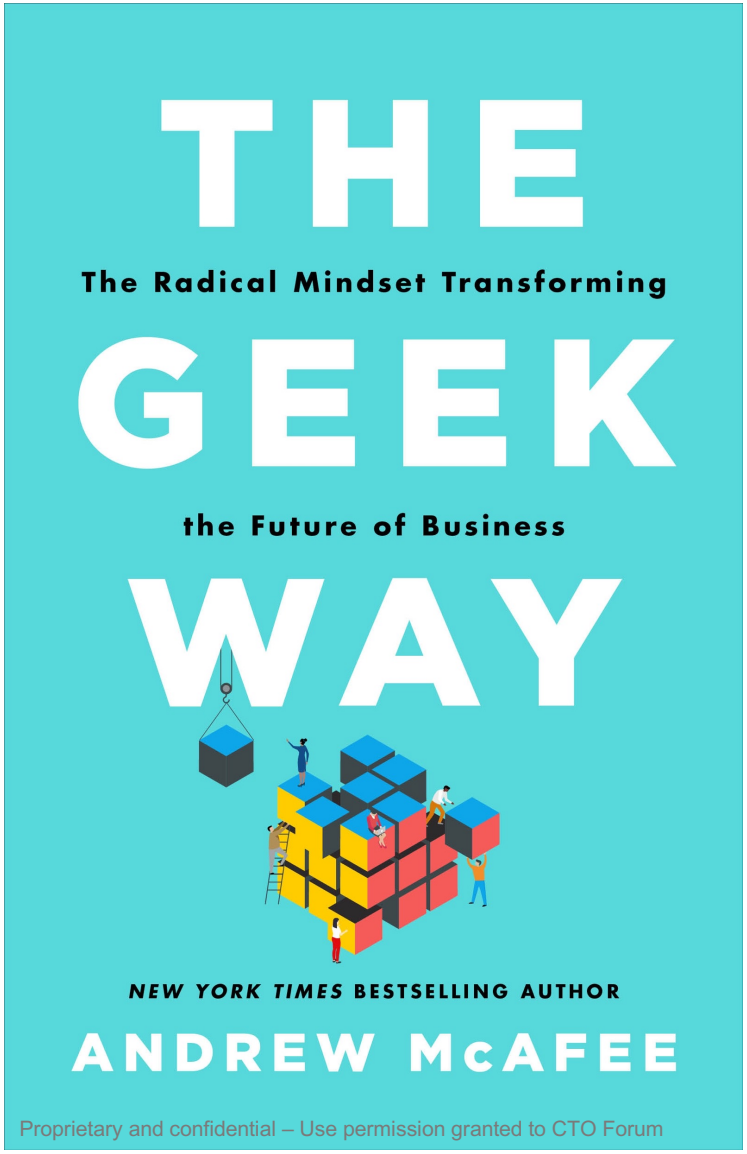


Putting AI to Work

Andrew McAfee
MIT and Workhelix

Even economists are excited about generative AI.

Why?

It's a *general purpose technology*

General Purpose Technologies have three characteristics:

1. Rapid improvement

The Evolution of Midjourney — A Journey From V1 to V6 (Feb 22 to Dec 23)

Female and male, couple, striking eyes, soft lighting –ar 2:3

General Purpose Technologies have three characteristics:

1. Rapid improvement
2. Complementary innovations

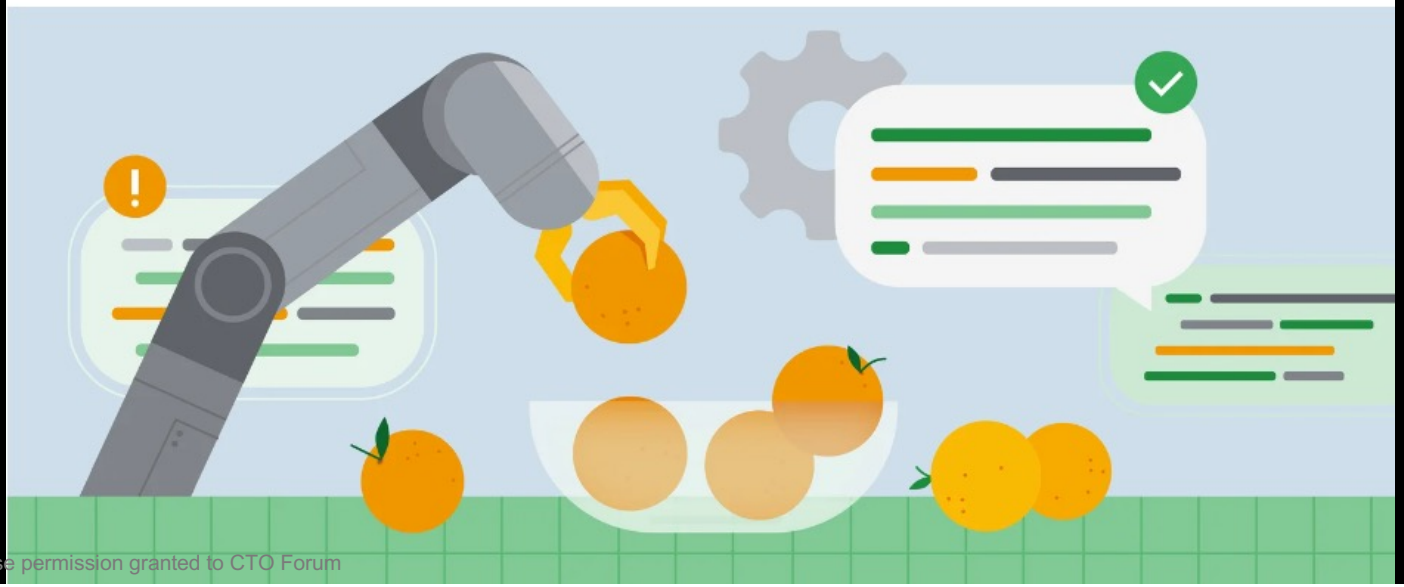
Speaking robot: Our new AI model translates vision and language into robotic actions

Jul 28, 2023
3 min read

RT-2, our new vision-language-action model, helps robots more easily understand and perform actions — in both familiar and new situations.

Vincent Vanhoucke
Distinguished Scientist and Head of Robotics, Google DeepMind

Share



EvolutionaryScale

JUNE 25, 2024 // RESEARCH

Introducing ESM3, esmGFP, and EvolutionaryScale

ESM3: A frontier language model for biology

Today we are sharing ESM3, the first generative model for biology that simultaneously reasons over the sequence, structure, and function of proteins.

General Purpose Technologies have three characteristics:

1. Rapid improvement
2. Complementary innovations
3. Broad diffusion

POLICY FORUM | ARTIFICIAL INTELLIGENCE

GPTs are GPTs: Labor market impact potential of LLMs

Abstract

We propose a framework for evaluating the potential impacts of large-language models (LLMs) and associated technologies on work by considering their relevance to the tasks workers perform in their jobs. By applying this framework (with both humans and using an LLM), we estimate that roughly 1.8% of jobs could have over half their tasks affected by LLMs with simple interfaces and general training. When

Abstract

We propose a framework for evaluating the potential impacts of large-language models (LLMs) and associated technologies on work by considering their relevance to the tasks workers perform in their jobs. By applying this framework (with both humans and using an LLM), we estimate that roughly 1.8% of jobs could have over half their tasks affected by LLMs with simple interfaces and general training. When accounting for current and likely future software developments that complement LLM capabilities, this share jumps to just over 46% of jobs. The collective attributes of LLMs such as generative pretrained transformers (GPTs) strongly suggest that they possess key characteristics of other "GPTs," general-purpose technologies (*1*, *2*). Our research highlights the need for robust societal evaluations and policy measures to address potential effects of LLMs and complementary technologies on labor markets.

Abstract

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Another reason to be excited about AI:

It's a powerful tool for upskilling

Generative AI at Work

Erik Brynjolfsson, Danielle Li & Lindsey R. Raymond

New AI tools have the potential to change the way workers perform and learn, but little is known about their impacts on the job. In this paper, we study the staggered introduction of a generative AI-based conversational assistant using data from 5,179 customer support agents. Access to the tool increases productivity, as measured by issues resolved per hour, by 14% on average, including a 35% improvement for novice and low-skilled workers but with minimal impact on experienced and highly skilled workers. We provide suggestive evidence that the AI model disseminates the best practices of more able workers and helps newer workers move down the experience curve. In addition, we find that AI assistance improves customer sentiment, increases employee retention, and may lead to worker learning. Our results suggest that access to generative AI can increase productivity, with large heterogeneity in effects across workers.

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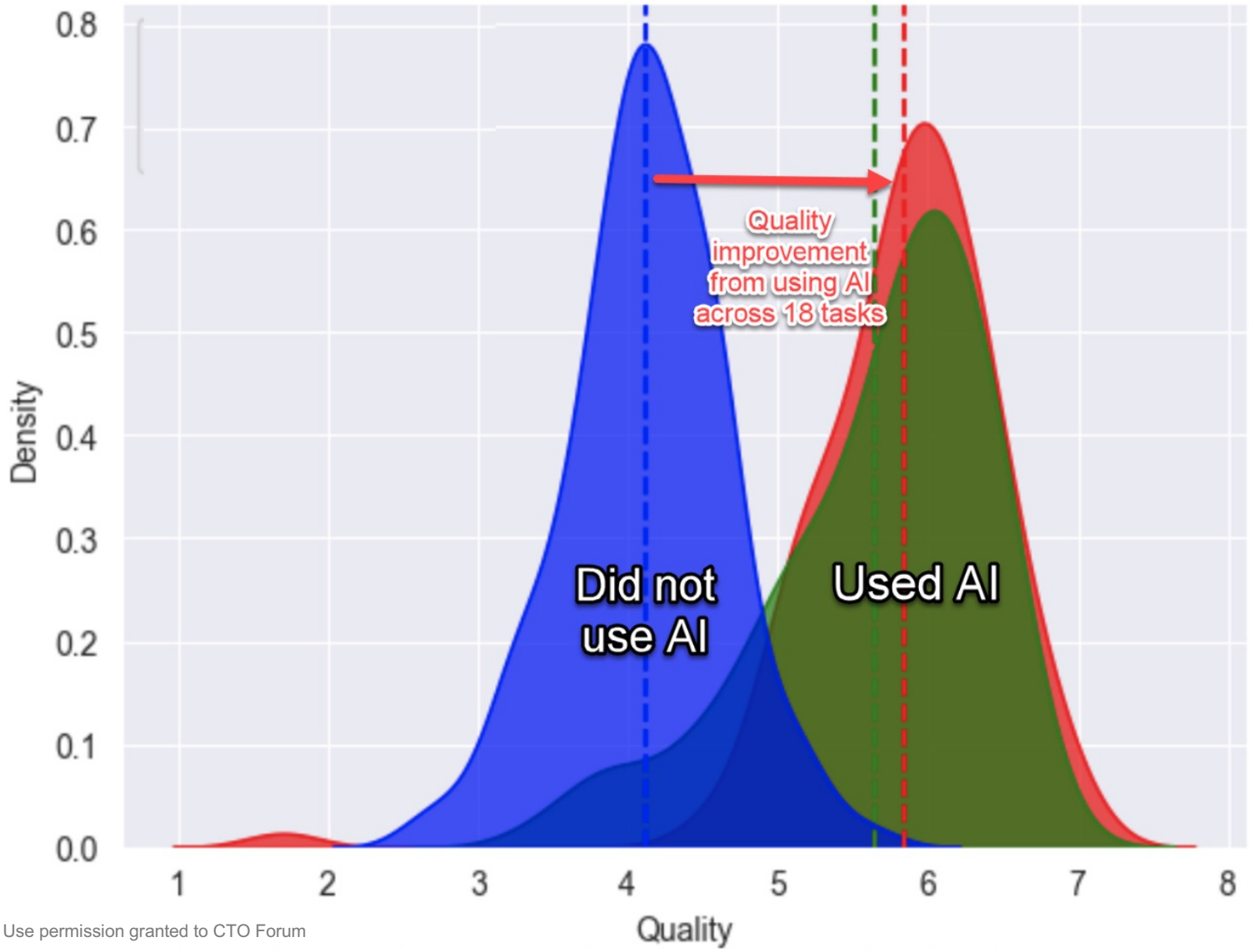
Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality

Harvard Business School Technology & Operations Mgt. Unit Working Paper No. 24-013

58 Pages • Posted: 18 Sep 2023 • Last revised: 27 Sep 2023

Fabrizio Dell'Acqua

Harvard University - Business School (HBS)



However, there’s a lot of confusion at present around generative AI

Companies are spending billions on AI, yet ROI remains elusive

CIO

Where's the ROI for AI? CIOs struggle to find it

Nearly half of all AI leaders question how to estimate or demonstrate the value of AI-related technologies — and for good reason, based on early implementations at many companies.

THE WALL STREET JOURNAL.

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Early Adopters of Microsoft's AI Bot Wonder if It's Worth the Money

Artificial-intelligence aide handles email, meetings and other things, but its price and limited use have some skeptical

The New York Times

Will A.I. Boost Productivity? Companies Sure Hope So.

Economists doubt that artificial intelligence is already visible in productivity data. Big companies, however, talk often about adopting it to improve efficiency.

Companies know AI is critical, yet are struggling to succeed with it

85%

Of executives plan to **increase their spending on AI** and GenAI

47%

Cite an **unclear AI and GenAI roadmap** and investment priorities as the primary **reason for their dissatisfaction**

66%

Of leaders are **ambivalent or dissatisfied with their company's progress** on AI and GenAI so far

Source: BCG

Why all the confusion?
Because GenAI Is So New

Technology has not settled down

Neither has vendor landscape

Risks seem high to some

Are best practices clear?

Are best practices clear? Yes.

Don’t sit on the sidelines when a GPT appears

We know to manage large, complex, high-payoff projects where change is fast, uncertainty is high, and risks exist

Are best practices clear? Yes.

Waterfall vs. Agile

"Waterfall amounts to a pledge by all parties not to learn anything while doing the actual work" **- Clay Shirky**

Legacy vs. Geek

Steve Jurvetson (interview in *The Geek Way)*:

"The agile way we've learned to build software is becoming **the agile way we build everything**.

Steve Jurvetson:

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Steve Jurvetson:

"The agile way we've learned to build software is becoming **the agile way we build everything**. I sometimes feel like I have a sixth sense. **I can see dead companies.** They don't know they're dead, but they're dead because **they're not responsive enough.** And **the companies that iterate more quickly will just run circles around them.** They're innovating every couple of years on something that you might take seven years to do."

Agile Generative AI: A Four-Step Process

Step 1: Create a ”minimum viable plan”

Science

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HOME > SCIENCE > VOL. 384, NO. 6702 > GPTS ARE GPTS: LABOR MARKET IMPACT POTENTIAL OF LLMS

POLICY FORUM | ARTIFICIAL INTELLIGENCE

GPTs are GPTs: Labor market impact potential of LLMs

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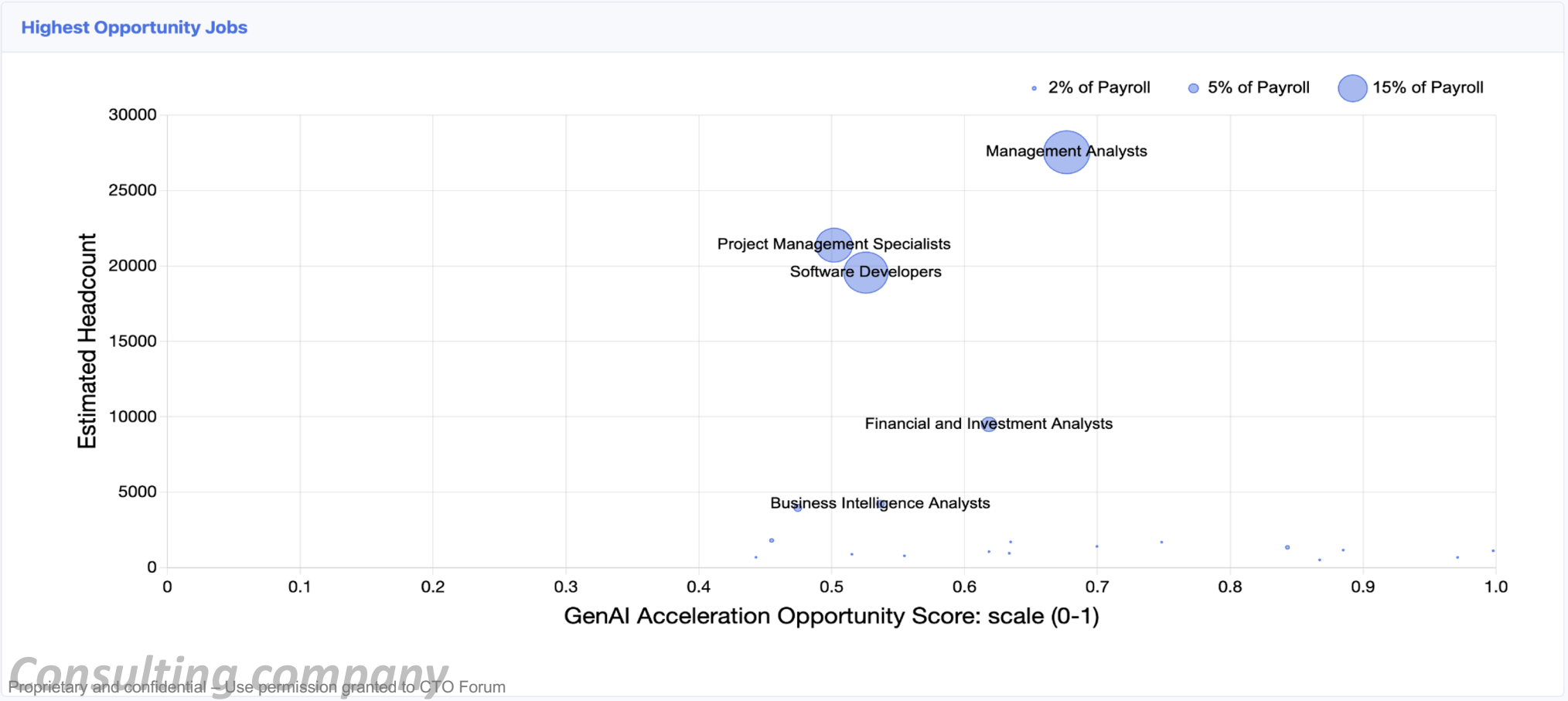
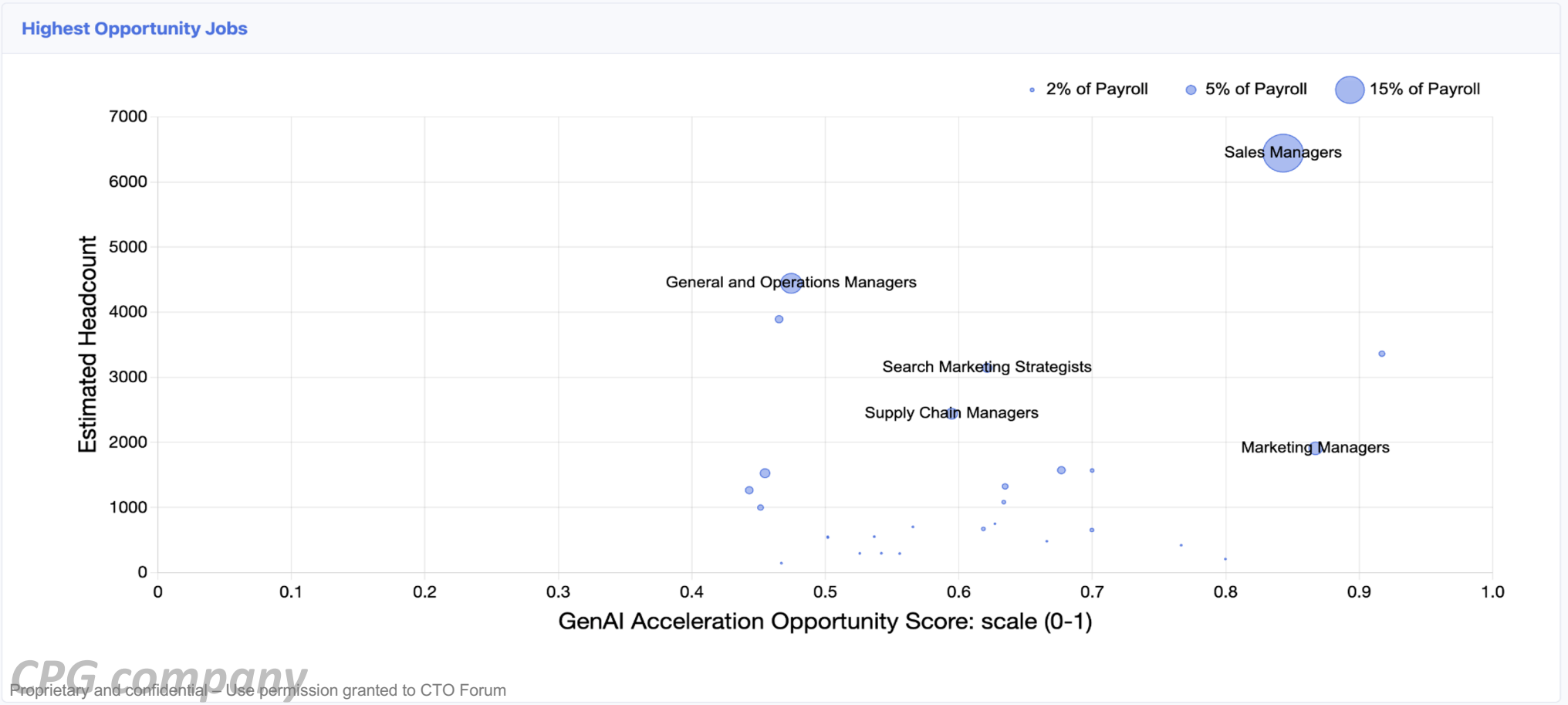
We propose a framework for evaluating the potential impacts of large-language models (LLMs) and associated technologies on work by considering their relevance

Step 1: Create a ”minimum viable plan”



Step 1: Create a ”minimum viable plan”



Step 2: Deploy technology and *measure results*

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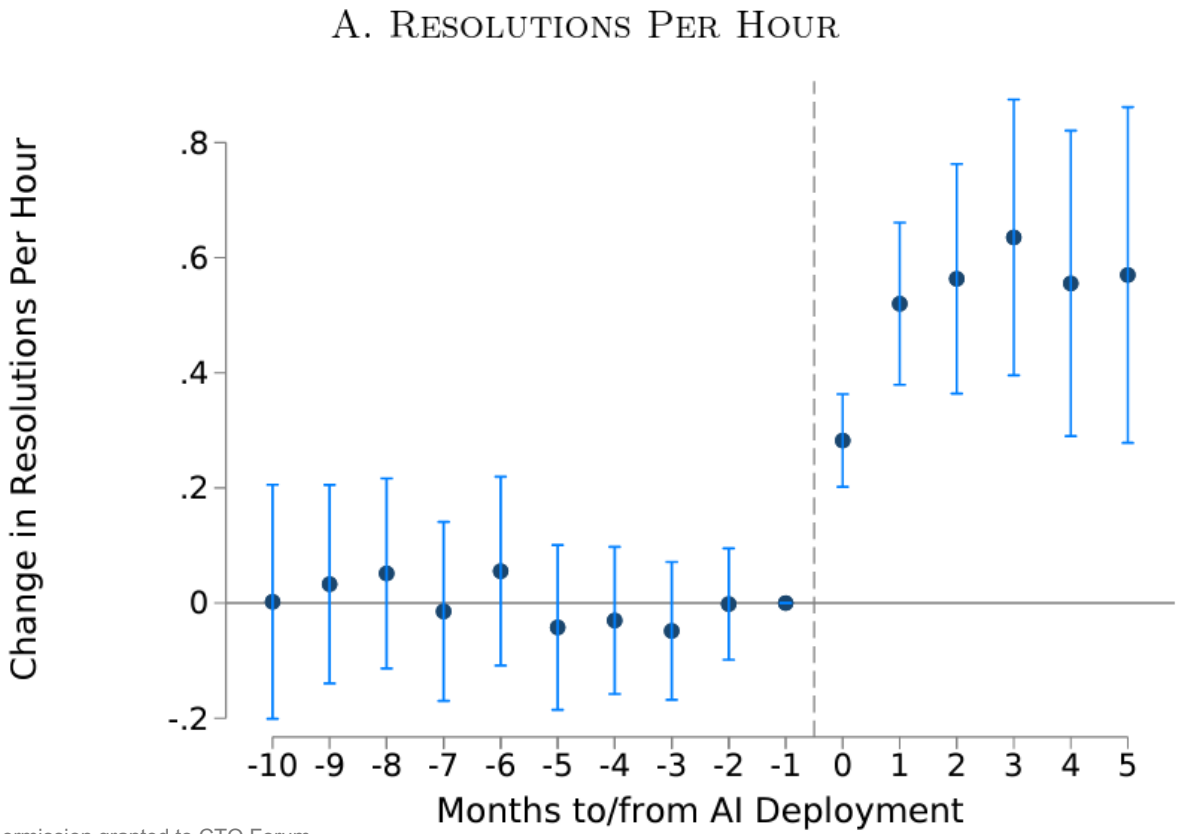
Generative AI at Work

Erik Brynjolfsson, Danielle Li & Lindsey R. Raymond

Step 2: Deploy technology and *measure results*



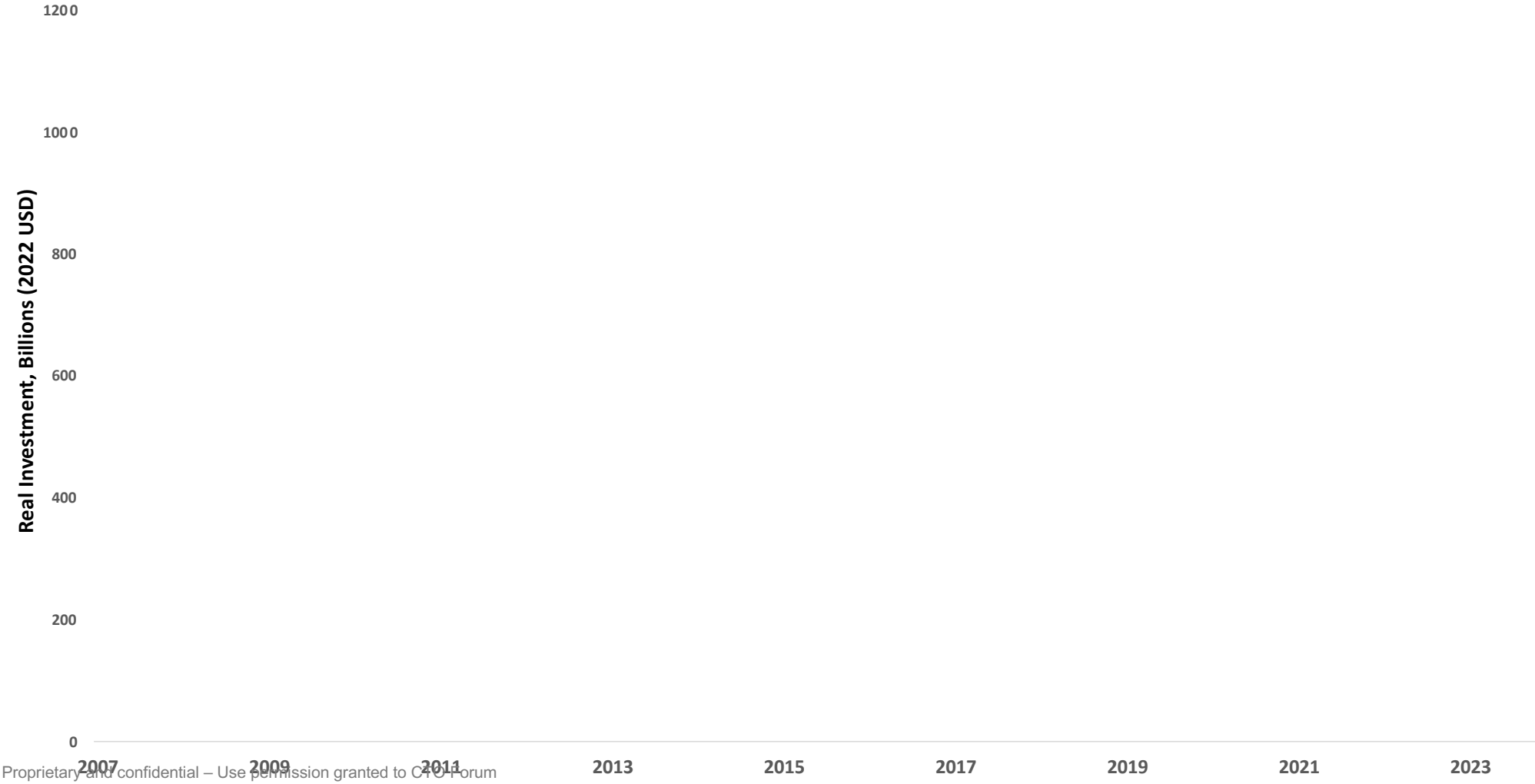
Step 3: Assess results; adjust and pivot as necessary

Step 4: Repeat steps 1-3

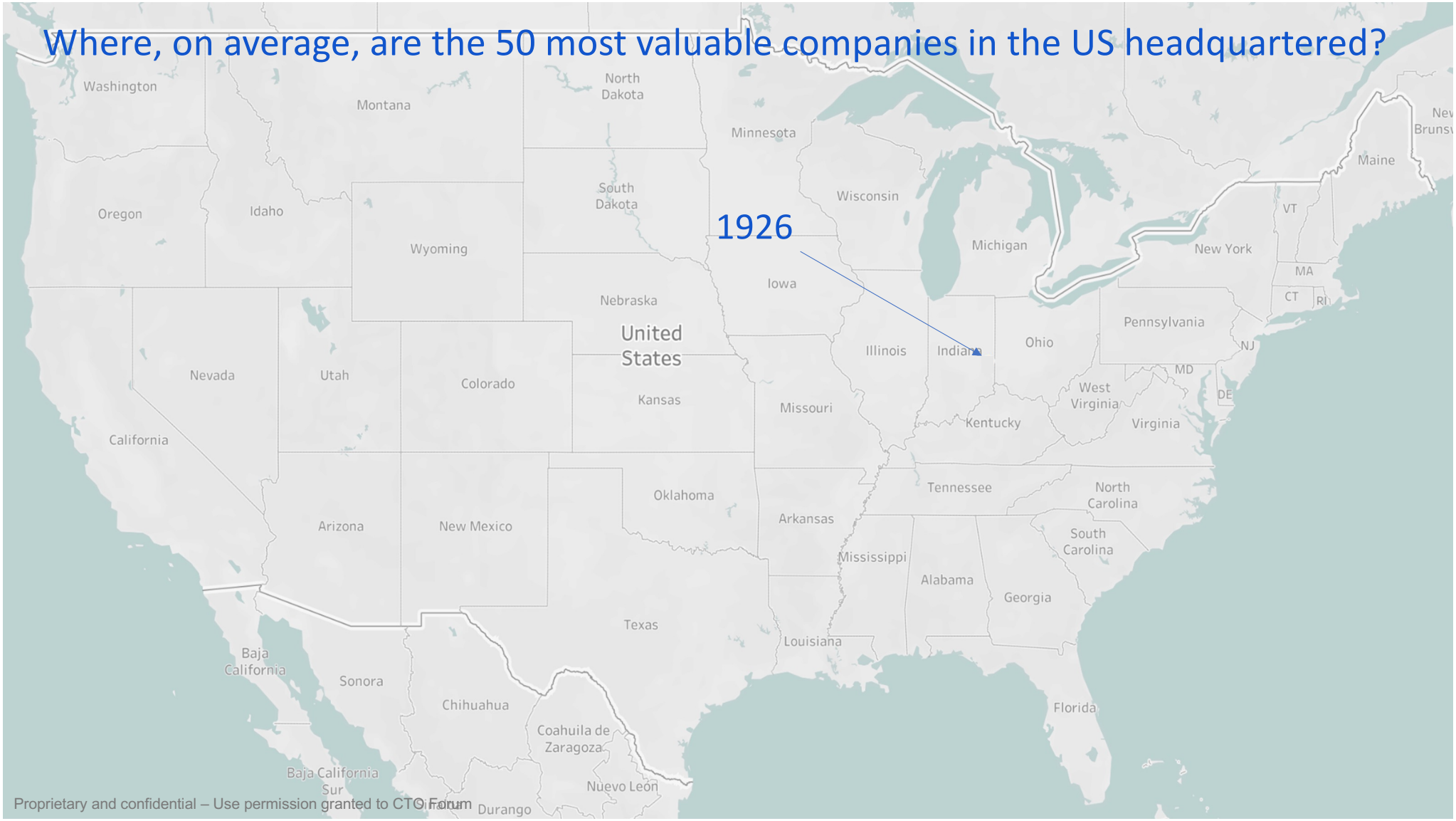
How Will AI Affect Competition?

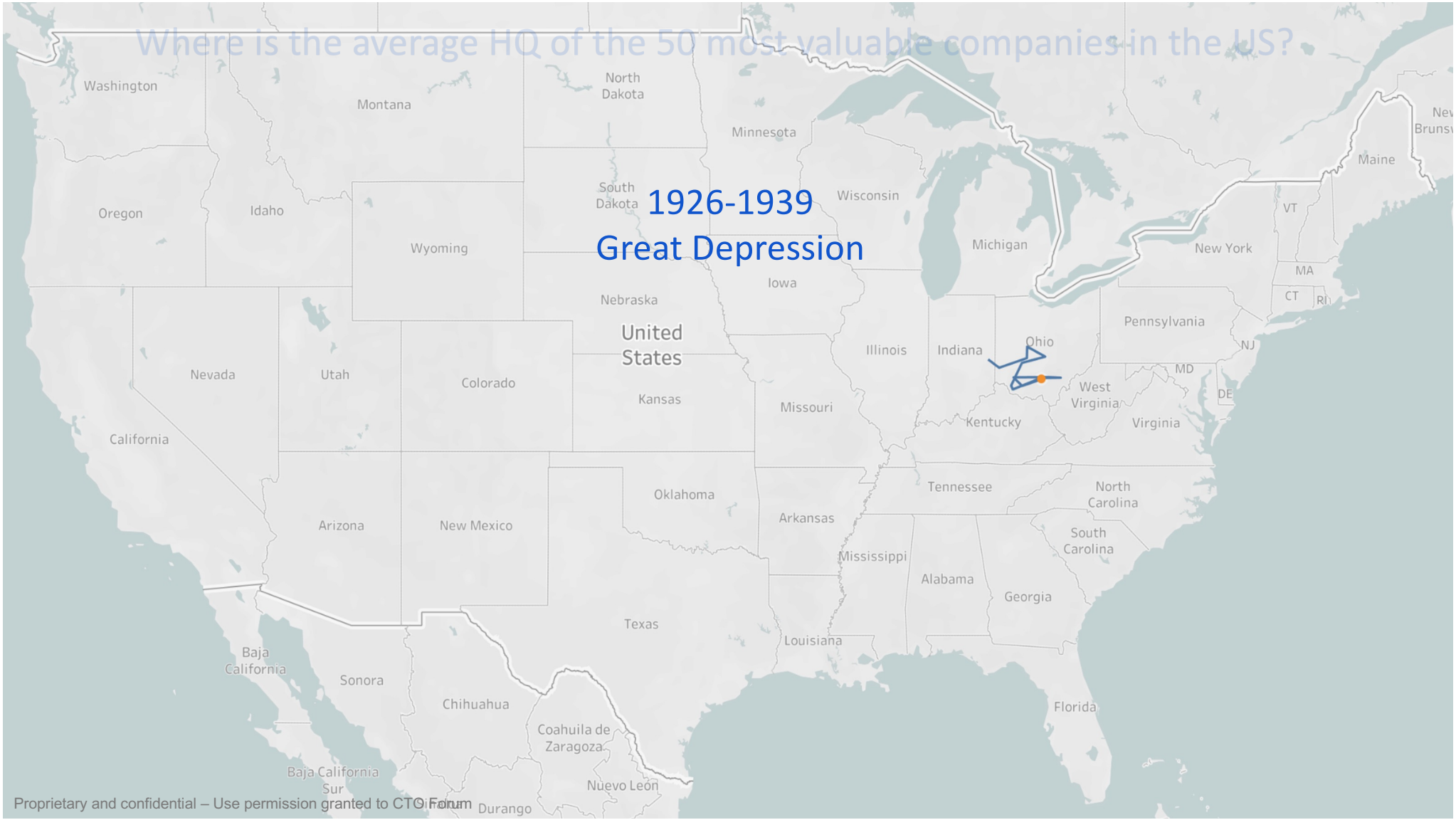
How Will AI Affect Competition? It Will Accelerate ”The Geek Takeover”

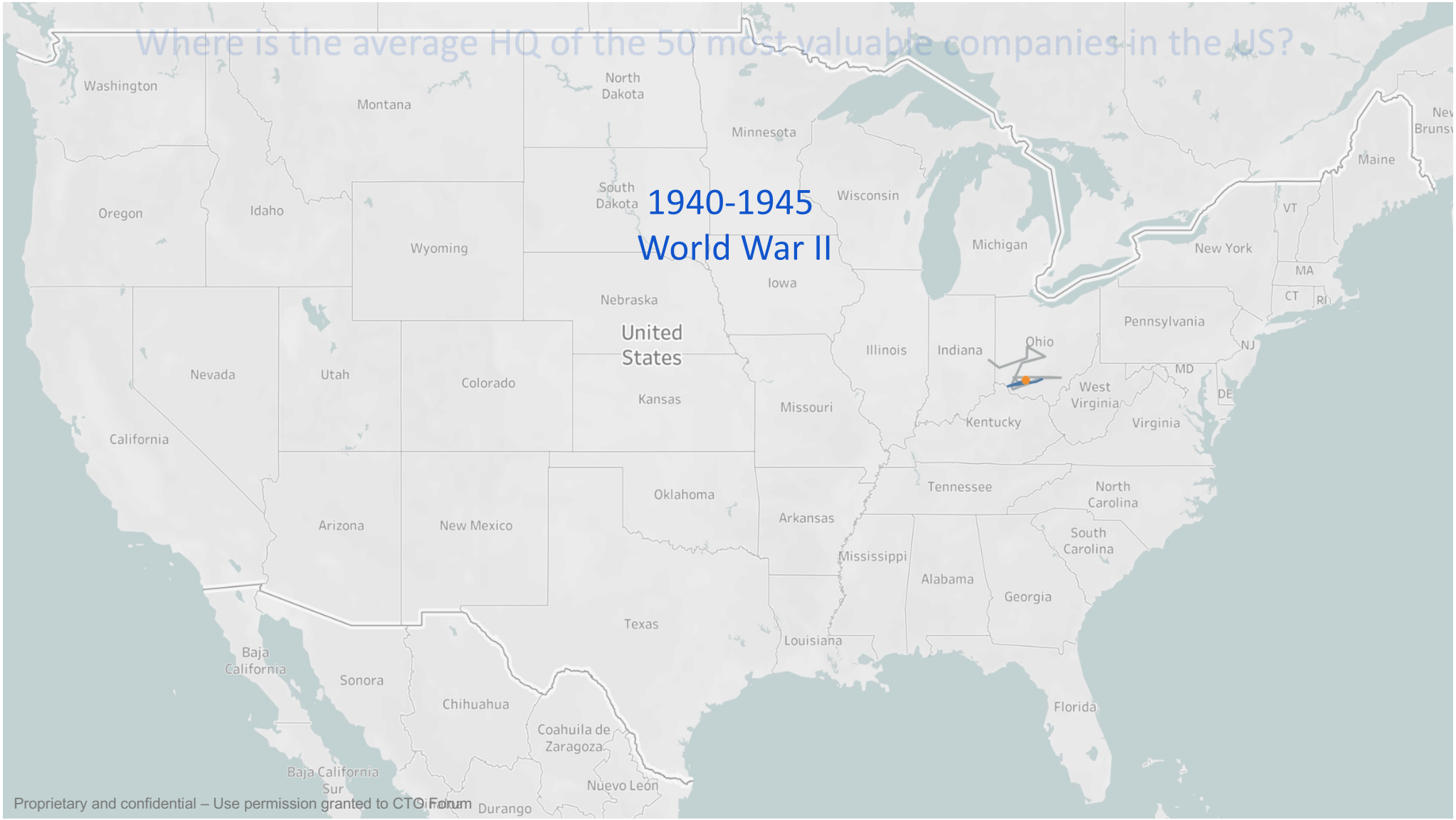
US Corporate Investment in Software + Hardware vs. All Other Equipment, 2007-2023

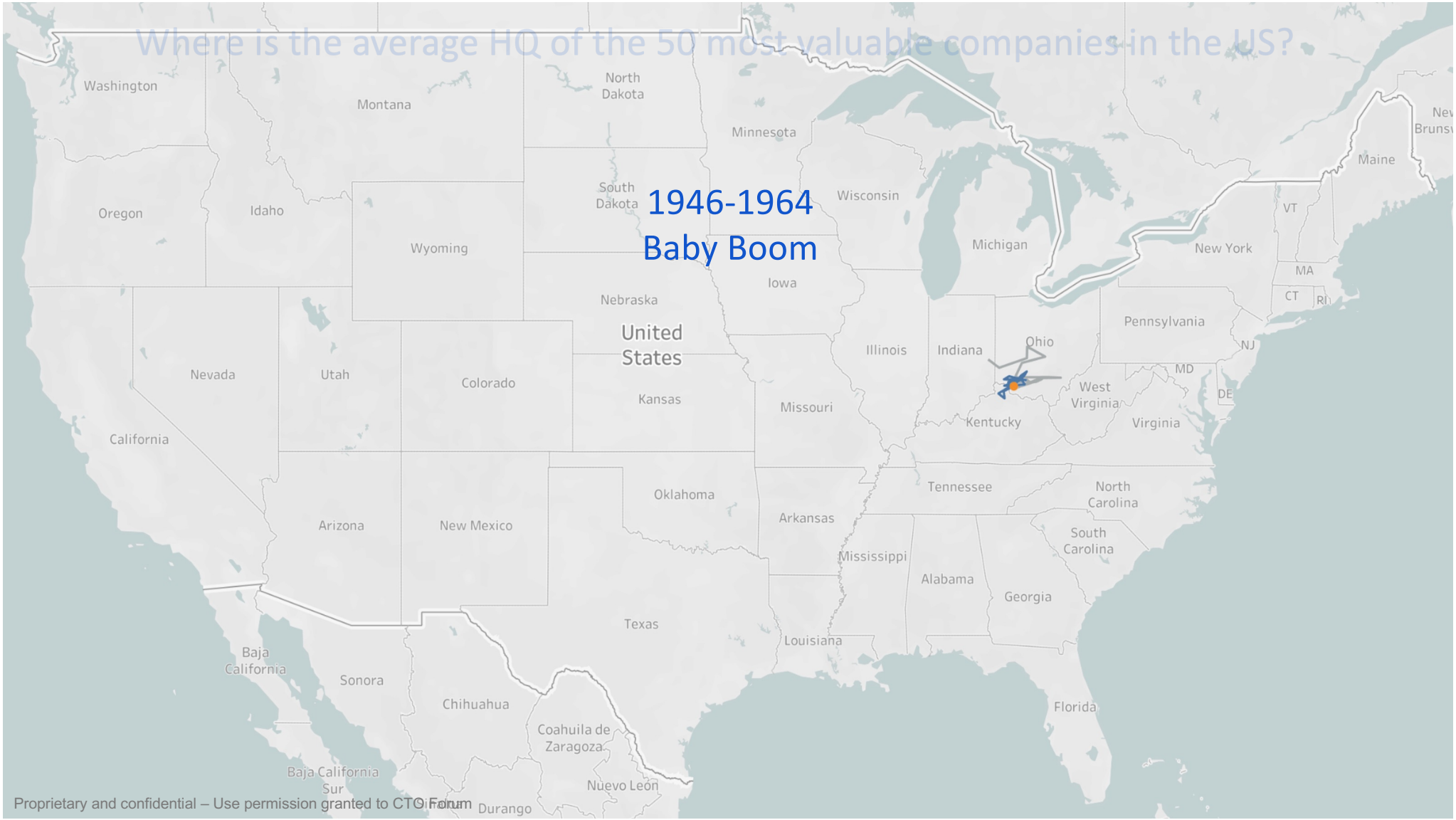


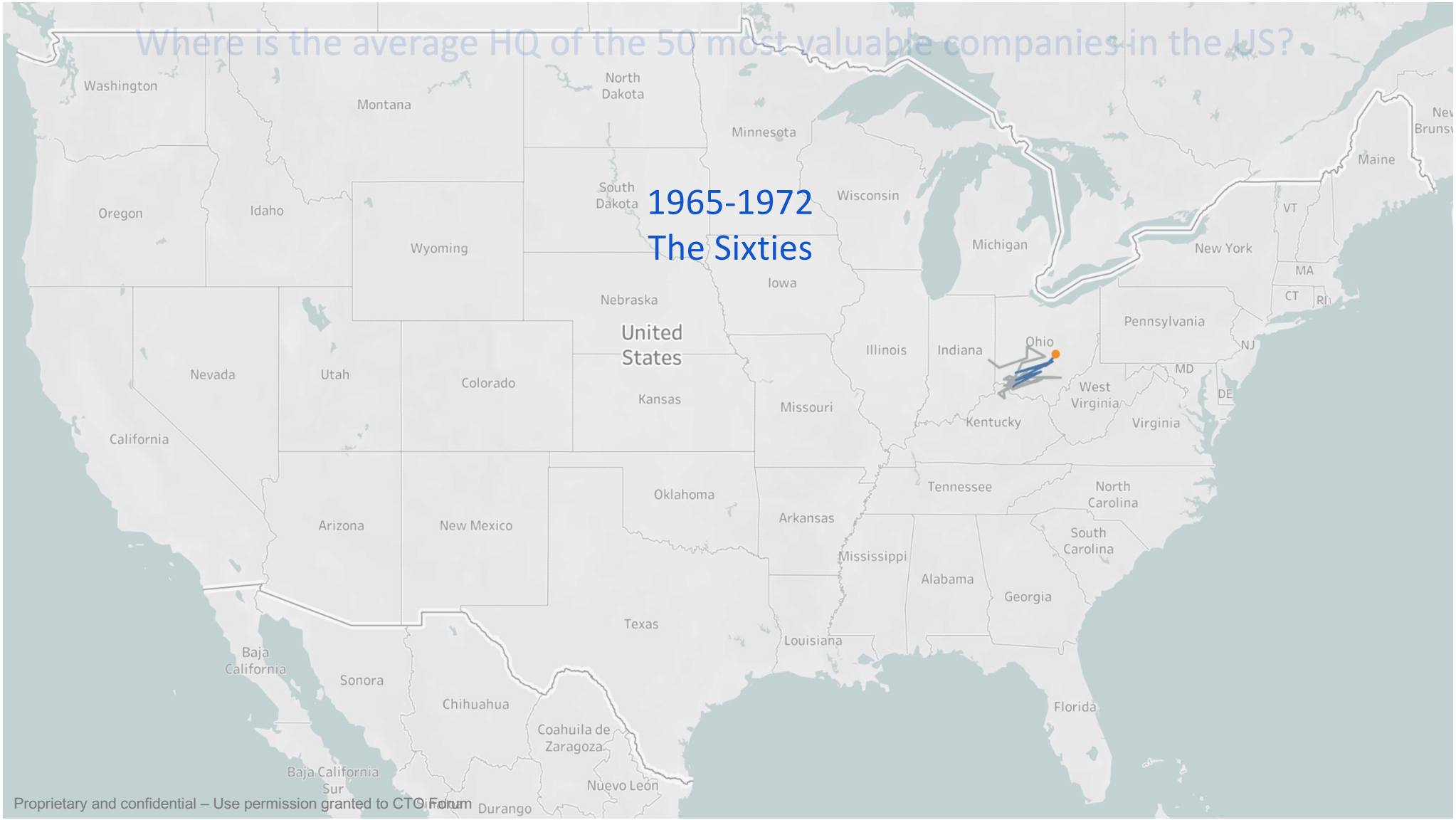
Where, on average, are the 50 most valuable companies in the US headquartered?

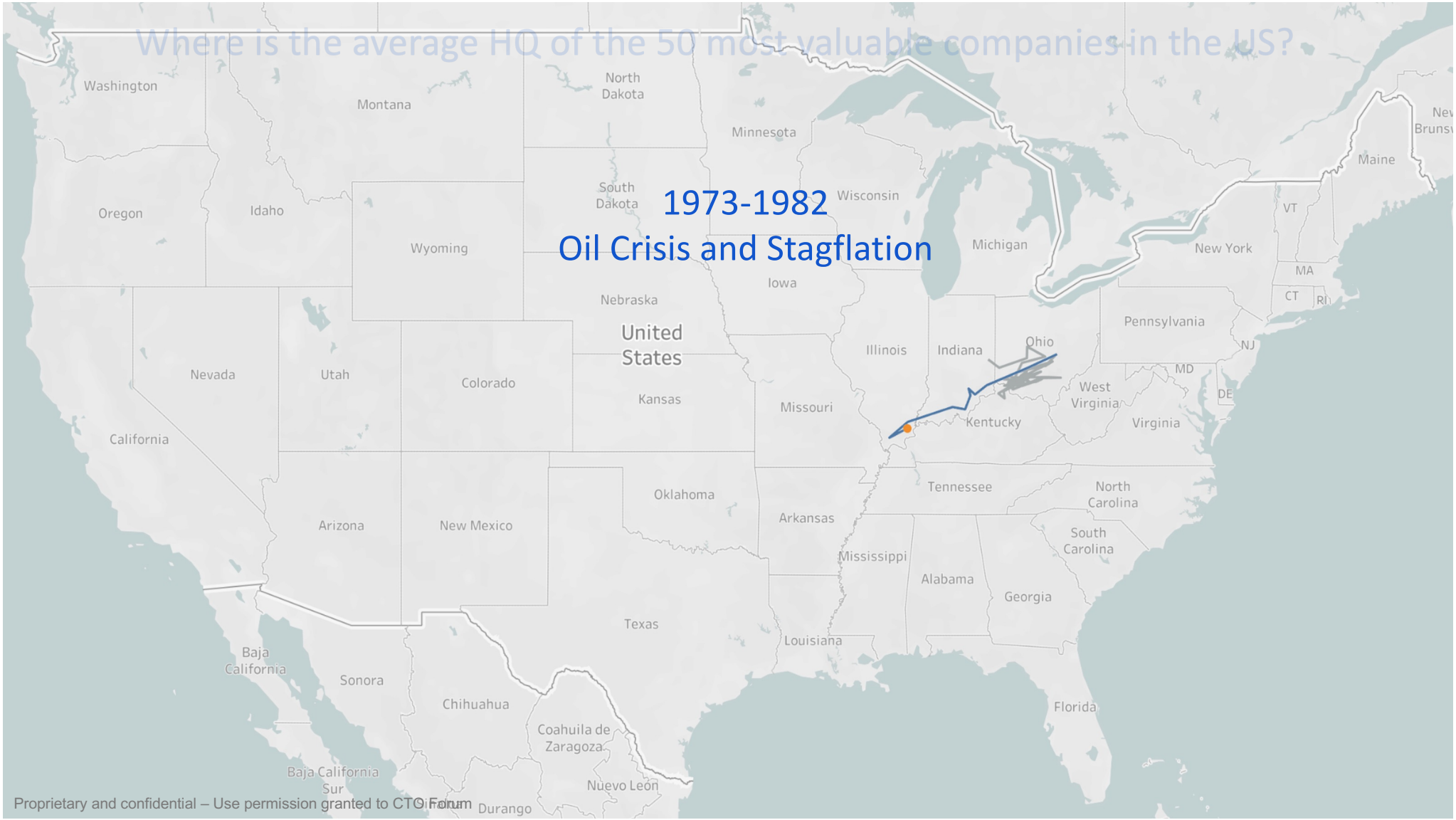


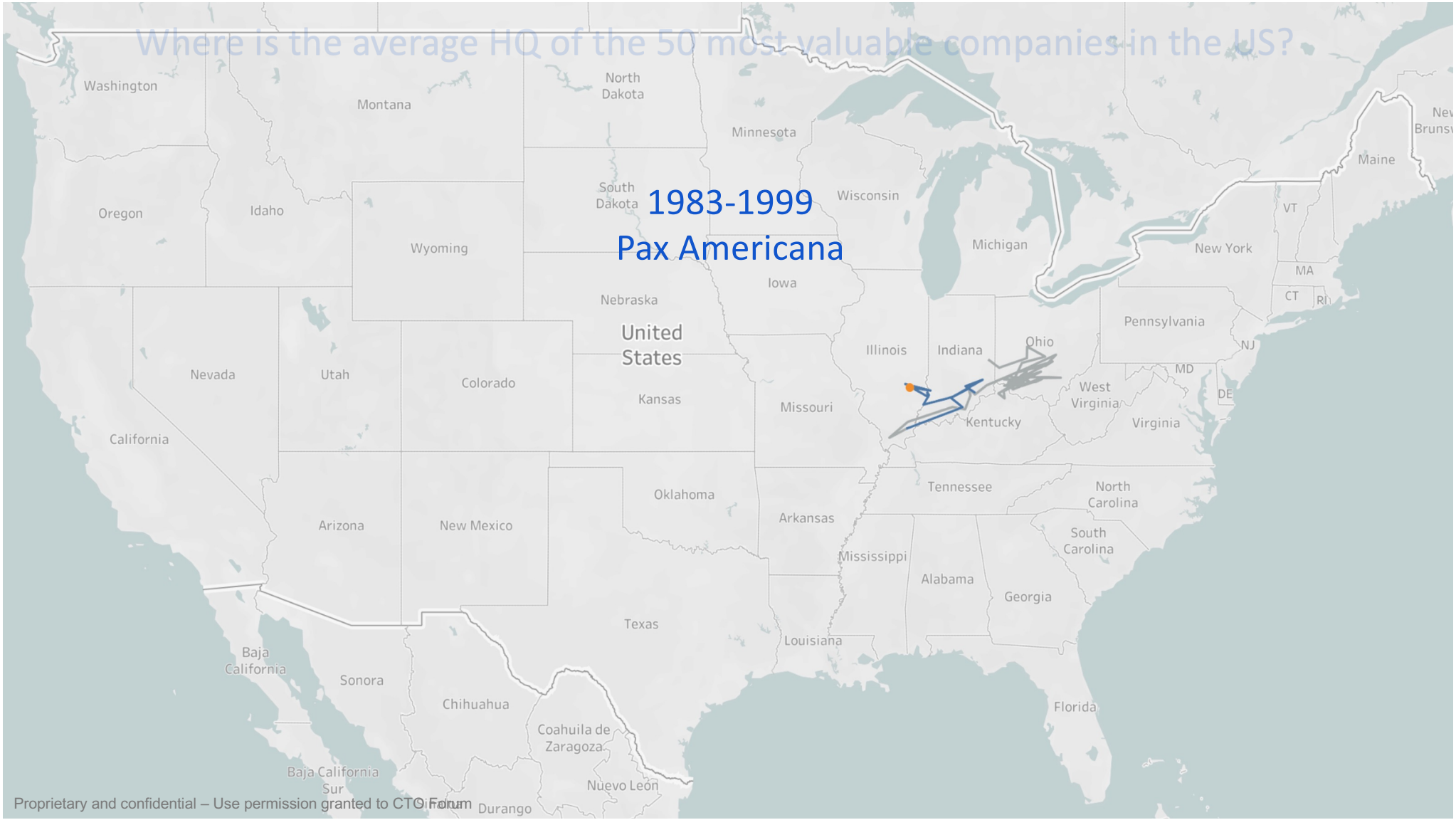


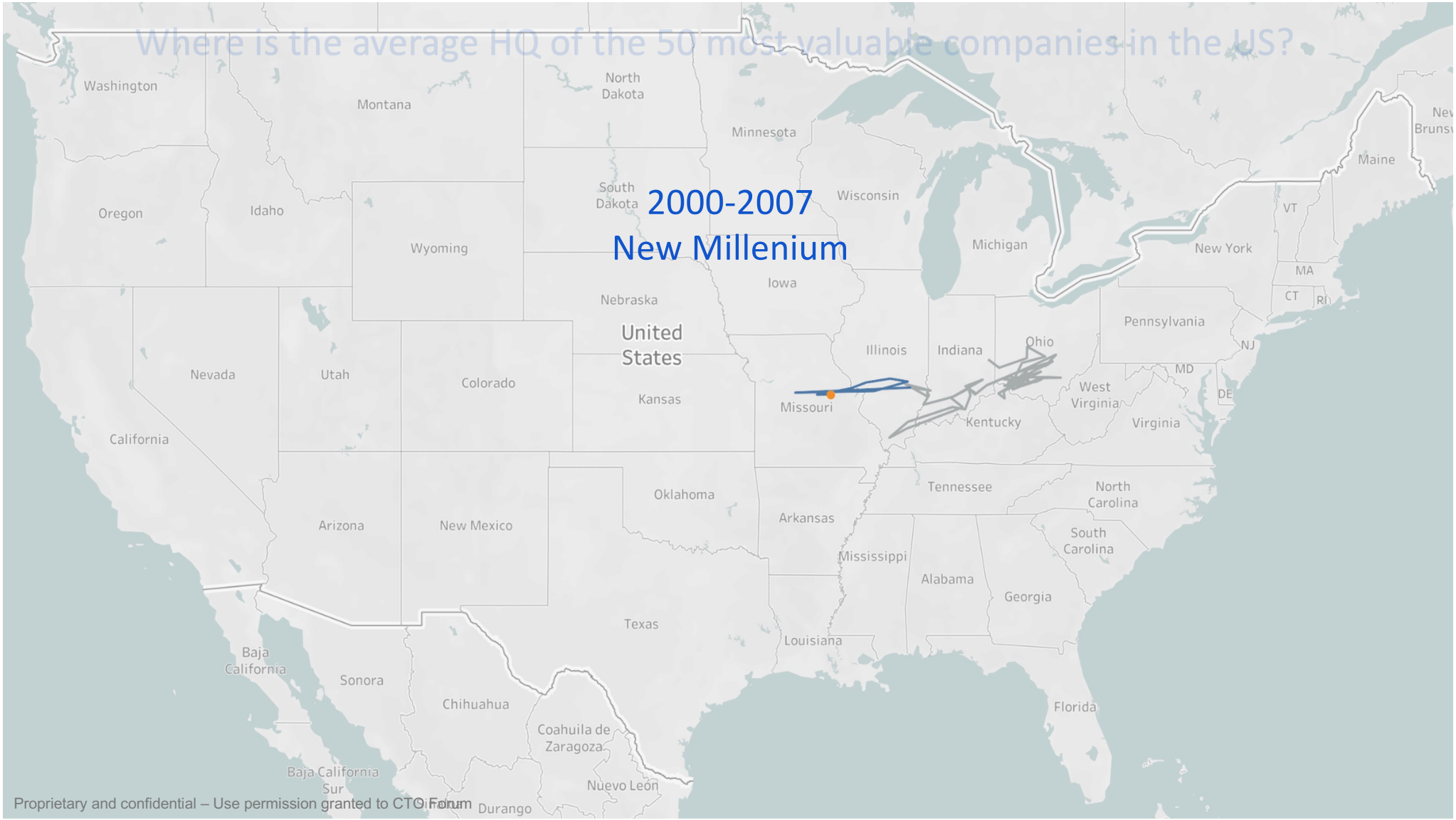


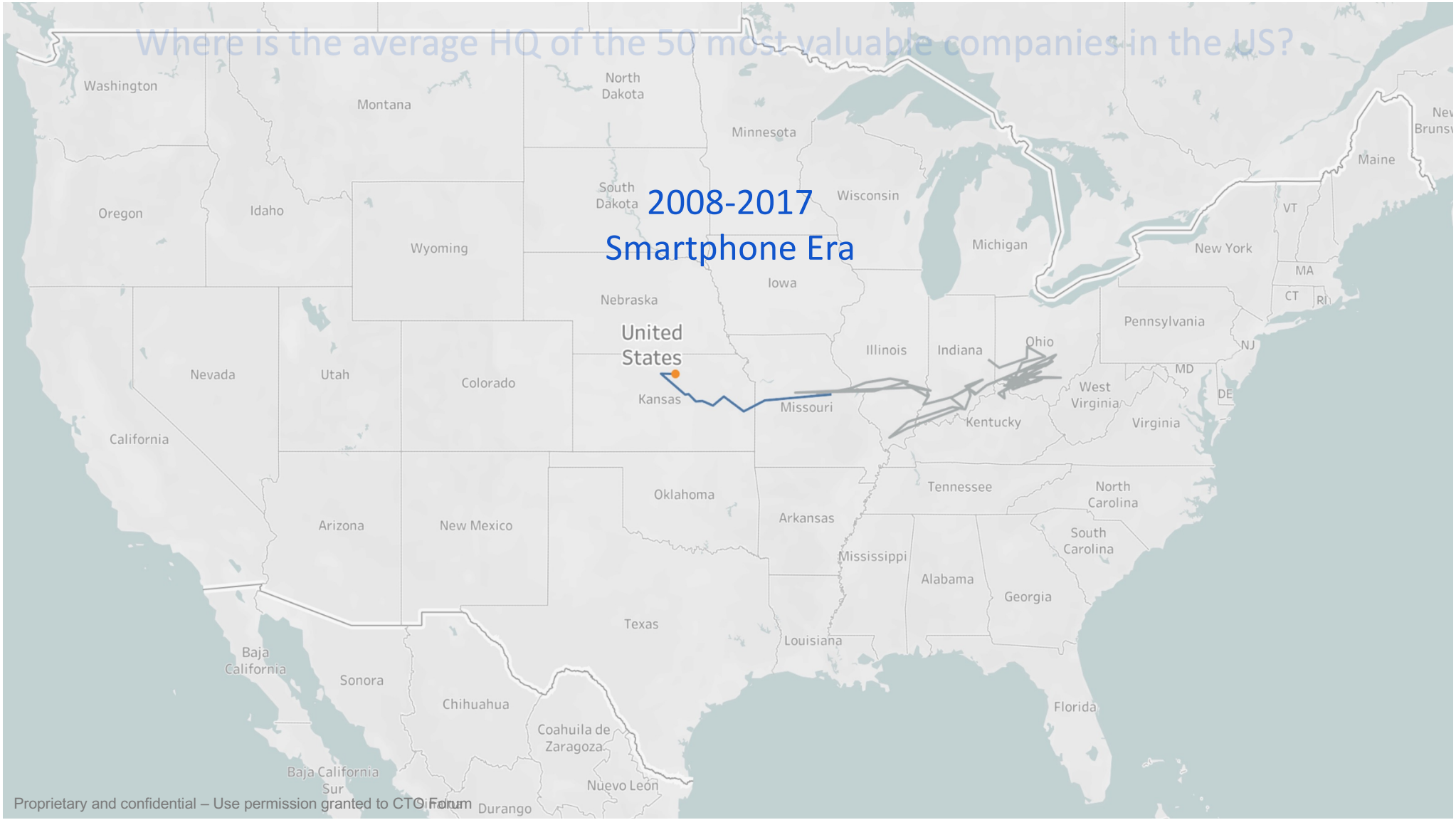


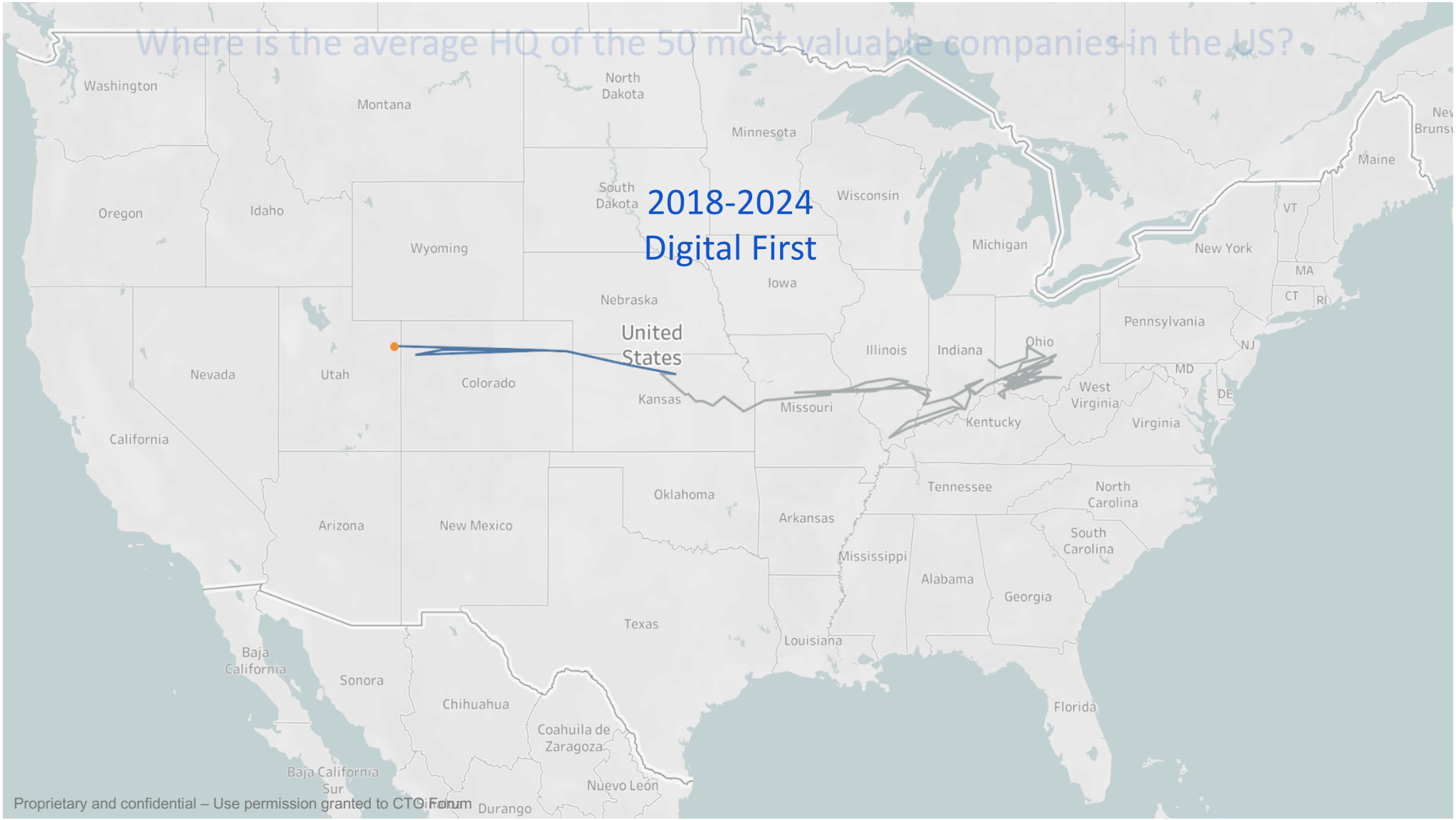








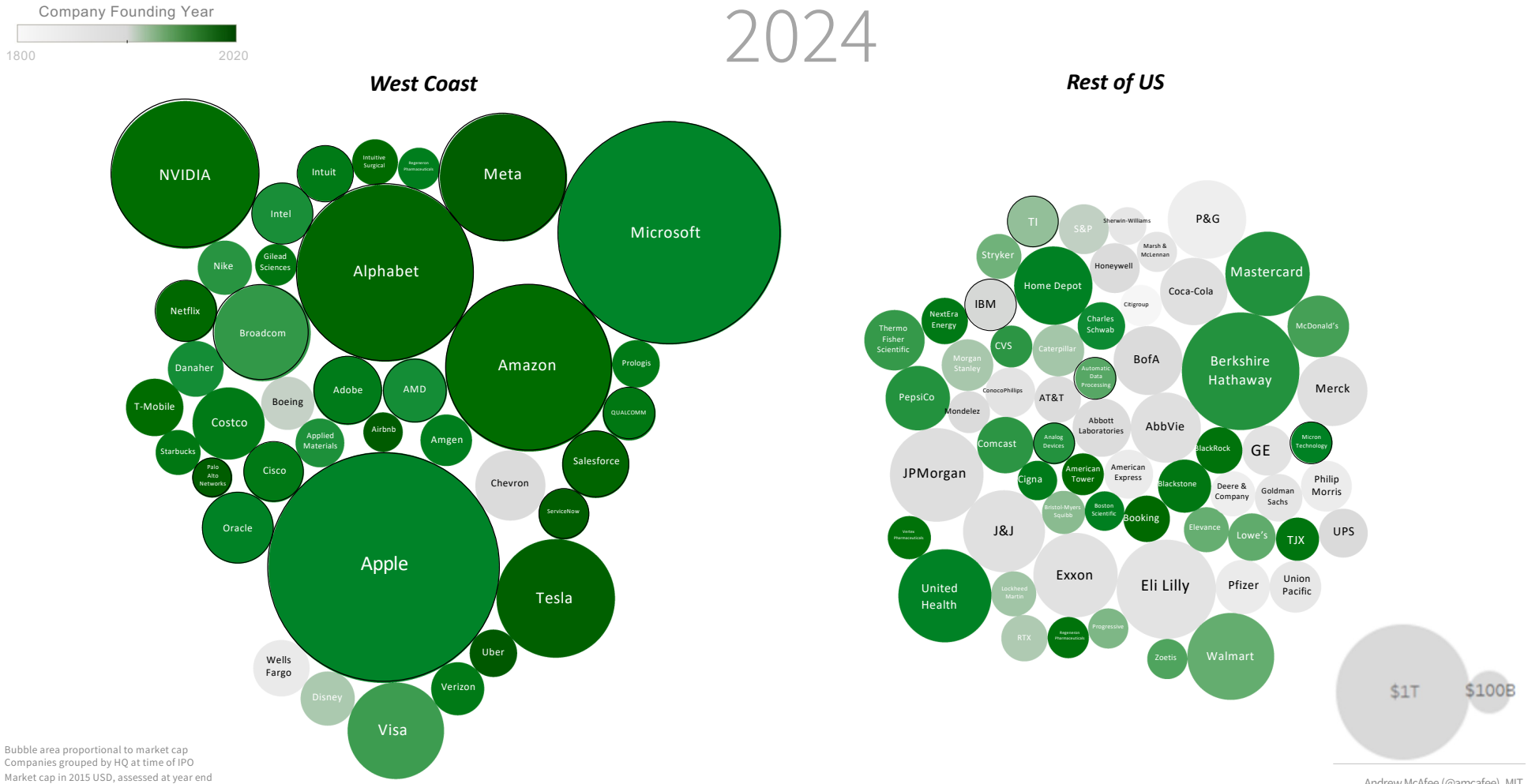




100 Most Valuable US Companies Grouped By Headquarters Location

2000

100 Most Valuable US Companies Grouped By Headquarters Location



Bubble area proportional to market cap
Companies grouped by HQ at time of IPO
Market cap in 2015 USD, assessed at year end
Dark bubble border indicates a company in a "tech" industry: Interactive Media & Services, Internet & Direct Marketing Retail, Semiconductors & Semiconductor Equipment, Software, Technology Hardware Storage & Peripherals

Andrew McAfee (@amcafee), MIT

World's 100 most valuable public companies grouped by headquarters location, 2000-2024

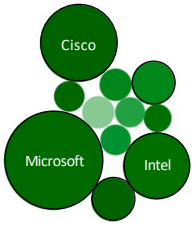
Tech Share of total number of companies
17%

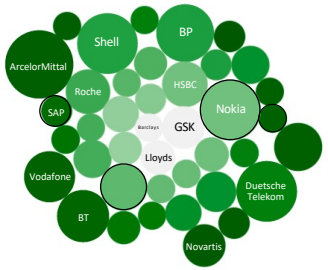
Tech Share of total Mrk Cap of companies
26.5%

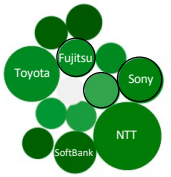
2000

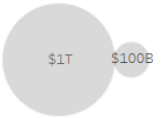
Company Founding Year
1800 2010

	US West Coast	***Rest of US***	*Europe*	*Asia*
Number of companies	11	36	40	7
Total real Mrk Cap	2,372	6,627	4,740	1,620
% of total Mrk Cap	15.43%	44.11%	43.09%	30.95%









Bubble's border for tech companies
Bubble area proportional to market cap
Companies grouped by HQ at time of IPO
Market cap in 2015 USD, assessed at year end

Andrew McAfee (@amcafee), MIT

World's 100 most valuable public companies grouped by headquarters location, 1999-2023

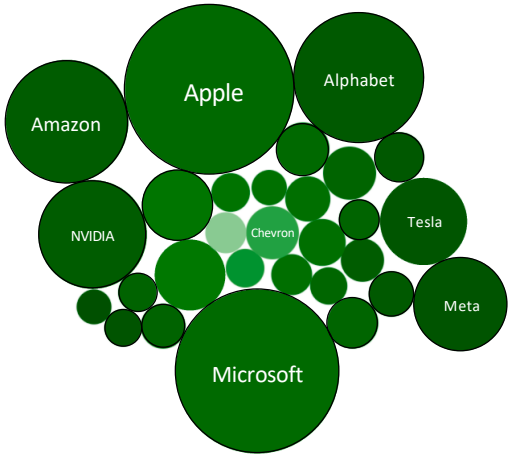
Tech Share of total number of companies
27%

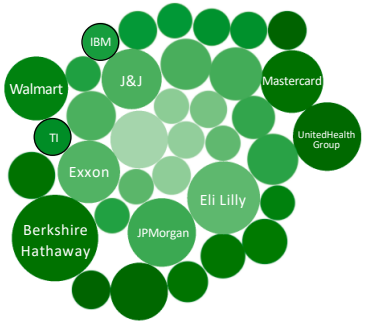
Tech Share of total Mrk Cap of companies
48.1%

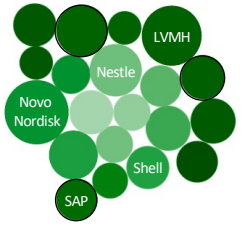
2024

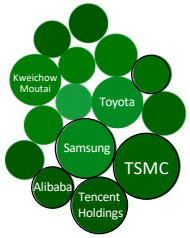
Company Founding Year
1800 2010

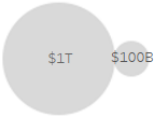
	US West Coast	***Rest of US***	***Europe***	***Asia***
Number of companies	29	36	20	15
Total real Mrk Cap	12,206	6,449	3,191	2,565
% of total Mrk Cap	49.6%	26.6%	13.2%	10.6%











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Bubble area proportional to market cap
Companies grouped by HQ at time of IPO
Market cap in 2015 USD, assessed at year end

Andrew McAfee (@amcafee), MIT

Conclusion #1:
AI is a GPT. It will change the world, and the business world

Conclusion #2:
Technological change like AI exposes organizational quality

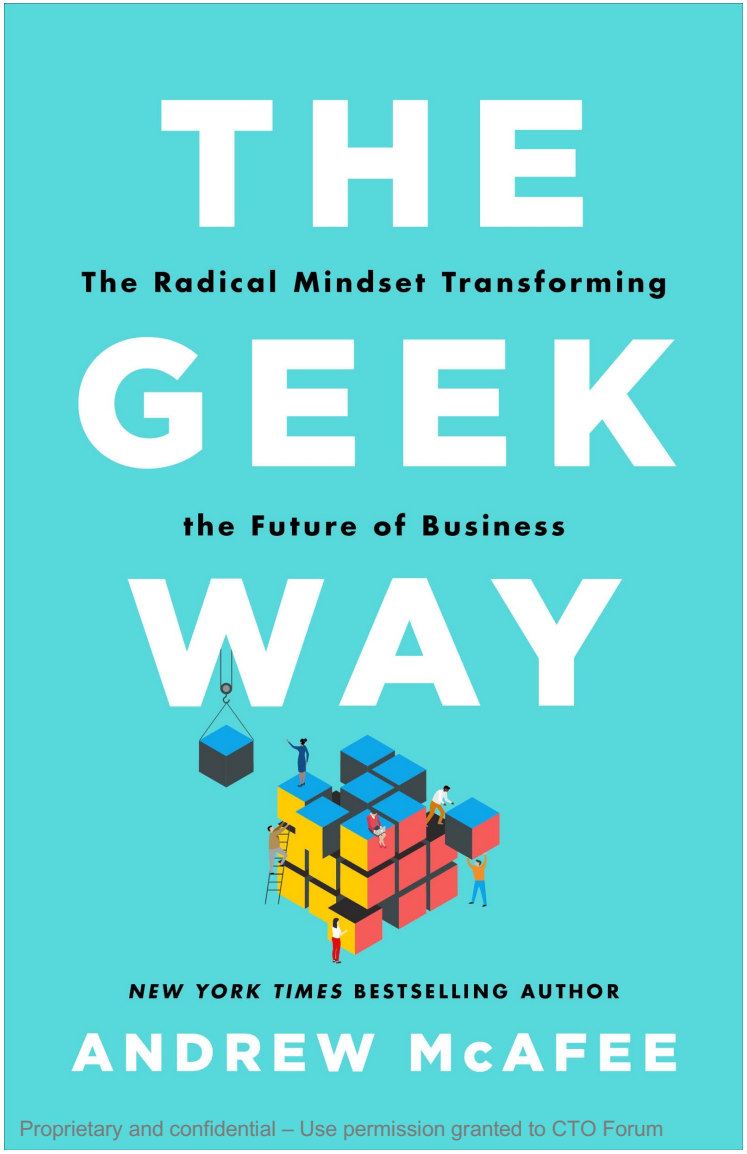
Conclusion #2:
Technological change like AI exposes organizational quality management leadership

Conclusion #3:
Many “best practices” of the 20th century are handicaps in the 21st.

Conclusion #3:

Many “best practices” of the 20th century are handicaps in the 21st.

The geeks haven’t just created AI; they’ve also upgraded the company



Thank you!

Andrew McAfee, MIT