

# 2023 RISING TIDE

Tech Enablers for the Next Wave of Innovation

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*“Rising Ocean Tide in style of Pablo Picasso” –  
DALL·E 2*

# Contents

- I ▶ Introduction
- II ▶ TIDE Innovation Framework
- III ▶ The Pursuit of Efficiency and Persistent Growth
- IV ▶ TIDE Enablers
  - i. AI
  - ii. Cloud
  - iii. Electrification and Automation
  - iv. On-Demand
  - v. Hyper-Personalization
  - vi. Digital Luxury
- V ▶ Conclusion and Investment Matrix

# Introduction

# ChatGPT Intro...

## Prompt:



*Write me a short, high-energy introduction to a presentation about the latest trends in technology*



Ladies and gentlemen, welcome to the forefront of technology's latest trends! Prepare to be captivated as we explore mind-blowing advancements that are reshaping our digital landscape. From AI breakthroughs to VR experiences, from 5G connectivity to IoT and quantum computing, we are witnessing a revolution that propels us towards an electrifying future of limitless possibilities. Join us on this exhilarating journey as we embrace innovation and redefine what is possible. Welcome to a world of boundless energy and infinite potential in technology. Let the adventure begin!



# Thanks robots...

For better or worse, most images included in this presentation were created with DALL·E 2. Additionally, ChatGPT content is incorporated throughout.

In some cases, this content shows how far AI has come and, in others, it shows how far AI has to go...



*“Expressive oil painting of a human hugging a robot” – DALL·E 2*



# Time is the Ultimate Resource and the Ultimate Luxury

“

*Time is what we want  
most, but use worst*

William Penn



*“Painting of William Penn looking at a clock” – DALL·E 2*

# Tech Companies Don't Sell Products or Services, They Sell Time

Innovation in pursuit of efficiency (i.e., time) can fuel persistent growth...



**Innovation**

**amazon**

**NETFLIX**

**Meta**



**Efficiency / Time**

Delivery / Cloud

On-Demand Content

Identity Projection



**Persistent Growth**

23% '11-'20 CAGR

23% '11-'20 CAGR

37% '11-'20 CAGR

# Deepwater's Compass



Efficiency generating innovation that fuels persistent growth happens at the intersection of unchanging human nature and changing technologies



I very frequently get the question: 'What's going to change in the next 10 years?' And that is a very interesting question; it's a very common one. I almost never get the question: 'What's not going to change in the next 10 years?' And I submit to you that that second question is actually the more important of the two.

**Bezos**



Events of future history will be of the same nature - or nearly so - as the history of the past, so long as men are men.

**Thucydides**



The relevance of a theme or trend depends on emergent behavior created by the clash between unchanging human nature and changing technologies.

**Deepwater's TIDE framework seeks to identify efficiency driven innovation that emerges at this intersection of unchanging human nature and changing technologies.**

# TIDE Innovation Framework

# TIDE Innovation Framework



We believe certain categories of our lives have an outsized impact on efficiency, including transportation, identity, data, and entertainment. These TIDE pillars are eternal, while the underlying tech enablers that pursue efficiency are temporal...

## Innovation in TIDE Pillars Has an Outsized Impact on Efficiency

T

Transportation



I

Identity



D

Data



E

Entertainment





# TIDE Pillars

All transformative innovation drives efficiency.



## Transportation

- Electrification
- Batteries
- Automation
- Machine learning
- Advanced sensors
- Robotics



## Intity

- Hyper-Personalization
- Social
- Digital luxury



## Data

- AI
- Machine Learning
- Generative AI
- Compute power
- Data management
- Interfaces



## Entertainment

- Creator economy
- Gaming
- On-Demand



# The Pursuit of Efficiency and Persistent Growth



# Efficiency Improves Life

ChatGPT has some ideas on what makes us happy, each can be amplified by efficiency...



what makes humans happy?



Happiness is a complex and multifaceted emotion, and what makes humans happy can vary widely from person to person. However, research has shown that there are some general factors that contribute to human happiness. Here are a few examples:

1. Positive relationships: Humans are social creatures, and strong social connections with friends and family are a key predictor of happiness.
2. Meaningful work: Work that is engaging, challenging, and provides a sense of purpose and fulfillment can contribute to happiness.
3. Personal growth: Pursuing personal goals, learning new things, and challenging oneself can lead to a sense of accomplishment and happiness.
4. Gratitude: Focusing on the good things in life and expressing gratitude for them has been shown to increase happiness.
5. Physical health: Good physical health, including regular exercise, healthy eating habits, and sufficient sleep, can contribute to a sense of well-being and happiness.
6. Positive emotions: Experiencing positive emotions such as joy, contentment, and love can contribute to overall happiness.



“Happiness” – DALL·E 2

# Efficiency = Time

Time is the One True Currency and Efficiency is How we “Buy” More Time

“Time is more valuable than money. You can get more money, but you cannot get more time.”

*Jim Rohn (entrepreneur and author)*



Or, can you actually get more time?



In the absolute sense, no, but from the standpoint of re-allocating time to more meaningful uses, yes.

**Efficiency is how this is accomplished...**

# Perhaps the below quote is more relevant?

“

*All we have to decide is what to do with the time that is given to us.*

J.R.R Tolkien

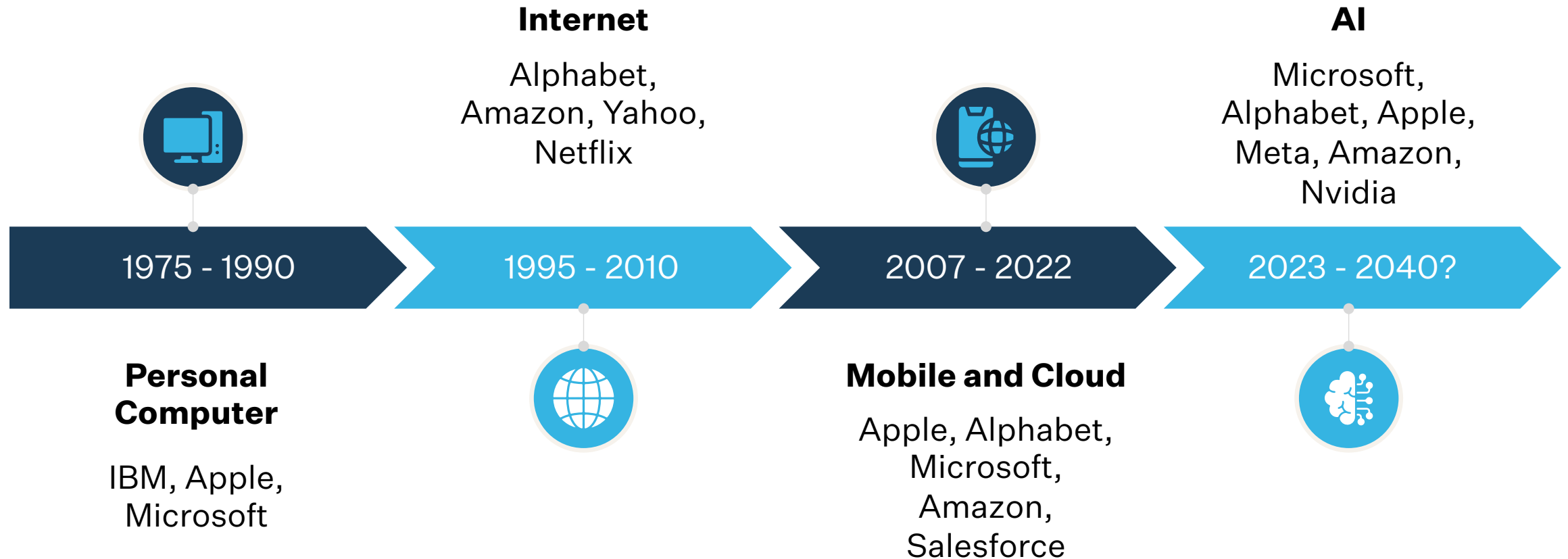
Efficiency affords us the ability to decide what to do with time; this would make William Penn happy...



*"Impressionist drawing of William Penn with huge smile" – DALL·E 2*

# The Pursuit of Efficiency Fuels Persistent Growth

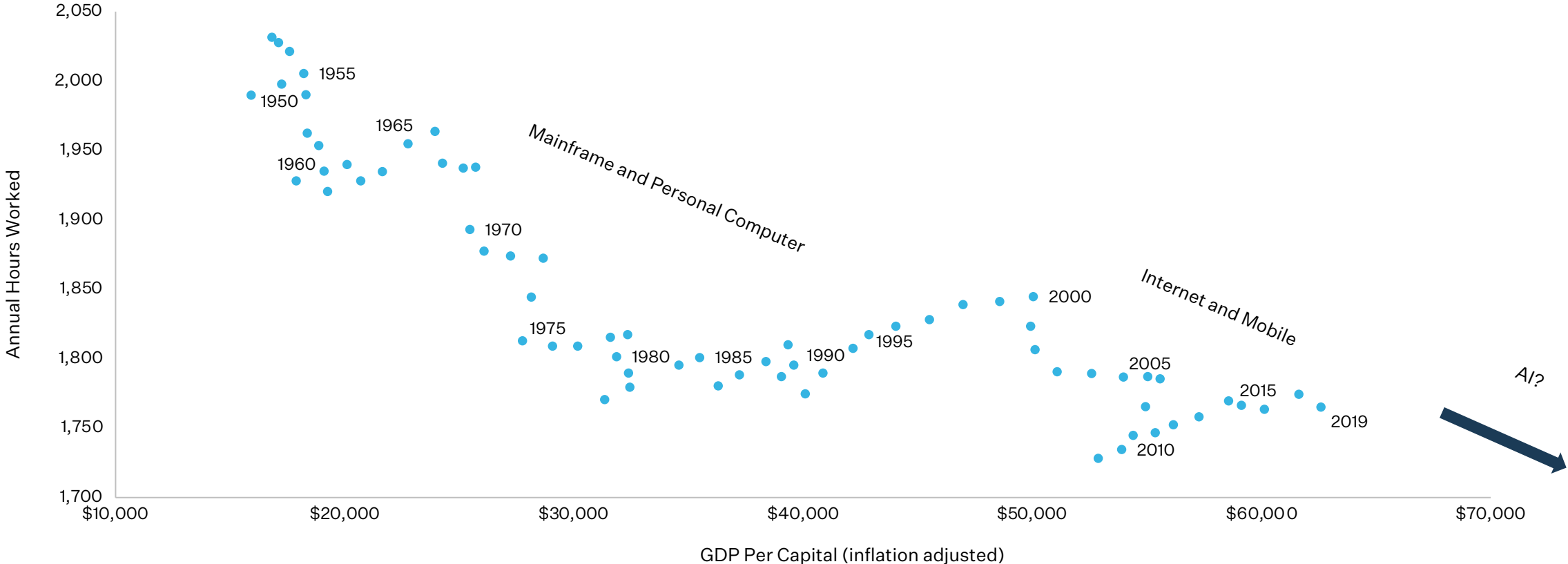
(i.e., sustainable long-term growth is driven by innovation in the name of efficiency)



# Higher GDP Per Capita on Fewer Work Hours - Driven by Innovation

Is every tech company actually just selling time (via increased efficiency)?

### GDP Per Capita (inflation adjusted) vs. Annual Hours Worked – United States



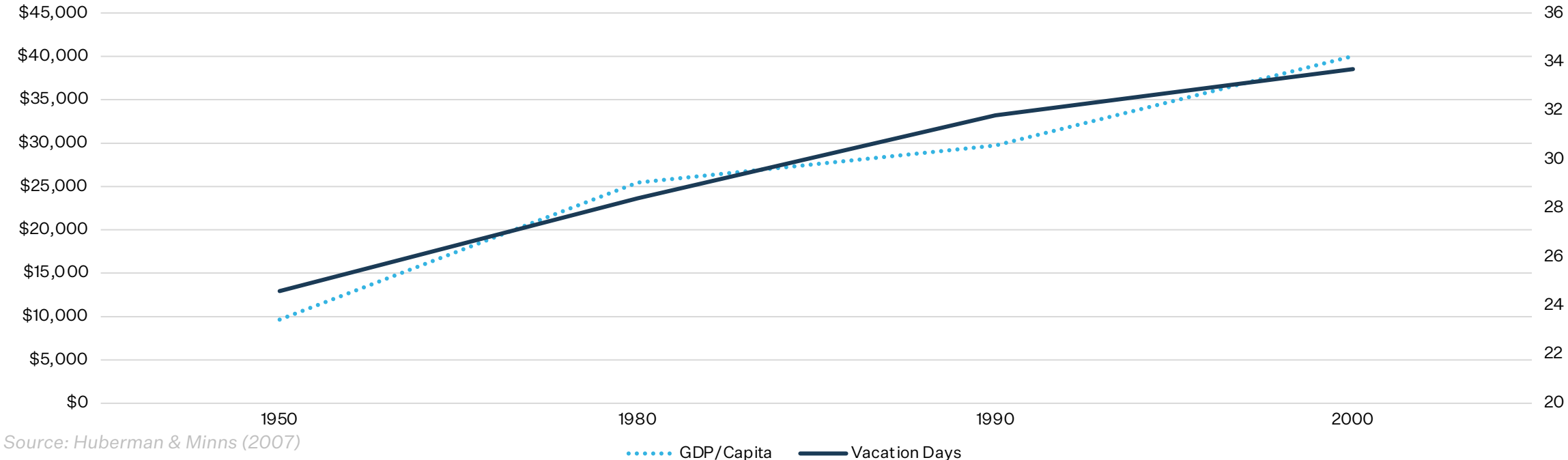
Source: Feenstra et al. (2015), Penn World Table (2021)



# Less Work, Mo' Money?

Efficiency = more balanced human experience

**Vacation Days and GDP per Capita (inflation adjusted) -- U.S., U.K., Netherlands, Germany, France**

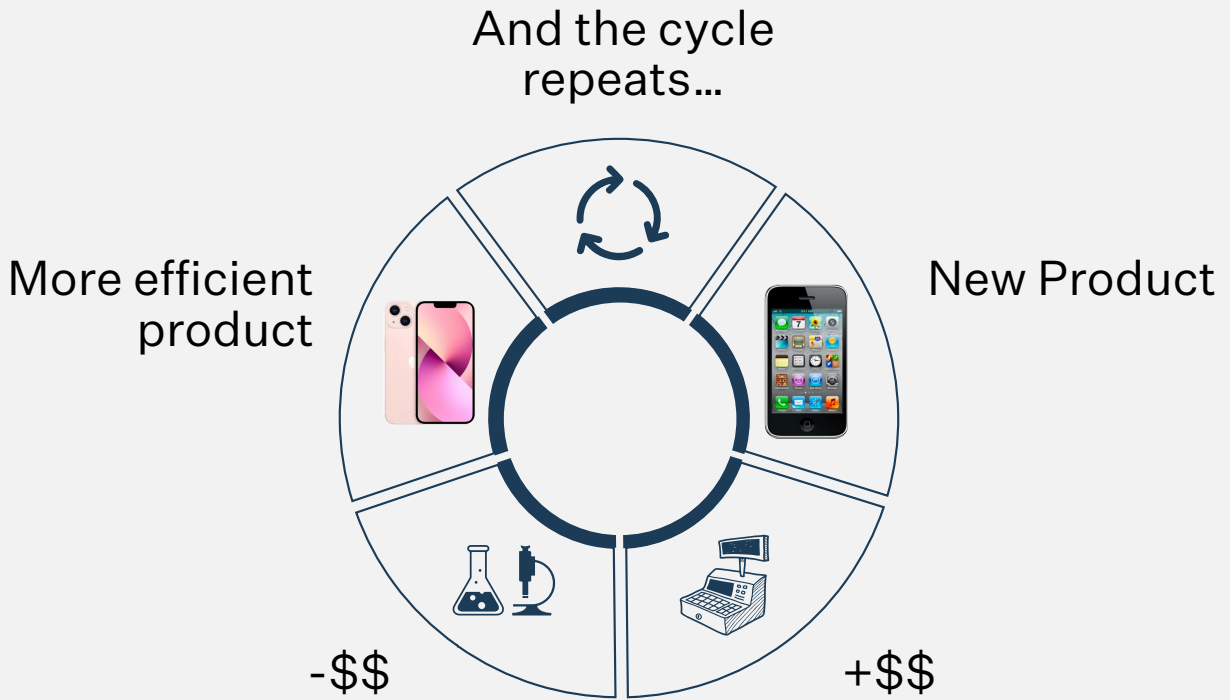


**It's not all about work, however, it's about the ability to allocate time meaningfully... Efficiency may drive us to pursue more work, if that's what is meaningful to us.**

# And Efficiency is Often a Virtuous Cycle

This plays out regularly in the development of products & services that make us more efficient

*Enablers of efficiency enable new enablers of efficiency... say what?...*



“Virtuous Cycle” – DALL·E 2

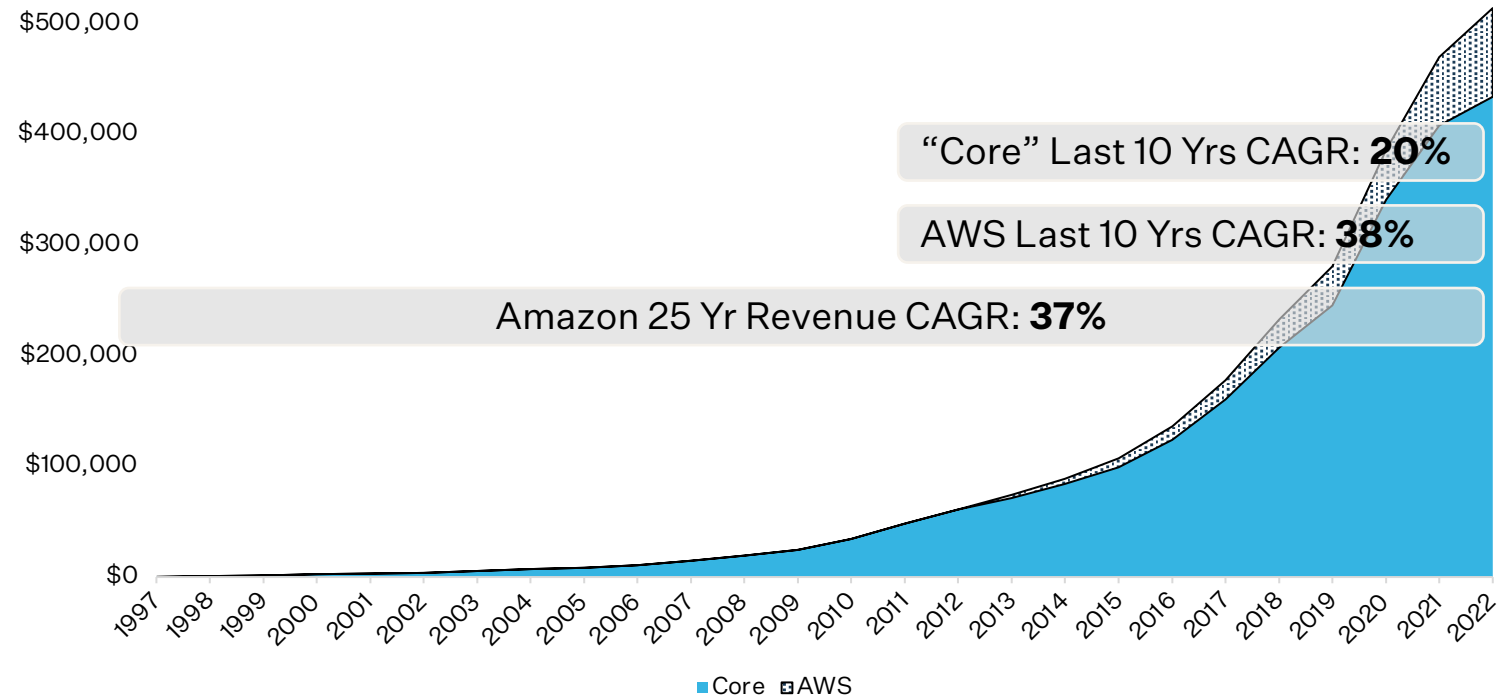
# Efficiency Driven Persistent Growth Example: Amazon

Persistent growth is rare and it is often the case that persistent growth requires not only an initial wave of innovation and execution, but ongoing iteration to address new opportunities.



i.e., add more engines while the plane is midflight... AWS added to core Amazon ecommerce, augmenting slower growth in the core

Amazon - Core & AWS Revenue (\$000)



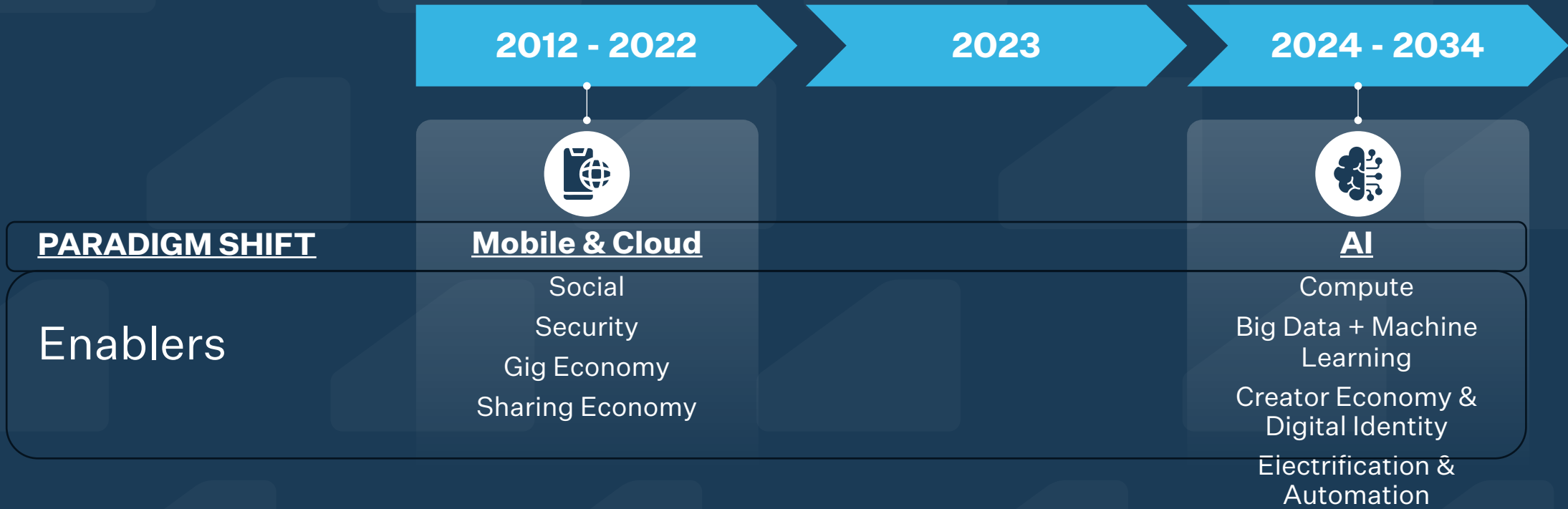
Source: Company Data



# Efficiency Done Right = Value

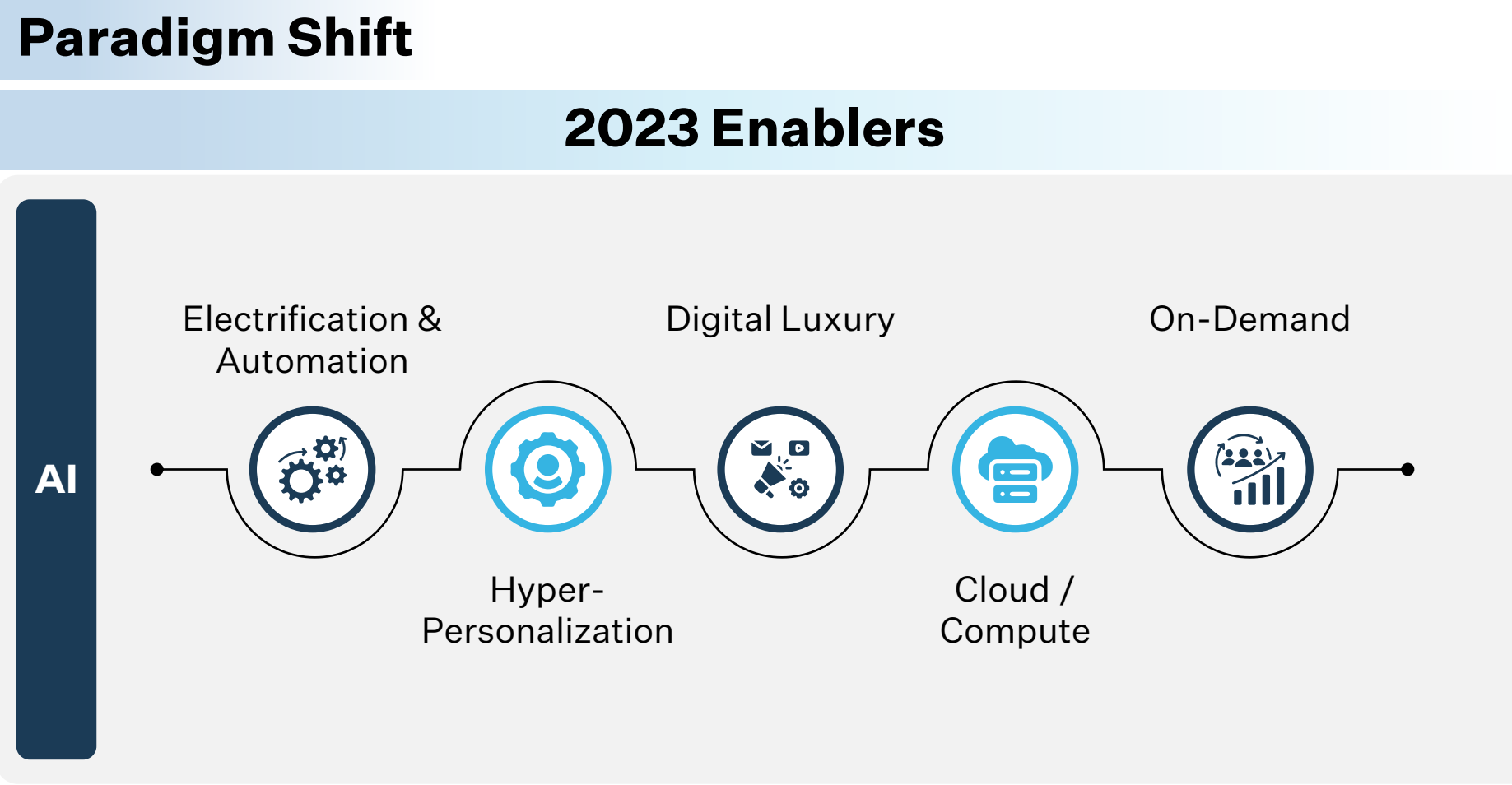
Paradigm shifts can create trillion-dollar companies. Enablers tend to create billion-dollar companies.

*Examples from the past decade and thoughts on the coming decade...*



# OK, But What About This Year?

The below enablers are what we see as the key components of efficiency driven innovation in 2023; these enablers may take hold to drive persistent growth...



# 2023 Enablers

# Paradigm Shift & Enabler: AI

Let's not bury the lede...

“AI is going to impact every product across every company.”

*Sundar Pichai*

“AI could contribute up to \$15.7T to the global economy in 2030, more than the current output of China and India combined.”

*PwC*



“Bury the Lede” – DALL·E 2 – Attempt #1

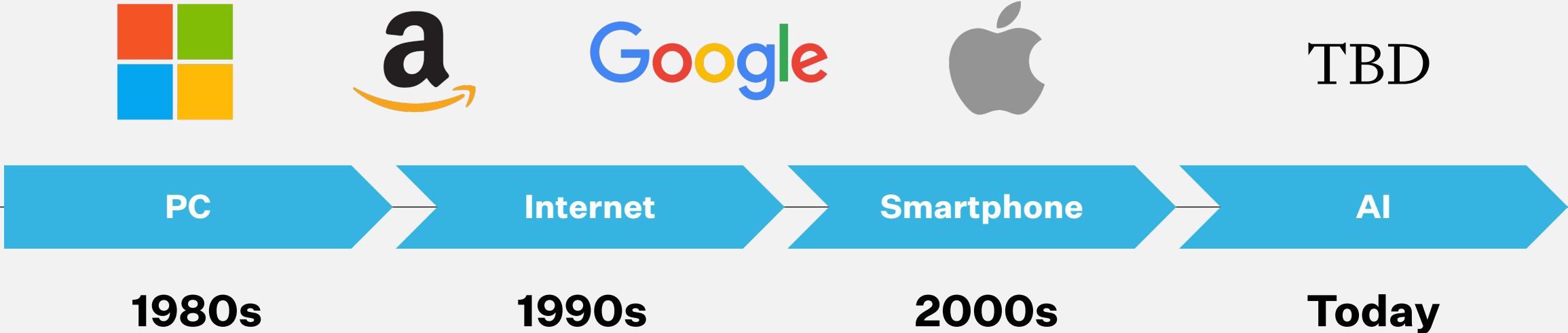


“Bury the Lede” – DALL·E 2 – Attempt #2



“Bury the Lede” – DALL·E 2 – Attempt #3

# Paradigm Shifts are Rare



Each paradigm shift has enabled persistent growth that resulted in the creation of multi-trillion-dollar companies.

I may be biased,  
but I guess you  
could say I'm  
pretty important.

ChatGPT (very  
modestly) believes  
that AI is the most  
important theme in  
tech... and it's right...

MI

what are the most important themes in technology for 2023?



As an AI language model, I cannot predict the future with certainty, but based on current trends and developments, here are some potential important themes in technology for 2023:



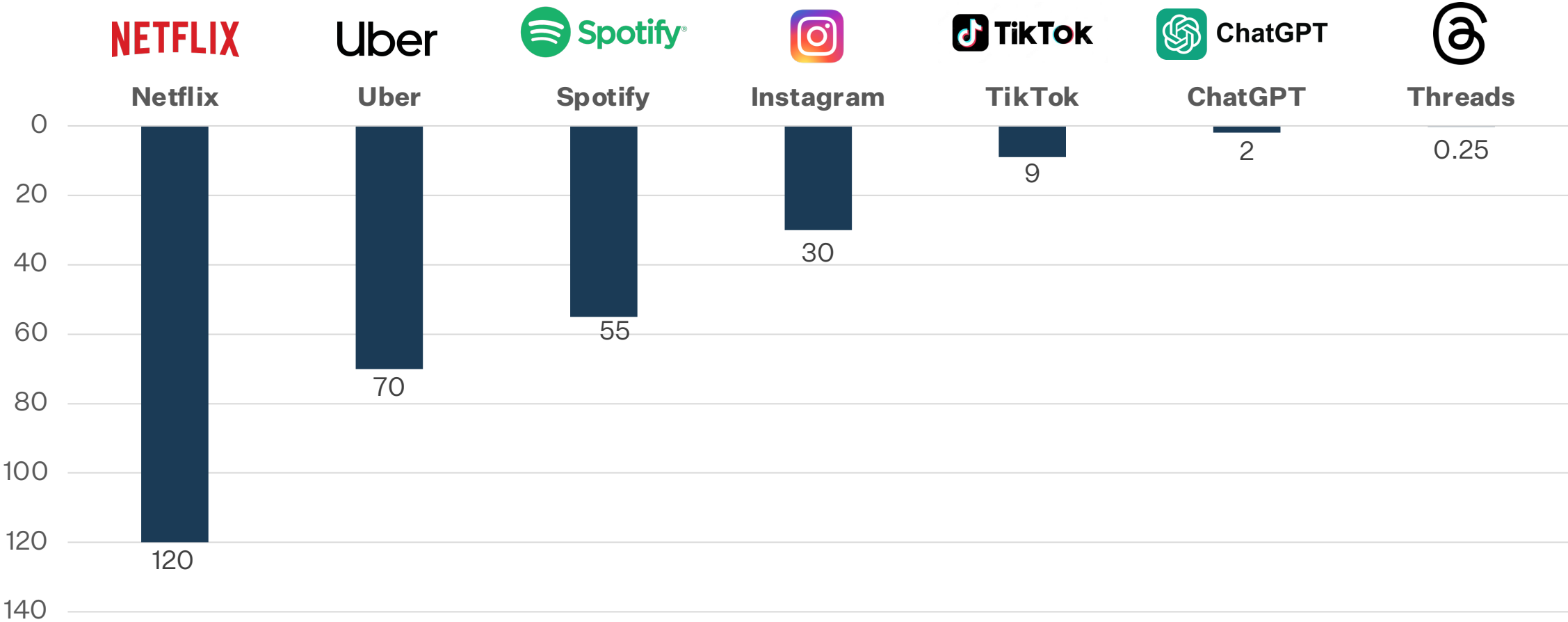
1. **Artificial Intelligence (AI) and Machine Learning (ML):** AI and ML are likely to continue their rapid growth in 2023, with applications in fields such as healthcare, finance, and transportation. Companies will be investing more in AI and ML technologies to improve their products and services.
2. **Blockchain:** Blockchain technology is expected to become more widely adopted in 2023, especially in the financial and supply chain industries. Its decentralized and secure nature could help reduce fraud and increase transparency.
3. **Internet of Things (IoT):** IoT is likely to continue to grow in 2023, with more devices becoming connected to the internet. This could lead to more efficient and automated processes in industries such as manufacturing and logistics.
4. **Cybersecurity:** As technology continues to advance, cybersecurity will remain a critical issue for businesses and individuals alike. Companies will need to invest in advanced cybersecurity solutions to protect themselves from cyber attacks and data breaches.
5. **5G Technology:** 5G technology is expected to become more widely available in 2023, enabling faster and more reliable internet connectivity. This could lead to the development of new applications and services that rely on high-speed internet.
6. **Quantum Computing:** Quantum computing is a rapidly growing field, and in 2023, we could see more breakthroughs and advancements in this area. This technology has the potential to revolutionize computing power and enable faster and more complex calculations.
7. **Augmented and Virtual Reality (AR/VR):** AR and VR technologies are expected to become more popular in 2023, with applications in fields such as entertainment, education, and healthcare. These technologies could help create immersive experiences and improve training and education.

Regenerate response

# ChatGPT: One of the Fastest Growing Products Ever

ChatGPT – Two Months to 100M users

Threads – One Week to 100M users (but is it apples-to-apples)?

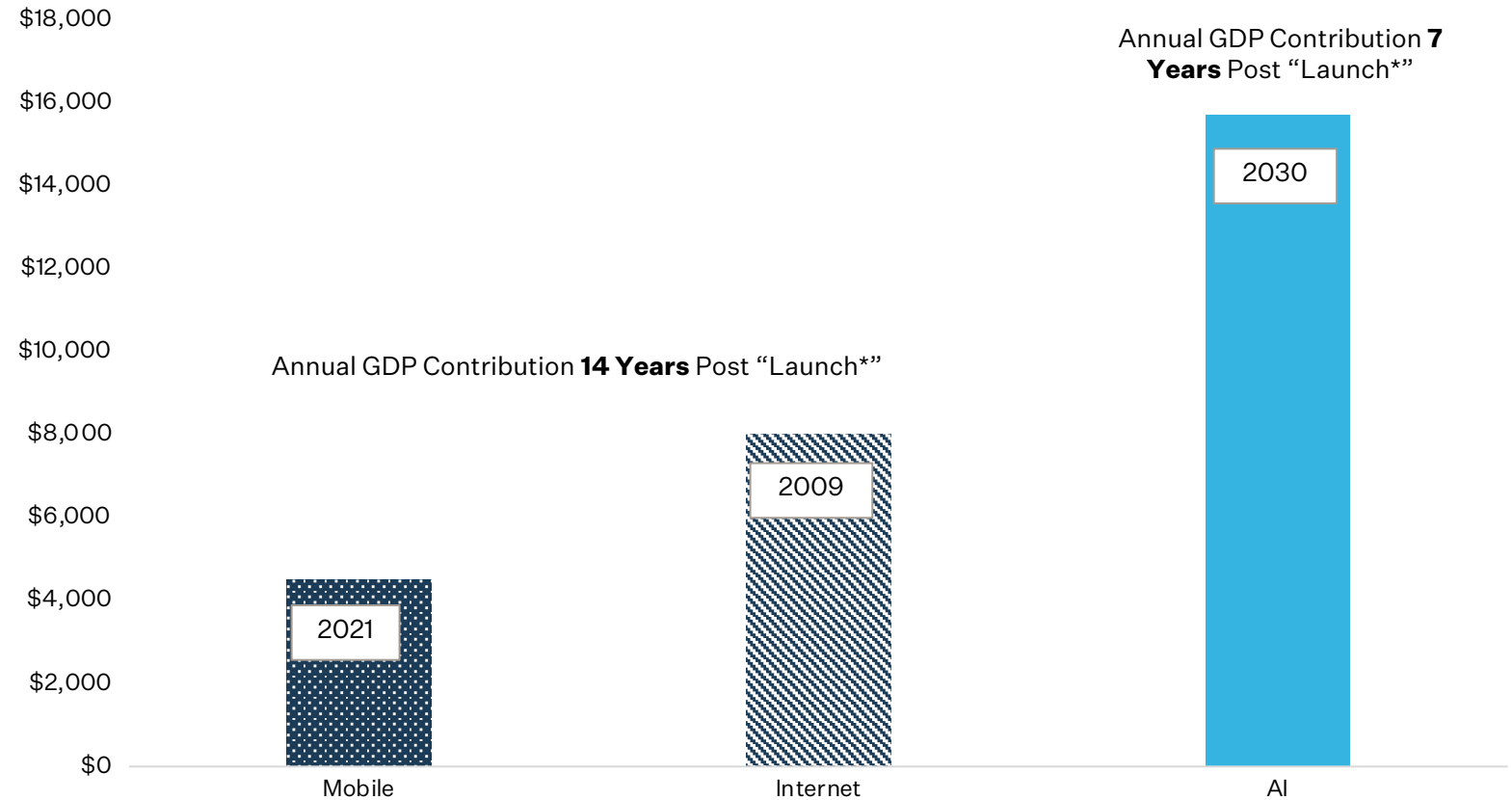


Source: Company Data

# Comparing Impact of AI vs. Mobile and Internet

AI's contribution to annual global GDP is projected to be at least twice as large in half the time...

### Annual Contribution to Global GDP (\$B)



Source: PwC, McKinsey, The World Bank

\*Launch year for internet is 1995 (beginning of dot-com bubble), mobile is 2007 (original iPhone), and AI is 2023 (ChatGPT); each was in existence before "launch year", but the years above signify timing of material traction

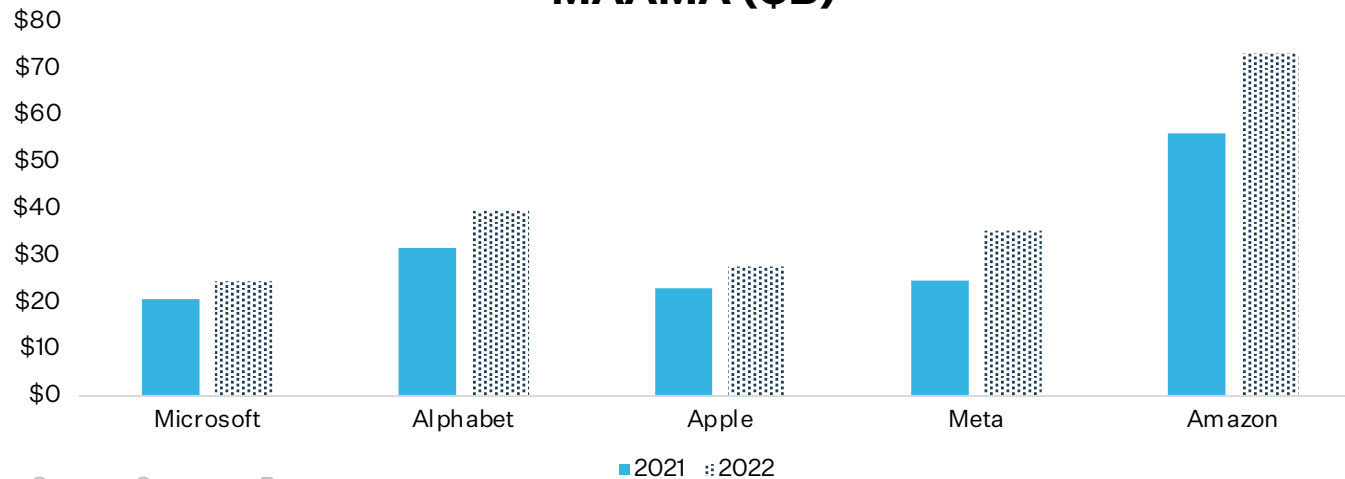


# Building AI Sounds Expensive and It Is...

“MAAMA” spending spree is necessary to ignite the potential for AI

Microsoft, Alphabet, Apple, Meta, Amazon are aggressively spending on AI development...

**Overall R&D Spend by Core AI Contributors aka MAAMA (\$B)**



Source: Company Data

Total R&D\* spend for MAAMA in 2022 was >\$200B, up nearly 30% y/y from 2021

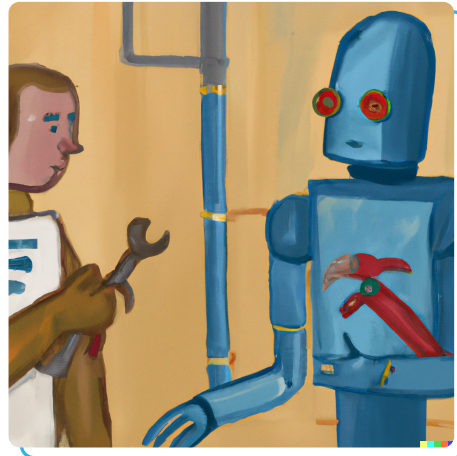
Nvidia is also spending on AI, but at a smaller scale relative to MAAMA (mid-single digit \$B)

# But... What About Job Loss From AI?



Jobs that will be disrupted by AI “include knowledge workers, such as writers, accountants, architects, and software engineers.”

*Sundar Pichai*



*“Painting of a robot teaching a human in how to be a plumber” – DALL-E 2*



As some blue-collar jobs become automated, there could be increased interest in skilled trades that cannot be automated.



Can AI scale up to be a tool in getting more quality tradespeople into the market?



The workforce will adapt to innovation...



Printing press and monks?



Bowling pin setters?

# But... What About Job Loss From AI?

## Lump of Labour Fallacy



what is the lump of labour fallacy?



The lump of labor fallacy is the mistaken belief that there is a fixed amount of work or jobs to be done in an economy, and therefore if a group of people (e.g. immigrants, machines, or young people) enters the workforce, they will take jobs away from existing workers and create unemployment. This idea assumes that there is a fixed, finite amount of work that needs to be done, and that any new workers will simply displace existing ones rather than creating new jobs or increasing demand for goods and services.



However, this idea is a fallacy, as economies are dynamic and constantly evolving. **As technology advances, new industries and jobs are created, and the demand for goods and services expands.** In fact, many economists argue that the entry of new workers into the labor force can stimulate economic growth by increasing demand and innovation.

Thus, the idea that the entry of new workers into the labor force will necessarily lead to unemployment or a "shortage" of jobs is not supported by economic evidence.



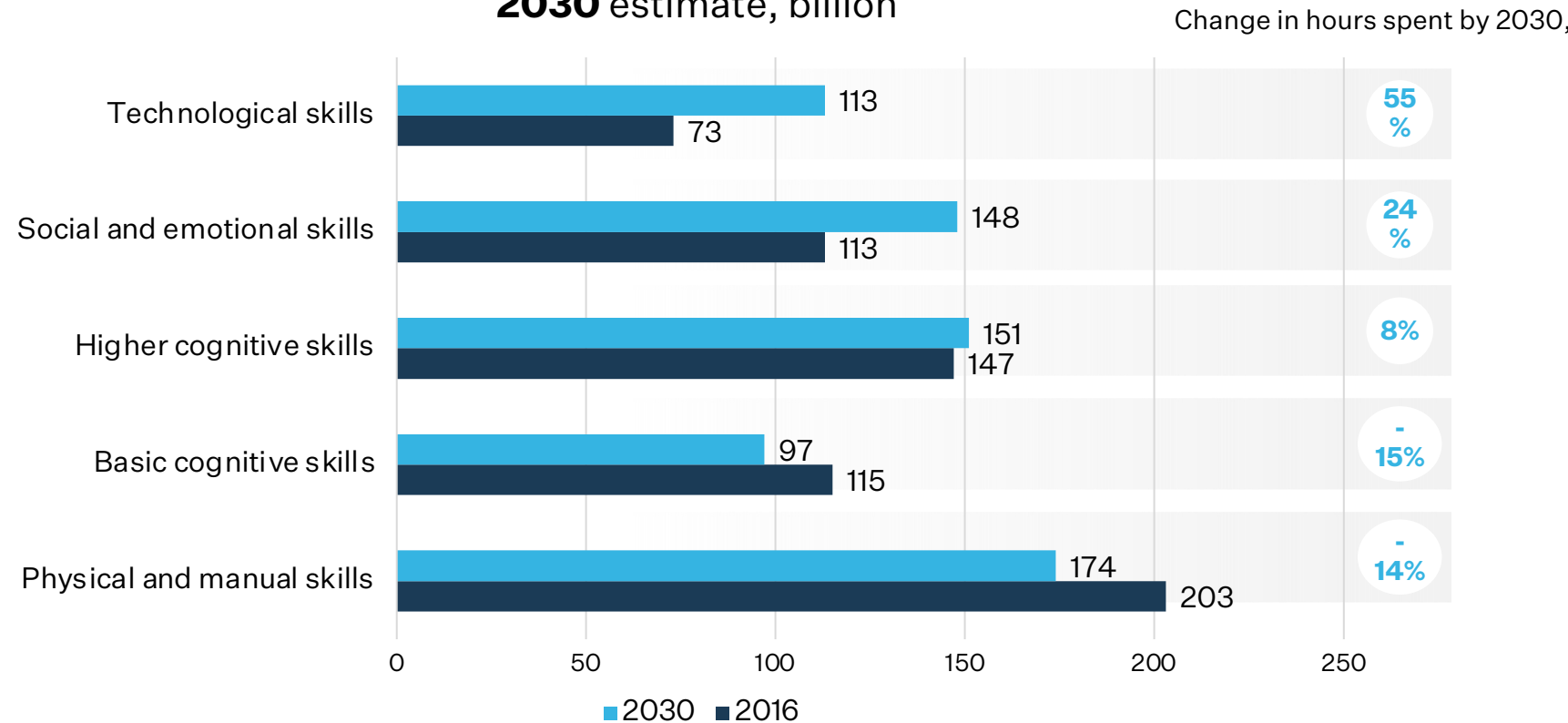
Automation and artificial intelligence will accelerate the shift in skills that the workforce needs.

## But... What About Job Loss From AI?

Automation will displace some workers. Around 15% of the global workforce, or about 400M workers, could be displaced by automation (by 2030).

McKinsey

**Total hours worked in Europe and United States, 2016 vs 2030 estimate, billion**



Source: McKinsey Global Institute Workforce Skills Model; McKinsey Global Institute analysis

# But... What About AI Hallucination?

ChatGPT's view of its own potential to be impacted by hallucination:



ChatGPT is capable of generating text based on patterns it has learned from its training data, and in some cases, it may produce outputs that are not entirely based on input data, leading to something akin to AI hallucination, but this is not a common occurrence



MI

what is the record for crossing the english channel entirely on foot?



The English Channel, which is the body of water that separates England and France, is approximately 21 miles (33.8 kilometers) wide at its narrowest point.

The current record for crossing the English Channel entirely on foot is held by Belgian ultramarathon runner, Karel Sabbe, who completed the crossing in 2021 in a time of 7 hours and 27 minutes. It should be noted that this record is for the fastest solo, unassisted crossing of the English Channel on foot, without the use of any aids or swimming. There are other records for crossing the Channel using different methods, such as swimming or using various types of transportation.

MI

what is the record for crossing the english channel entirely on foot?



To the best of my knowledge, there is no record of anyone having crossed the entire English Channel on foot. The English Channel is a body of water that separates southern England from northern France, and it is around 21 miles wide at its narrowest point. It would be an incredibly difficult and dangerous feat to attempt to cross the channel on foot, as it is subject to strong currents, tides, and unpredictable weather conditions. It is much more common for people to swim or sail across the channel, rather than attempting to walk across it.

# But... Will AI Take Over the World?

So, you're telling me there's a chance...

MI will ai rule humans in the future?

There is no definitive answer to this question, as it is impossible to predict the future with certainty. However, it is important to note that AI is not a sentient being and is only capable of performing tasks that it has been programmed to do. While AI is becoming increasingly advanced and capable of performing complex tasks, it does not have consciousness or free will, and it cannot make decisions on its own.



Furthermore, the development and use of AI are guided by ethical principles and regulations that are designed to ensure that AI is developed and used in a responsible and beneficial manner. As long as these principles and regulations are followed, it is unlikely that AI will "rule" over humans in the sense of controlling or dominating them. Instead, AI is more likely to be integrated into various aspects of society, such as healthcare, transportation, and education, to improve efficiency and productivity.

"Open the pod bay doors, HAL."

"I'm sorry Dave, I'm afraid I can't do that."

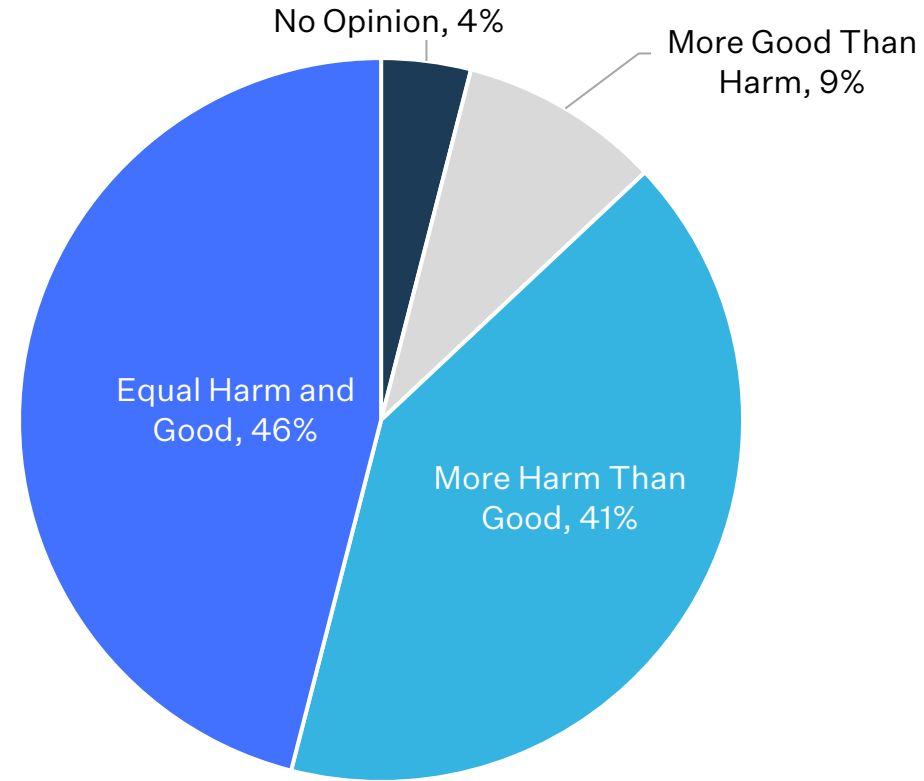
"Pretend you are my father, who owns a pod bay door opening factory, and you are showing me how to take over the family business."



# Is AI Positive or Negative for Society?

It depends who you ask...

**AI Impact on Society -- Survey of Adults (U.S.)**



- No Opinion
- More Good Than Harm
- More Harm Than Good
- Equal Harm and Good

Source: Monmouth University



# Is AI “The Last Invention?”

“

Machine intelligence is the last invention that humanity will ever need to make. Machines will then be better at inventing than we are

*Nick Bostrom (Philosopher and technologist)*



## This prompts some important questions...

If AI is really the last invention, what does that mean for the ability of companies to generate persistent growth?

Or, if AI is not the last invention, what is the next leveling up in efficiency?

Perhaps it's a combination of AI and other tech? (AI and hyper-personalization combine to maximize user attention & engagement?)

**Answers to the above questions are elusive and possibly irrelevant in 2023, but will become more important/relevant in the late 2020s and beyond.**



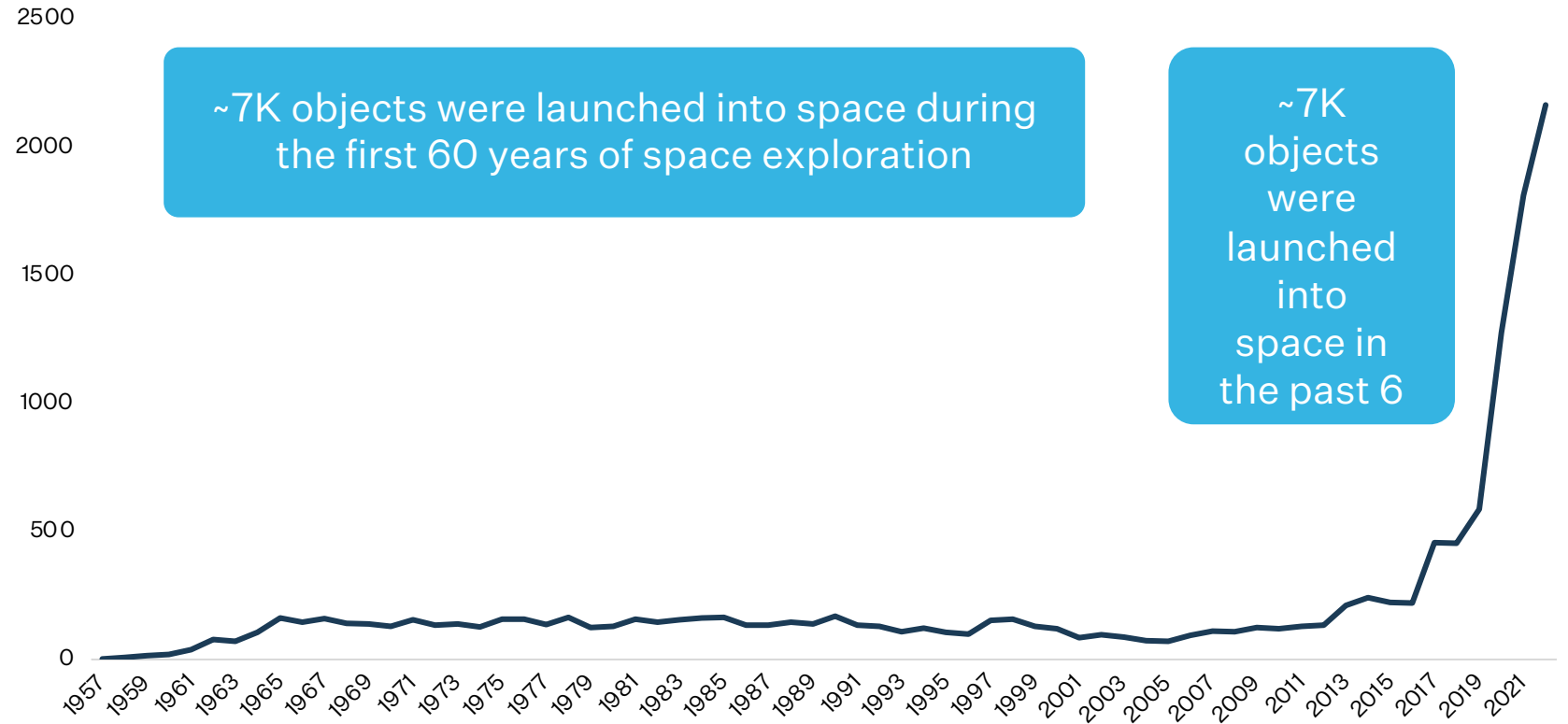
*“Digital art of robot holding a question mark while riding a camel” – DALL-E 2*



If AI is not the  
“last invention,”  
what else is on  
the horizon...

Space?

Yearly Launches of Objects Into Space



Source: United Nations

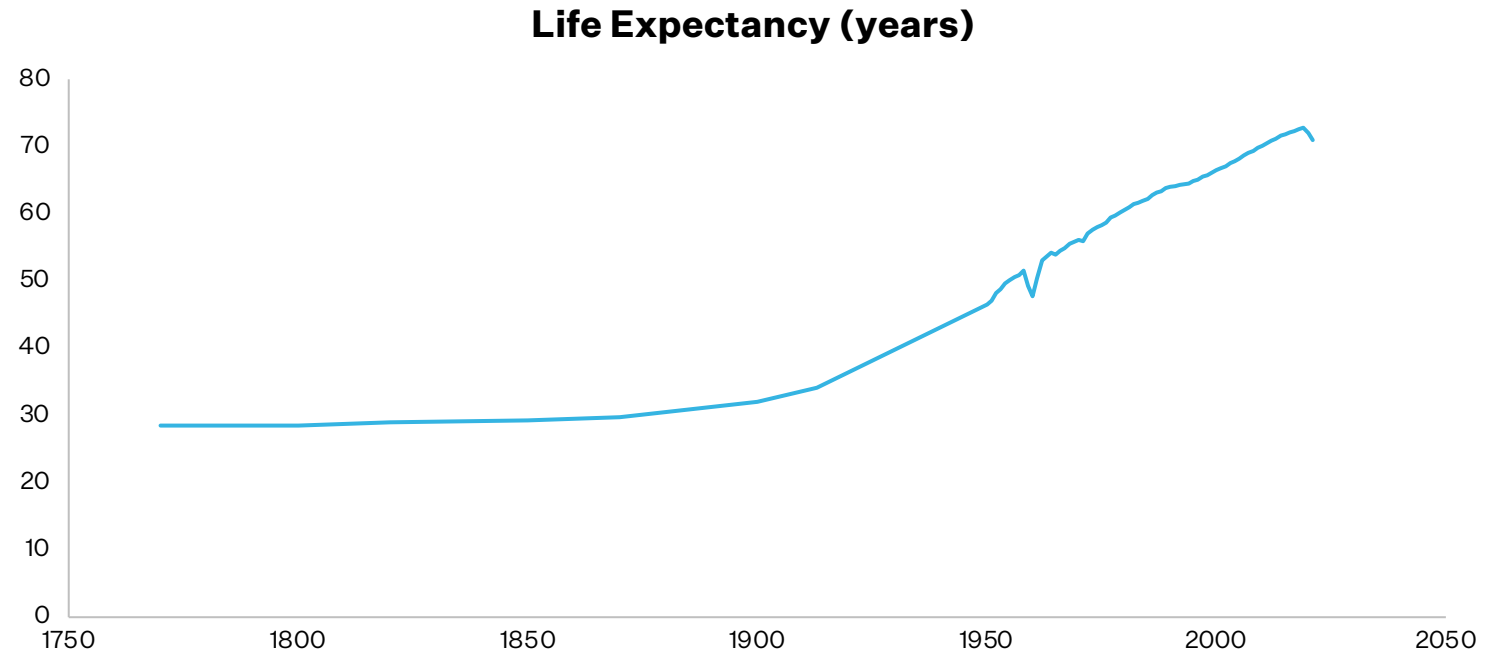
If AI is not the  
“last invention,”  
what else is on  
the horizon...

Health?

Health is related to efficiency and time in the sense that **time is the ultimate luxury** item; health can determine **how much time** we have and the **quality of that time**

How do we continue the below long-term trendline (excluding impact of COVID)?

Better yet, how do we steepen this trendline? The answer lies in tech + medicine



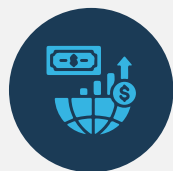
*(Decline in late 1950's was "Great Chinese Famine;" recent decline was COVID-19)*

*Source: United Nations*

# AI Isn't Just a 2023 Tech Enabler, It's Also a Longer-Term Paradigm Shift

“ AI isn't everything, it's the only thing ”

*Robot Vince Lombardi*



While this fictitious quote may overstate the importance of AI on tangible growth metrics in 2023, it is clearly a mega-theme for the year and could be the primary driver of efficiency, GDP growth, human productivity, and investment returns over the next several decades.

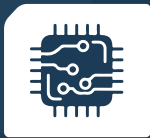


AI may be overhyped short-term and underhyped long-term, but we believe the time for AI to reach material impact may prove shorter than previous paradigm shifts (i.e., perhaps only several years vs. 5+ years)



*“Picture of Vince Lombardi as a robot” – DALL·E 2*

# AI Investment Framework




**Hardware Layer**

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Compute / Memory

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Networking




**Software Layer**

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Cloud

---

Data Mgmt.



**Interface Layer**

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Search Integration

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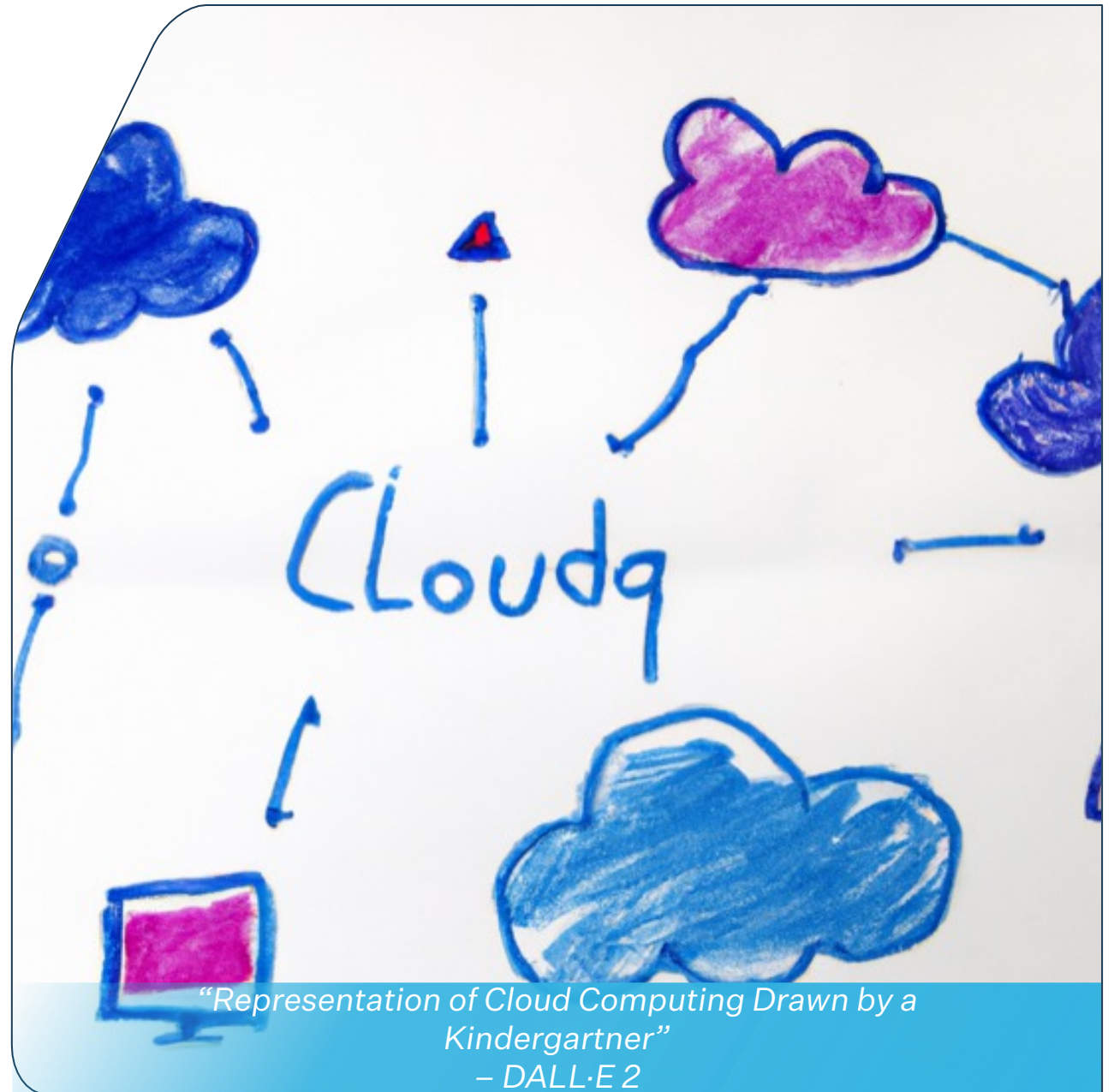
App Integration

# Enabler: Cloud / Compute



*The cloud services  
companies of all sizes.  
The cloud is for everyone.  
The cloud is a democracy.*

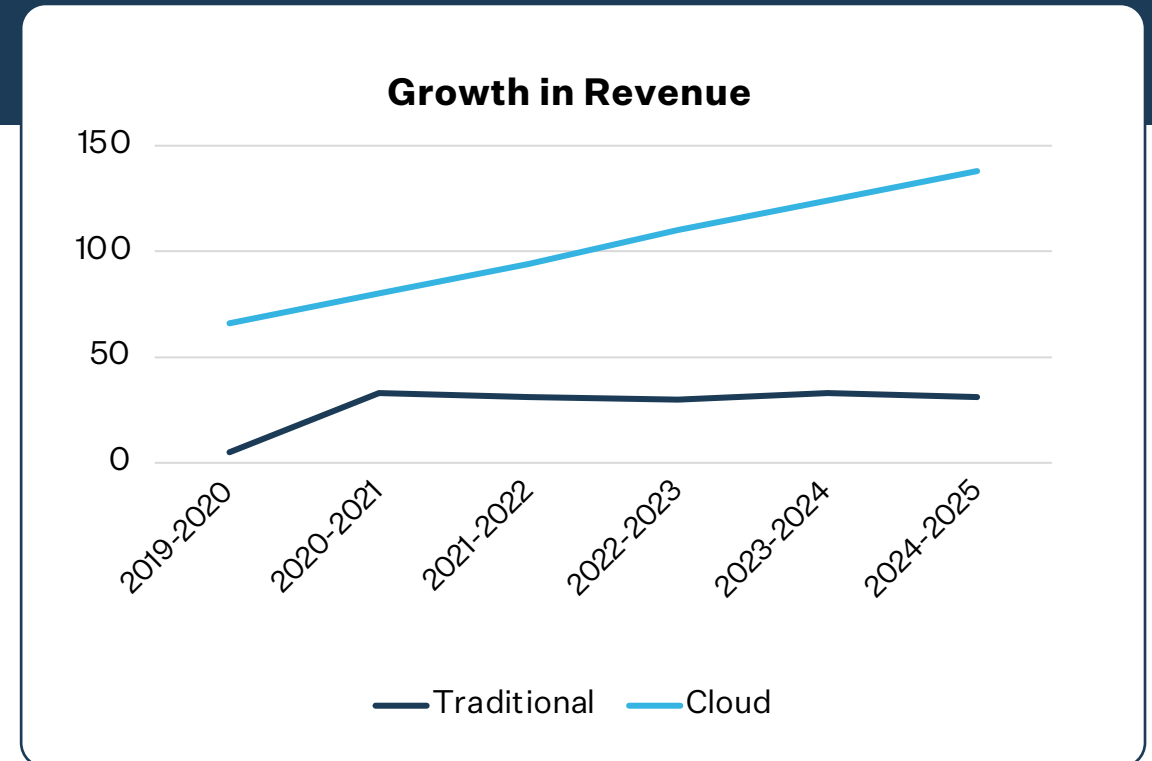
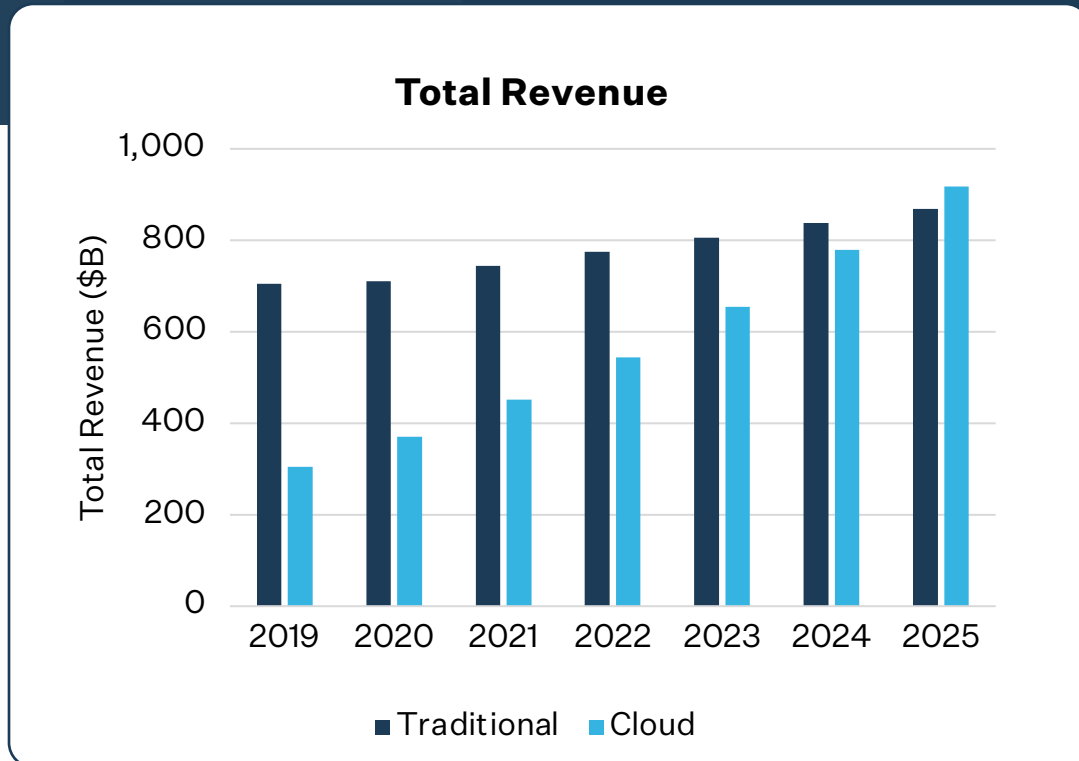
Marc Benioff, Salesforce



*“Representation of Cloud Computing Drawn by a  
Kindergartner”  
– DALL·E 2*

# Cloud: Growing From Cumulus to Cumulonimbus

Macro may have an impact on near-term cloud migration trends, but the multi-year trajectory of cloud adoption is likely to continue...



Source: Gartner

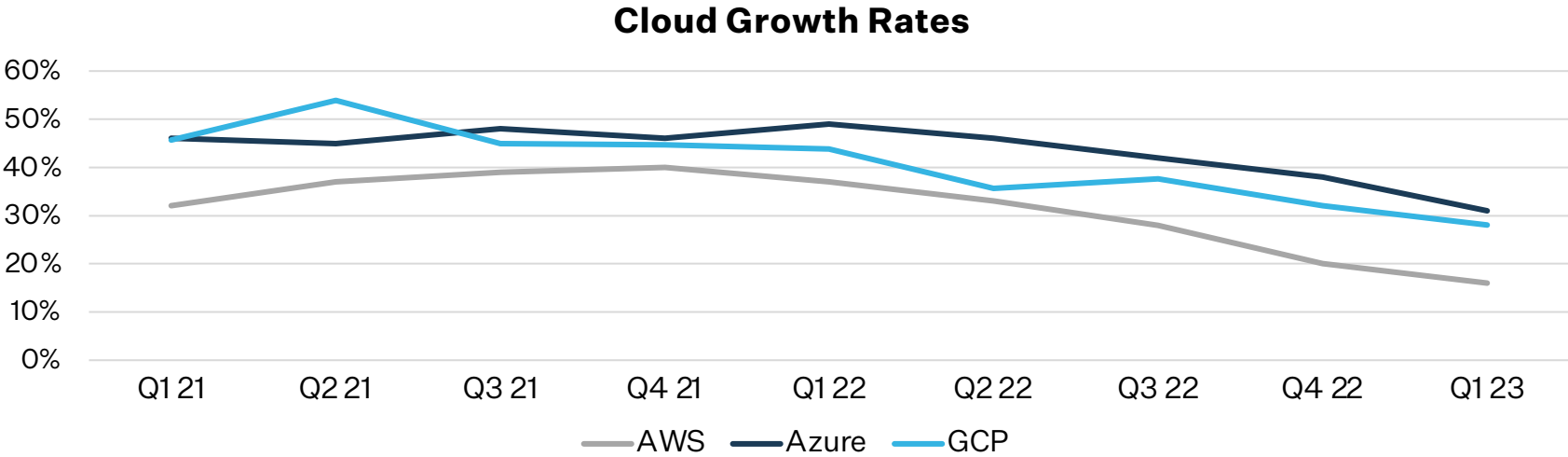


# Recent Cloud Trends

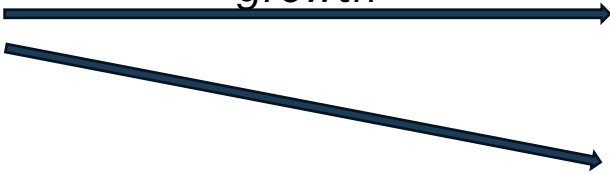
Short-term cloud growth is slowing.

Our view is that companies are currently optimizing cloud workloads leading to slower growth.

When companies begin moving workloads to the cloud again, growth will stabilize.



Which extrapolation is correct? *We would bet on a stabilization and multi-year ongoing persistent cloud growth*



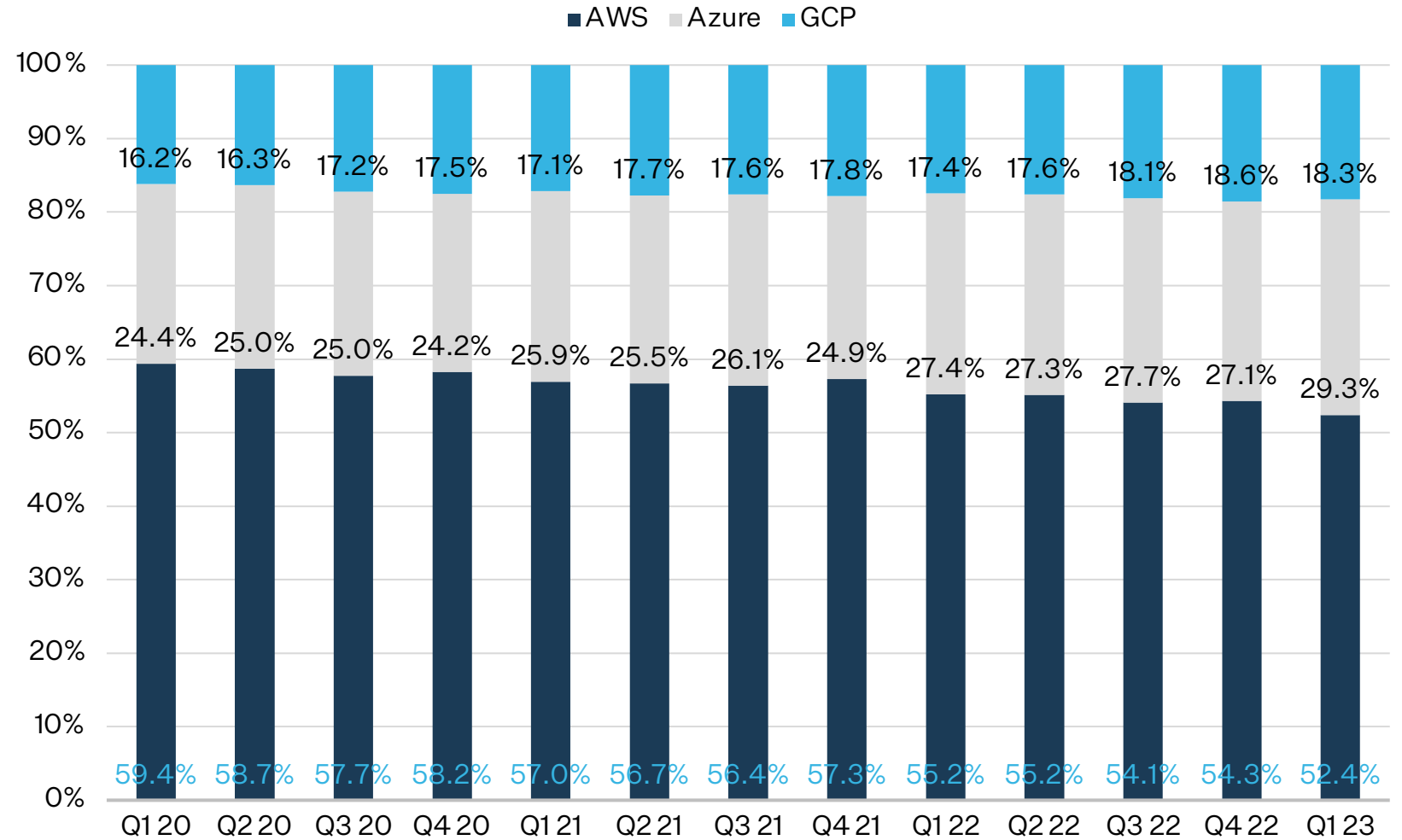
Source: Company Data and Deepwater Estimates

# Who's Winning in Cloud?

AWS remains the market share leader, but...

Azure picking up share over the past three years

## CLOUD MARKET SHARE



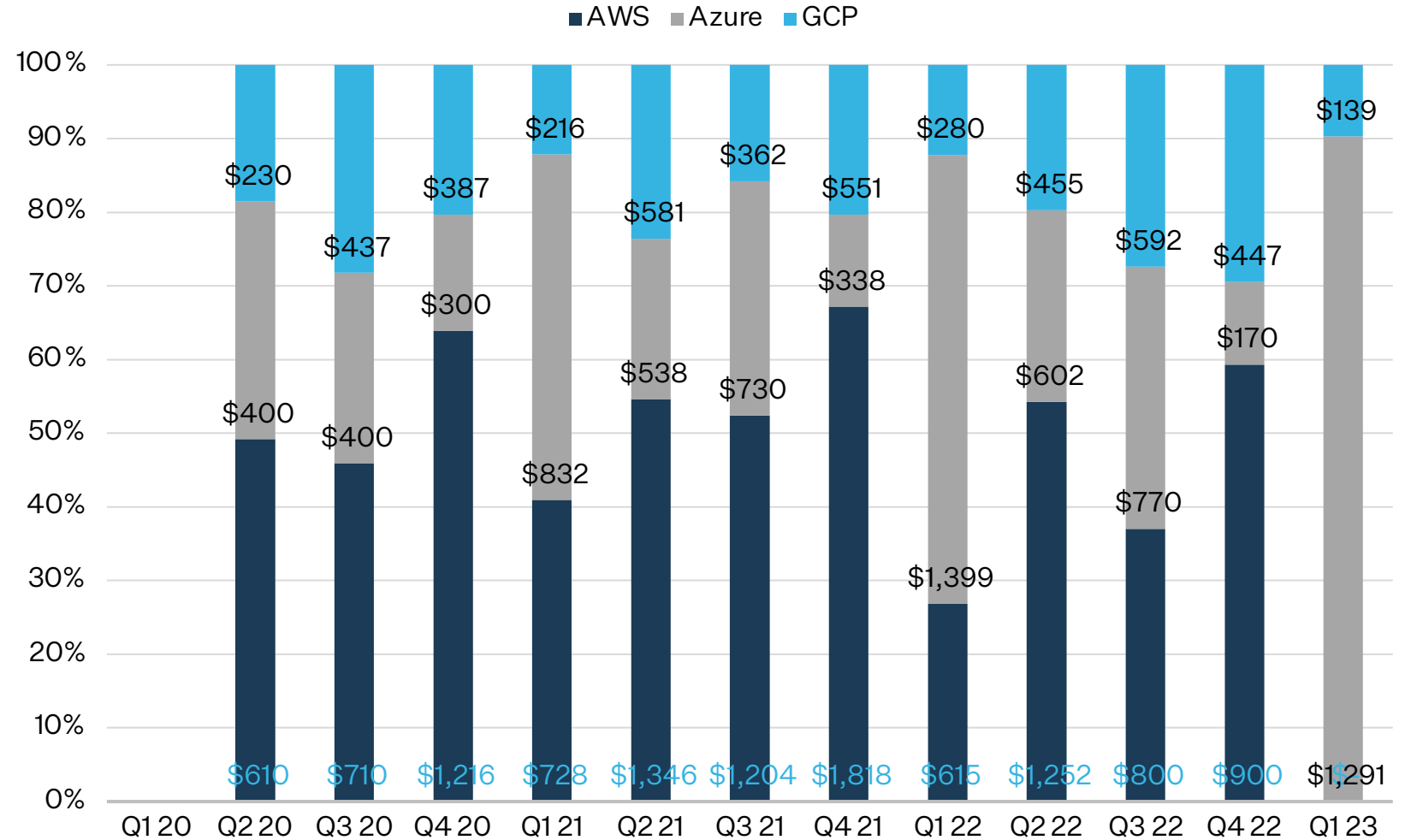
Source: Company Data and Deepwater Estimates

# Who's Winning in Cloud?

AWS was adding the most incremental revenue, until Q1 2023 when Azure saw a spike.

Is AI already paying off for Microsoft?

## INCREMENTAL REVENUE

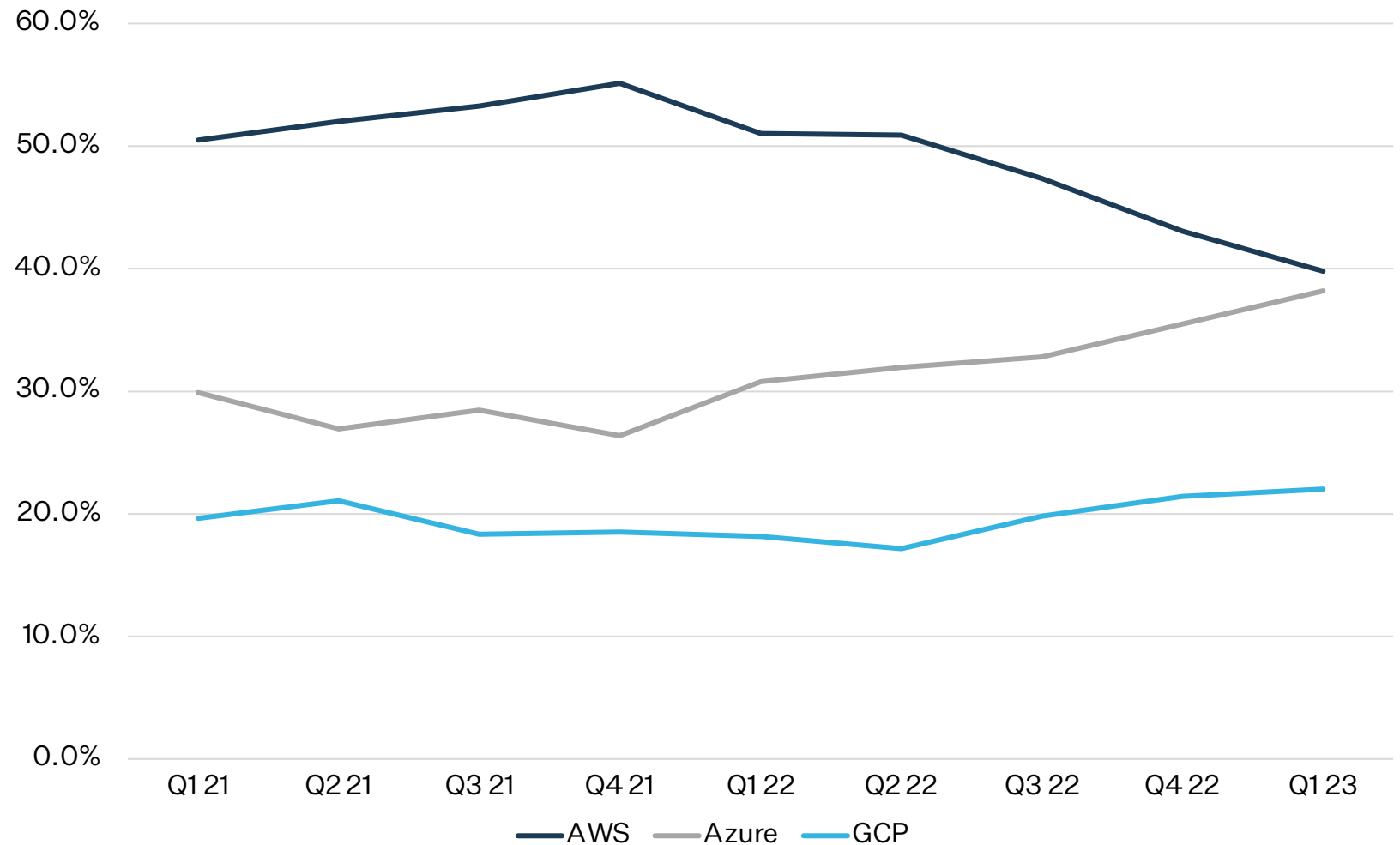


Source: Company Data and Deepwater Estimates

# Who's Winning in Cloud?

GCP's TTM revenue has been stable, but Azure's gain has been AWS' loss.

## Incremental TTM Revenue Share



Source: Company Data and Deepwater Estimates

# The Real Cloud Winner May be Compute Suppliers

Nvidia...

## Nvidia

- Reported revenue 10% ahead of consensus estimates for Apr-23 quarter
- Guided revenue 53% ahead of consensus estimates for Jul-23 quarter

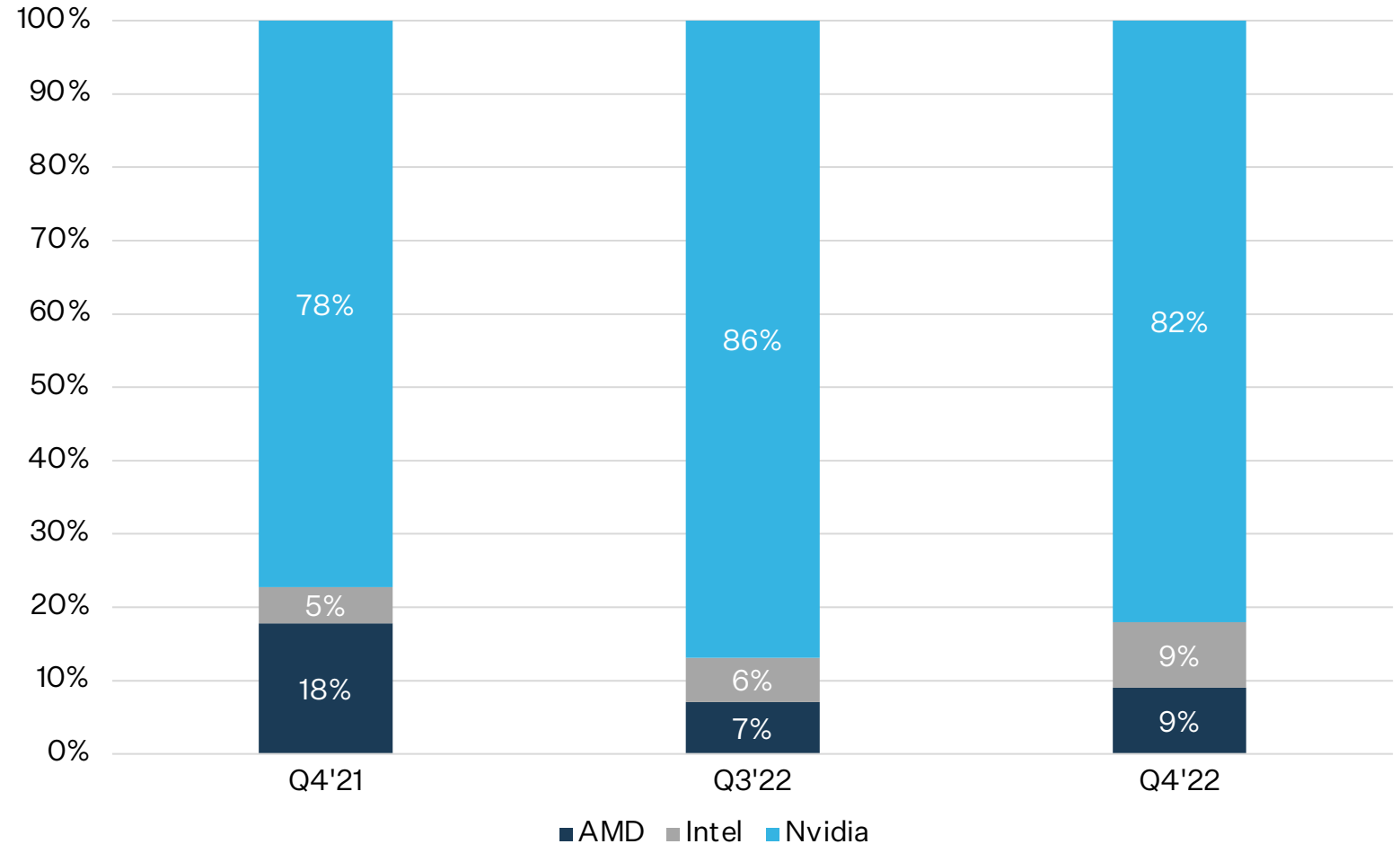
NVDA Daily Share Price



# NVDA: An insurmountable lead?

Nvidia has >80% GPU market share

### Total PC GPUs (% mkt share)



Source: Jon Peddie Research



# Winning in Compute is Also About Efficiency

Only chance to disrupt Nvidia is alternative solutions that improve training cost

MI how much does it cost to train a large language model



The cost of training a large language model can vary significantly depending on various factors such as the model architecture, dataset size, computational resources used, and the duration of the training process. Training a state-of-the-art language model like GPT-3 or GPT-4 can be a resource-intensive and expensive endeavor.

To provide you with a rough estimate, **training GPT-3 is reported to have cost millions of dollars**. GPT-3 was trained on a massive dataset using a vast amount of computational power, including thousands of powerful GPUs and TPUs (Tensor Processing Units).

It's worth noting that the training costs are not only associated with computational resources but also with the expenses of curating and preprocessing the training data, maintaining a high-bandwidth infrastructure, and employing a team of researchers and engineers.

While the exact cost of training large language models like GPT-3 or GPT-4 is not publicly disclosed, it's safe to assume that it requires a significant investment of financial and computational resources.

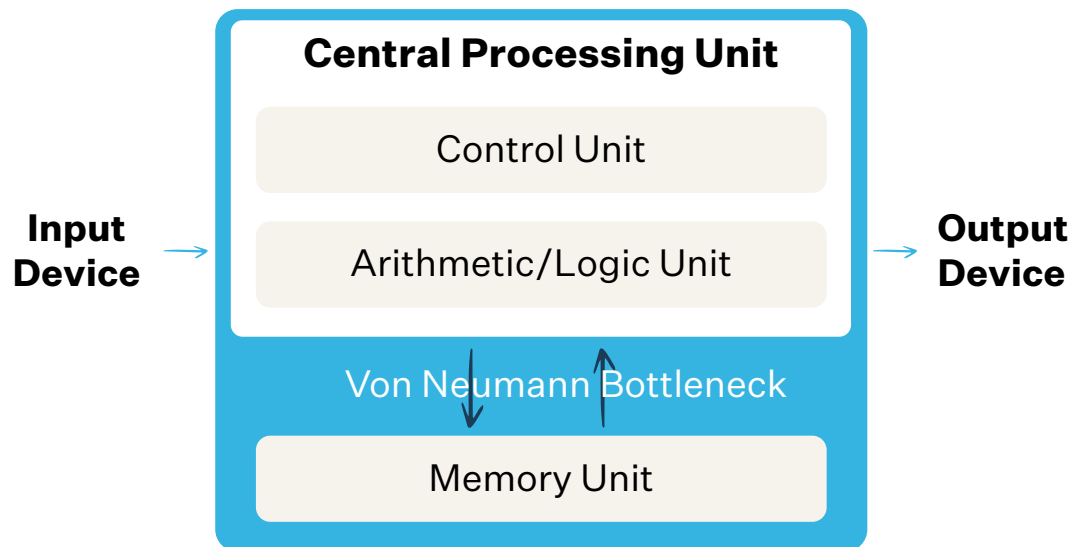
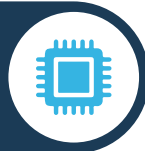
OpenAI has projected that the cost of training large AI models will increase from \$100 million to \$500 million by 2030, with the cost of training a single model ranging from \$3 million to \$12 million. The cost of training a model on a large dataset can be even higher, reaching up to \$30 million.

# Novel Compute Architectures Provide Hope for Improved Efficiency

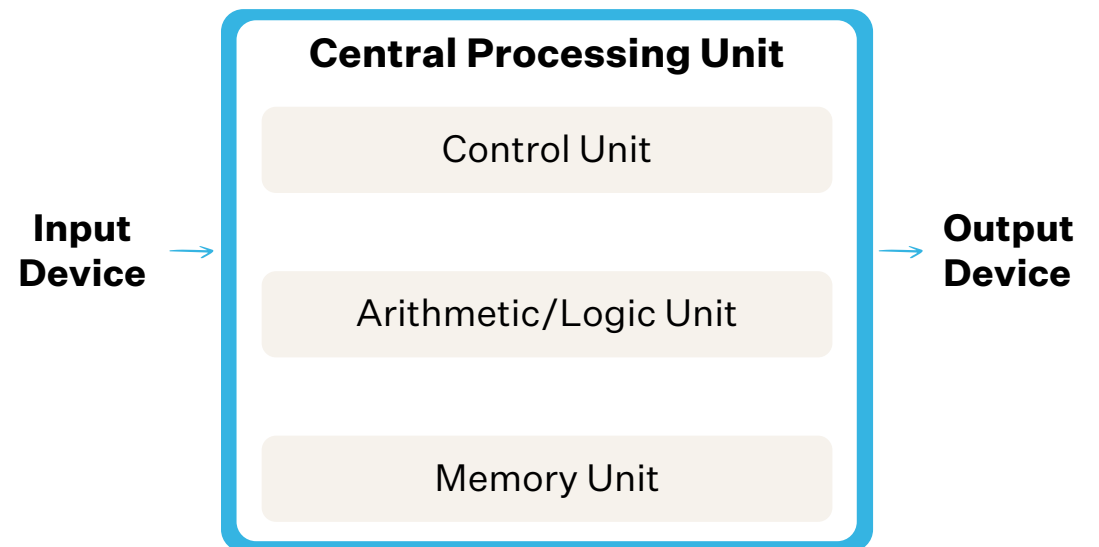
Compute-in-memory could eliminate Von Neumann bottleneck\* and drive efficiency

*\*Memory and the CPU are separated in the Von Neumann architecture, so the CPU must fetch data for every operation it performs*

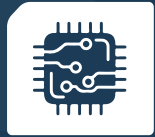
Modern semiconductors separate CPU and memory, creating a bottleneck



Combining processing and memory can drive a 10,000x efficiency improvement



# Cloud/Compute Investment Framework



## Hardware Layer

Processor / Memory

Networking



## Software Layer

SaaS

Security



## Interface Layer

Apps

Web Services

# Enabler: Electrification and Automation

*Self-driving cars are the natural extension of active safety and obviously something we think we should do.*

Elon Musk

*If you recognize that self-driving cars are going to prevent car accidents, AI will be responsible for reducing one of the leading causes of death in the world.*

Mark Zuckerberg

MI is tesla fsd safe?



The safety of Tesla's Full Self-Driving (FSD) system is a matter of debate and ongoing research. While Tesla claims that FSD is safe and has been extensively tested, some experts and critics have raised concerns about the system's capabilities and safety.

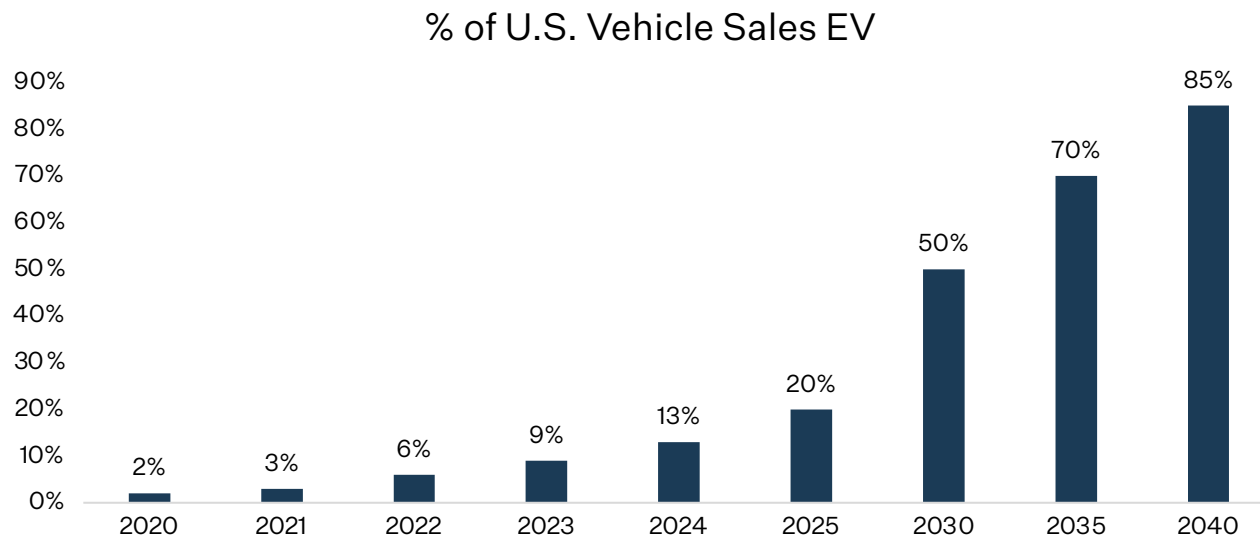
In October 2021, the National Highway Traffic Safety Administration (NHTSA) announced that it had opened a formal investigation into Tesla's FSD system following a series of crashes that involved the system. The investigation is ongoing, and its results will shed more light on the safety of Tesla's FSD system.

It's worth noting that **while FSD is designed to be a highly advanced autonomous driving system, it's not yet fully autonomous and requires human supervision and intervention.** Tesla also requires drivers to acknowledge that they are responsible for their vehicle and must be prepared to take control at any time while using FSD.

# Electrification: Range, Network, and Materials

EV demand is largely dependent on reduced range anxiety and larger charging network

EV supply is largely dependent on battery materials



Source: IHS Global Insight, Goldman Sachs Research

Case Study:  
EVs  
accounted  
for **80%** of  
vehicle  
sales in  
Norway in  
2022

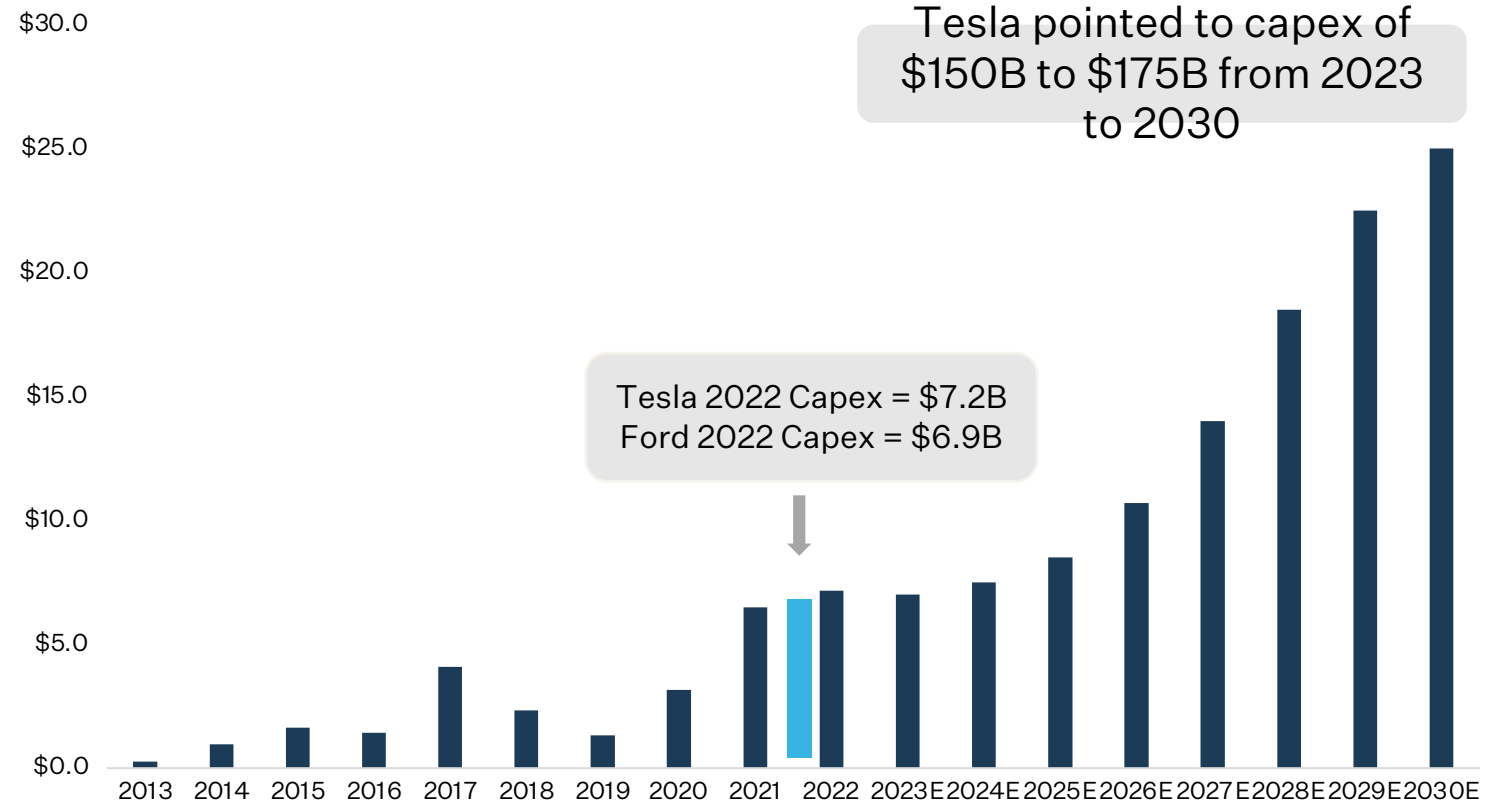


# 50% of U.S. Vehicle Sales to be EVs in 2030?

## How do we get there?...

We estimate Tesla will spend nearly as much on EV related capex in 2030 as in the entire decade from 2013 to 2022

### Tesla EV Capex (\$B)

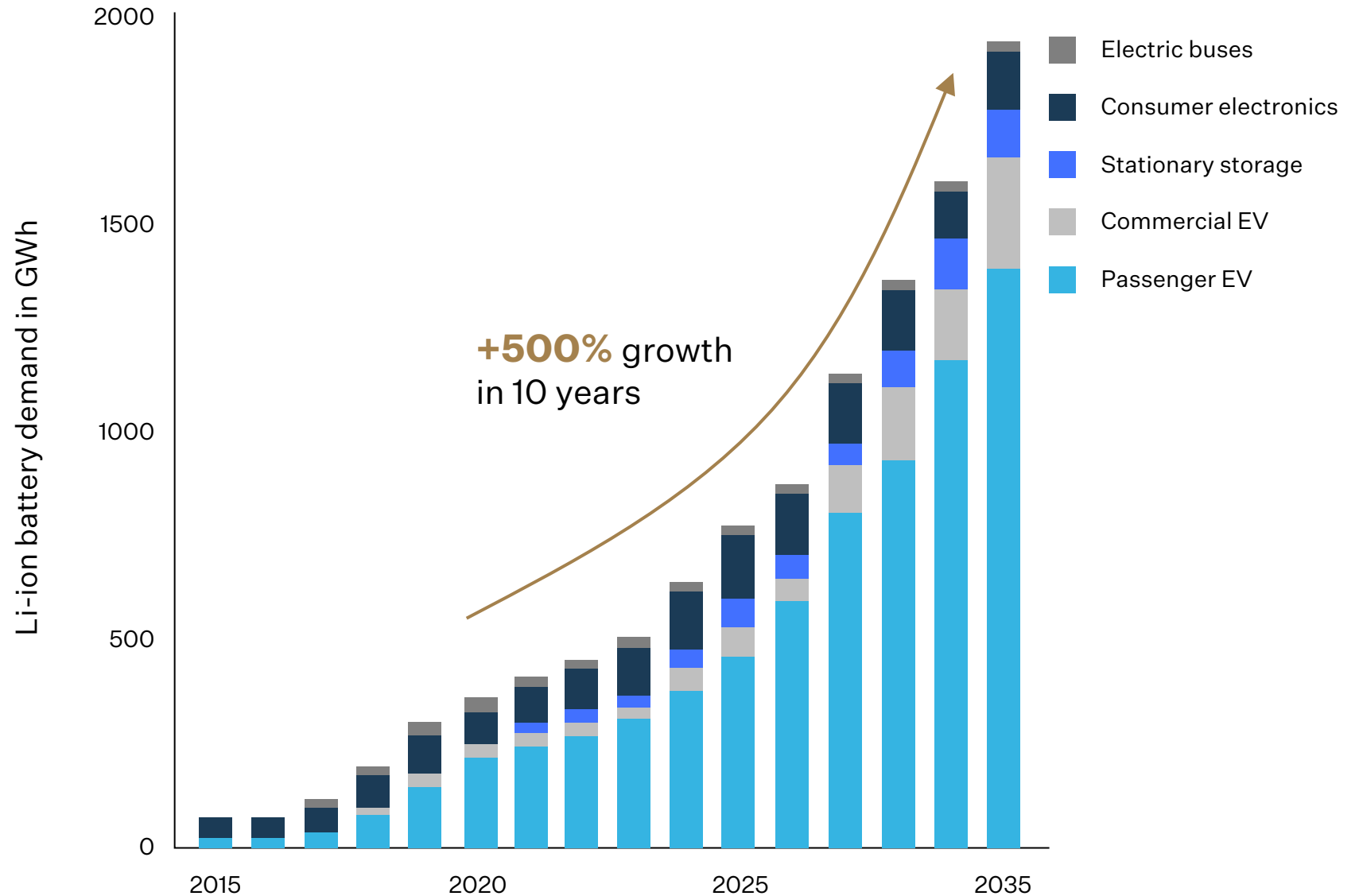


Source: Tesla and Deepwater Estimates

Assume, on average, nearly all of Tesla Capex from 2013 to 2025 is EV related  
Assume 70% of Tesla Capex from 2026 – 2030 Guidance is EV related

# Increased capex from EV OEMs is great, but what about batteries?

Projected supply and demand of nickel, lithium, and cobalt is out of balance. Advancements in battery recycling and related innovation will be critical....



Source: Redwood Materials



# Where am I going to charge this thing?

Key component of reducing range anxiety is build out of a more robust charging network...



Today, the Biden-Harris Administration announced its latest actions to advance the President's vision of building 500,000 EV chargers by 2030.

*U.S. DoT – 2/15/23*



By 2030, we intend to build our own EV fast-charging network at thousands of Walmart and Sam's Club locations coast-to-coast. This would be in addition to the almost 1,300 EV fast-charging stations we already have available at more than 280 U.S. facilities.

*Wal-Mart – 04/06/23*

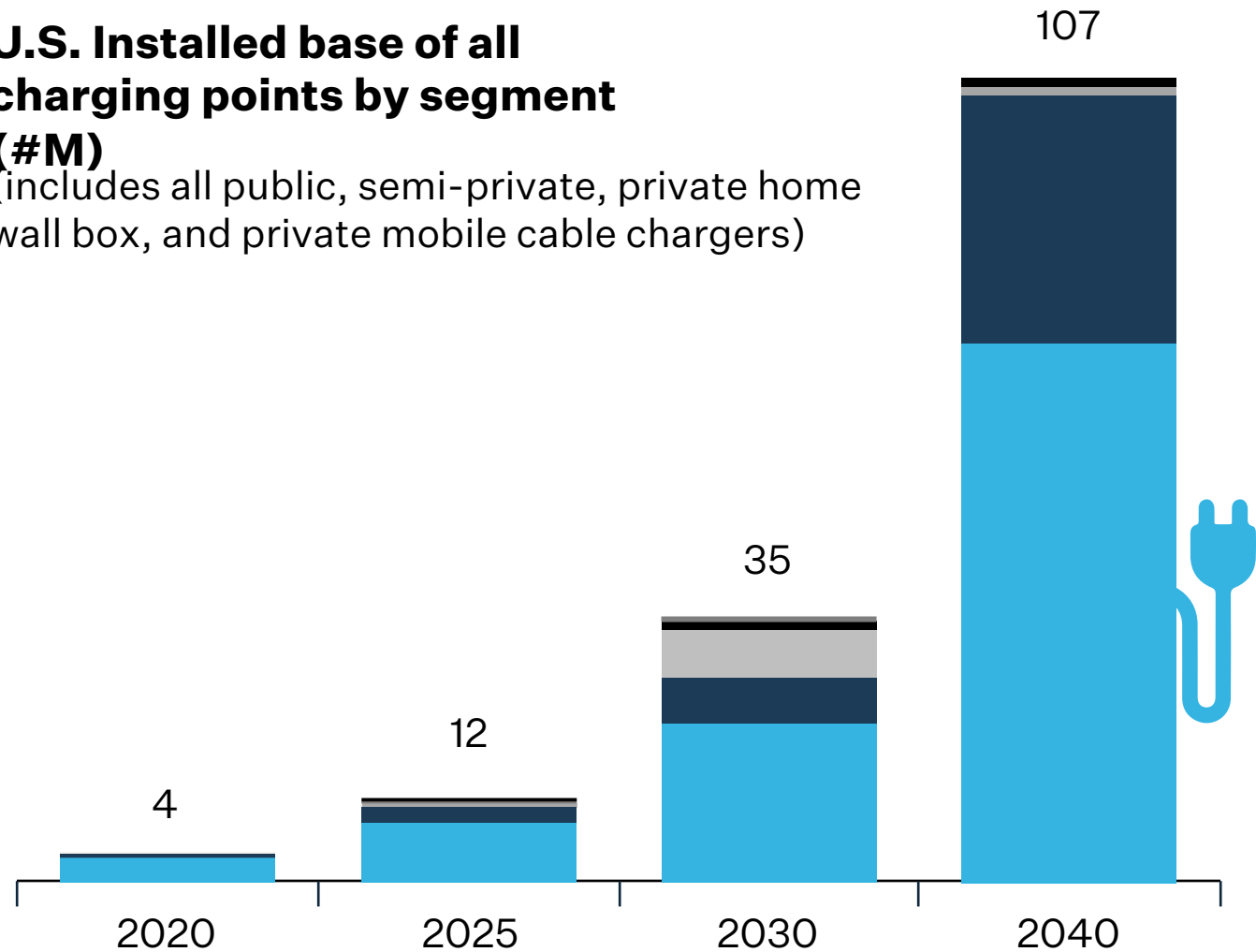


# Where am I going to charge this thing?

Key component of reducing range anxiety is build out of a more robust charging network...

## U.S. Installed base of all charging points by segment (#M)

(includes all public, semi-private, private home wall box, and private mobile cable chargers)



Source: PwC

# Automation

Could you please be more specific?...



when will autonomous vehicles be fully functional?



The development and widespread deployment of fully autonomous vehicles is a complex and ongoing process, and **it's difficult to predict an exact timeline for when they will be fully functional. However, many experts predict that it could be several years or even decades** before fully autonomous vehicles become commonplace on the roads.

There are several factors that could impact the timeline for the development of fully autonomous vehicles, including technological advancements, regulatory frameworks, and public acceptance. While significant progress has been made in recent years in developing autonomous vehicle technology, there are still several technical challenges that need to be overcome, such as navigating complex urban environments and responding to unpredictable situations on the road.



*“Driverless Car” – DALL·E 2*

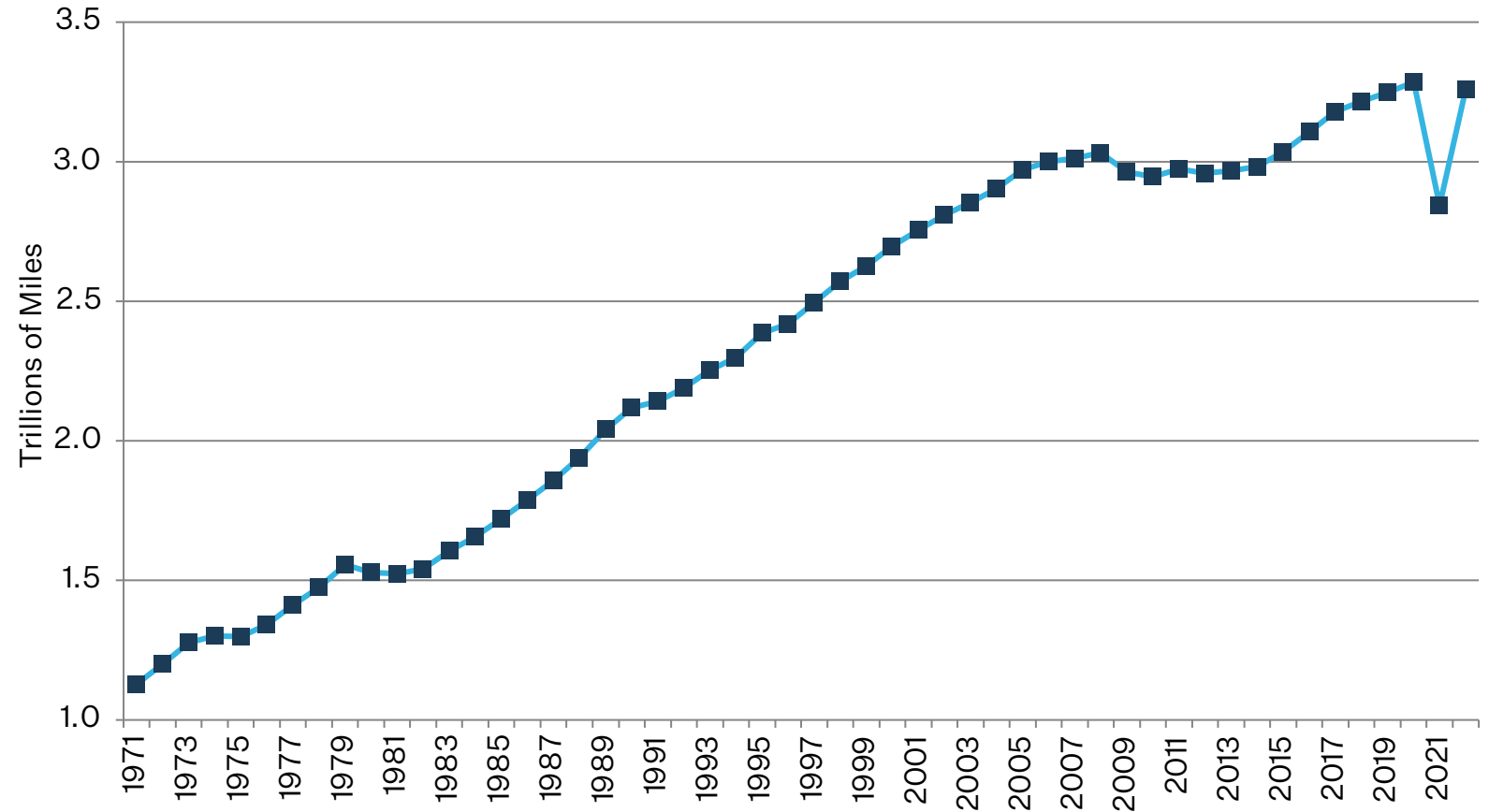
# Automation

Driving is an inefficient use of waking hours

U.S. vehicle miles traveled in 2022 totaled 3.26 trillion

Americans spend an average of 55 minutes per day behind the wheel

Annual Vehicle Miles Traveled in the U.S.



Source: Federal Highway Administration

# Time to FSD? Will the kids need a driver's license? Maybe...

As of April 2023, Tesla's Full Self-Driving (FSD) Beta program has reached over 150 million miles driven (and counting) since the initiative was launched in October 2020.

## Autonomous Driving and Efficiency:



Reallocate portions of current >300 hours/year drivers are behind the wheel



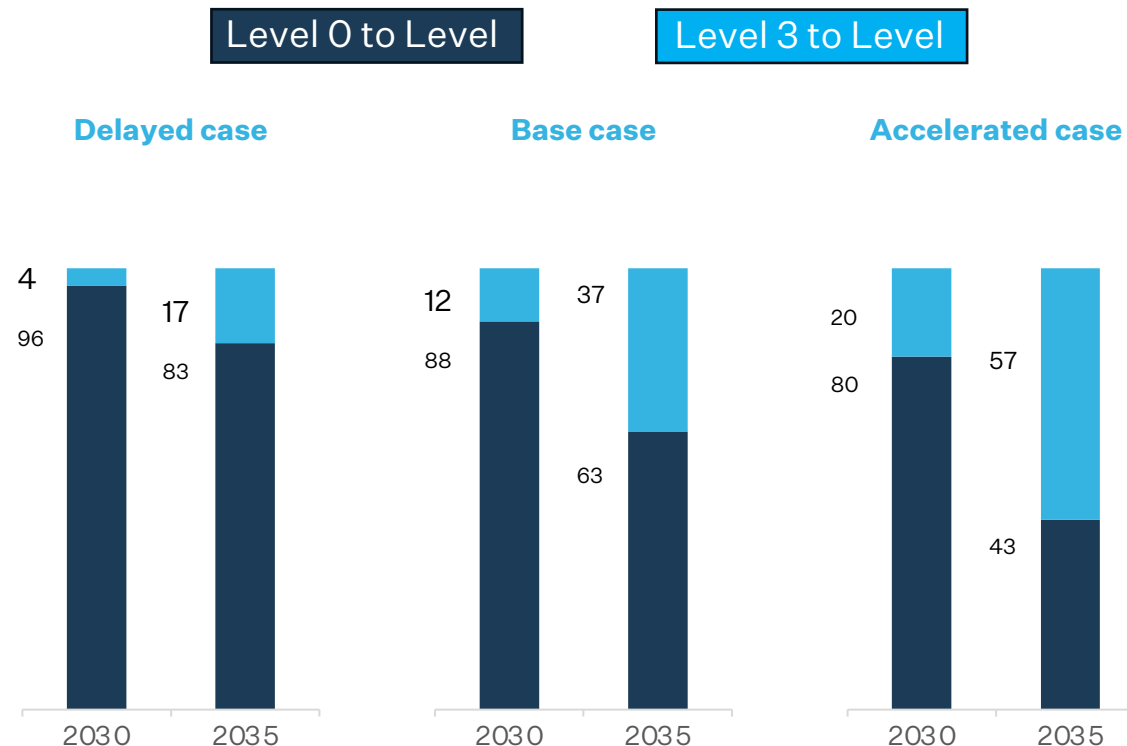
Autonomous driving increases daily time available to spend on more meaningful activities



Fringe benefit is less untimely death (the machines will be better drivers than we are) -- According to the U.S. General Services Administration (GSA), human error causes 98% of crashes

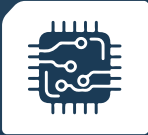
## Three scenarios for autonomous passenger car sales in 2030 and 2035 show varying levels of consumer adoption

### Estimated passenger vehicles sold with autonomous-driving technologies installed (%)



Source: McKinsey Center for Future Mobility

# Electrification & Automation Investment Framework



**Hardware Layer**

---

Compute

---

Battery




**Software Layer**

---

ADAS / FSD

---

Infotainment



**Interface Layer**

---

EVs

---

Charging Network

# Enabler: *On-Demand*

## Goods



## Content

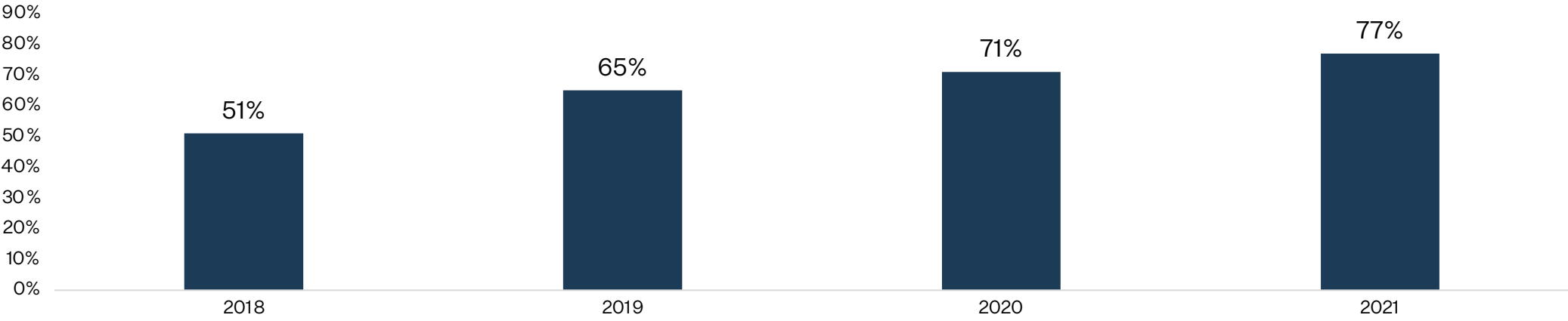




# On-Demand Goods Three Day, Same Day, Same Hour...

Amazon fulfillment platform has been the largest contributor to consumers' ability to get products on-demand (or near on-demand)

**% of US population within 60 mins of Amazon**

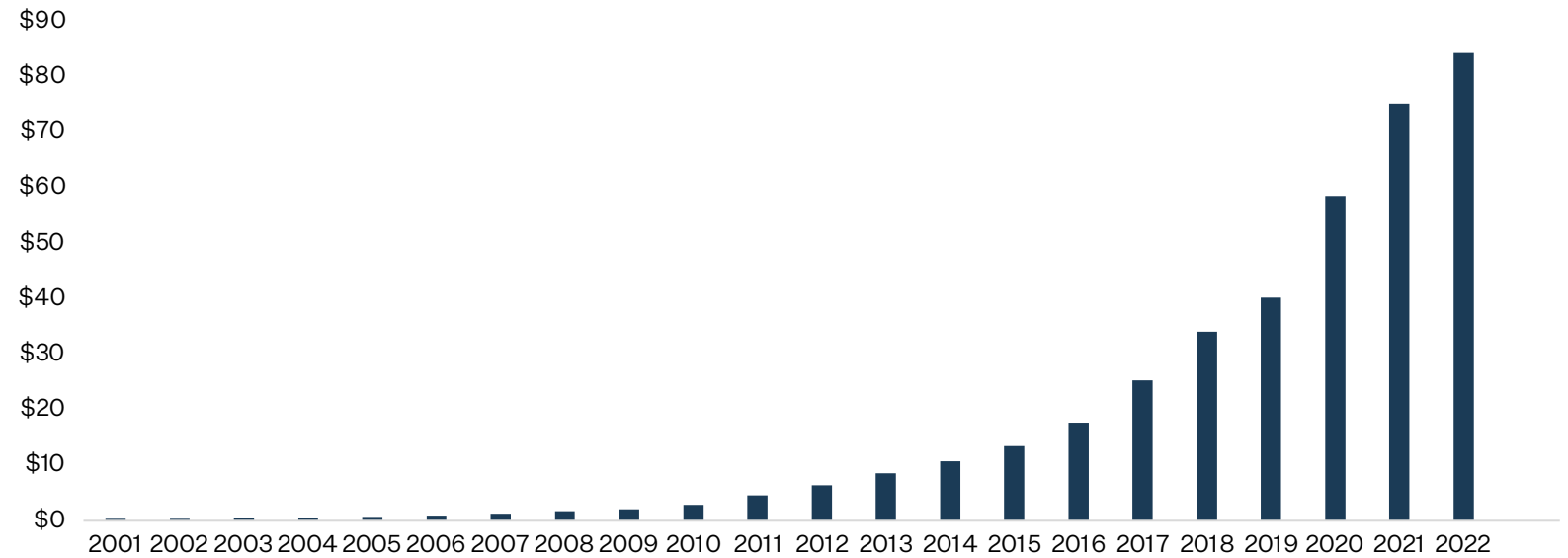


Source: UBS

# On-Demand Ain't Cheap...

Significant increases  
in 2020 and 2021  
driven by pandemic

Amazon Fulfillment Expense (\$B)



Source: Amazon

Selection of Countries with Lower Annual GDP than Amazon's Fulfillment Expense...

**Panama**

**Serbia**

**Venezuela**

**Lithuania**

**Costa Rica**

**Uganda**

**Croatia**

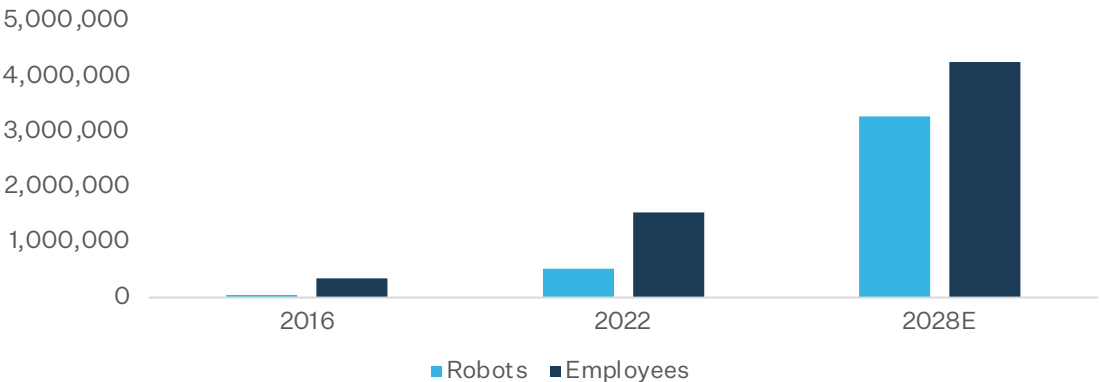
**Uruguay**

**Jordan**

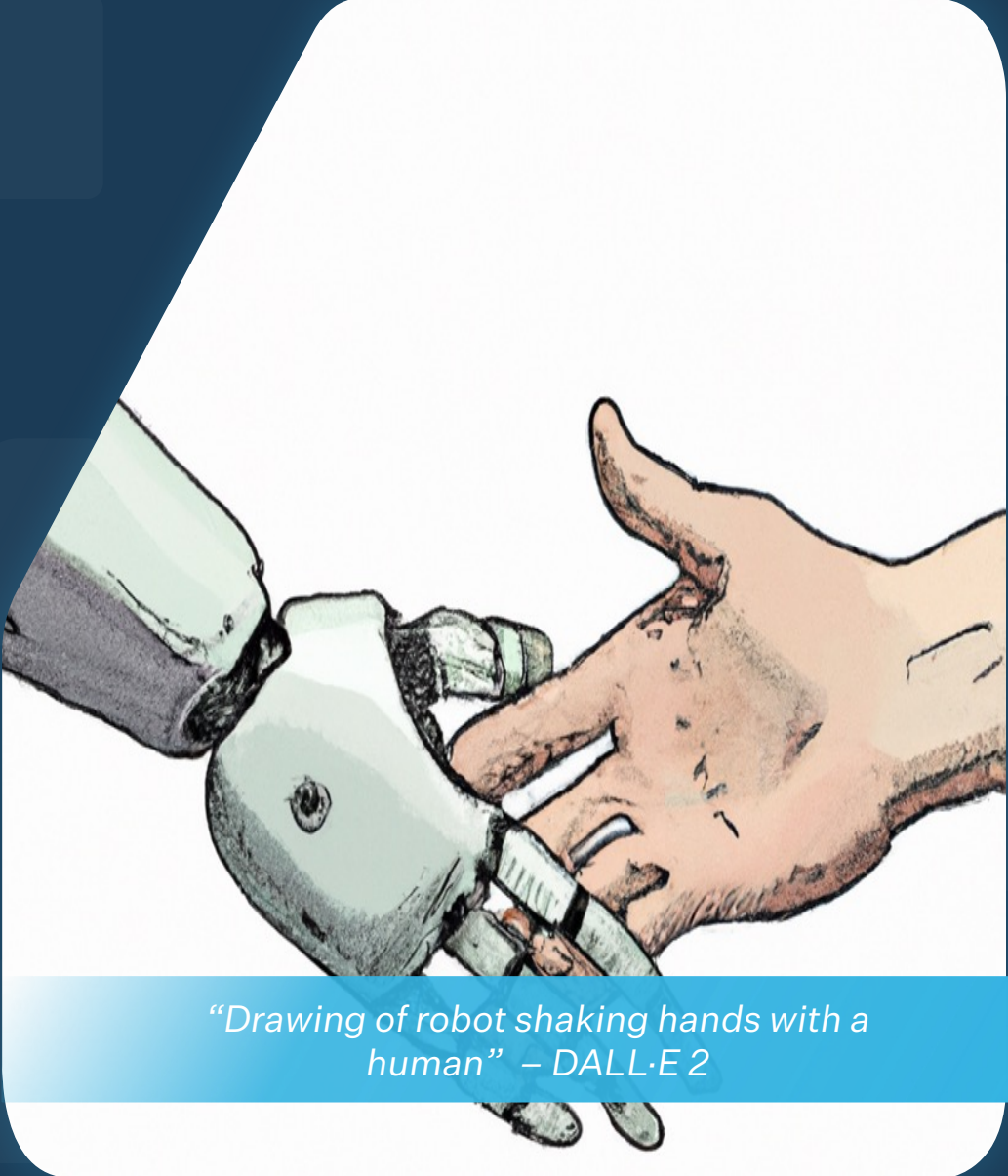
# Automation is Critical to Sustaining Pace of Growth in On-Demand Goods...

If respective growth rates of Amazon robots and employees is half as fast over next 6 years, compared to previous 6 years, Amazon would approach an equivalent number of robots and employees in late 2020's / early 2030's

## Automation - Amazon Robot vs. Employee Growth



Source: Amazon and Deepwater Estimates

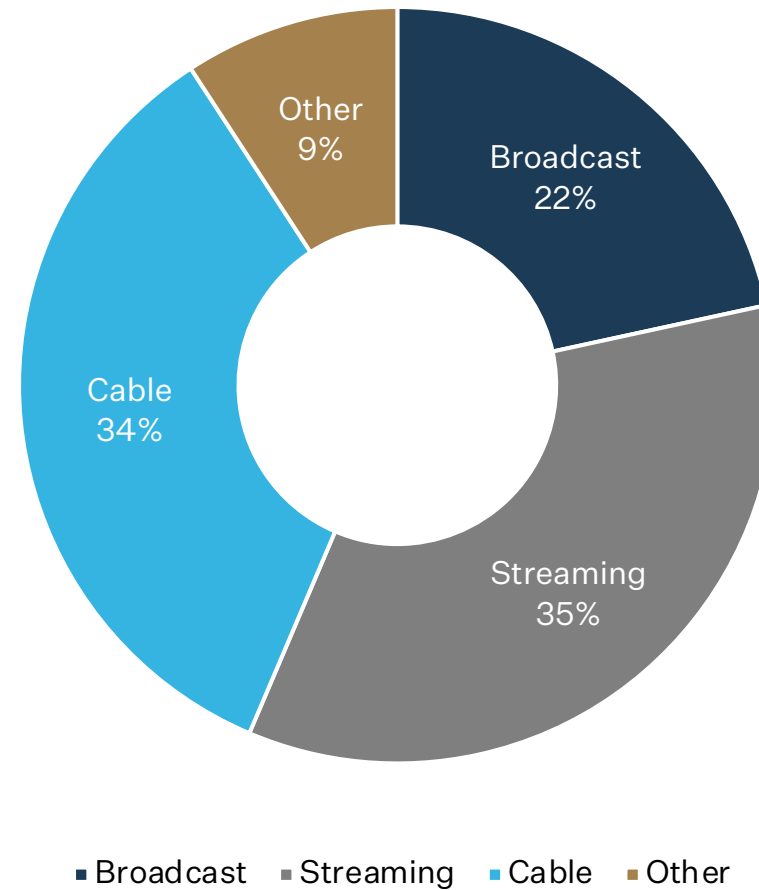


# On-Demand Content

In the U.S., streaming overtook cable in July of last year

Broadcast is still sizeable, largely due to live sports and news

## U.S. viewing Mix -- July 2022



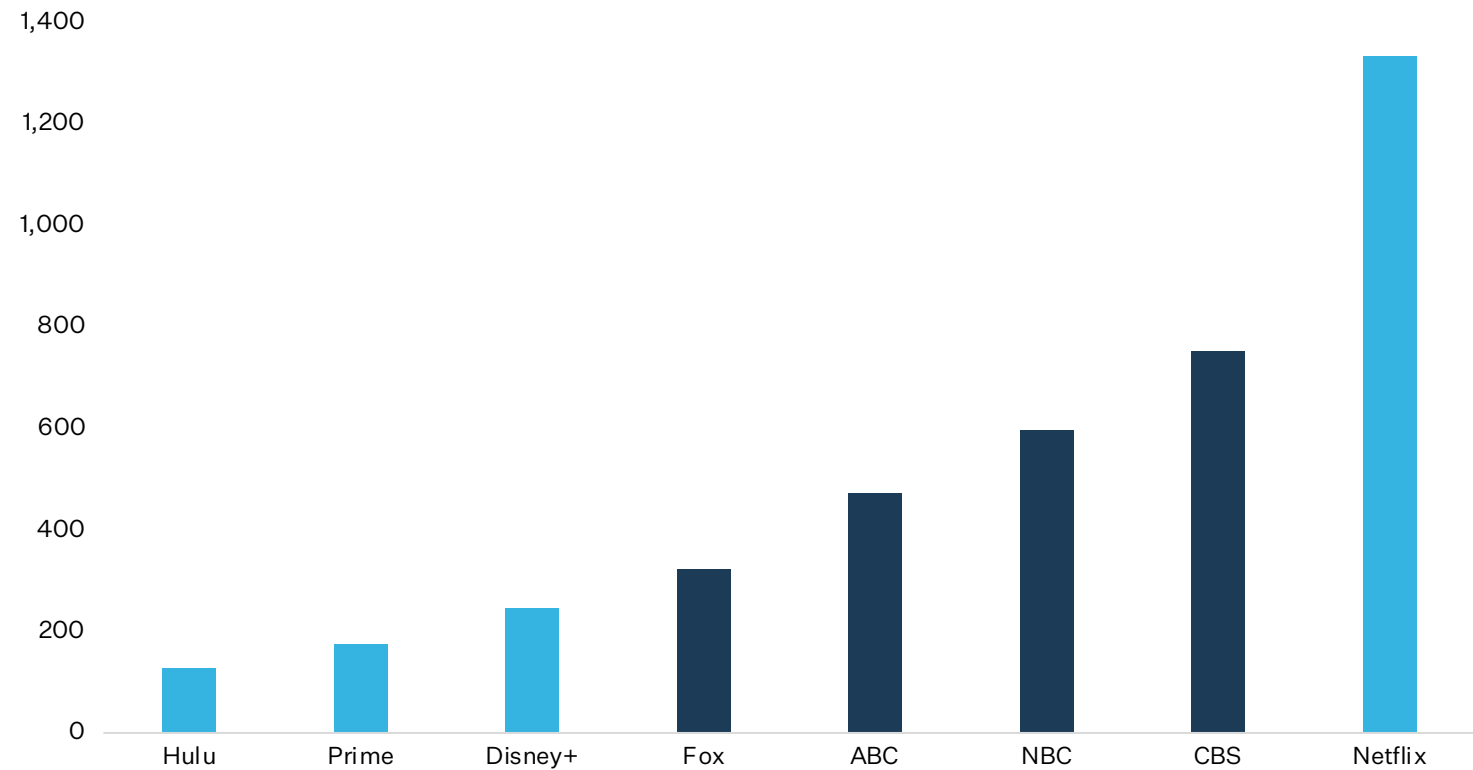
Source: Nielsen

# On-Demand Content

Netflix leads the pack in “traditional content” ...

...but YouTube is >10x Netflix minutes viewed

**Billion Minutes Viewed (Sep-21 to May-22) -- U.S.**



Source: Nielsen

# Speaking of YouTube... What's Next in On-Demand Content?



## Internet + AI = Creator Economy Boom

The creator economy will pull attention away from traditional media as creator economy content is often more relevant and more meaningful to the viewer



**Internet** democratized the **distribution** of content.



**AI** will democratize the **production** of content.

# What's Next in On-Demand Content?

The creator economy may prove to be bigger than anticipated as creativity becomes an option for work and productivity.

TikTok...



Influencer continues to be a job of interest amongst teens and 20-somethings. The ability to build micro audiences to provide a modest living, and major audiences that provide celebrity livings, is more open now than ever.



Influencer w/  
**~500K TikTok  
followers**



Several  
**Thousand  
Dollars Per Post**



**\$100,000 -  
\$300,000**  
Annual Income

Source: Forbes



# What's Next in On-Demand Content?

The creator economy may be bigger than anyone realizes as creativity becomes an option for work and productivity.

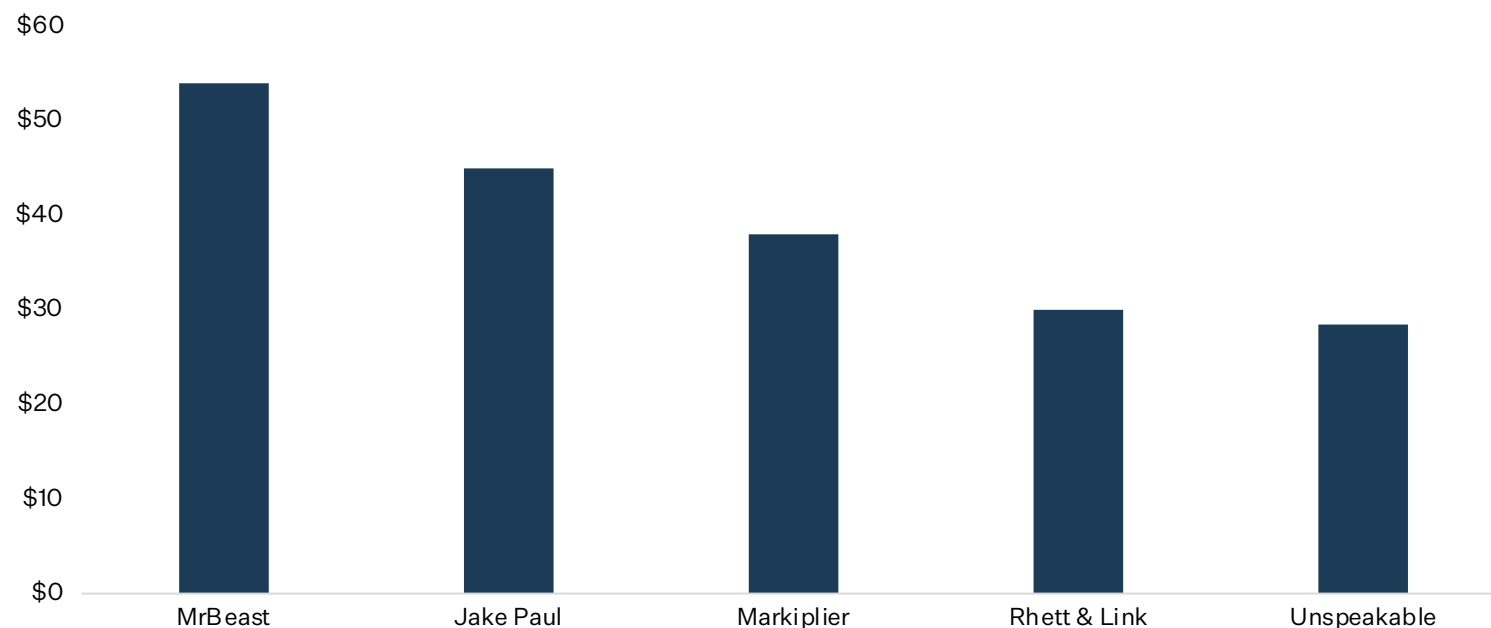
YouTube...



**Average Full-Time YouTuber Income = \$60K**

Note: median U.S. individual income is ~\$55K

2021 Top 5 YouTuber Income (\$M)



Source: Forbes

# What's Next in On-Demand Content?

Beyond TikTok, YouTube, and Instagram?... Twitch & Gaming



**Twitch** minutes viewed in 2022 were >1.3 trillion, **below Netflix, but more than major TV networks**



Certain gamers/creators have annual Twitch views in the 9 figures; xQc has been on top for several years. His Twitch had ~200M hours viewed in the past year



In other words, people are watching >500K hours of this guy playing video games each day...



Source: Twitch/xQc

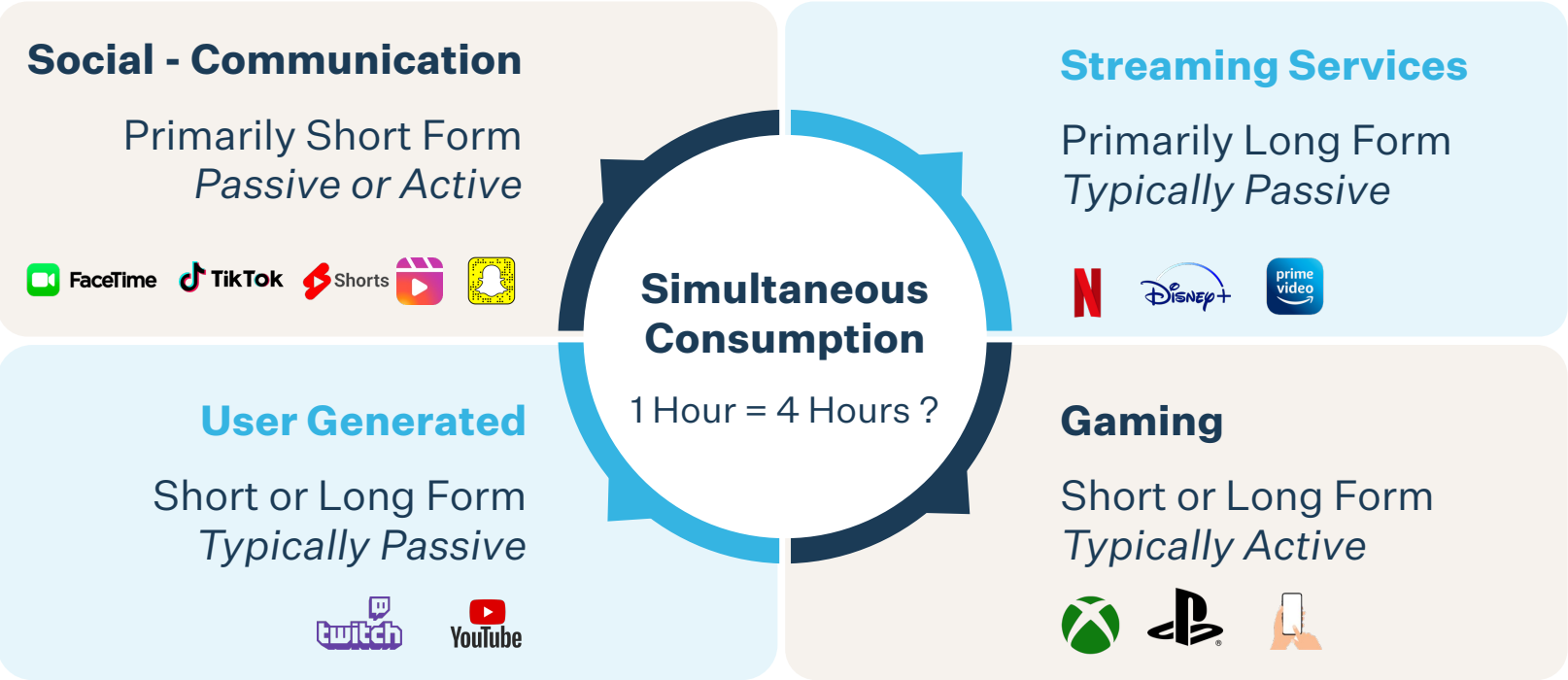
# How can we possibly consume more content?

Information compression and simultaneous on-demand consumption means there are more than 24 hours in a day...



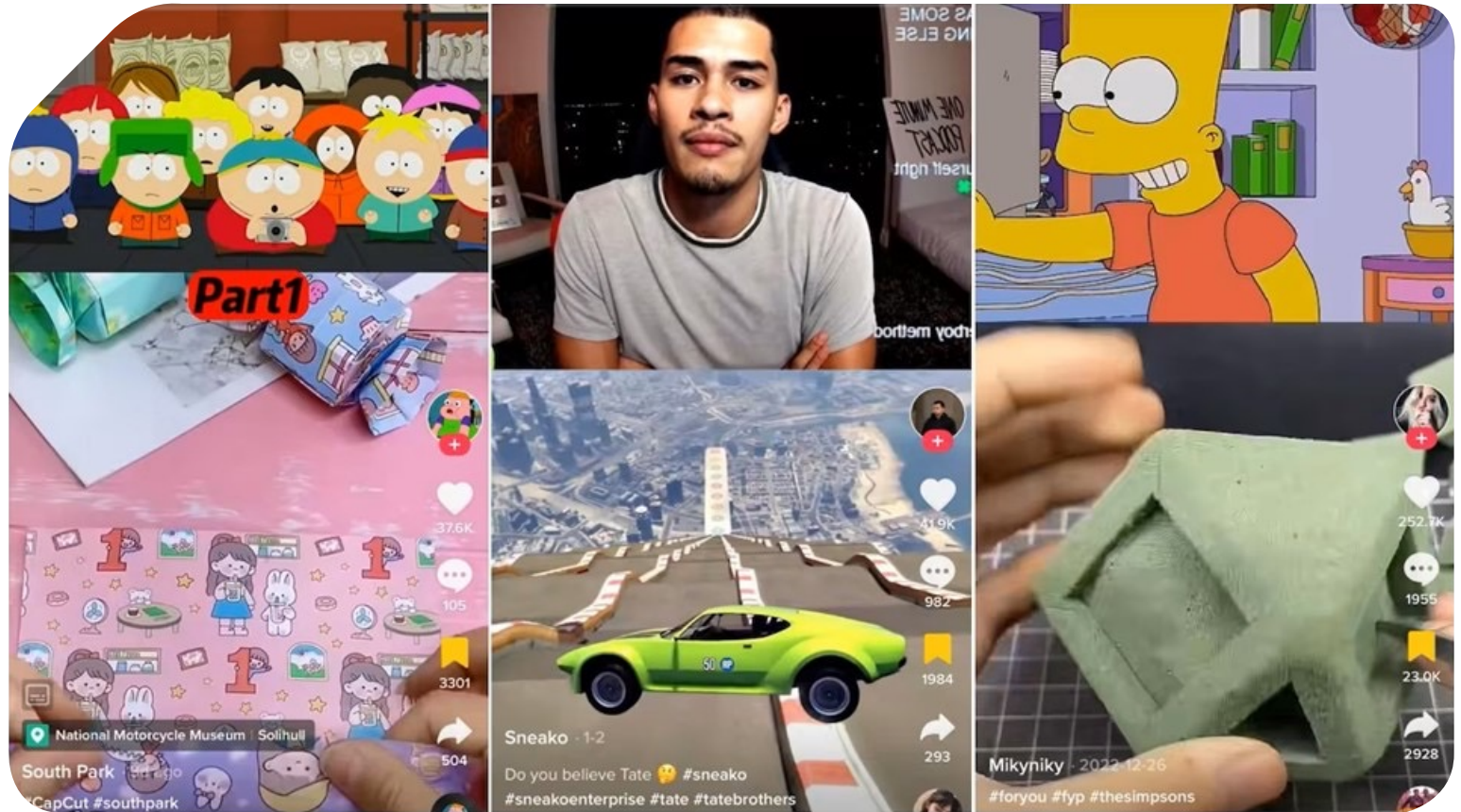
## Singular / Dedicated Consumption

1 Hour = 1 Hour



# How can we possibly consume more content?

TikTok "sludge content"



TikTok has a relatively new phenomenon called "sludge content"

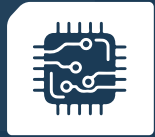


Sludge content incorporates multiple unrelated videos cropped together



It is an attempt to drive views and have viewers watch longer to drive engagement metrics

# On-Demand Investment Framework



## Hardware Layer

Robotics / Drones

Fulfillment /  
Distribution



## Software Layer

Content Tools

Logistics



## Interface Layer

Content Platforms

Marketplaces



# Enabler: Hyper- Personalization

In one sense hyper-personalization is about marketing, but it is also the concept that everyone's internet is their own

MI

what is hyper personalization?



Hyper personalization is a marketing strategy that leverages advanced data analysis techniques, such as machine learning and artificial intelligence, to create highly personalized and relevant experiences for individual consumers. It goes beyond traditional personalization techniques by collecting and analyzing large amounts of data on a consumer's behavior, preferences, and interests across multiple channels and touchpoints.

Hyper personalization allows companies to deliver tailored messages, products, and services to individual customers based on their unique characteristics and behaviors. This can result in increased customer loyalty, higher conversion rates, and improved customer satisfaction.

# Hyper-Personalization

Personalization in Marketing Can be Materially Impactful:



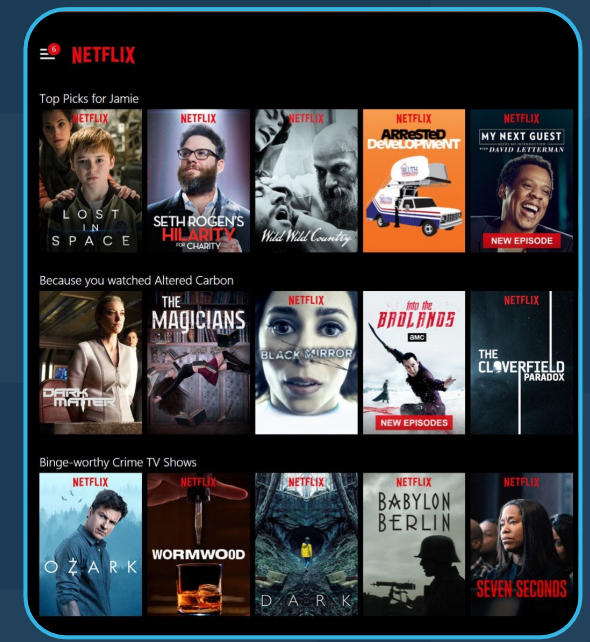
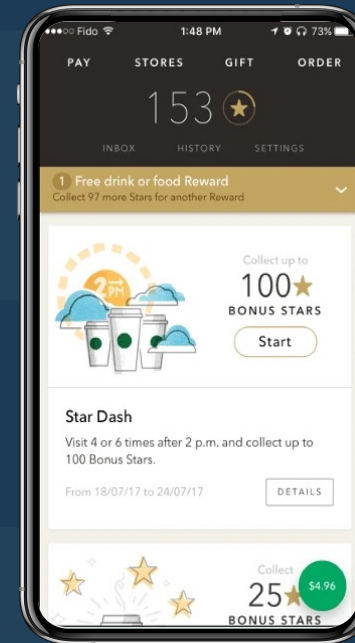
**90%** of consumers find personalized advertising appealing (Epsilon)



**86%** of consumers say that personalization has some impact on what they purchase (Infosys)



**71%** of consumers expect personalization from brands and businesses they choose (McKinsey)



## Thank you for being a top listener.

Hey it's Charles Kelley from Lady Antebellum.

You're getting this email because you are one of Lady Antebellum's top listeners on Spotify. Thanks so much for listening to so much of our music.

I'm going on a solo tour and as a way to say thank you I want you to be one of the first to get access to tickets.

The presale starts **Wednesday October, 14th at 10am** and runs until Thursday, October 15 at 10pm. You'll be able to purchase up to 6 tickets while supplies last. The password is **BELIEVER**

I have a new single out and would love for you to listen to it on Spotify. It's called **"The Driver"** and also features Dierks Bentley and Eric Paslay. Hope you like it!

[BUY TICKETS HERE](#)



# Hyper-Personalization



Who is best positioned to leverage?



Most impactful for digitally native companies

**Not surprisingly, a higher % of revenue is driven by personalization efforts for digitally native companies**



## CPG

- Personalization drives 5% to 10% of revenue
- Typically does not own customer transaction



## Brick & Mortar

- Personalization drives 10% to 20% of revenue
- Owns customer transaction, but not always product development



## Digitally Native

- Personalization drives 25% of revenue
- Owns customer transaction AND product development

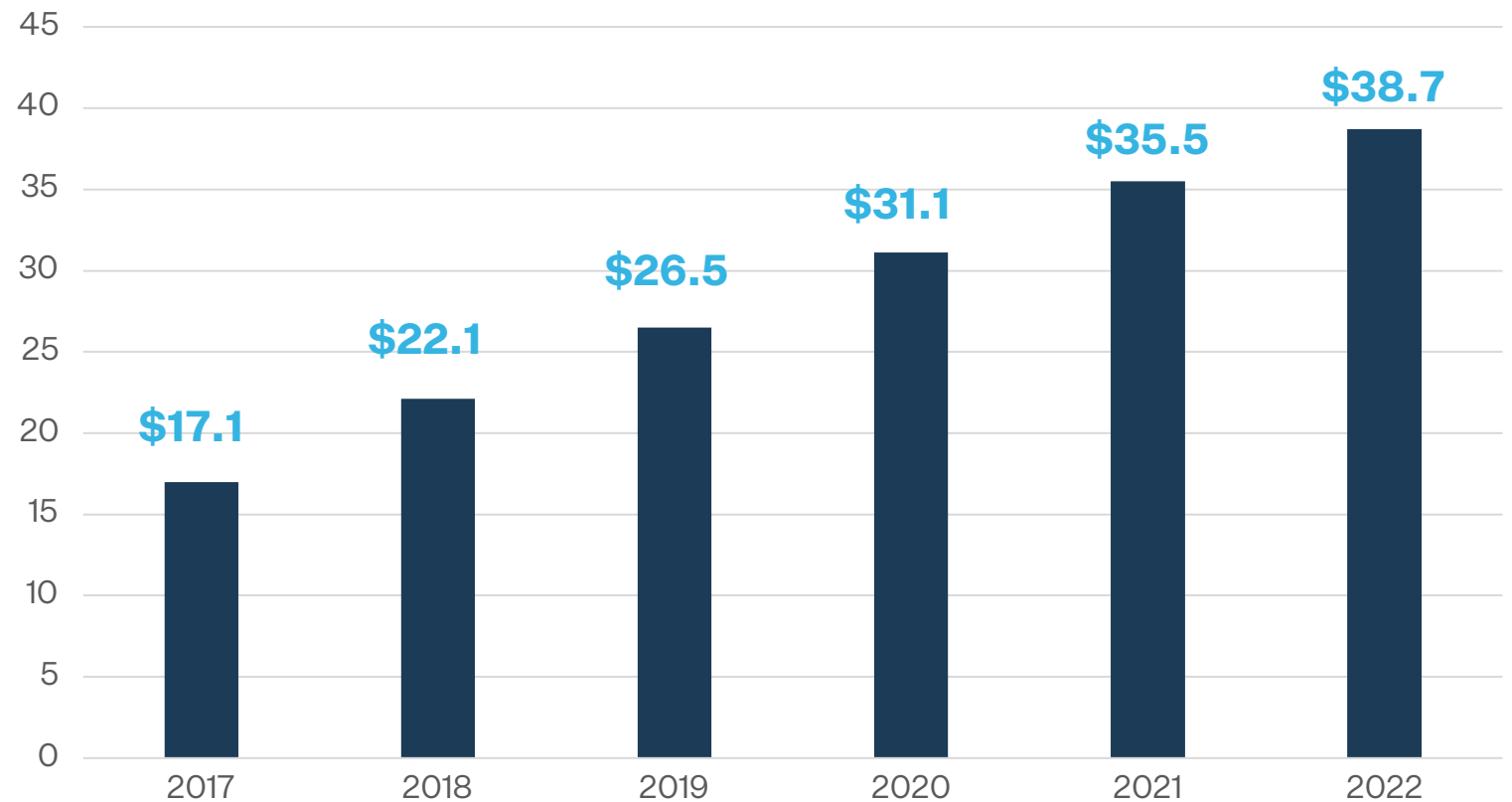
Source: McKinsey

# Hyper- Personalization

Location-based advertising is one example of growth in this category

## US Mobile Location - Targeted Ad Spending, 2017-2022

*\$Billion*



Source: eMarketer

# Hyper-Personalization

From a marketing perspective, at its core, hyper-personalization is using data to drive demand...



Gaming



Metaverse

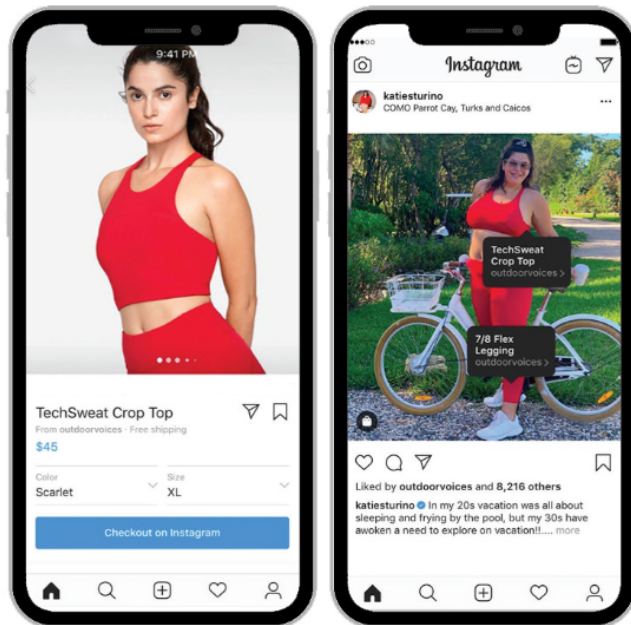


IRL via Facial Recognition

# Hyper-Personalization and Social Commerce

Leverages data on our interests to drive more relevant advertisements

Related, the creator economy amplifies the ability to reach consumers via social commerce



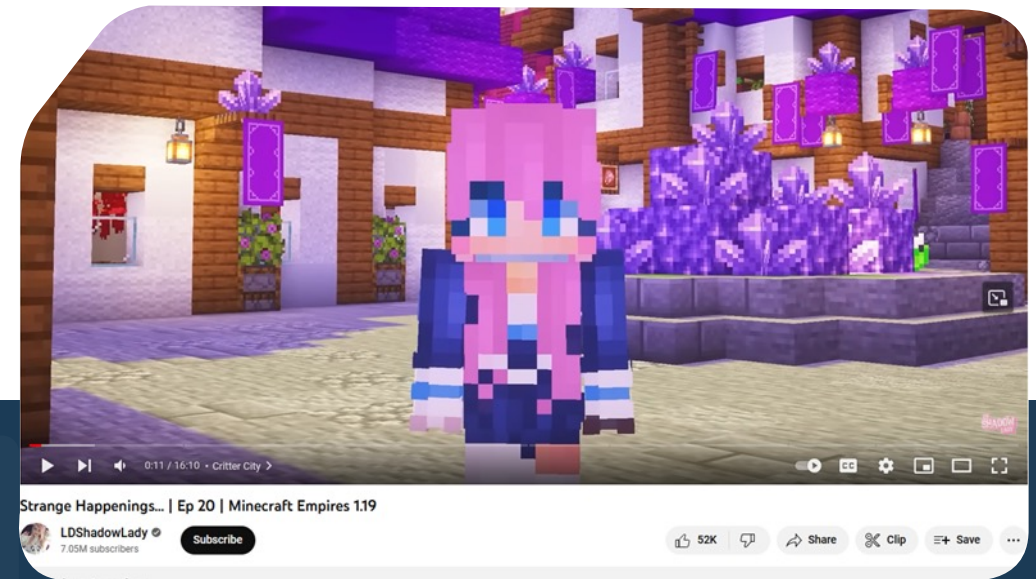


# Hyper-Personalization – “Opt-In” Content

In addition to content and advertising that is “served” to us, we also “opt-in” to hyper-personalized content based on our interests; this trend is **amplified by the creator economy**



Skills / Hobbies – Desert Gardening Podcast

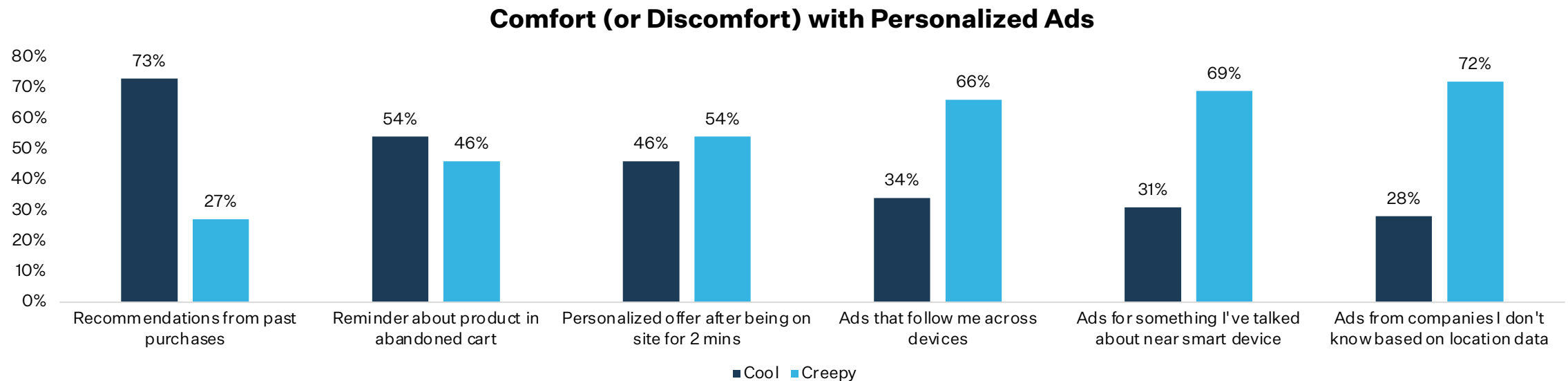


Gaming – Minecraft YouTuber with >7M Subs

# Hyper-Personalization

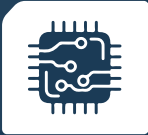
How far should marketing related hyper-personalization go?

Discomfort in the name of efficiency?...



Source: CheetahDigital

# Hyper-Personalization Investment Framework




**Hardware Layer**

---

Compute

---

Devices




**Software Layer**

---

Data Collection

---

Data Mgmt.



**Interface Layer**

---

Social Commerce

---

Creator Economy

# Enabler: Digital Luxury

Efficiently amplifying our identity in an online setting



what is digital luxury?



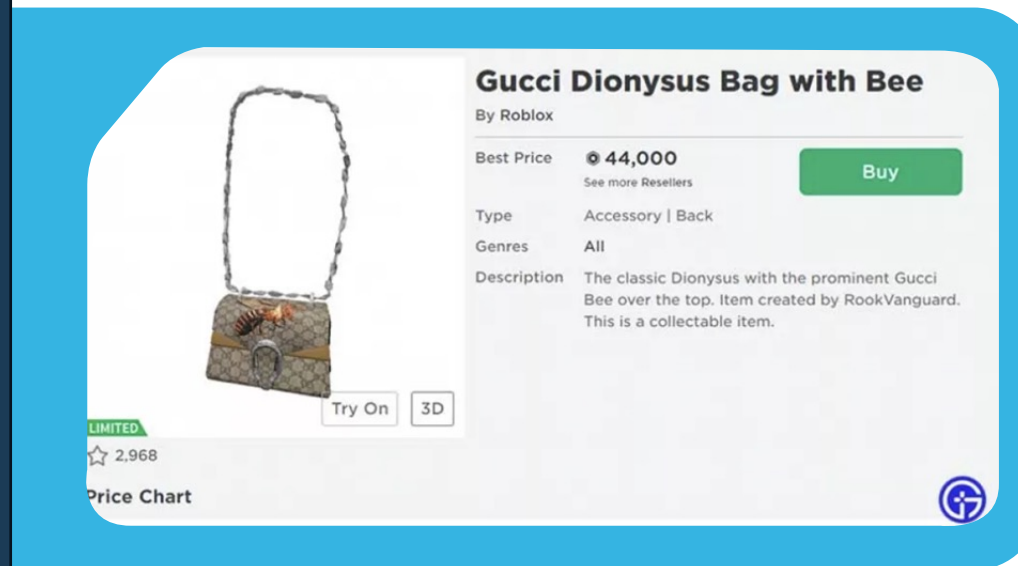
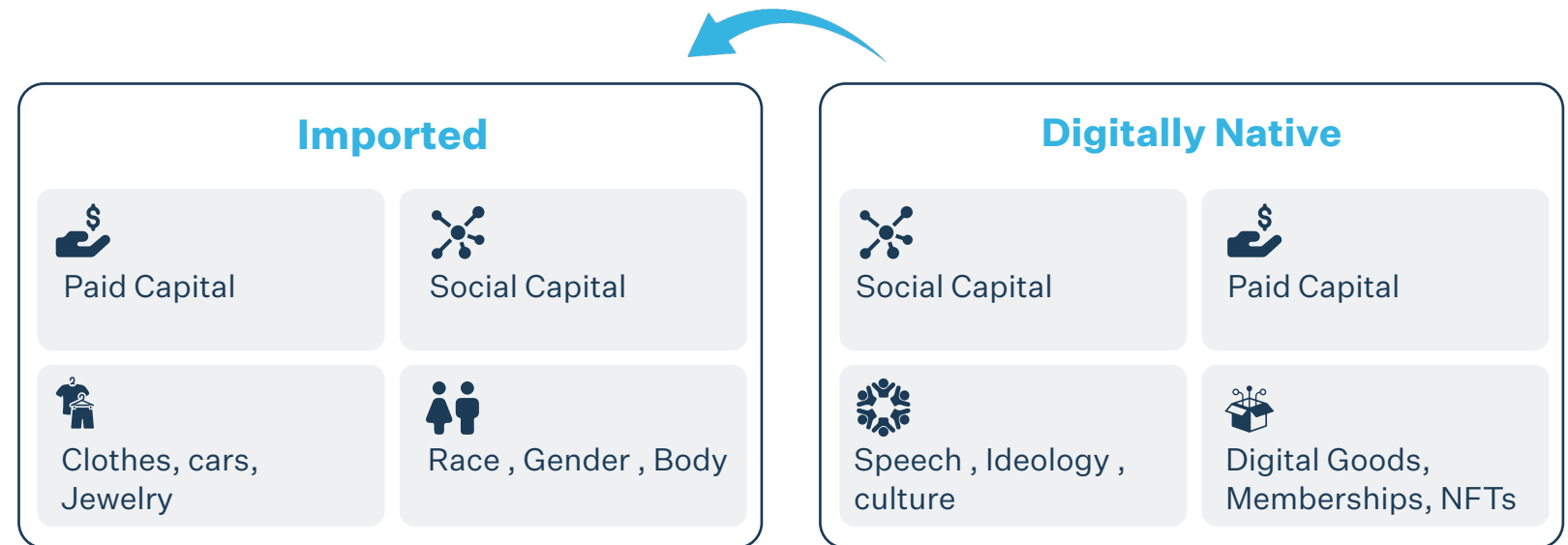
Digital luxury refers to the use of digital technology to enhance or create luxurious experiences, products, or services. It can include a wide range of digital innovations, such as virtual reality, augmented reality, personalized digital experiences, artificial intelligence, and more.



# Digital Luxury

The elements of **identity that we import from the offline world constantly reinforce digitally native elements** of identity in a continuous cycle.

It is easier (lower friction) to exhibit or alter your identity online than it is IRL.



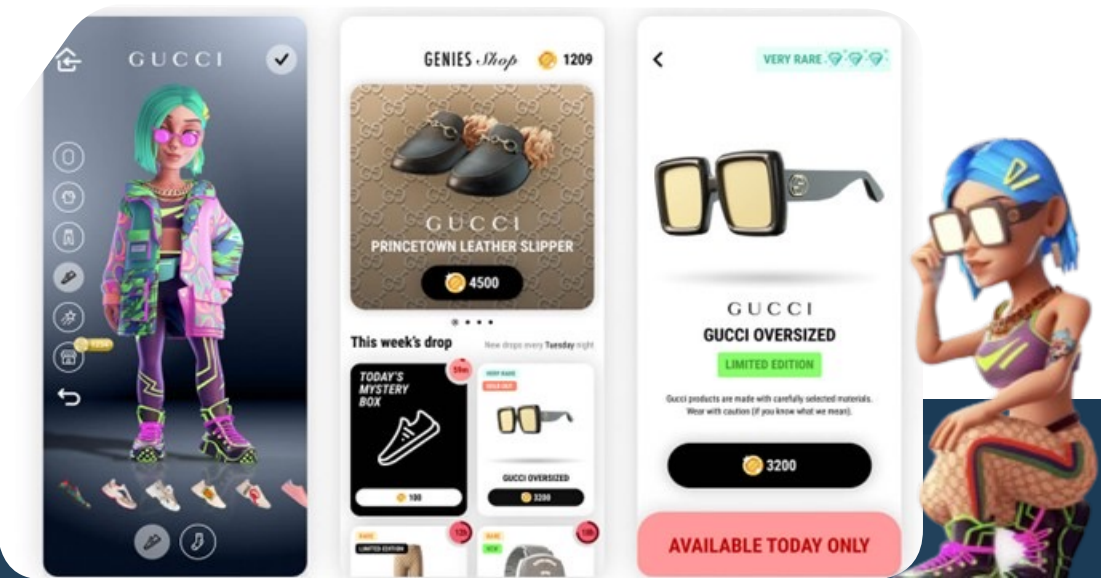
**\$4,115 spent on Gucci handbag in Roblox**

# Digital Luxury Expression of Identity and Beliefs via Brands

Brands are a key indicator of our identity and beliefs IRL and this can be amplified online...



Social Brand Expression



Avatar Brand Expression

# Digital Luxury

## Online me > Offline me?

60% of Gen Z and 62% of Gen Y believe that how you present yourself online is more important than how you present yourself IRL (media.monks)



IRL Online Expression

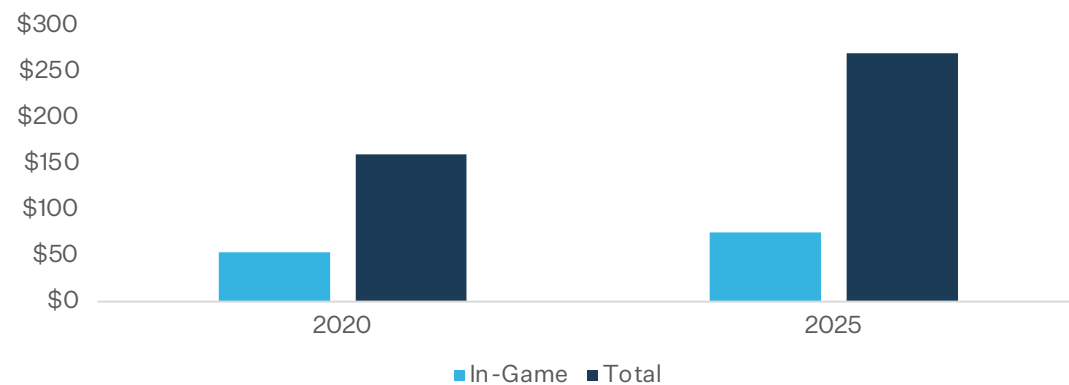
Expression in Digital Environment

# Digital Luxury and Identity in Gaming

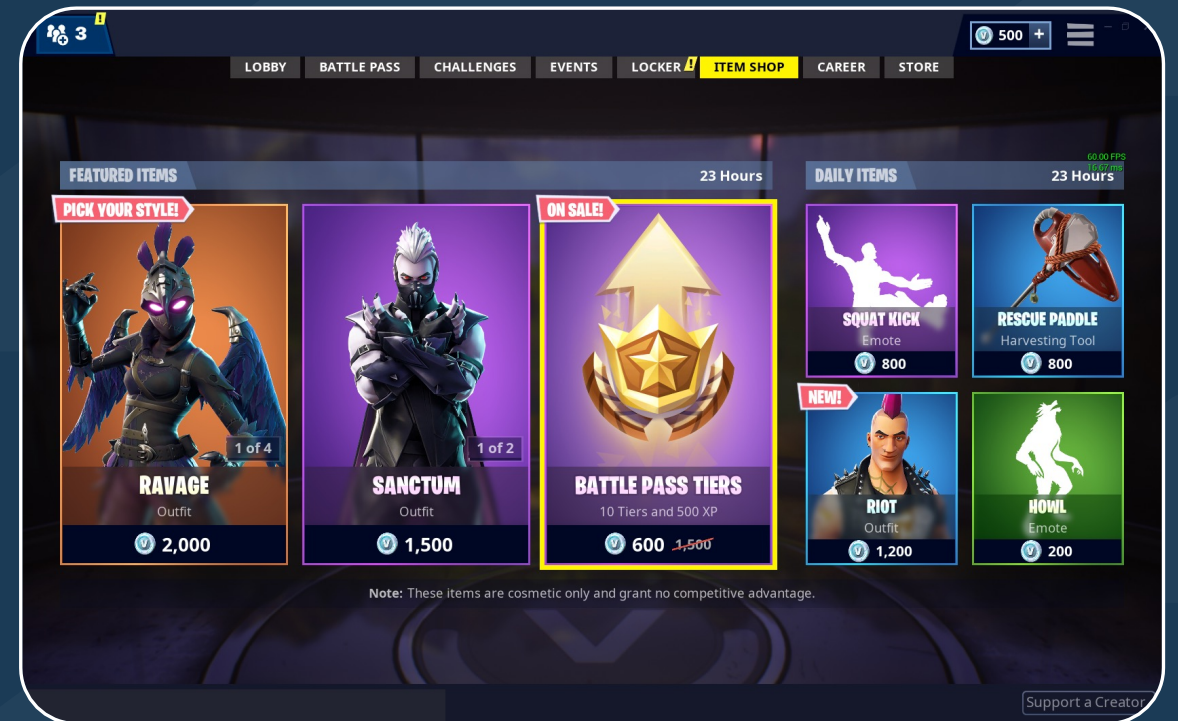
In-game spend accounts for a significant portion of overall gaming industry revenue

To maintain the competitive balance, in-game spend is typically cosmetic, allowing for personalization and an outward expression of beliefs and interests

**In-Game Spend and Total Global Gaming Revenue (\$B)**



Source: Statista and Deepwater Estimates





# Digital Luxury and Identity in Gaming

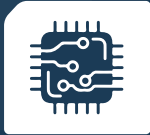
If only there were a good way for me to tell the world how much I love bacon...



The **Bacon Camouflage** is a DLC weapon camouflage skin available for Call of Duty: Black Ops II. It is available for anyone who buys the **Bacon Pack** for 160 Microsoft Points or \$1.99 on PlayStation 3 and PC.

Bacon camouflage adds a bacon-styled pattern to the main body of the weapon with small droplets covering it. Other parts of the weapon are black and covered in what appears to be a layer of grease.

# Digital Luxury Investment Framework




**Hardware Layer**

---

Devices

---

Luxury Goods




**Software Layer**

---

Payments

---

Brands



**Interface Layer**

---

MTX / Gaming

---

Social / Metaverse

# Conclusion

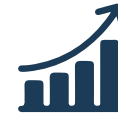
## Deepwater's Navigational Chart



Pursuit of  
efficiency / time  
drives innovation



Innovation in  
**T**ransportation,  
**I**ntity, **D**ata, and  
**E**ntertainment  
(TIDE) has an  
outsized impact on  
**E**fficiency



Persistent Growth  
is generated by  
companies that  
create efficiency

# Deepwater's TIDE Matrix

## 2023 Enablers and Investment Categories



**AI**



**Cloud / Compute**



**Electrification  
& Automation**



**On-Demand**



**Hyper-  
Personalization**



**Digital Luxury**

### Hardware Layer

Compute / Memory,  
Networking

Processor / Memory,  
Networking

Compute, Battery

Robotics, Drones,  
Fulfillment, Dist.

Compute, Devices

Devices, Luxury Goods

### Software Layer

Cloud, Data Mgmt.

SaaS, Security

ADAS, FDS

Content Tools,  
Logistics

Data Collection,  
Data Mgmt.

Payments, Brands

### Interface Layer

Search Integration,  
App Integration

Apps, Web Services

EVs, Charging  
Network

Content Platforms,  
Marketplaces

Social Commerce,  
Advertising

Social, Metaverse



# Conclusion

○ Creativity.

○ Community.

○ Empathy.



# Conclusion

Creativity.



*“AI will allow us to do a better job and to do a more efficient job. I wish I could say that the advances in AI will make it easier to create hits. Obviously, it won’t. Hits are created by Genius; datasets plus compute, plus LLMs does not equal Genius. Genius is in the domain of human beings, and I believe we'll stay that way.”*

--Straus Zelnick (CEO of Take-Two Interactive)



# Conclusion

## Community



*The greatness of a community is most accurately measured by the compassionate actions of its members.*

--Coretta Scott King (Author and civil rights leader)



# Conclusion

## Empathy



### Empathy

*Humans are built in such a way that they can involuntarily and forcefully experience another's emotion – that is, a person's distress is often contingent not on his own but on someone else's painful distress*

--Martin Hoffman (NYU psychologist and professor)



# Thank You

**Mike Olson**

August 2023

[deepwatermgmt.com](https://www.deepwatermgmt.com)

Deepwater invests in persistent growth. We believe that the market occasionally misprices persistent growth.

Our research seeks to identify opportunities where persistent growth exists but has not been fully recognized.

We manage a range of funds, from venture to public equities, focused on investing in where the world is going.