Future of AI

November 11th, 2023

12 years of experience in Artificial Intelligence as a practitioner

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

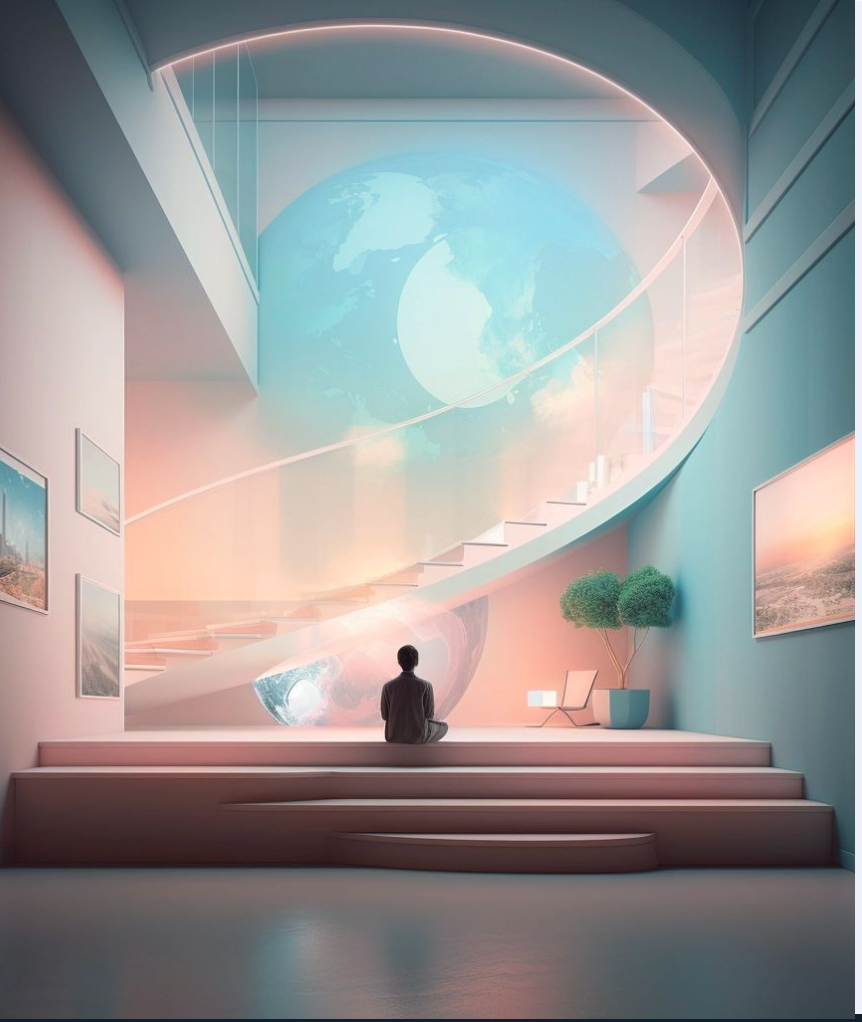
R&D at MIT for foundation of patented ***Merlin AI Model***

1000's of hours of AI R&D

Know the problem as an AI ***practitioner*** from ground up

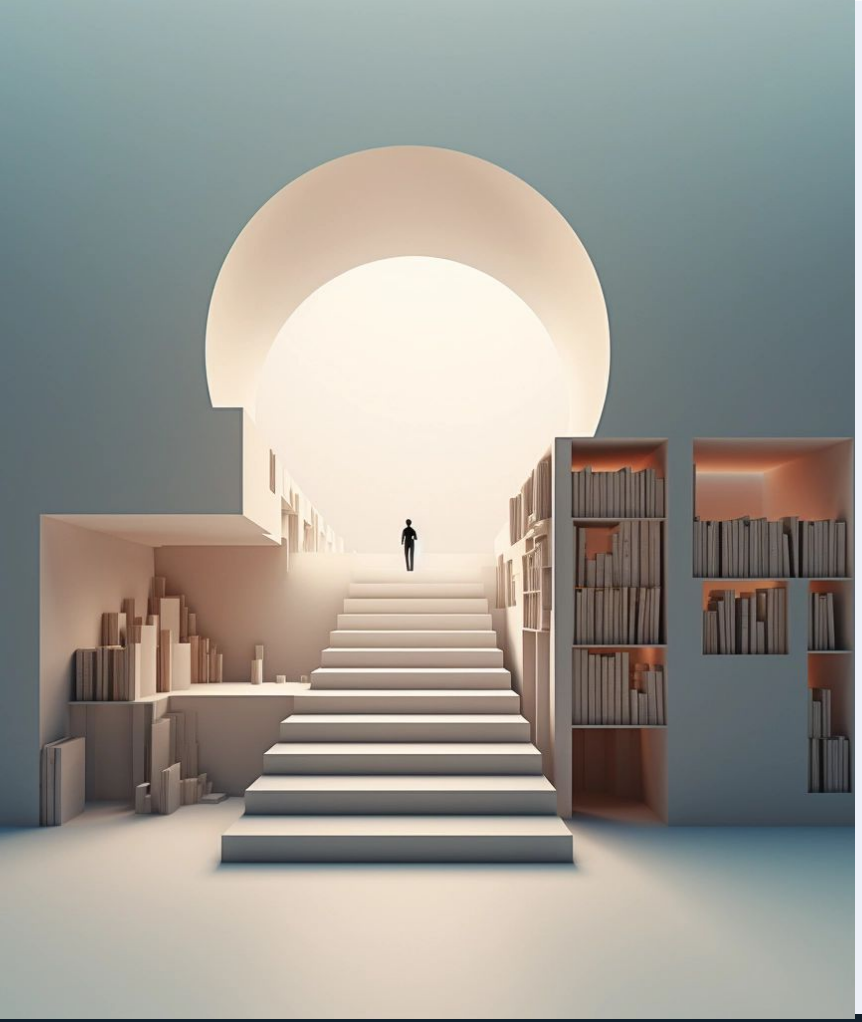
In the Arena as a Practitioner

ANTHROP\C
OpenAI
Pinecone
Hugging Face
cohere
stability.ai
Weaviate
Llama 2
Midjourney
LangChain



Approach

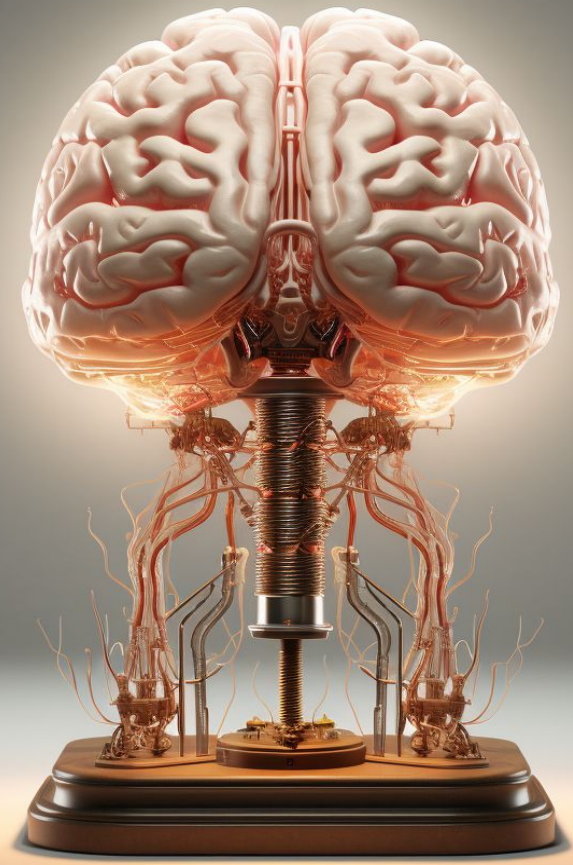
I have focused on bringing attention to the positive aspects of the era we're in



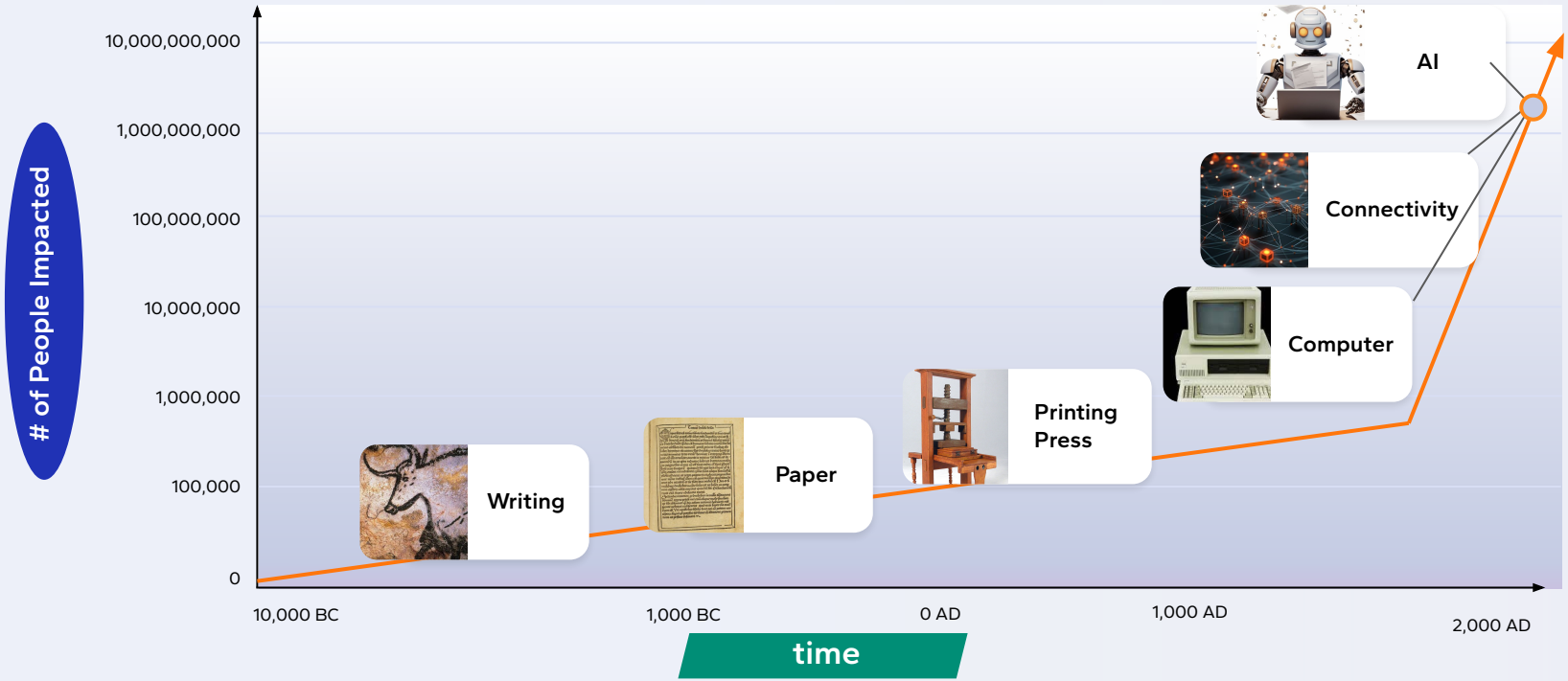
Key Topics

- 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



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

Artificial Intelligence

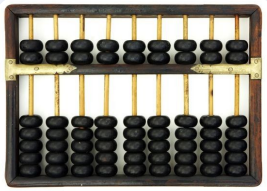
Big Data

Global Connectivity

Cloud Computing

Computerization

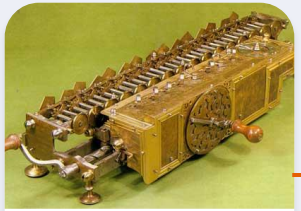
Evolution of Computers



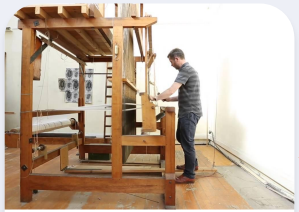
Abacus
(3000 BC)

Napier Bones
(1617)

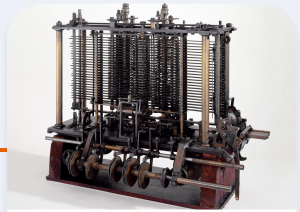
Pascaline
(1642)



Leibniz Wheel
(1685)



Jacquard Loom
(1804)



Analytical Engine
(1833)

Census Machine
(1889)

Mark I
(1944)

revolution in evolution

Highlights from the Journey to 1 Billion PCs

For more information, please visit **http://www.intel.com**

[1] www.inventors.about.com
[2] Gartner Dataquest
[3] www.ADL.com
[4] www.discuss.com/dvd
[5] www.idsoftware.com
[6] www.microsoft.com
[7] Consumer Electronics Association
[8] TruServe.com (Dow Jones News Service 11/06/96)
[9] PRS.org/internet-timeline
[10] www.napster.com
[11] US News & World Report, 3/22/99
[12] Nua Internet Surveys, 12/00
[13] NielsenNetRatings, "Half Billion Can Surf From Home," Reuters 3/02

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

- GPU (Graphics Processing Unit)
- CPU (Central Processing Unit)
- ASIC (Application-Specific Integrated Circuit)
- FPGA (Field-Programmable Gate Array)
- TPU (Tensor Processing Unit)
- DSP (Digital Signal Processor)
- NPU (Neural Processing Unit)
- VPU (Vision Processing Unit)
- IPU (Intelligence 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

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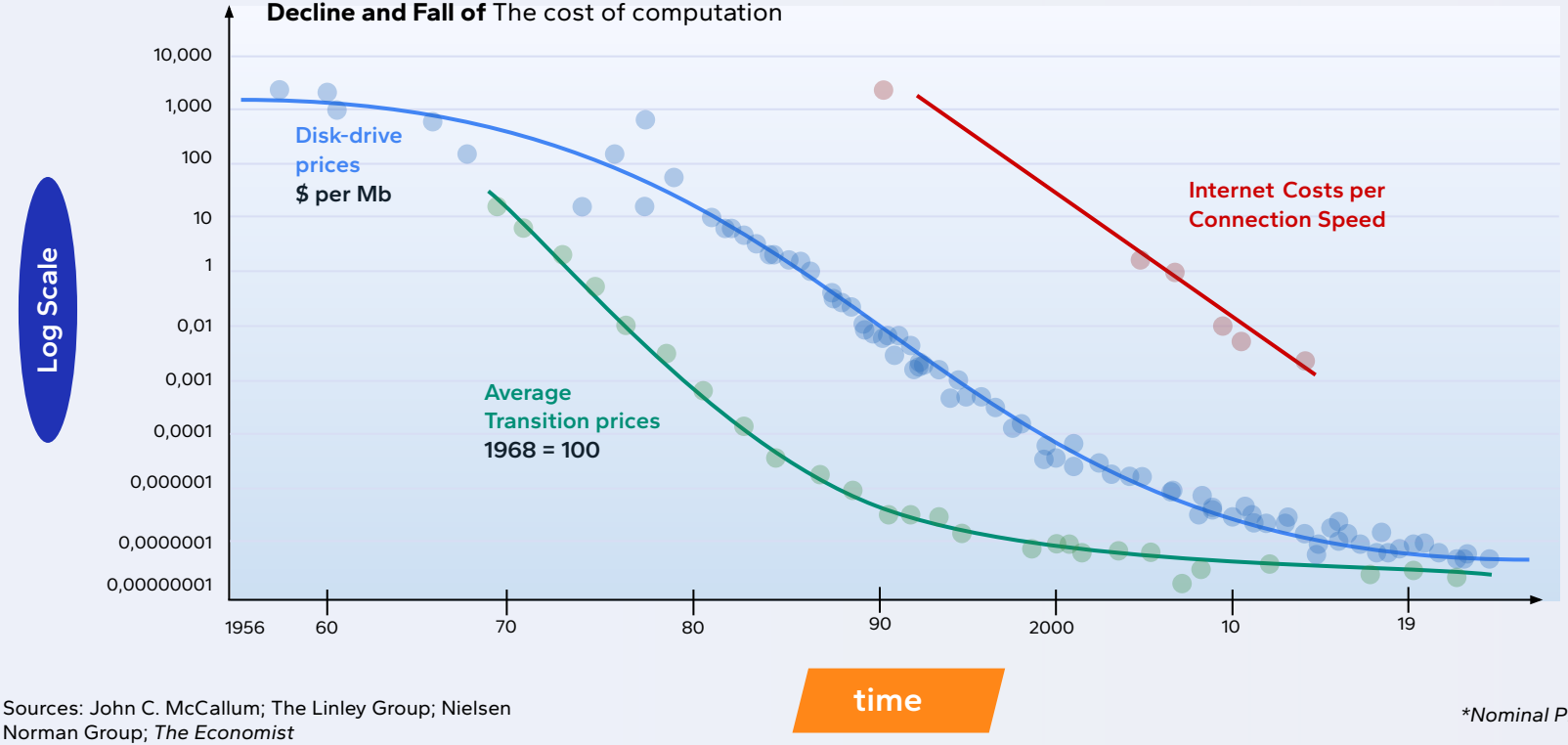
Precloud

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*

**Nominal Price*

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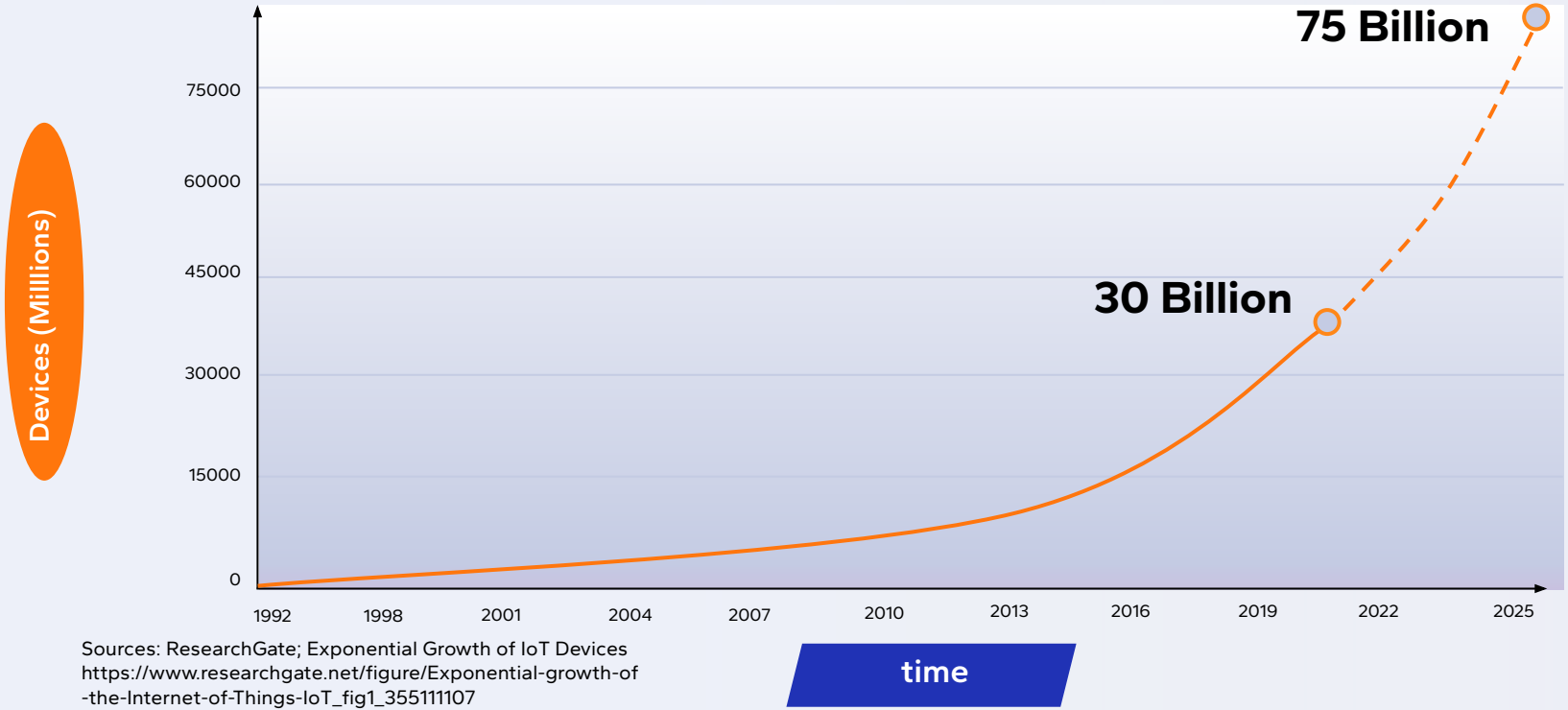
This has lead to the acceleration of mobile, connected devices.



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

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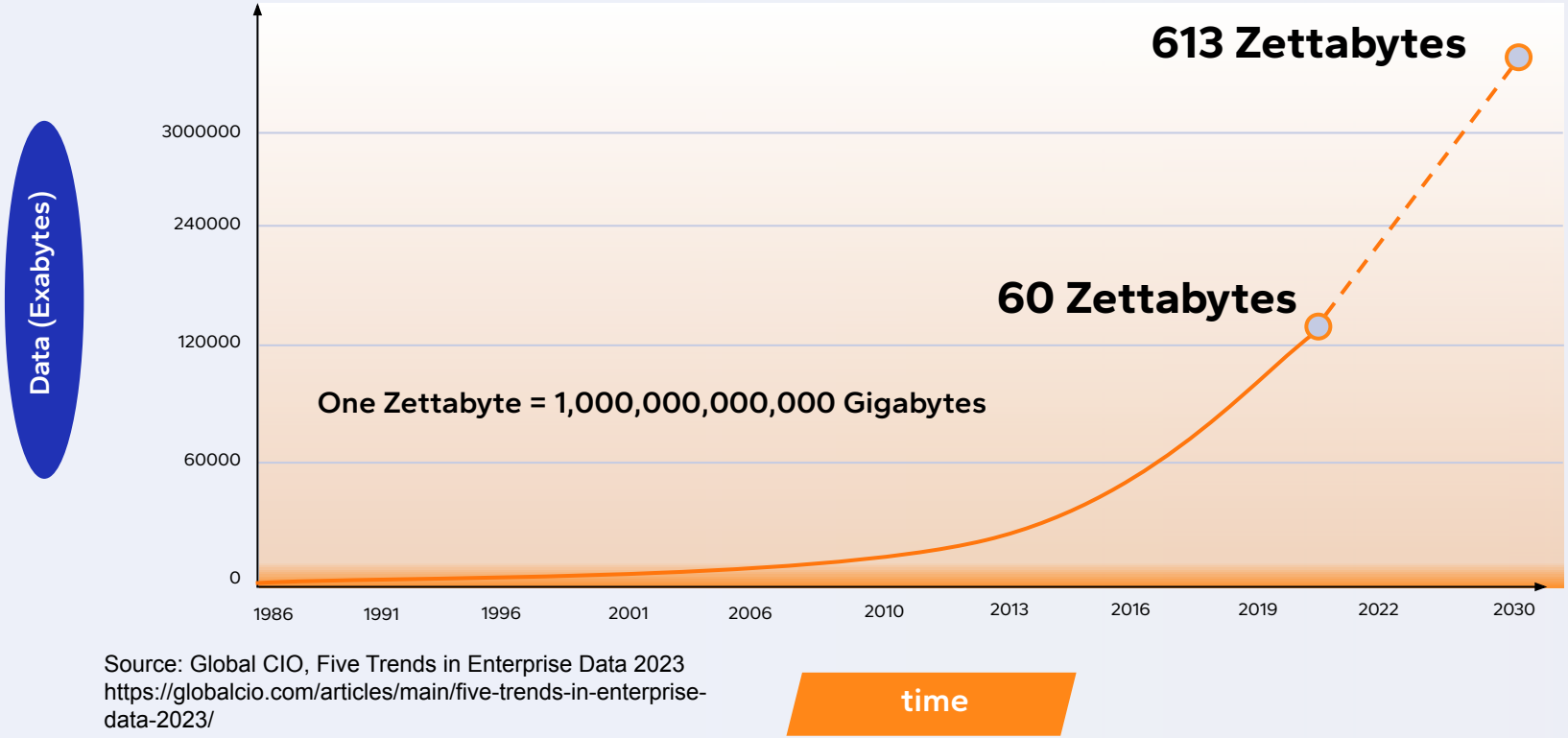
The exponential increase in the amount of connected devices has led to the exponential increase in the amount of data created.



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

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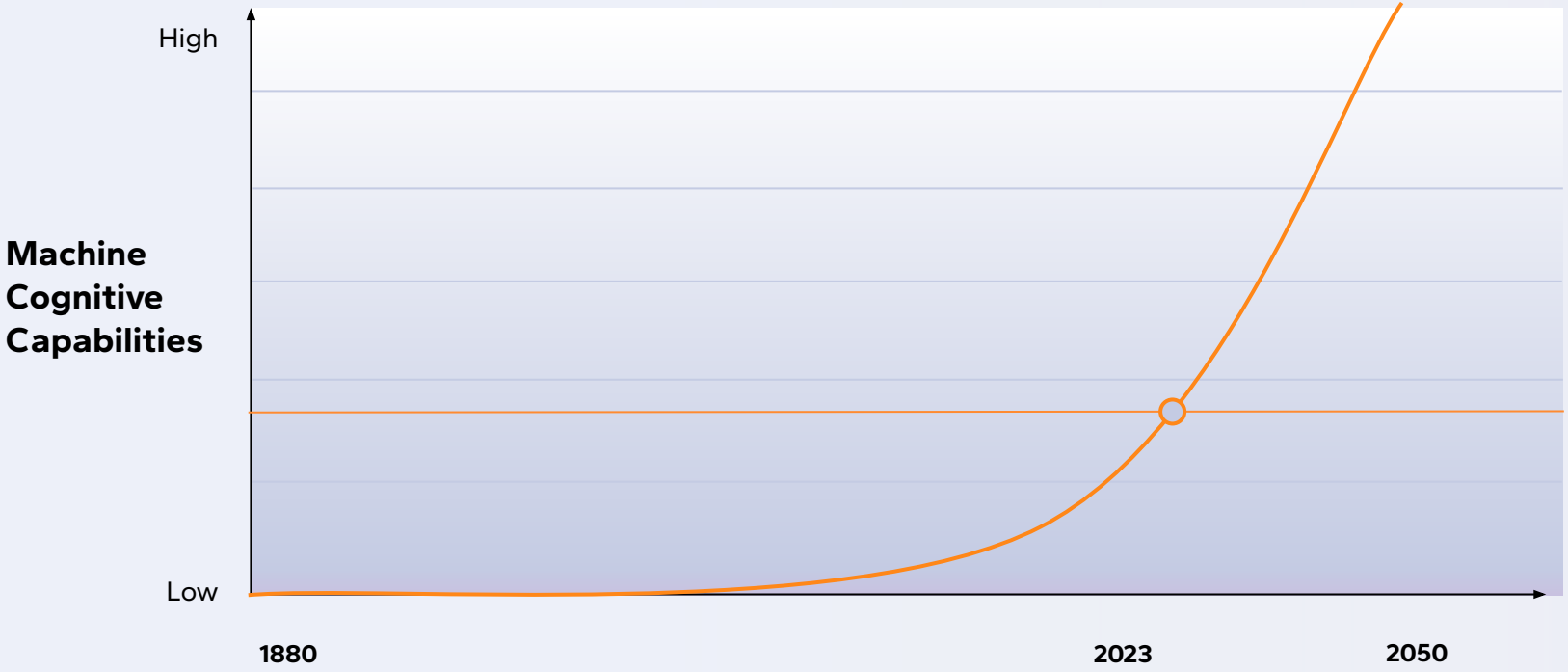
With exponentially increasing computing power, devices and data the ability to process, pattern match and understand that data accelerated.



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

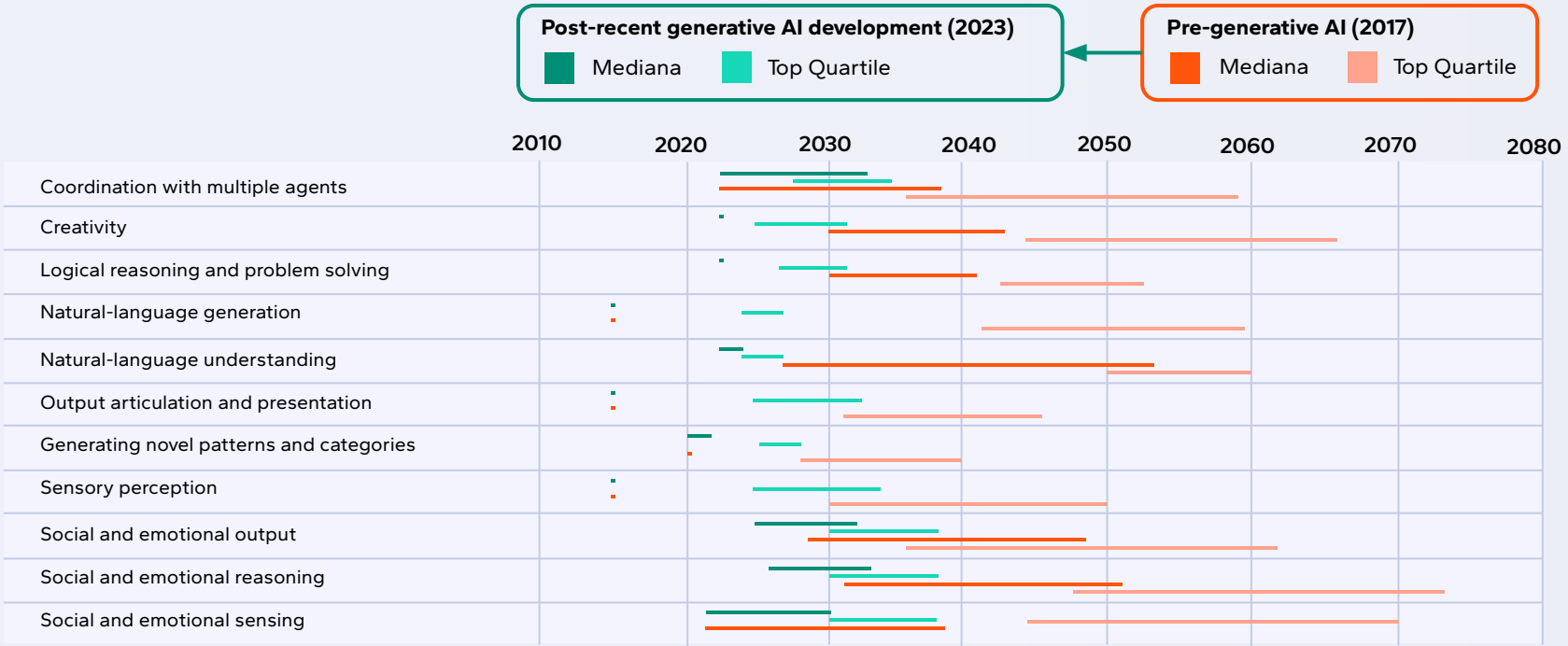
LLM's became the fastest adopted technology in human history

Crossed cost threshold for affordability & adoption

All forecasts on AI's impact got radically reduced

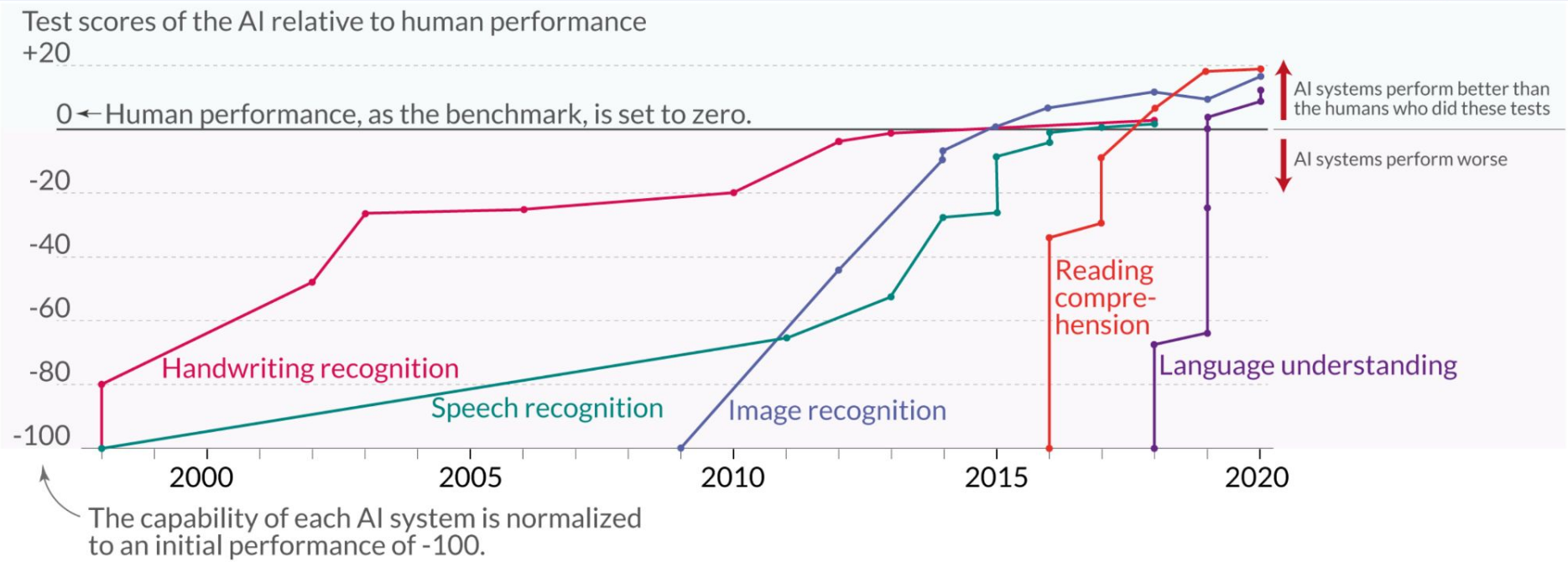
In 2023, the road to human-level performance got radically shorter

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



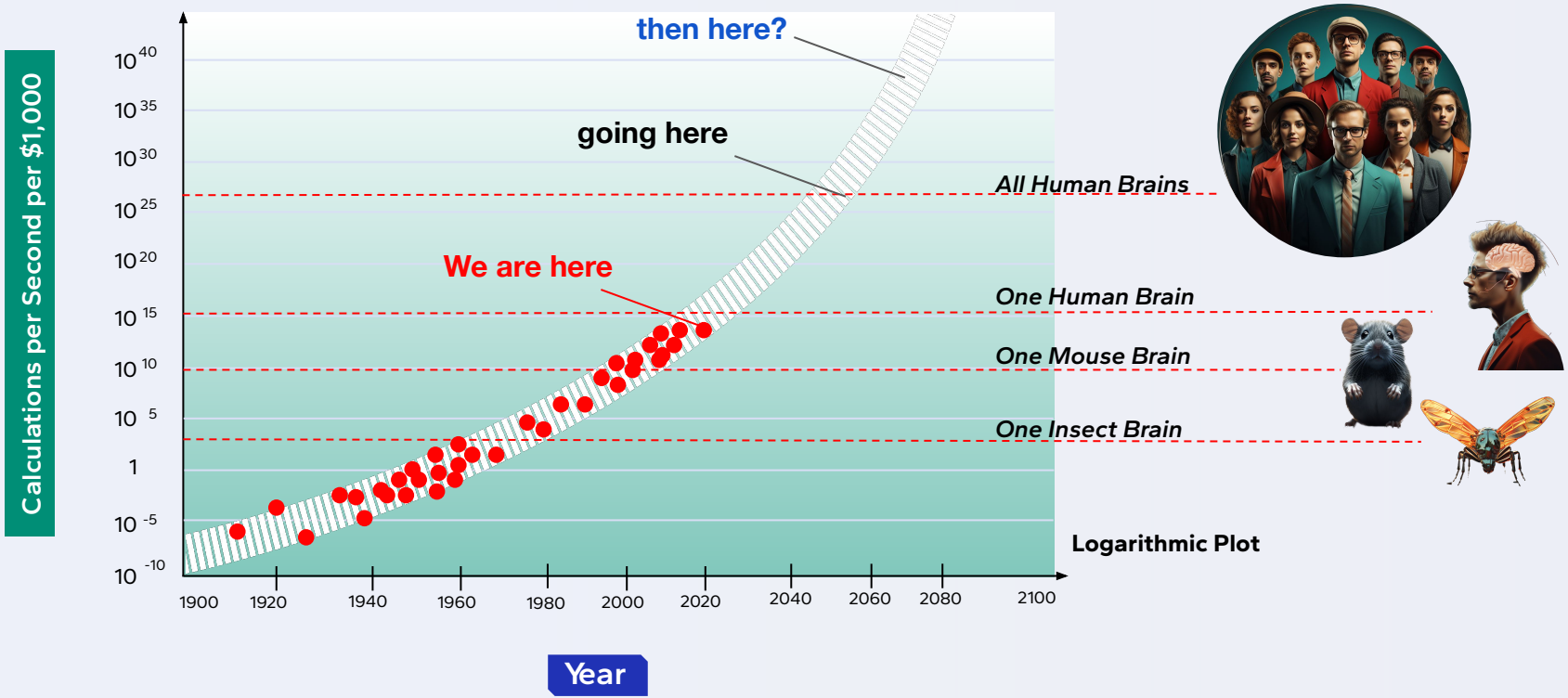
Source: What's the Future of Generative AI in 15 charts, McKinsey, 2023

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.

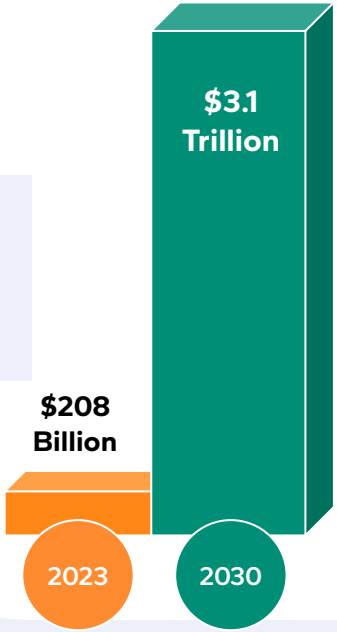
And we're just beginning. At some point there will be an AI that has the computation power of all humanity combined

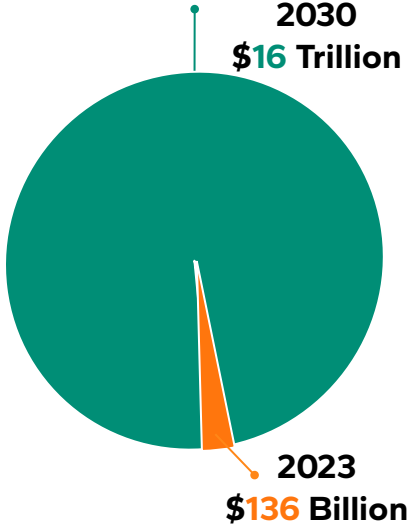


$3 Trillion will be invested into AI contributing $16 Trillion to the global economy by 2030

AI Investment

over 1 billion people will engage GenAI virtual colleagues





AI Market Size

AI market will become largest driving of economic growth over the next 10 years

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

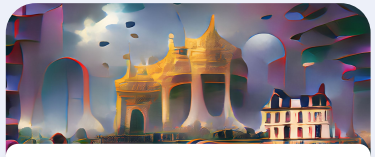
There will be ***8.4 billion*** AI-autonomous agents or "assistants" in the world by 2024, which will surpasses the total global population. They will begin to replace routine human tasks.

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."

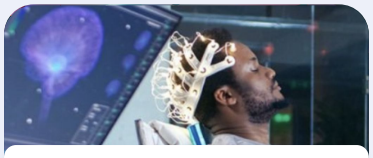
5 Drivers are Accelerating the Convergence of Technology

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

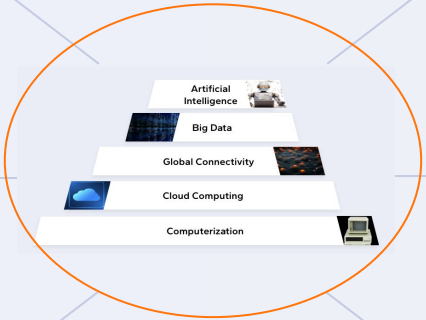


Capability Augmentation

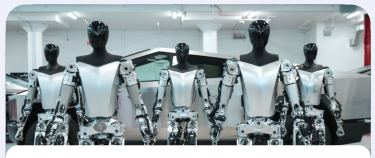
Biotech/Genetics



Brain Machine Interface



Decentralized Fabrication



Workplace Automation

IoT

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IoT

- Intelligent wearables
- Intelligent homes
- Intelligent medical devices

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

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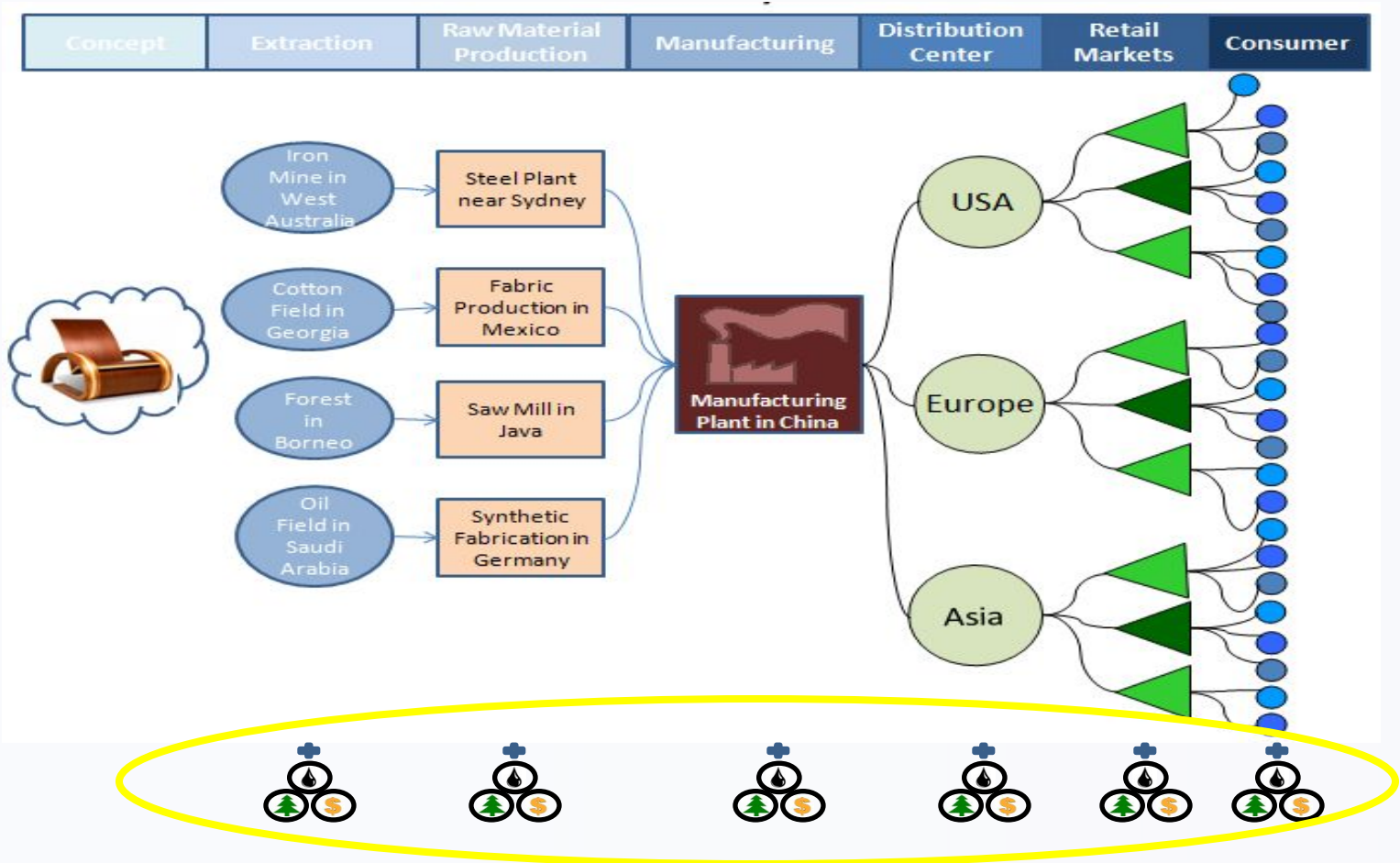
Decentralized Fabrication

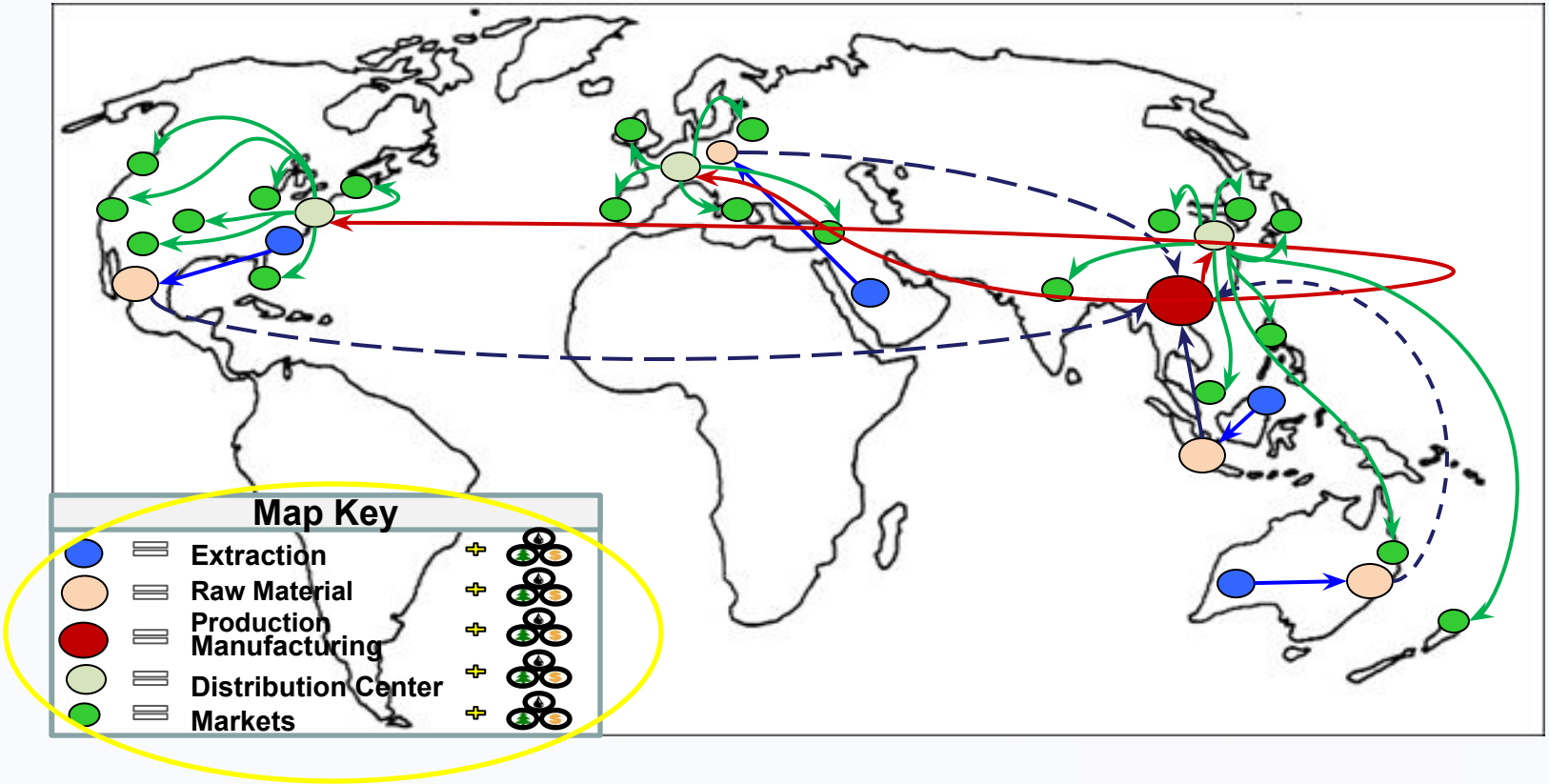
- 3D Printing
- Material Science
- Generative Design
- 4D Printing

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

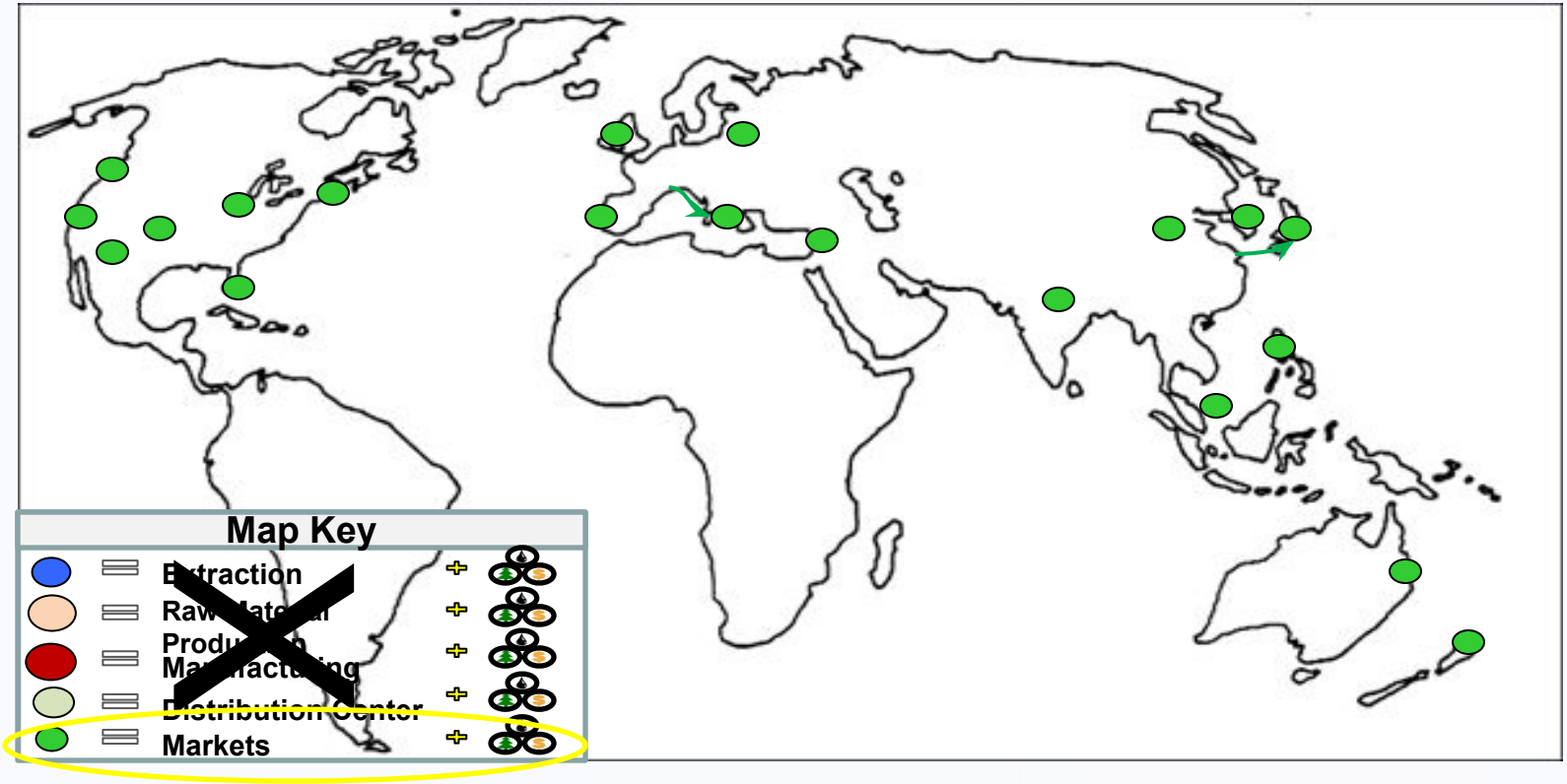
Industrial Era Production Process



Industrial Era Distribution System



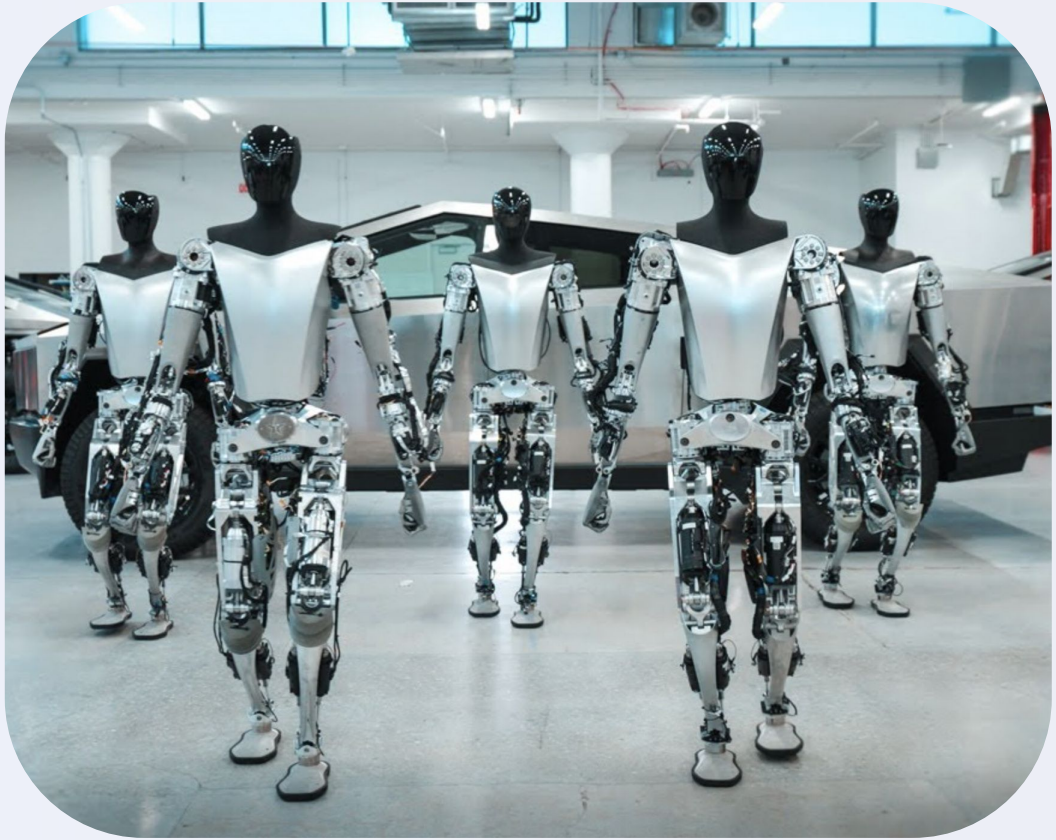
Emerging Era Distribution System



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)

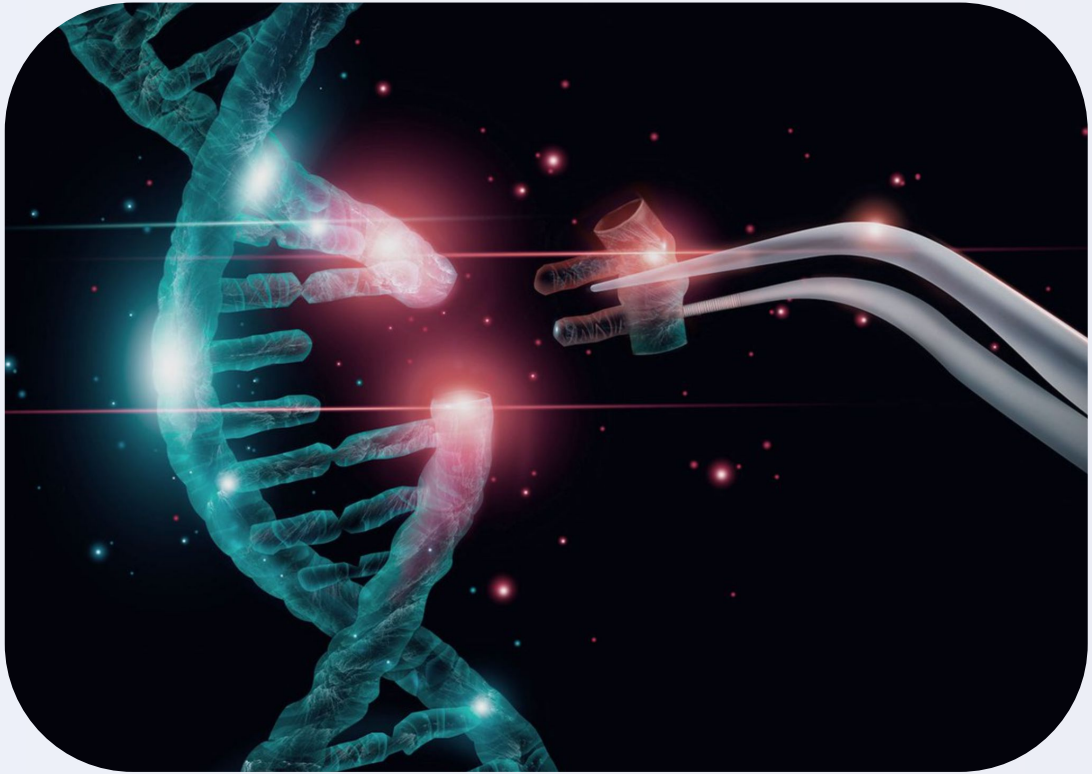
- Path to overcome parkinson, alzheimer's, dementia
- Augment brain capabilities
- Enabling new capabilities

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

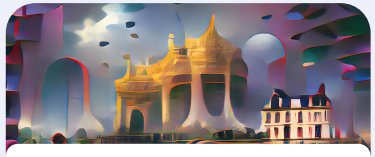


Summary

- 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



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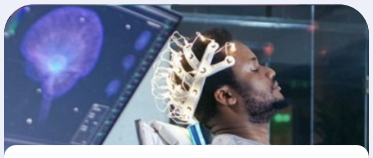

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Decentralized Fabrication

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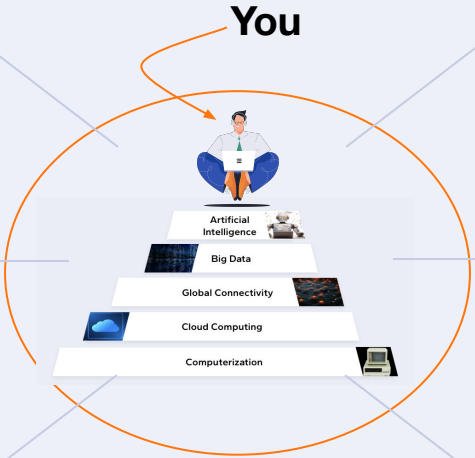

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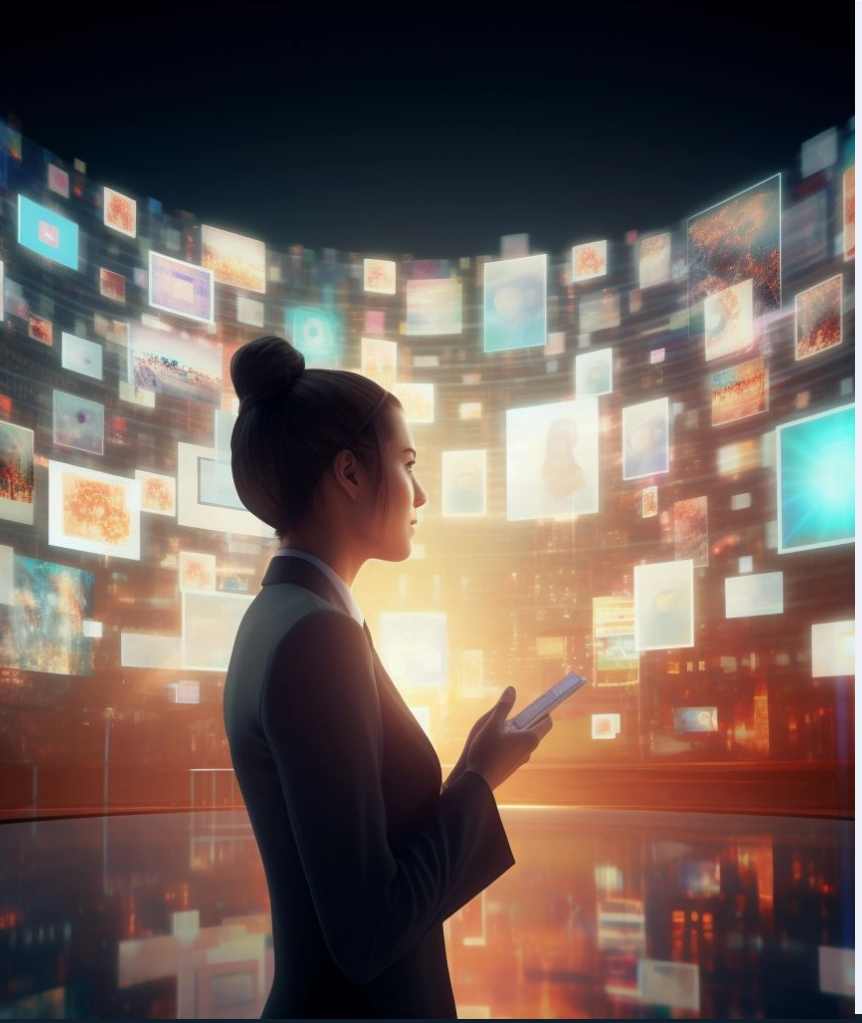
Augmentation of our ability to think, create, build, communicate & manifest

- 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.