stem cells
- Gene editing/ bio printing
- Gene Regeneration

upleveling humanity's health,
life extension, and potentially
longevity escape velocity





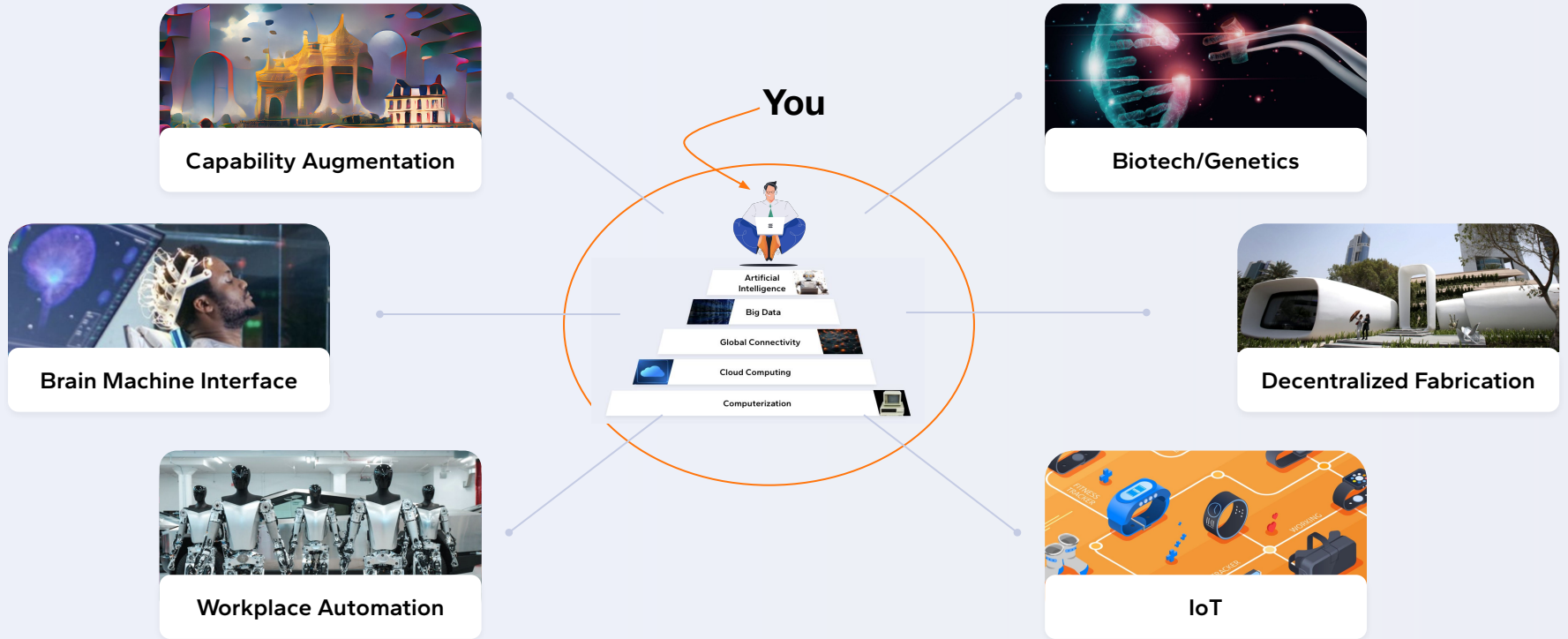
Summary

- Reached critical moment in human history of unprecedented change
- Entering period of physical, biological and technological convergence
- Ability to forecast more than a year is difficult, if not, impossible
- Opportunity for new creativity & imagination about the future

**What does all this
mean?**



This all means it's the augmentation of Us



Augmentation of our ability to think, create, build, communicate & manifest

- Do more, faster
- Learn more, better
- Augment creative abilities
- Build faster & with less resources
- Communicate more broadly & effectively
- Amplify your life purpose





Opportunities

- Radical abundance
- Universal education at highest level in history
- Longevity escape velocity
- Transformation of how we spend our time
- Acceleration of human evolution

Closing Message

- Learn as much as you can
- Embrace the change and adapt
- Use the new technology to tap into new personal/ organization potential
- Reimagine your work and creatively expand what it can be
- Actively create the future you want to live in.



A detailed, futuristic cityscape where nature and advanced technology are seamlessly integrated. The scene is dominated by lush greenery, including trees and vines, which are intertwined with complex, multi-tiered structures. These structures feature curved, metallic surfaces and large, spherical glass domes that reflect the sky. In the foreground, a sleek, elevated roadway with a glowing orange stripe curves through the landscape. Below it, a river flows through a verdant valley. In the background, tall, slender spires and more domes rise against a bright blue sky with scattered white clouds. The overall atmosphere is one of a harmonious and advanced civilization.

Thank you