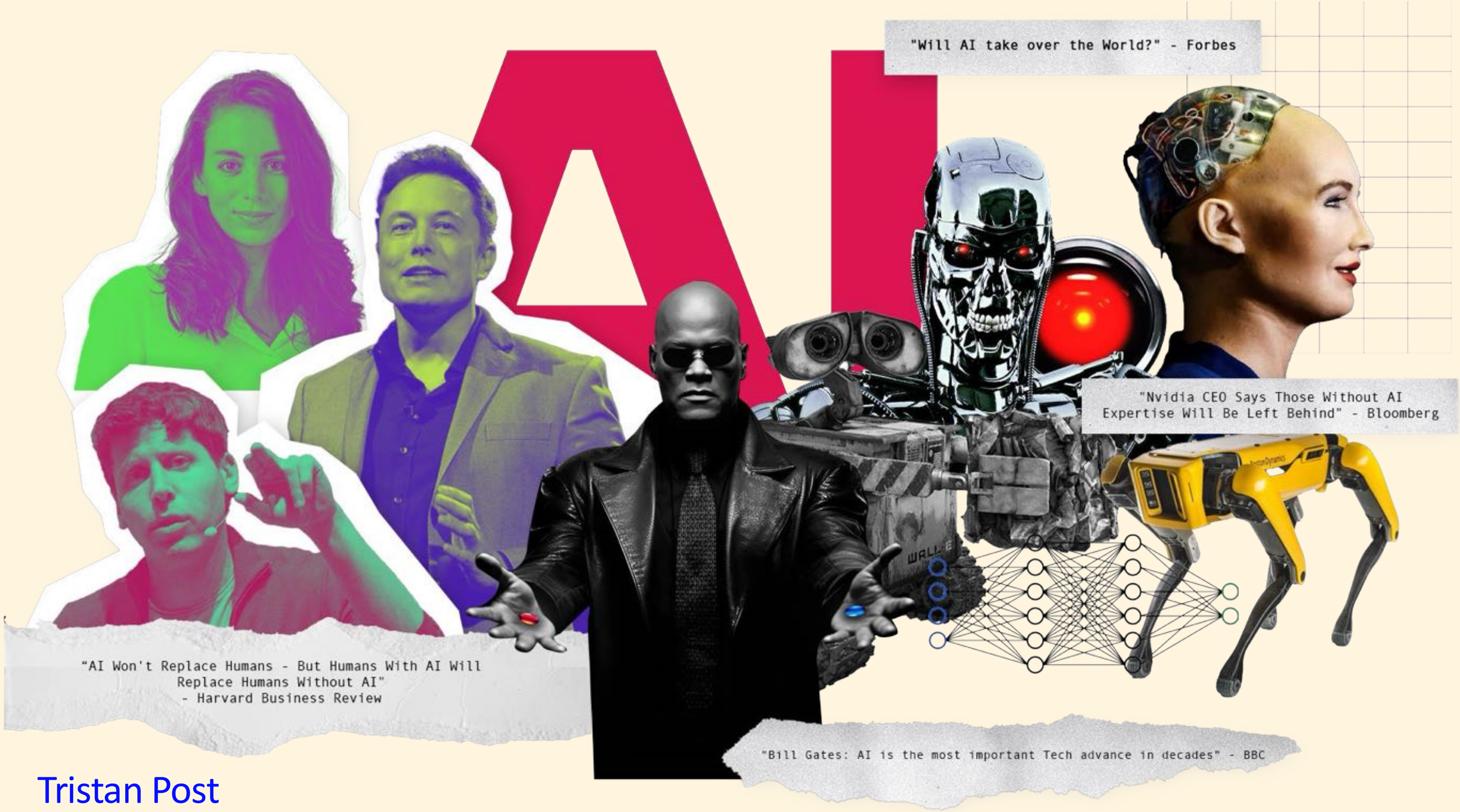
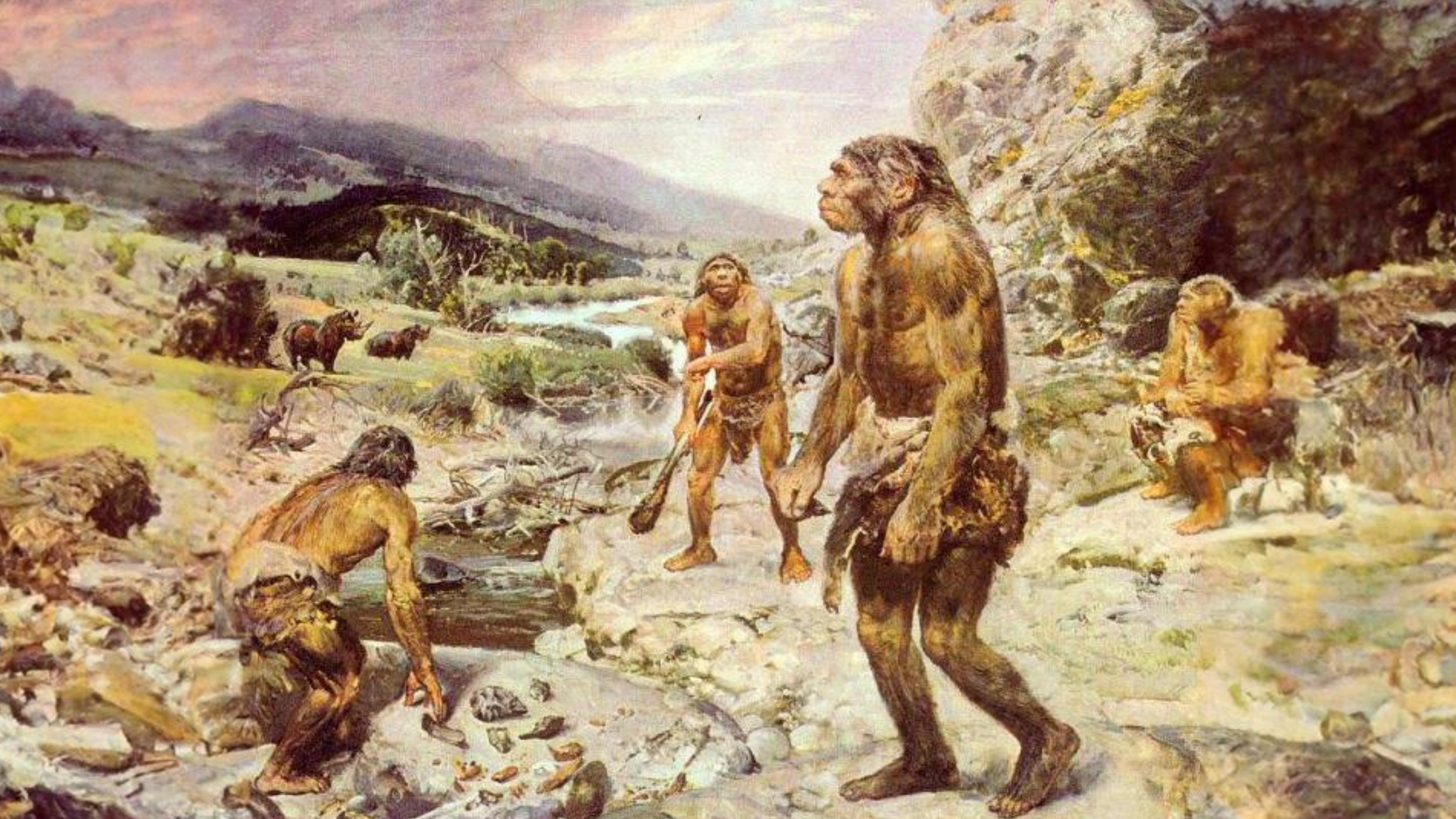
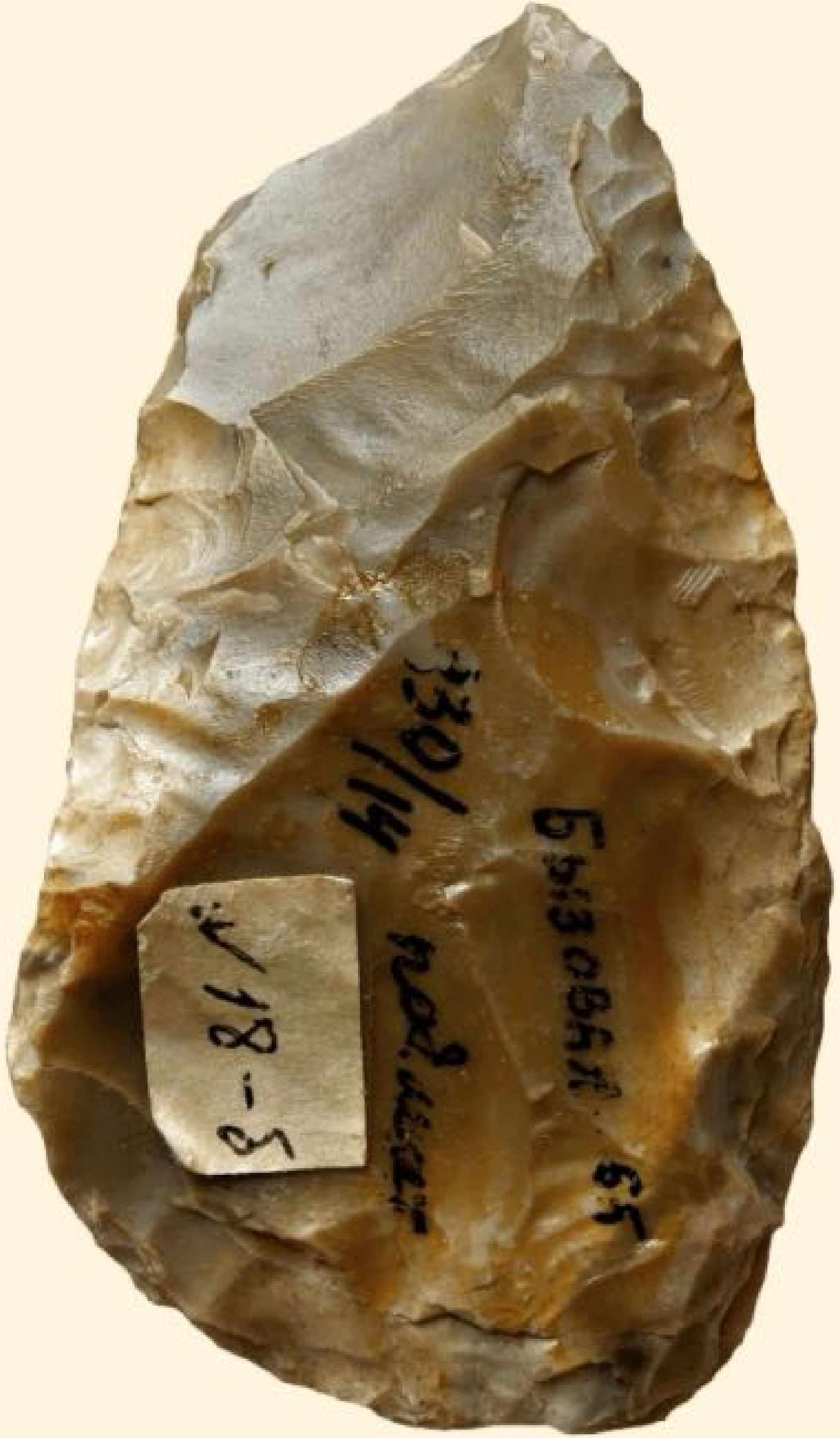


Tristan Post

Where are we coming from?
Where are we going?




Бызовая 65
330/14

Tools = Technology

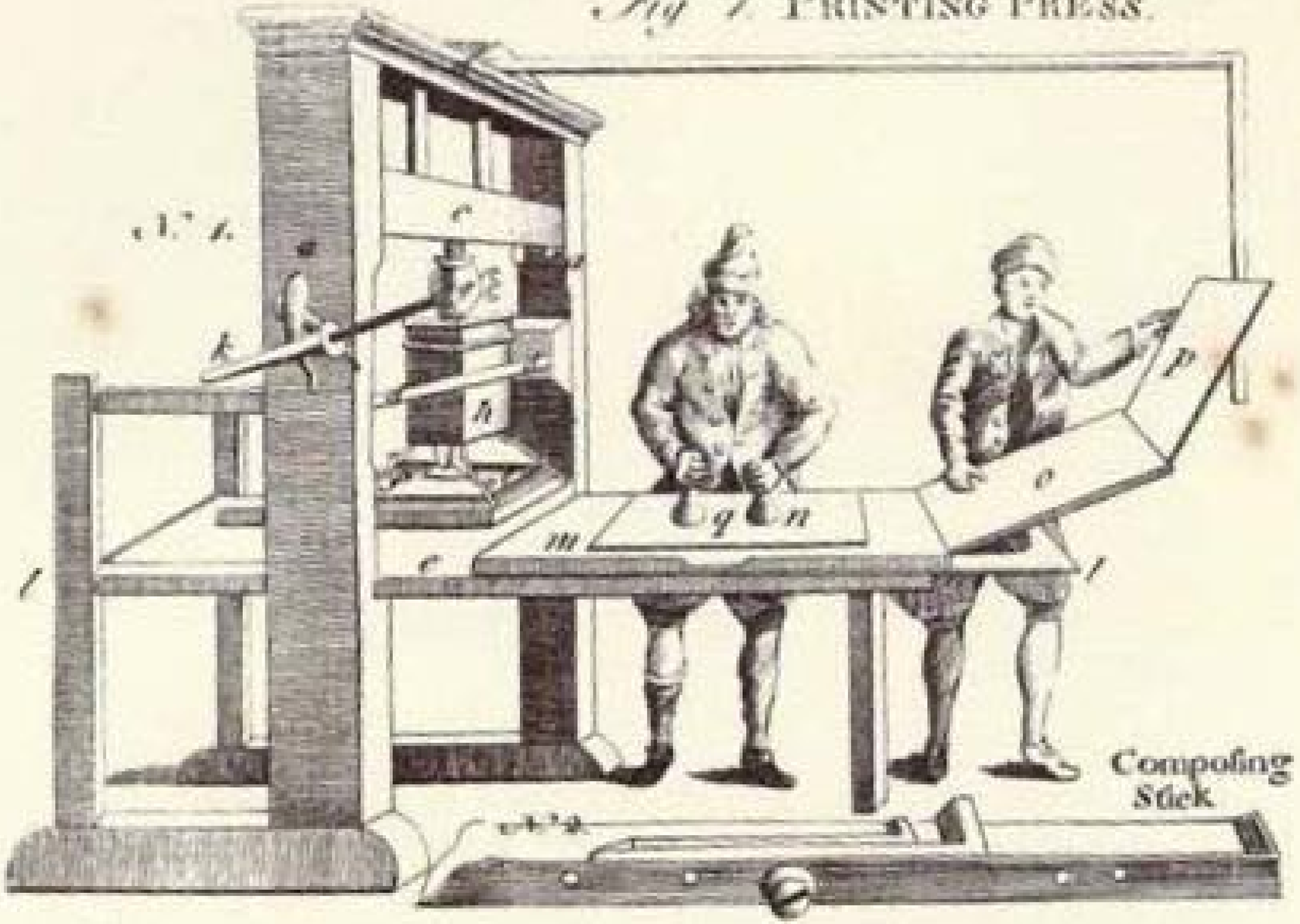
General Purpose Technology

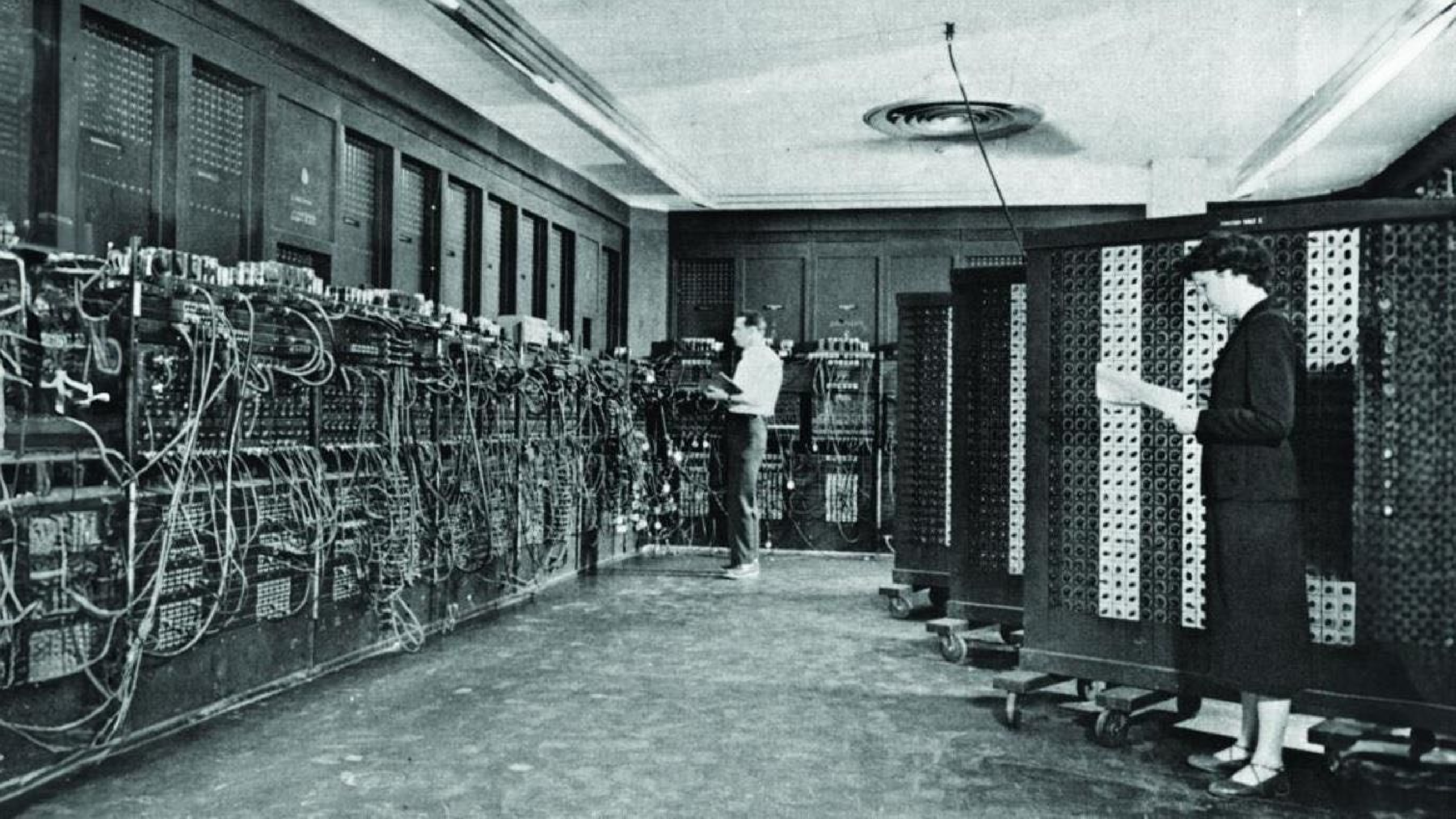
General Purpose Technology

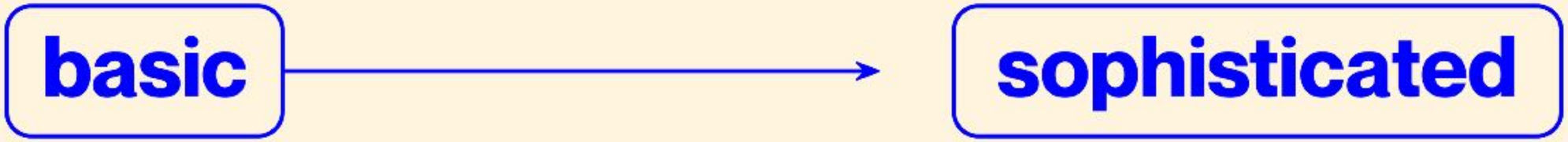
A technology that can affect an entire economy and has the potential to drastically alter societies through their impact on pre-existing economic and social structures.

Camelus inde nomē accepit· siue quia cū honerā-
tur· ut breuior et humilior fiat· accubat· qui

Fig 1. Printing Press.






basic
sophisticated

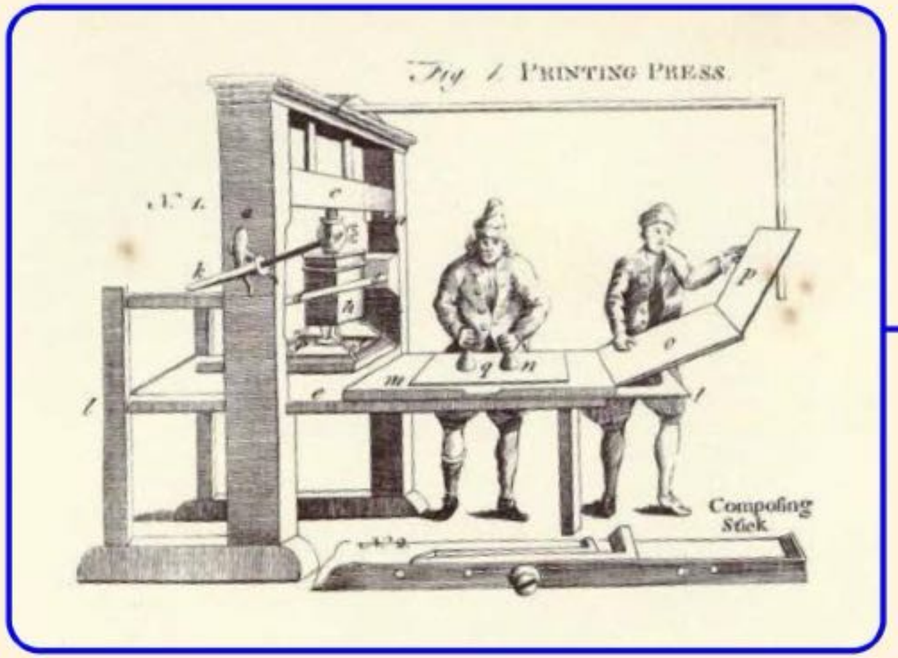
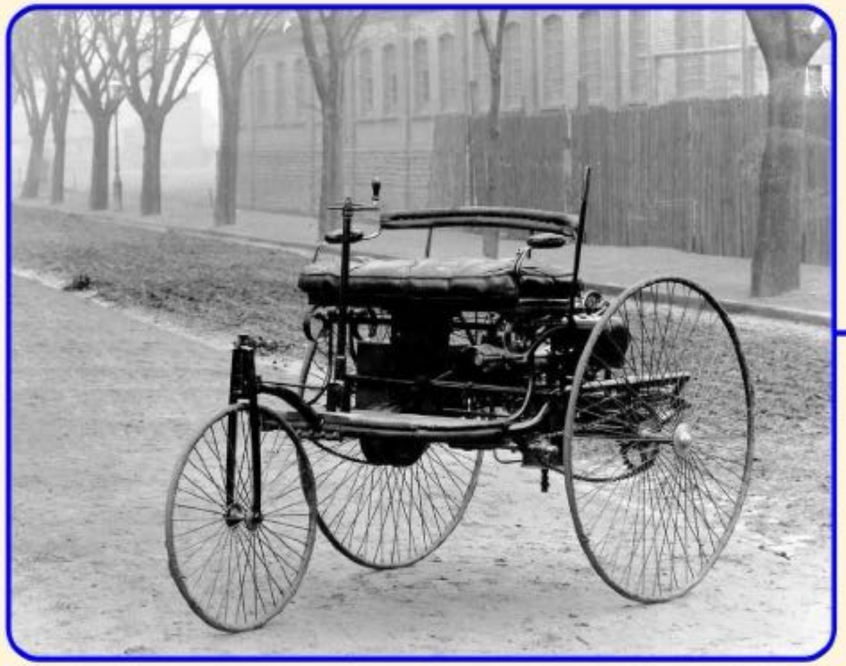


Fig 1 PRINTING PRESS
Composing Stick


Canon



IN THIS BUILDING DURING THE SUMMER OF 1956

JOHN McCARTHY (DARTMOUTH COLLEGE), MARVIN L. MINSKY (MIT)
NATHANIEL ROCHESTER (IBM), AND CLAUDE SHANNON (BELL LABORATORIES)
CONDUCTED

THE DARTMOUTH SUMMER RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

FIRST USE OF THE TERM "ARTIFICIAL INTELLIGENCE"

FOUNDING OF ARTIFICIAL INTELLIGENCE AS A RESEARCH DISCIPLINE

"To proceed on the basis of the conjecture
that every aspect of learning or any other feature of intelligence
can in principle be so precisely described that a machine can be made to simulate it."

IN COMMEMORATION OF THE PROJECT'S 50th ANNIVERSARY
JULY 13, 2006

Computer Defeats Kasparov, Stunning the Chess Experts

I.B.M. Chess Machine Beats Humanity's Champ, 3½-2½

Continued From Page A1

but by Mr. Kasparov's poor play in the game.

"I think he didn't try his best," said Susan Polgar, the women's world champion, who after the game issued her own challenge to I.B.M. to play against Deep Blue.

The game itself was problematic for Mr. Kasparov from the start. Playing black and needing a victory to capture the match, he was perhaps too defiant in the early going, pursuing a risky sequence of moves in a conservative opening called the Caro-Kann. He encouraged Deep Blue to sacrifice a knight, resulting in a position that left his own king exposed, and many chess experts wondered if he hadn't made a simple blunder.

terrified at the prospect of losing an honest competition, and he gave himself an excuse, that this is not real chess. Well, I have news for him. This is real chess. What we've seen today is psychological weakness of the sort I'd never expect from him."

Mr. Kasparov had his supporters, particularly among those who thought this was a spectacle staged by I.B.M. for the good of I.B.M.

"This was not a serious chess match," said Lev Alburt, a former United States champion who has said there are 100 grandmasters in the world who could beat Deep Blue. "This was a show. If they want to prove it was more than a show, let them play anyone but Garry. If it would play against, say, Grandmaster Boris Gulko, who is not even among the top 50, I am willing to bet $10,000 the computer would lose."

Swift and Slashing, Computer Topples Kasparov

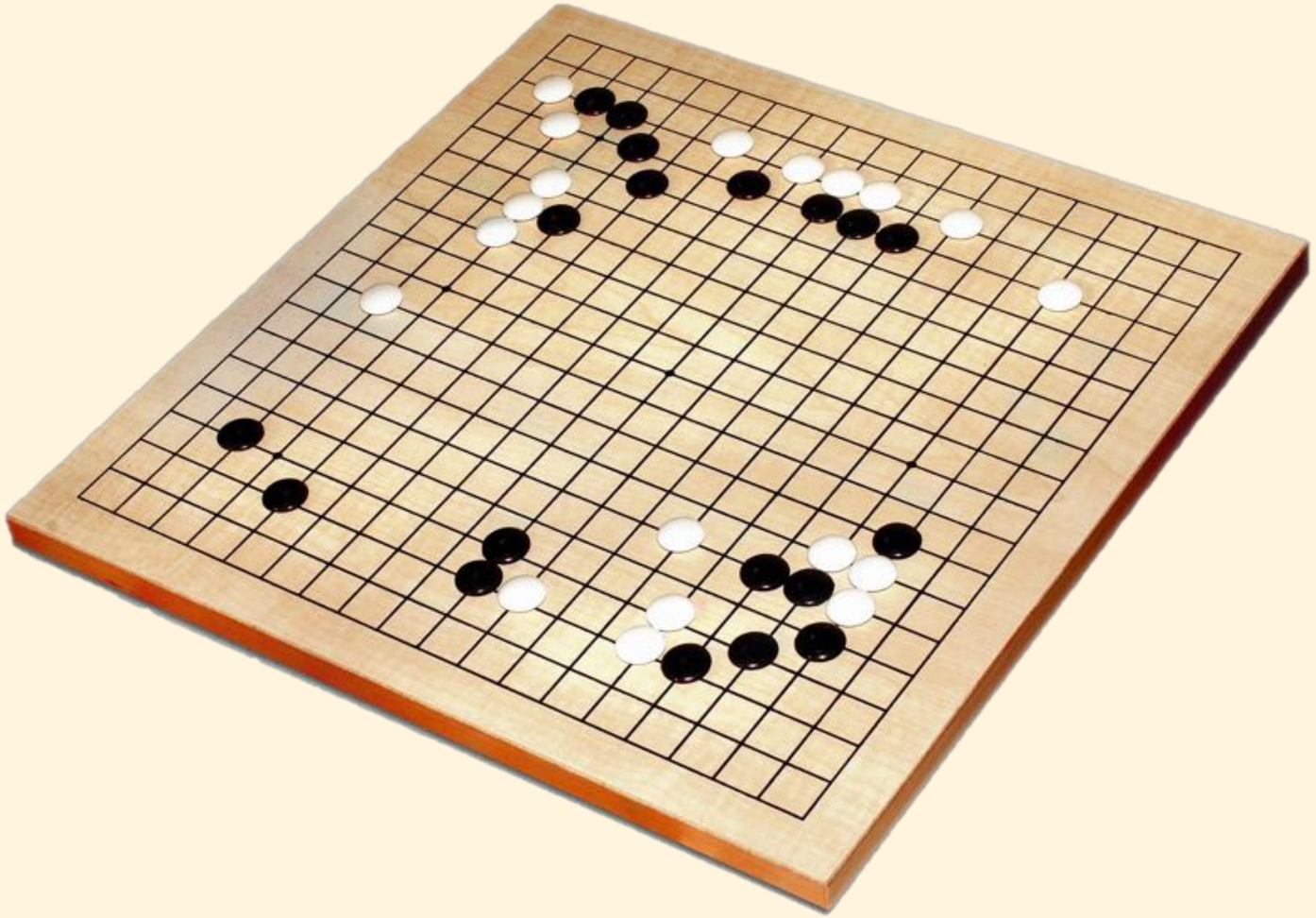
By BRUCE WEBER

In brisk and brutal fashion, the I.B.M. computer Deep Blue unseated humanity, at least temporarily, as the finest chess playing entity on the planet yesterday, when Garry Kasparov, the world chess champion, resigned the sixth and final game of the match after just 19 moves, saying, "I lost my fighting spirit."

The unexpectedly swift denouement to the bitterly fought contest came as a surprise, because until yesterday Mr. Kasparov had been able to summon the wherewithal to match Deep Blue gambit for gambit.

The manner of the conclusion overshadowed the debate over the meaning of the computer's success. Grandmasters and computer experts alike went from praising the match as a great experiment, invaluable to both science and chess (if a temporary blow to the collective ego of the human race) to smacking their foreheads in amazement at the champion's abrupt crumpling.

Reuters



Master of Go Board Game Is Walloped by Google Computer Program

By Choe Sang-Hun and John Markoff
March 9, 2016

SEOUL, South Korea — Computer, one. Human, zero.

A Google computer program stunned one of the world's top players on Wednesday in a round of Go, which is believed to be the most complex board game ever created.

The match — between Google DeepMind's AlphaGo and the South Korean Go master Lee Se-dol — was viewed as an important test of how far research into artificial intelligence has come in its quest to create machines smarter than humans.

"I am very surprised because I have never thought I would lose," Mr. Lee said at a news conference in Seoul. "I didn't know that AlphaGo would play such a perfect Go."

> Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don’t think AI will transform in the next several years.

Andrew Ng
Co-Founder Google Brain


source: google
Sundar Pichai
he/him

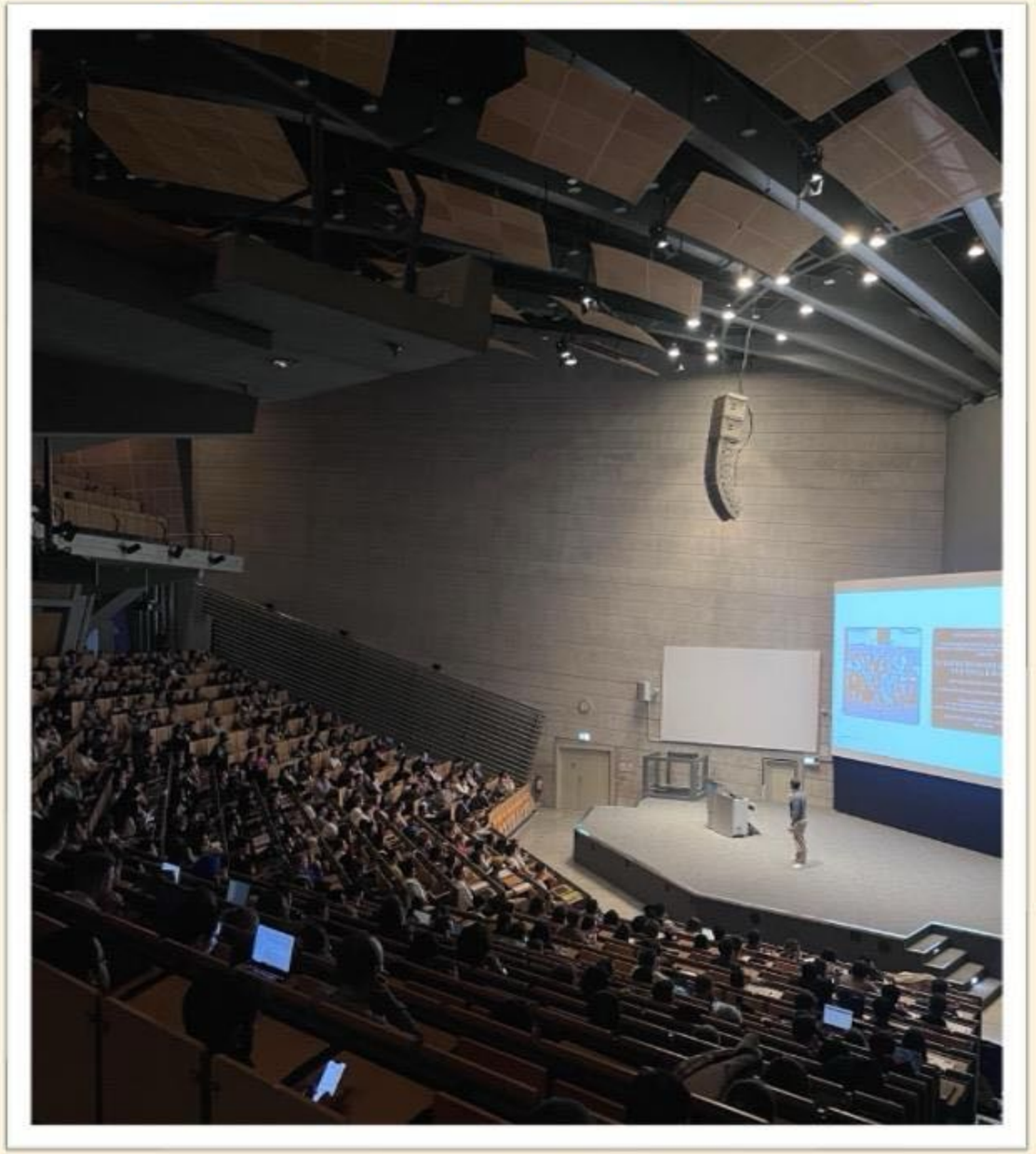
2022 (Before ChatGPT)

40 students

2022 (Before ChatGPT)

40 students

2023 (After ChatGPT)

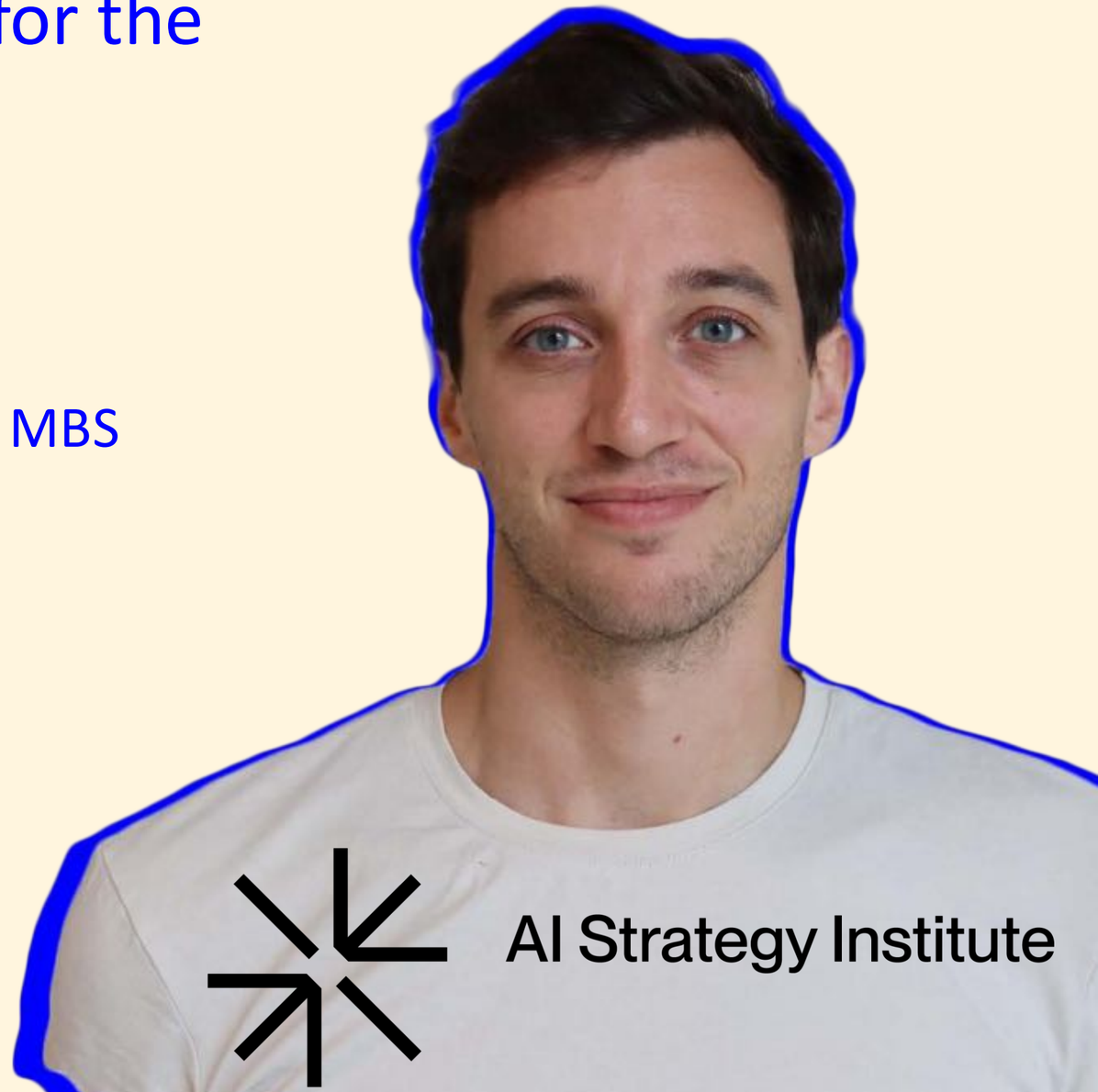


1046 students

Tristan Post

AI Strategist, Public Speaker, Expert for the Management of AI

CEO & Founder @ AI Strategy Institute
Faculty Member GenAI/AI @ BCG
Lecturer for AI @ Technical University Munich & MBS
Ex-AI Lead @ AI Founders
Ex-Senior AI Strategist @ appliedAI



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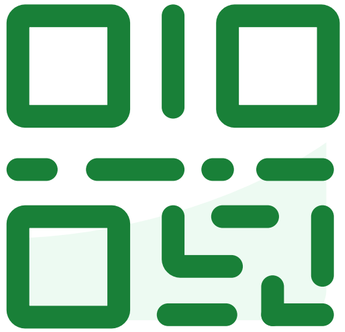

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What is your background?

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How would you judge your (Gen)AI know how?

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What are your expectations?

ⓘ Start presenting to display the poll results on this slide.

Agenda

How does AI work?
The Definition of AI
The GenAI Revolution
How AI Drives Value
How AI is Going to Change Jobs

How does AI work?


Input
Processing
Output


Emails
Spam Filter
Spam/
Not Spam

‘A step-by-step procedure for solving a problem or reaching some conclusion especially by a computer.’

Ages/edades

6+

40332

6279195 / 6279196

2x 6029156
1x 300401
2x 609101
4x 302301
1x 366001
1x 302001
2x 6063445
1x 4533742
4x 4143005
2x 428624
2x 307026
4x 302426
4x 654126
2x 6187572
2x 6047276
1x 6138173
1x 4558170
1x 302126
2x 4613153
3x 371026
1x 4647296
2x 6028736
1x 6022064
1x 6020073

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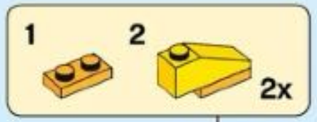
2



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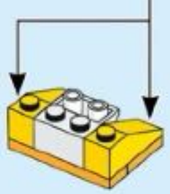

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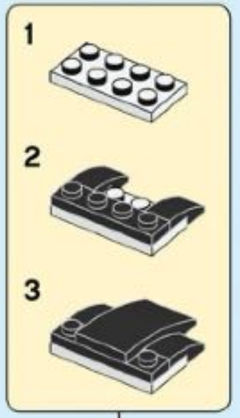

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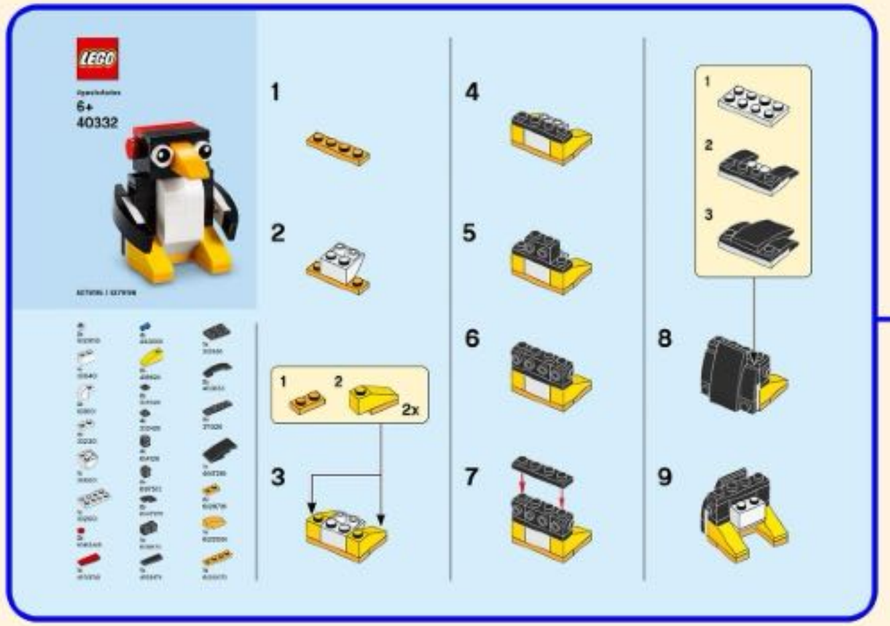
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1
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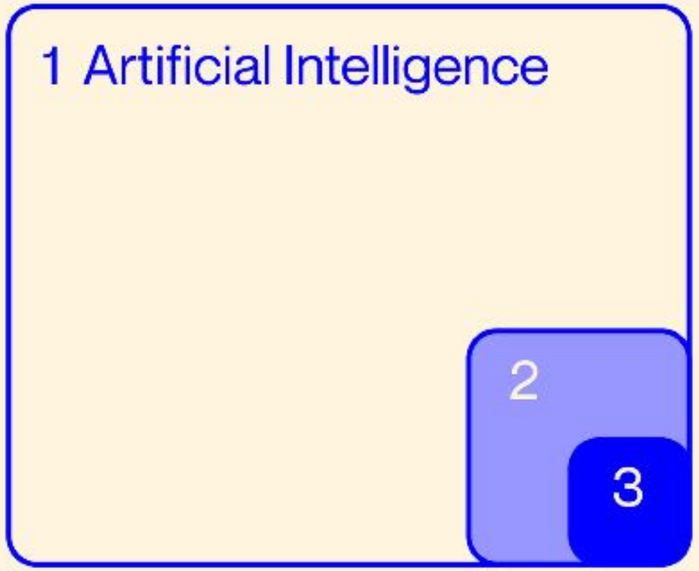
7
8
9
2x

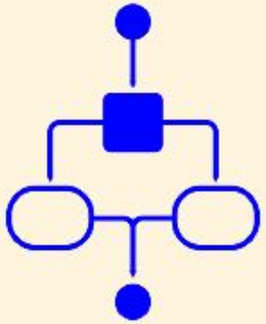
Rule-Based Algorithms

If (**NUMBER/2** = **INTEGER** NUMBER)
Then **EVEN** NUMBER
Else **ODD** NUMBER
END IF

```
1. Start
2. Input a number
3. If the number % 2 == 0, then print "Even"
4. Else, print "Odd"
5. End
```

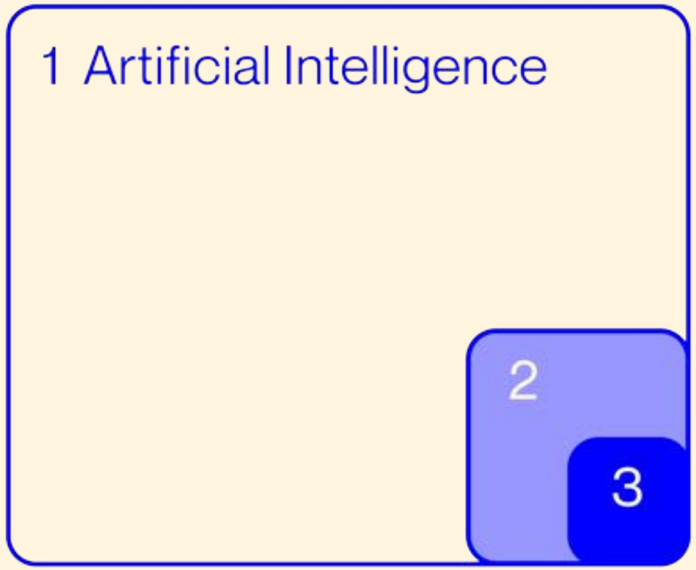
1950s - 1980s

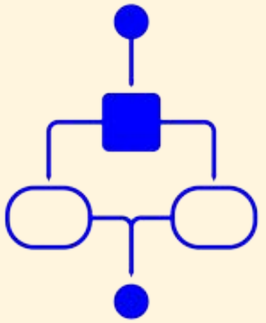




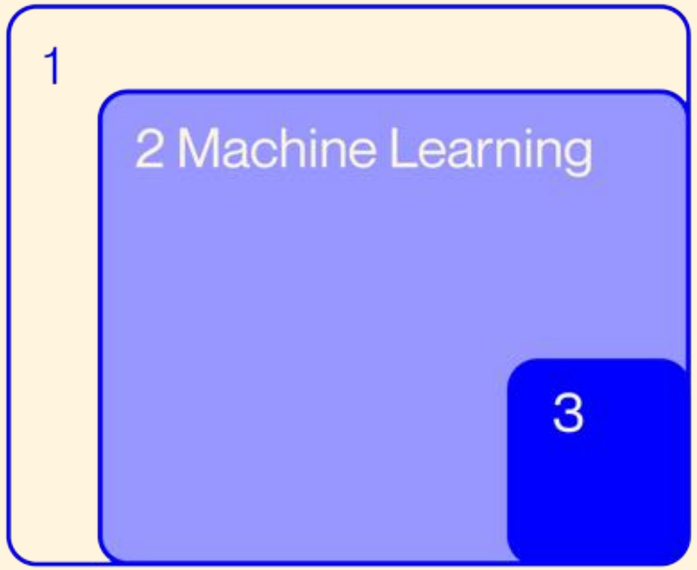
Our world is messy
unstructured.
non-deterministic.

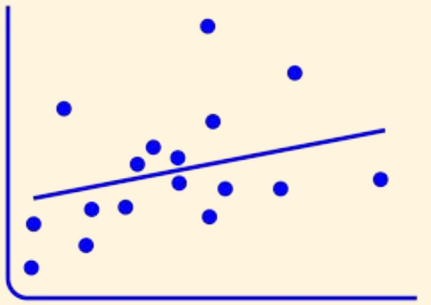
1950s - 1980s





1990s - 2000s





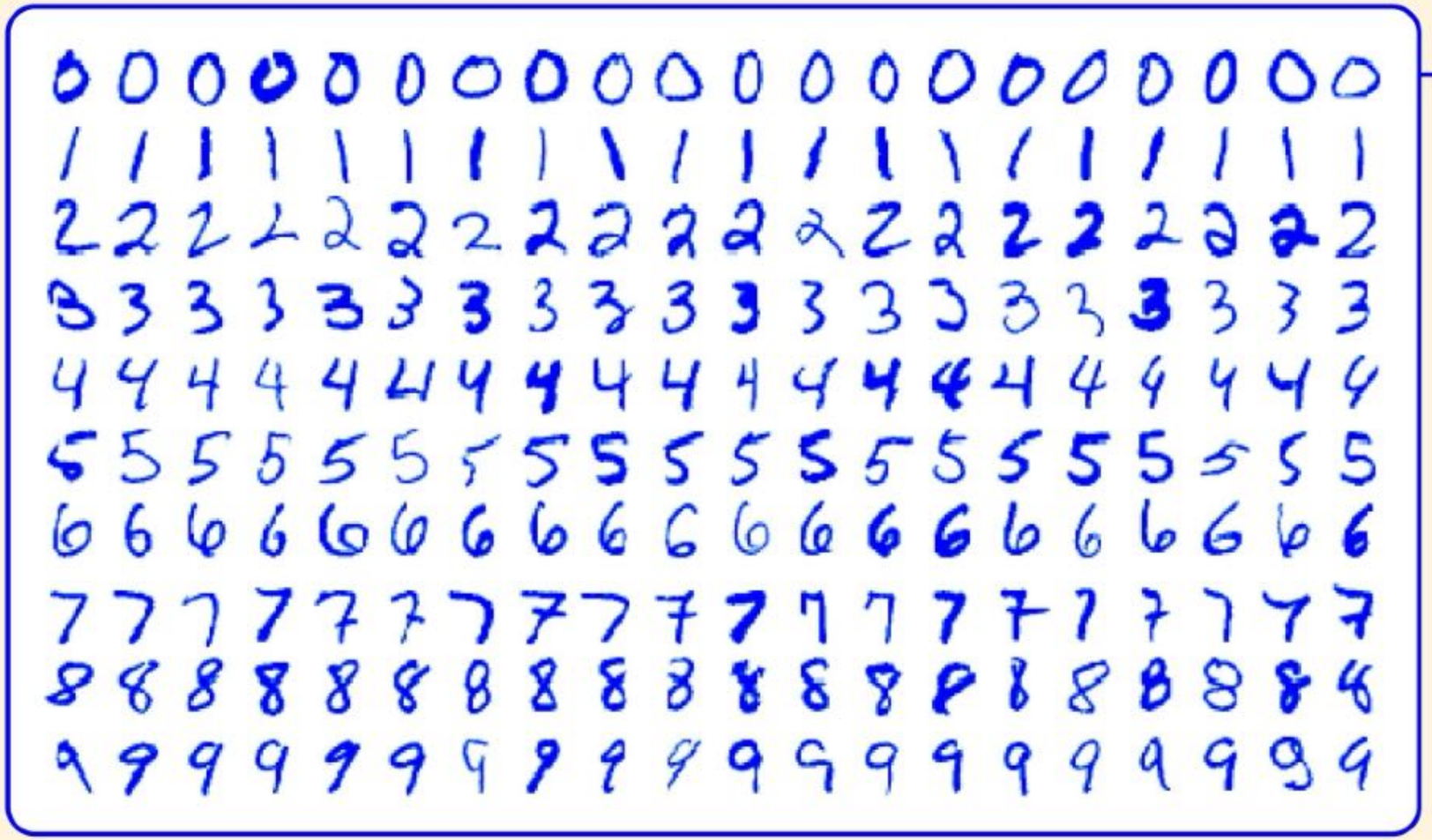
ML-Based Algorithms

Barack Obama
1600 Pennsylvania Ave ~~NW~~ NW
Washington, DC 20500

PORTLAND OR 970
23 JAN 2014 PM 3 L

Hugh Amick
v Letter, inc
509 Cascade Ave, Suite H
Hood River, OR 97031

9703120608080



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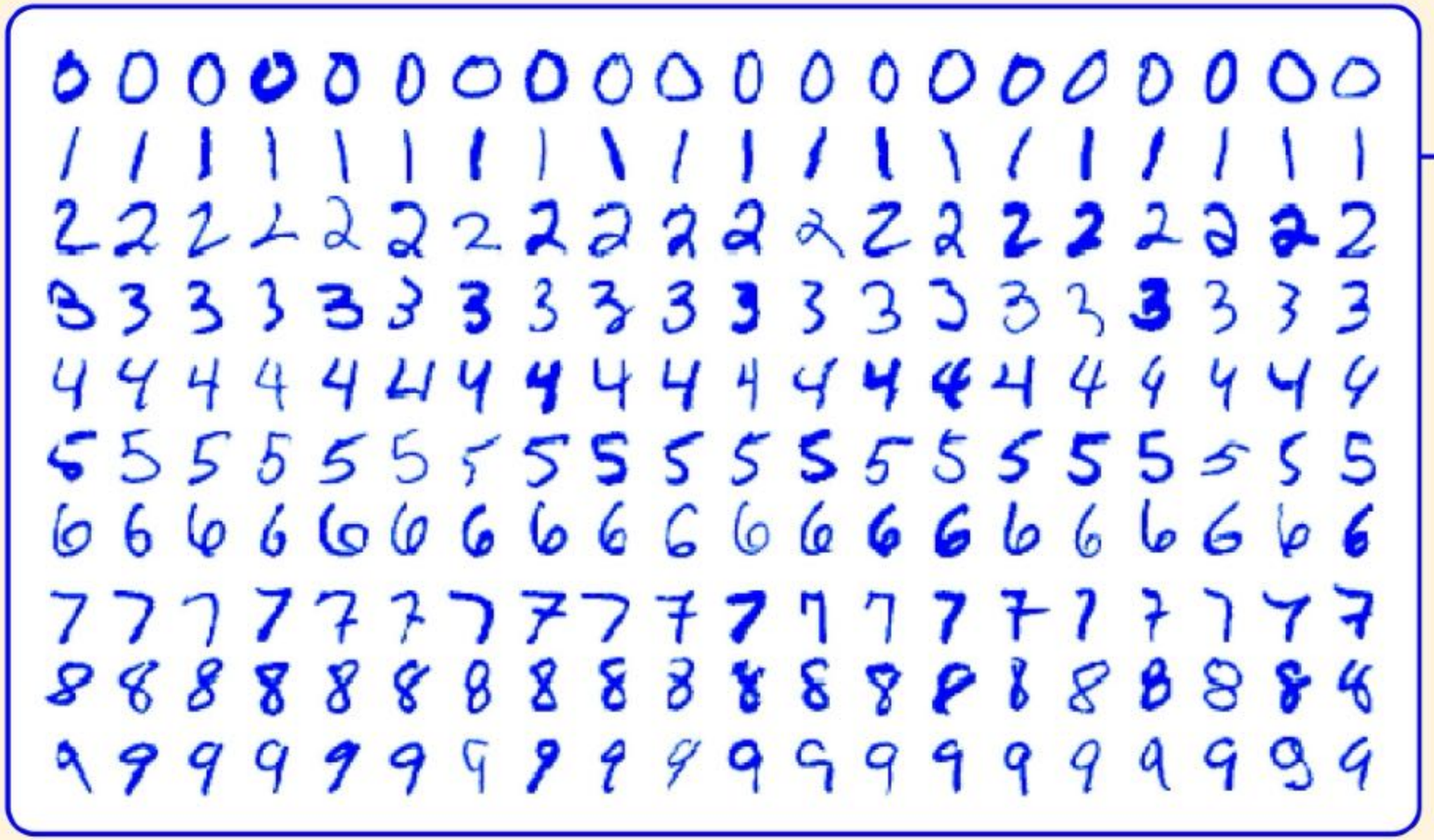

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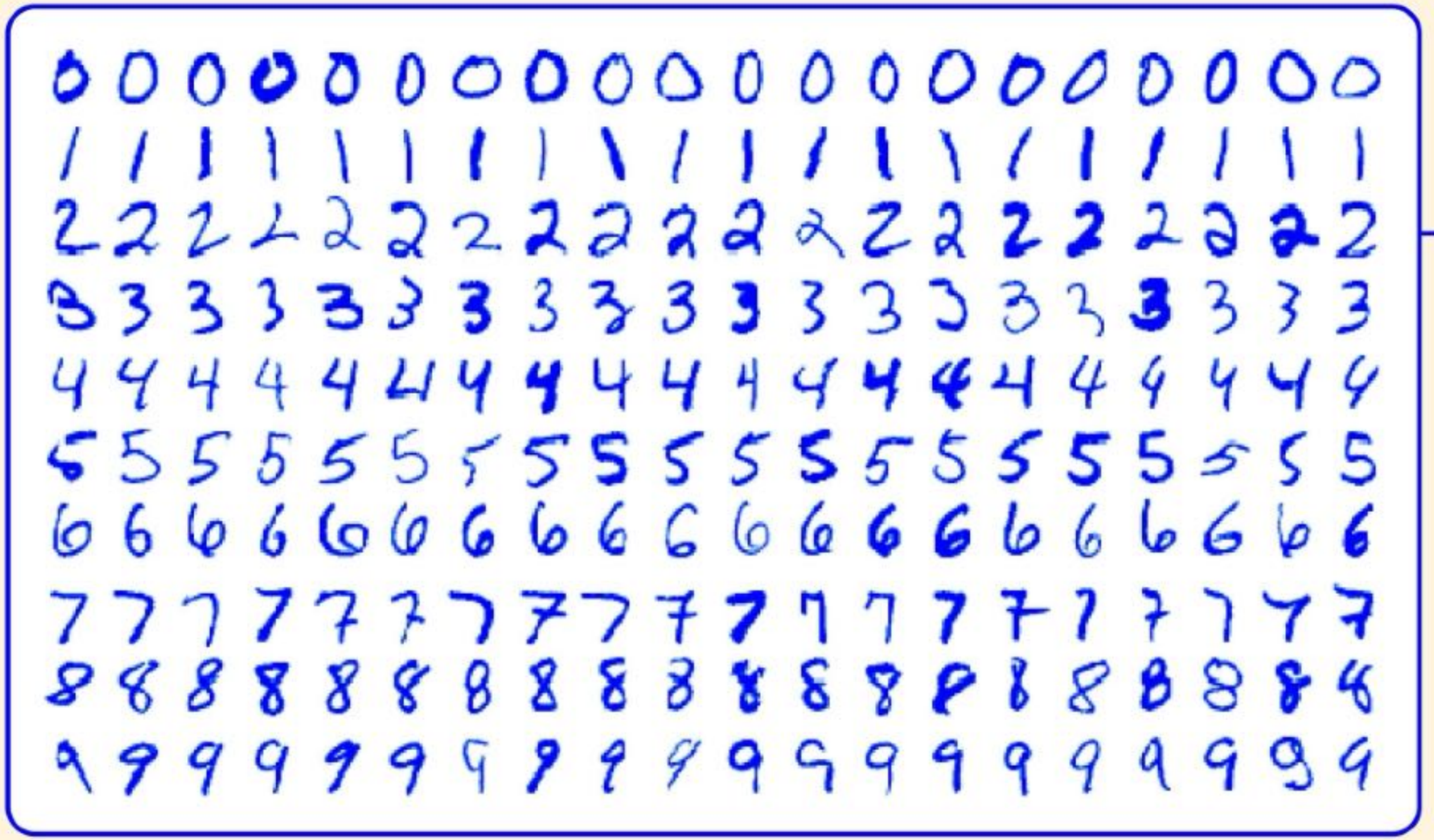

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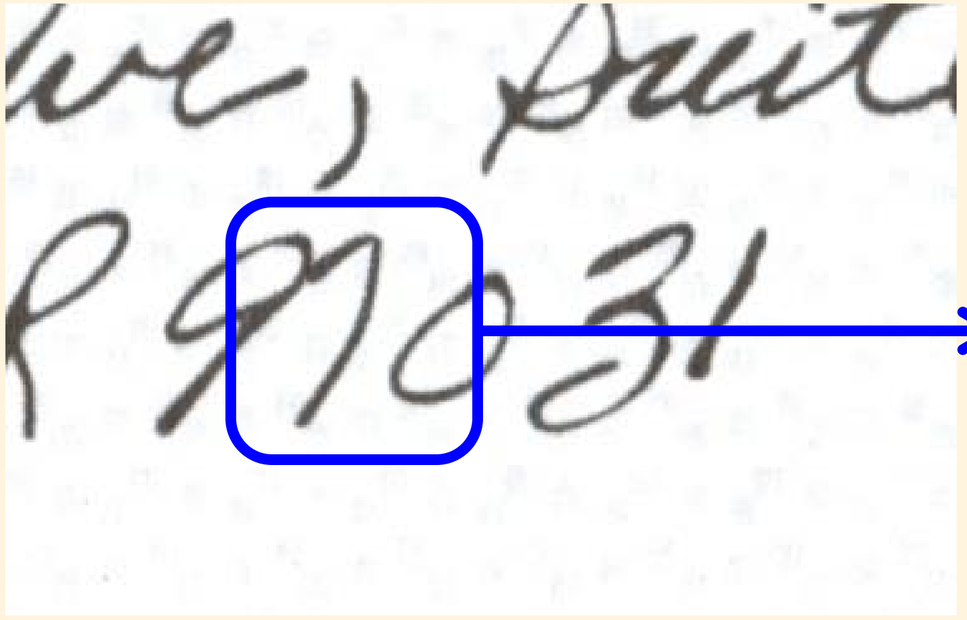

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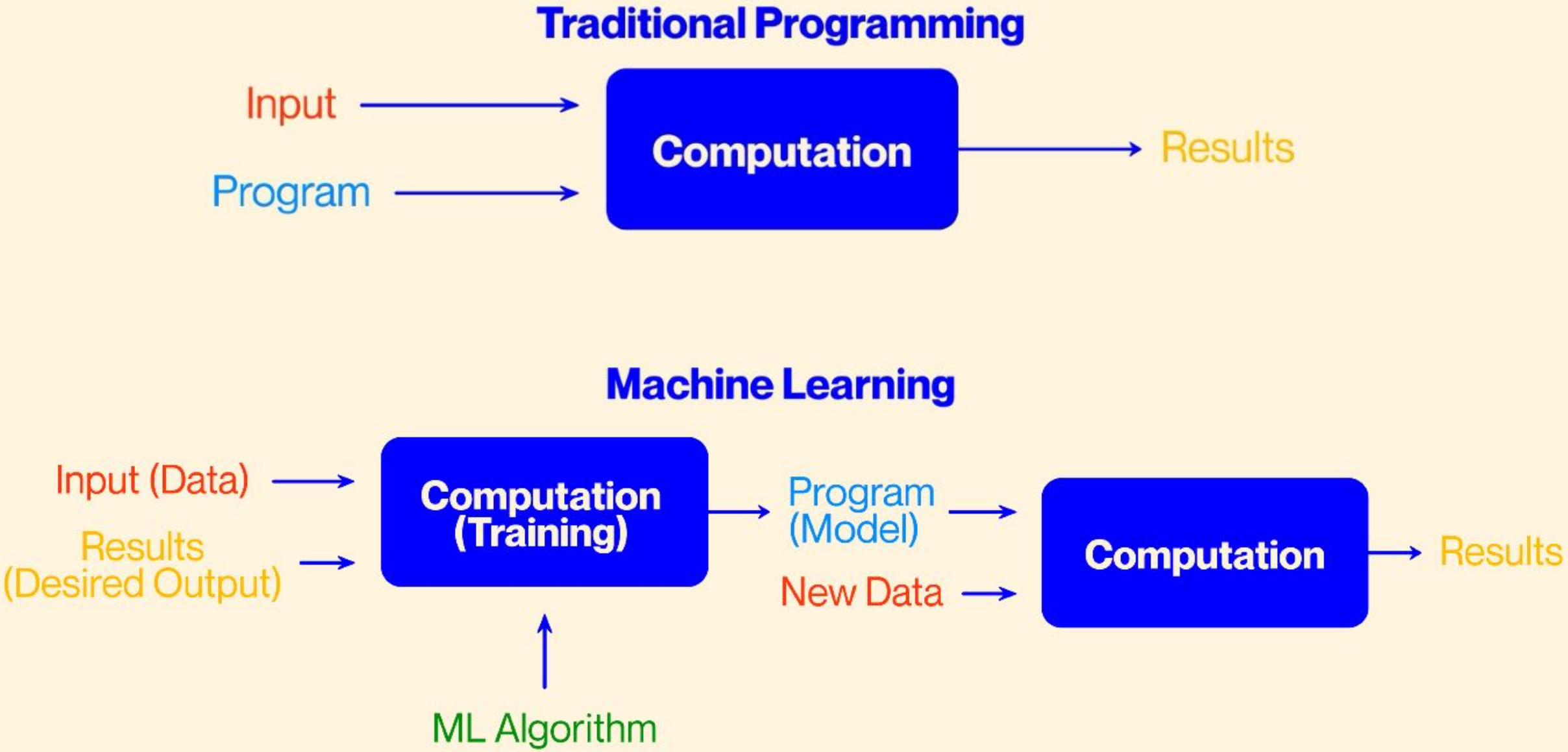
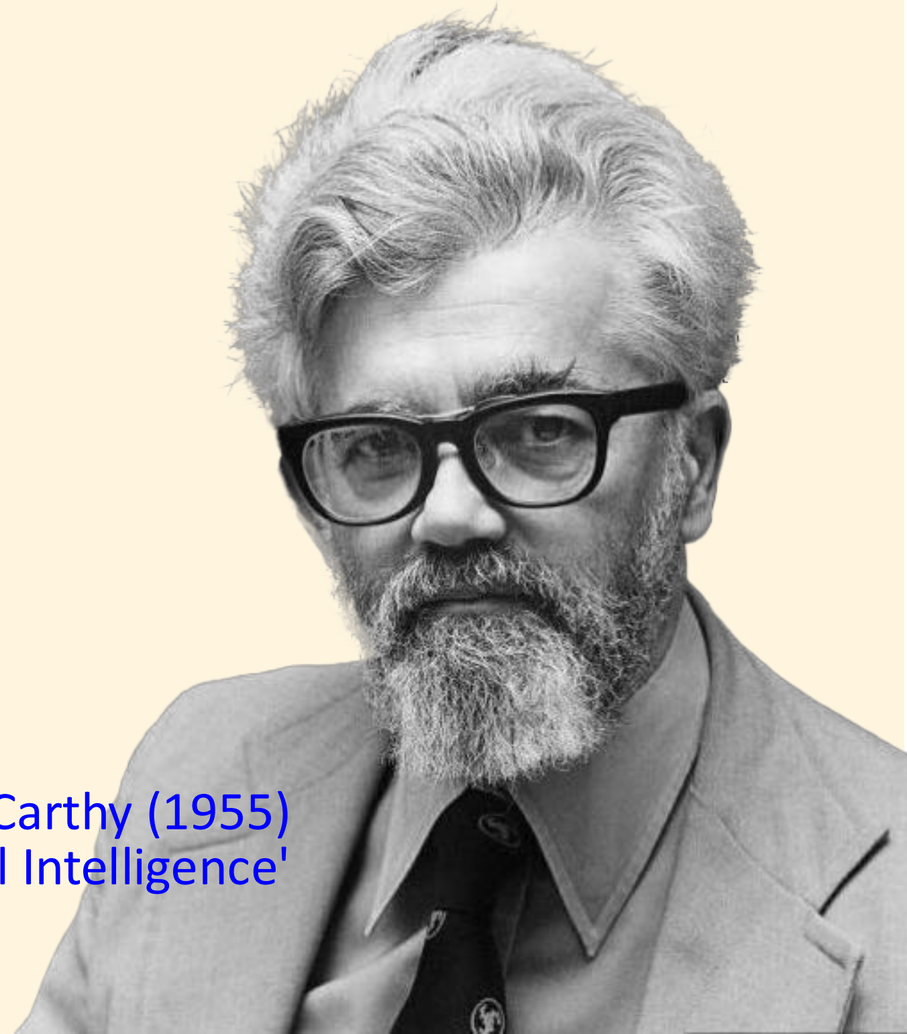

Traditional Programming
Input
Program
Computation
Results
Machine Learning
Input (Data)
Results
(Desired Output)
Computation
(Training)
Program
(Model)
New Data
Computation
Results
ML Algorithm

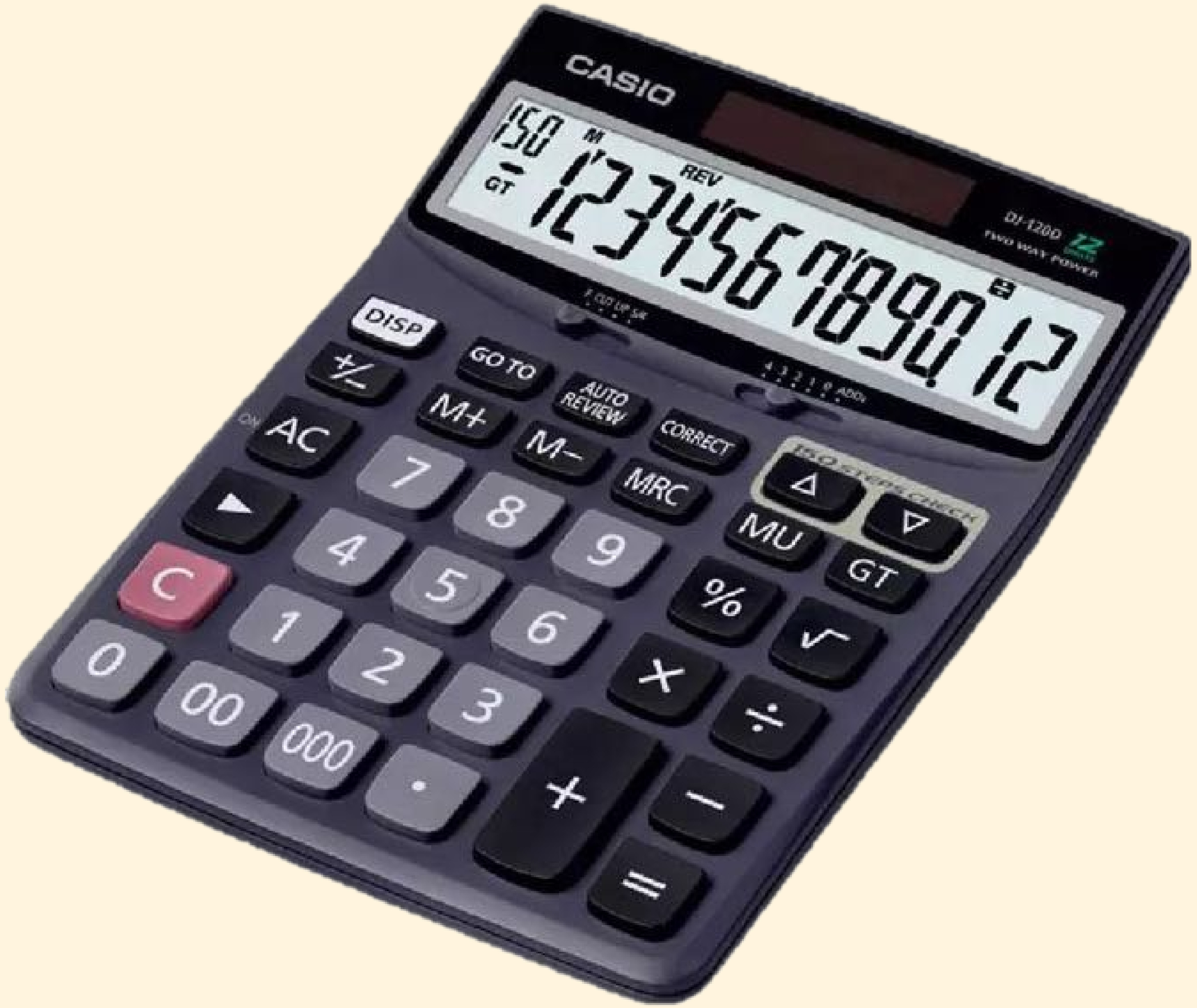
The Definition of AI

> Making a machine behave in ways that would be called intelligent if a human were so behaving.



John McCarthy (1955)
coined the term 'Artificial Intelligence'


AI
≠
Machine Learning


CASIO
REV
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DISP
GO TO
AUTO REVIEW
CORRECT
AC
M+
M−
MRC
MU
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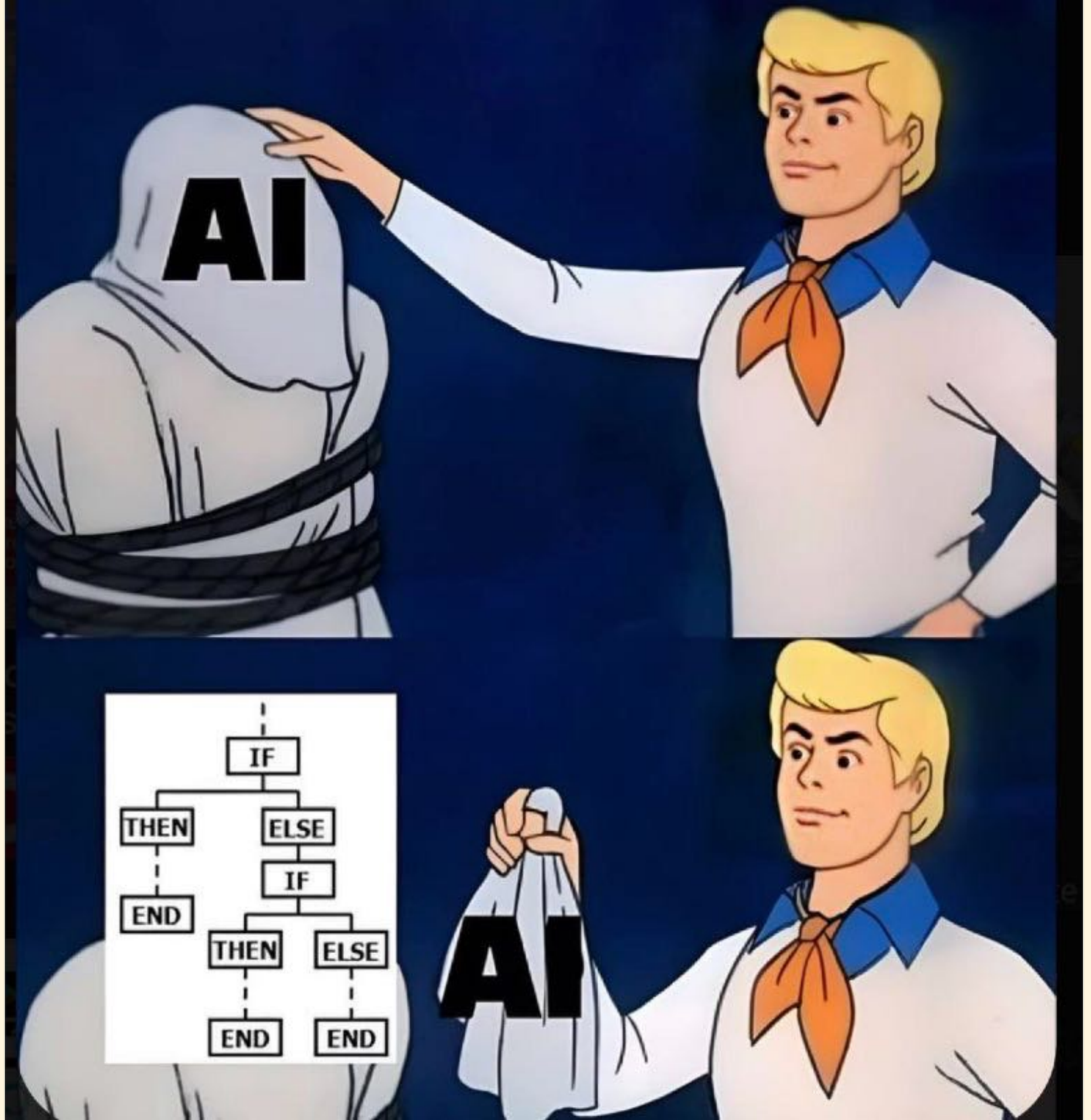
Would you call a calculator an AI tool?

ⓘ Start presenting to display the poll results on this slide.

> It is not matter producing material effects, but matter which thinks, reflects, reasons, calculates, and executes all the most difficult and complicated arithmetical operations with a rapidity and infallibility which defies all the calculators in the world.

The Gentleman's Magazine (1857)


AI
IF
THEN
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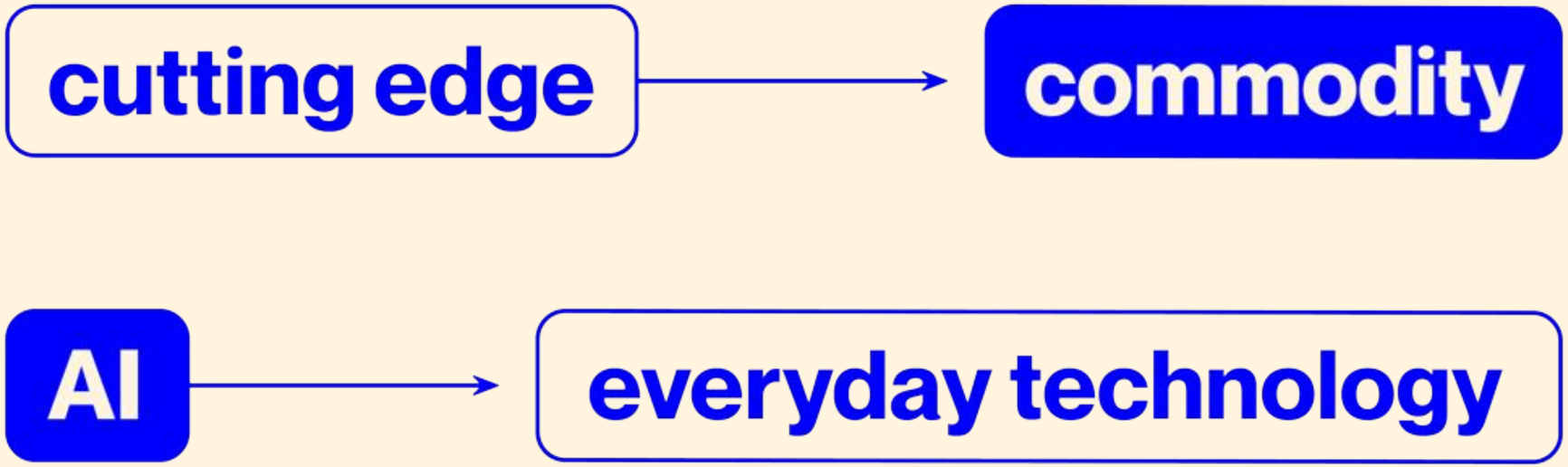
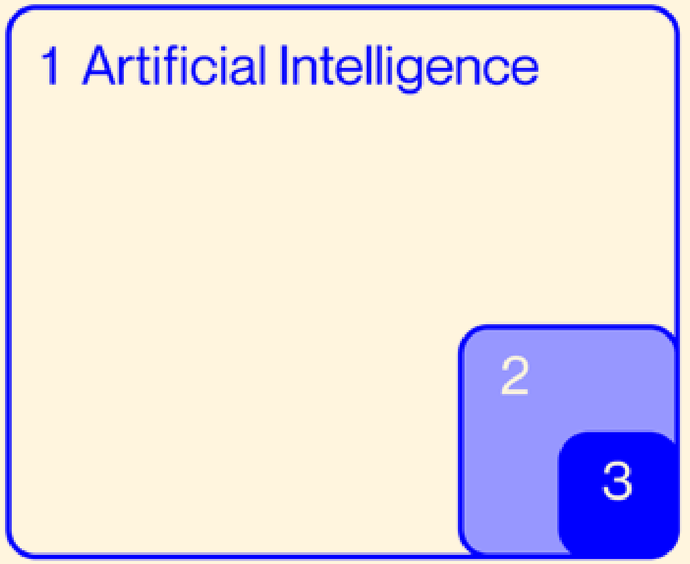
END
AI

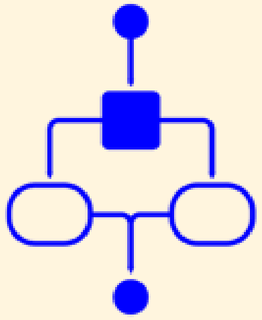
The AI Effect



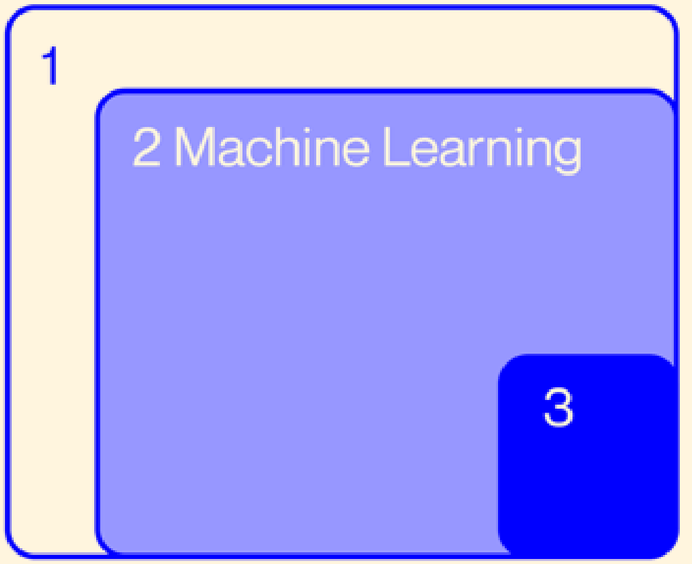
1950s - 1980s



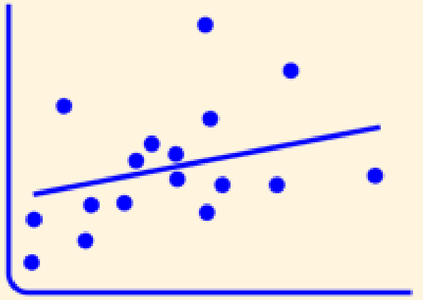
Rule-based



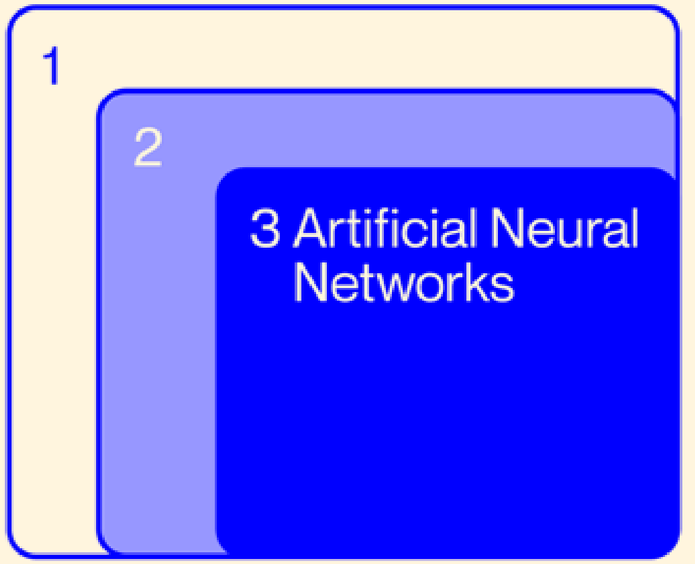
1990s - 2000s



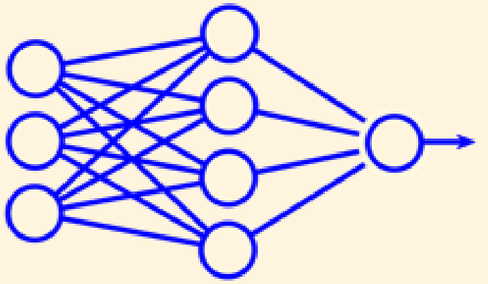
Statistics/Curve Fitting



since 2010s



Deep Learning

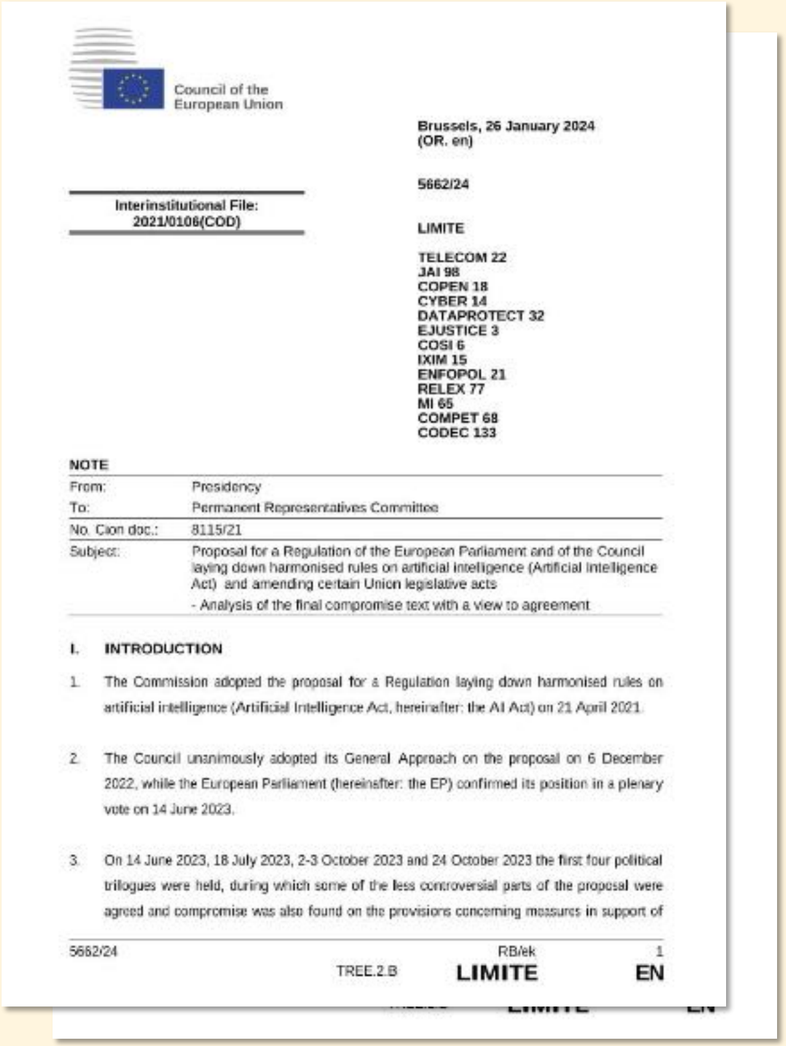


a machine-based system designed to operate with varying levels of autonomy

and that may exhibit adaptiveness after deployment and that, for explicit or implicit objectives, infers, from the input it receives,

how to generate outputs such as predictions, content, recommendations, or decisions

that can influence physical or virtual environments



Council of the European Union

Brussels, 26 January 2024
(OR. en)

5662/24

Interinstitutional File:
2021/0106(COD)

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CYBER 14
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EJUSTICE 3
COSI 6
IXIM 15
ENFOPOL 21
RELEX 77
MI 65
COMPET 68
CODEC 133

NOTE

From:	Presidency
To:	Permanent Representatives Committee
No. Cion doc.:	8115/21
Subject:	Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts - Analysis of the final compromise text with a view to agreement

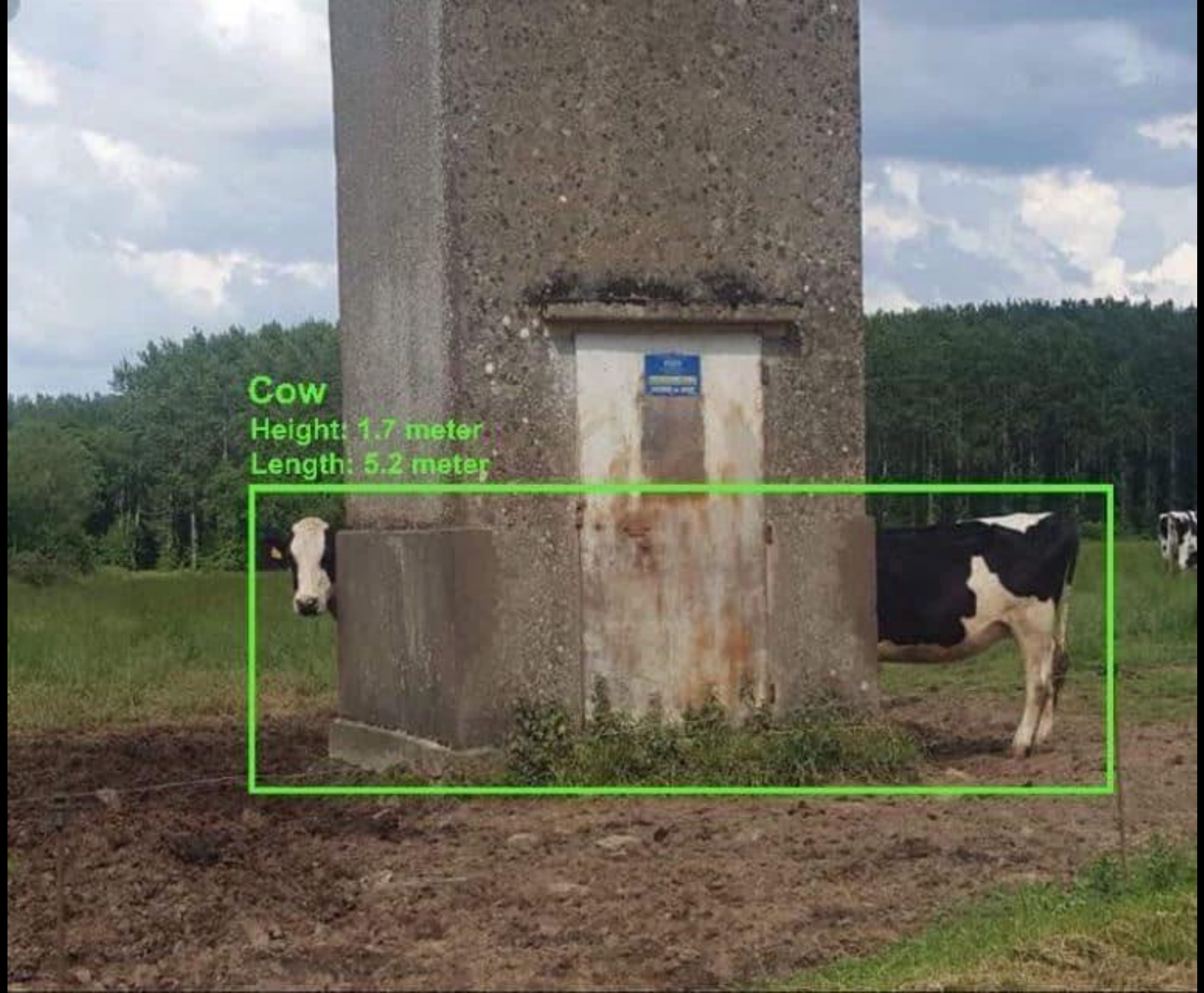
I. INTRODUCTION

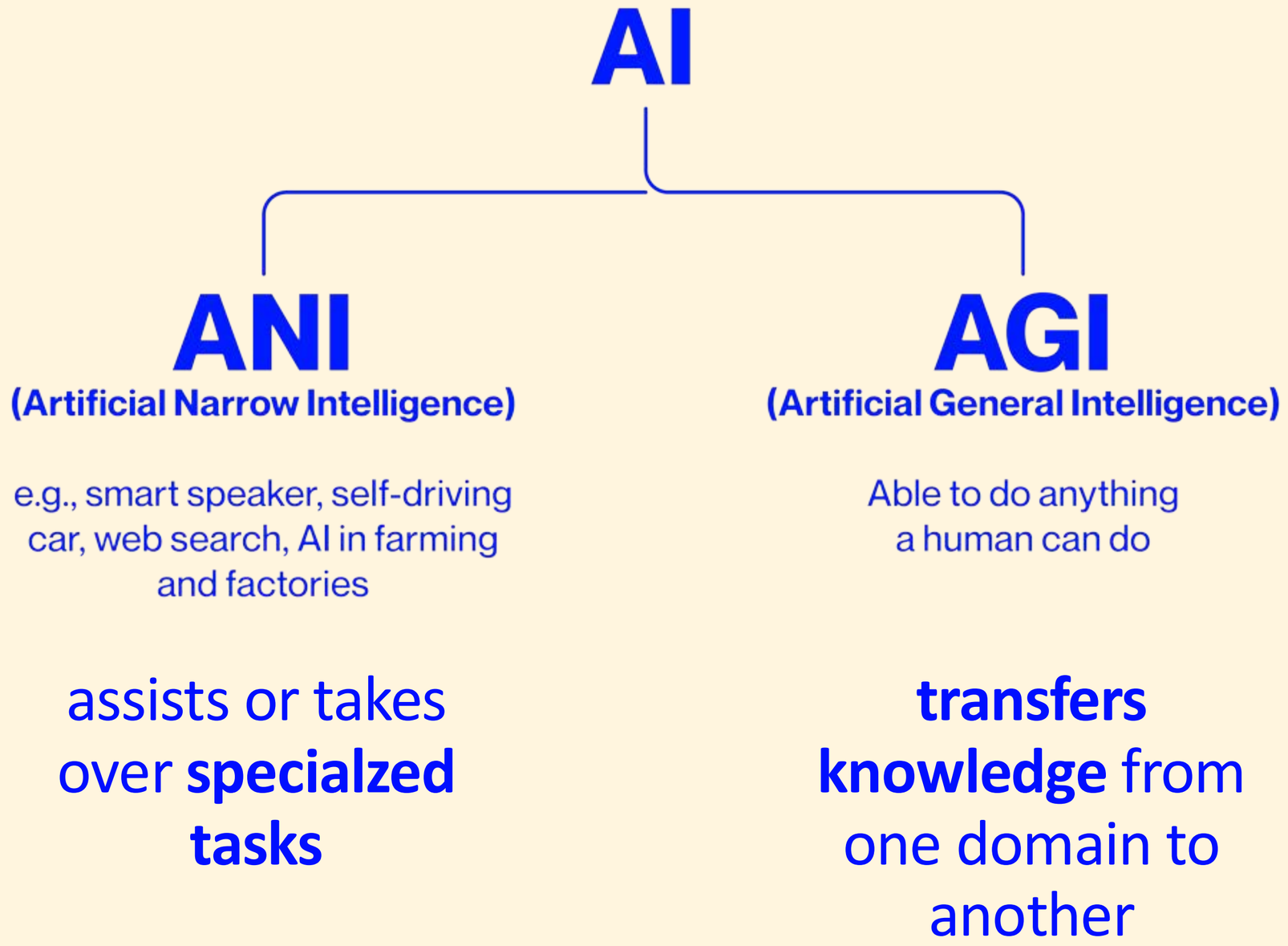
1. The Commission adopted the proposal for a Regulation laying down harmonised rules on artificial intelligence (Artificial Intelligence Act, hereinafter: the AI Act) on 21 April 2021.

2. The Council unanimously adopted its General Approach on the proposal on 6 December 2022, while the European Parliament (hereinafter: the EP) confirmed its position in a plenary vote on 14 June 2023.

3. On 14 June 2023, 18 July 2023, 2-3 October 2023 and 24 October 2023 the first four political trilogues were held, during which some of the less controversial parts of the proposal were agreed and compromise was also found on the provisions concerning measures in support of

Artificial Intelligence = Intelligence ?

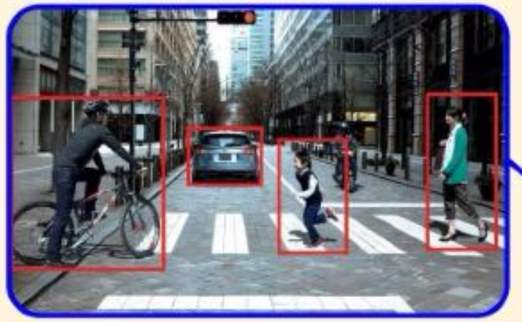

Cow
Height: 1.7 meter
Length: 5.2 meter



assists or takes over **specialzed tasks**

transfers knowledge from one domain to another

detecting people



detecting traffic signs

detecting traffic

other ...

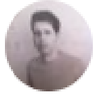
Sam Altman

@sama · **Follow**

ChatGPT is incredibly limited, but good enough at some things to create a misleading impression of greatness.

it's a mistake to be relying on it for anything important right now. it’s a preview of progress; we have lots of work to do on robustness and truthfulness.

1:11 AM · Dec 11, 2022



Read the full conversation on Twitter

28.6K **Reply** **Share**

Read 914 replies

The GenAI Revolution

Google DeepMind

Google DeepMind CEO: AGI is Coming ‘in a Few Years’

The accelerated pace of AI advancements made Demis Hassabis believe AGI will arrive much sooner than expected.

“We could be just a few years, maybe within a decade, away” to AGI, said Google DeepMind CEO Demis Hassabis, at The Wall Street Journal’s Future of Everything Festival. “The progress in the last few years has been pretty incredible. … I don’t see any reason why that progress is going to slow down. I think it may even accelerate.”

BUSINESS INSIDER APRIL 18 2023

ELON MUSK, WHO CO-FOUNDED OPENAI, SAYS HE TRIED TO MAKE IT 'THE FURTHEST THING FROM GOOGLE' AFTER DISAGREEING WITH LARRY PAGE OVER AI SAFETY

In a monday interview with Tucker Carlson, Elon Musk said "the reason Open AI exist at all" is because of a disagreement with Goo-

OpenAI researchers warned board of AI breakthrough ahead of CEO ouster, sources say

Some at OpenAI believe Q* (pronounced Q-Star) could be a breakthrough in the startup's search for what's known as artificial general intelligence (AGI), one of the people told Reuters. OpenAI defines AGI as autonomous systems that surpass humans in most economically valuable tasks.

OpenAI

Sparks of Artificial General Intelligence: Early experiments with GPT-4

Sébastien Bubeck Varun Chandrasekaran Ronen Eldan Johannes Gehrke
Eric Horvitz Ece Kamar Peter Lee Yin Tat Lee Yuanzhi Li Scott Lundberg
Harsha Nori Hamid Palangi Marco Tulio Ribeiro Yi Zhang

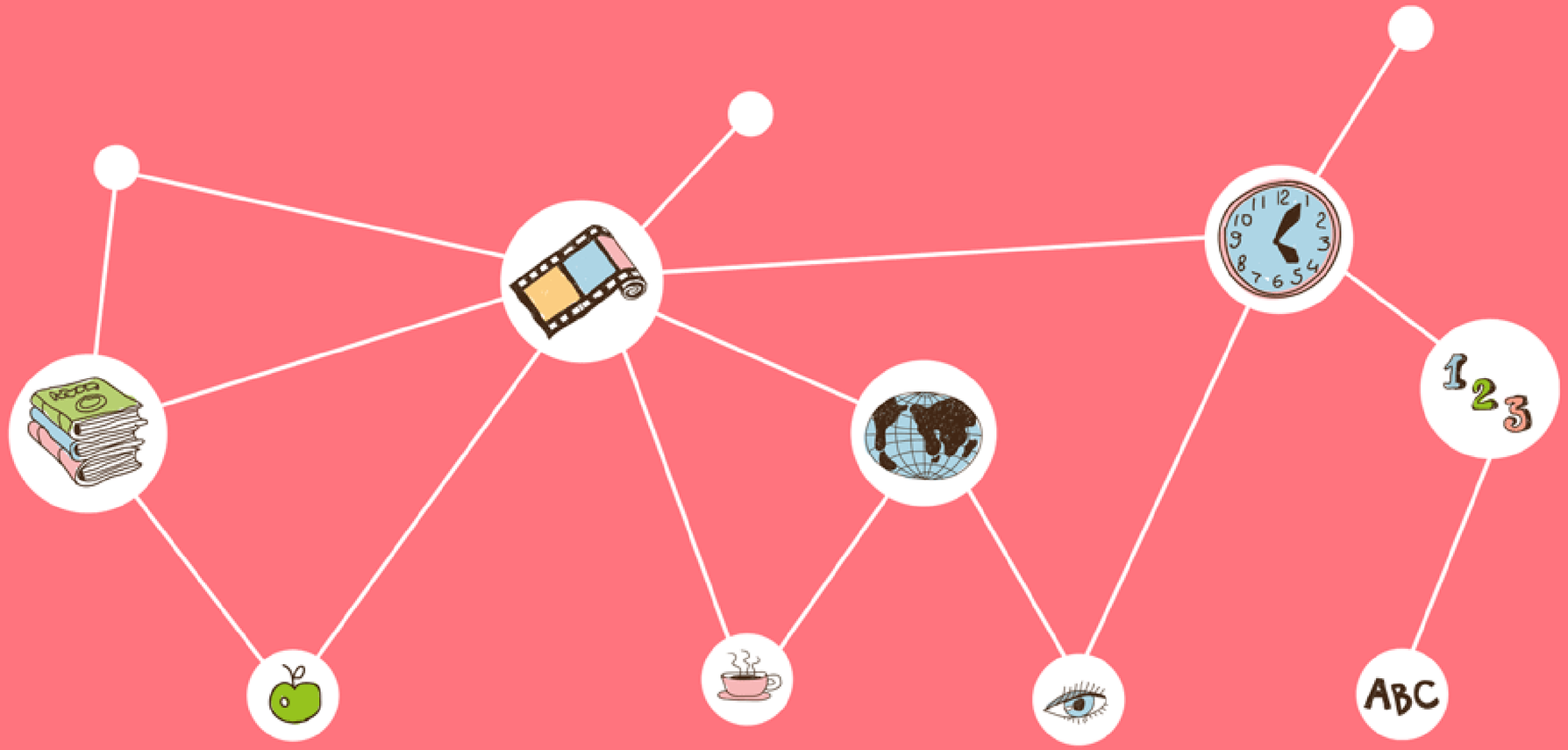
Microsoft Research

Abstract

Artificial intelligence (AI) researchers have been developing and refining large language models (LLMs) that exhibit remarkable capabilities across a variety of domains and tasks, challenging our understanding of learning and cognition. The latest model developed by OpenAI, GPT-4 [Ope23], was trained using an unprecedented scale of compute and data. In this paper, we report on our investigation of an early version of GPT-4, when it was still in active development by OpenAI. We contend that (this early version of) GPT-4 is part of a new cohort of LLMs (along with ChatGPT and Google's PaLM for example) that exhibit more general intelligence than previous AI models. We discuss the rising capabilities and implications of these models. We demonstrate that, beyond its mastery of language, GPT-4 can solve novel and difficult tasks that span mathematics, coding, vision, medicine, law, psychology and more, without needing any special prompting. Moreover, in all of these tasks, GPT-4's performance is strikingly close to human-level performance, and often vastly surpasses prior models such as ChatGPT. Given the breadth and depth of GPT-4's capabilities, we believe that it could reasonably be viewed as an early (yet still incomplete) version of an artificial general intelligence (AGI) system. In our exploration of GPT-4, we put special emphasis on discovering its limitations, and we discuss the challenges ahead for advancing towards deeper and more comprehensive versions of AGI, including the possible need for pursuing a new paradigm that moves beyond next-word prediction. We conclude with reflections on societal influences of the recent technological leap and future research directions.

Performance (columns) **Generality** (rows)	**Level 0: No AI**	**Level 1: Emerging** *equal to or somewhat better than unskilled human*	**Level 2: Competent** *at least 50th percentile of skilled adults*	**Level 3: Expert** *at least 90th percentile of skilled adults*	**Level 4: Virtuoso** *at least 99th percentile of skilled adults*	**Level 5: Superhuman** *outperforms 100% of humans*
Narrow clearly scoped task or set of tasks	**Narrow Non-AI** calulator Software; compiler	**Emerging Narrow AI** GOFIA; simple rule-based systems, eg. SHRDLU	**Competent narrow AI** Toxicity detectors such as Jigsaw; smart Speakers such as *Siri*, *Alexa* or *Google Assistant*; VQA Systems such as *PaLI, Watson;* SOTA LLMs for a subset of tasks (short essay writing, simple coding)	**Expert Narrow AI** spelling & grammar checkers like *Grammarly*; generative image models like *Imagen* or *Dall-2*	**Virtuoso Narrow AI** *Deep Blue, AlphaGO*	**Superhuman Narrow AI** *AlphaFold, AlphaZero, StockFish*
General Wide range of non-physical tasks, including metacognitive abilities like learning new skills	**General Non-AI** human-in-the-loop computing, e.g. Amazon Mechanical Turk	**Emerging AGI** Chat GPT, Bard, Llama 2	**Competent AGI** not yet achieved	**Expert AGI** not yet achieved	**Virtuoso AGI** not yet achieved	**Virtuoso AGI** not yet achieved

Human does everything → **Fully Autonomous AI**


ABC

Elon Reeve Musk is an entrepreneur and business magnate. He is the founder of Tesla Inc. Musk is one of the richest people in the world. Musk was raised in pretoria, South Africa.

Elon Reeve Musk is an (???) and business magnate. He is the founder of Tesla Inc. → Entrepreneur

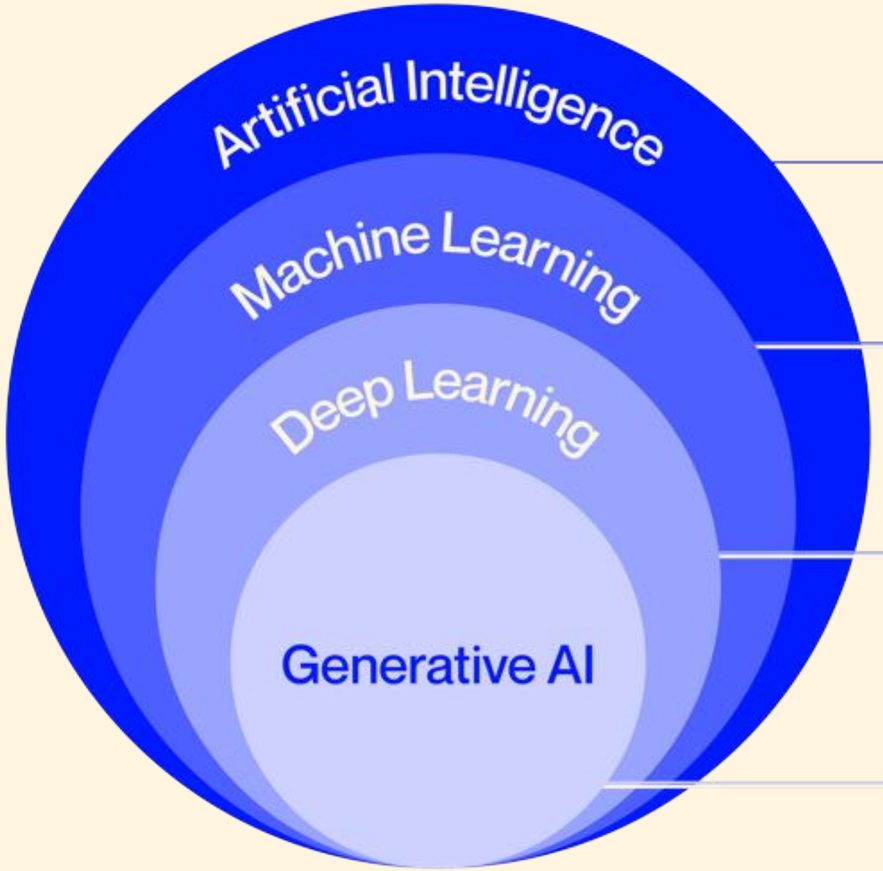
Musk is one of the richest people in the (???). → world

Musk was raised in Pretoria, (???). → South Africa

At its simplest, the model's aim is now to predict the next word in a sequence and do this repeatedly until the output is complete.

The best thing about AI is its ability to	**learn**	4.5%
	predict	3.5%
	make	3.2%
	understand	3.1%
	do	2.9%

Generative AI



Solves tasks by enabling computer to mimic human behavior

Learn → Analyze → Predict

Trains machine to solve a specific AI Problem

Data → Statistics and Math Algorithms → Prediction

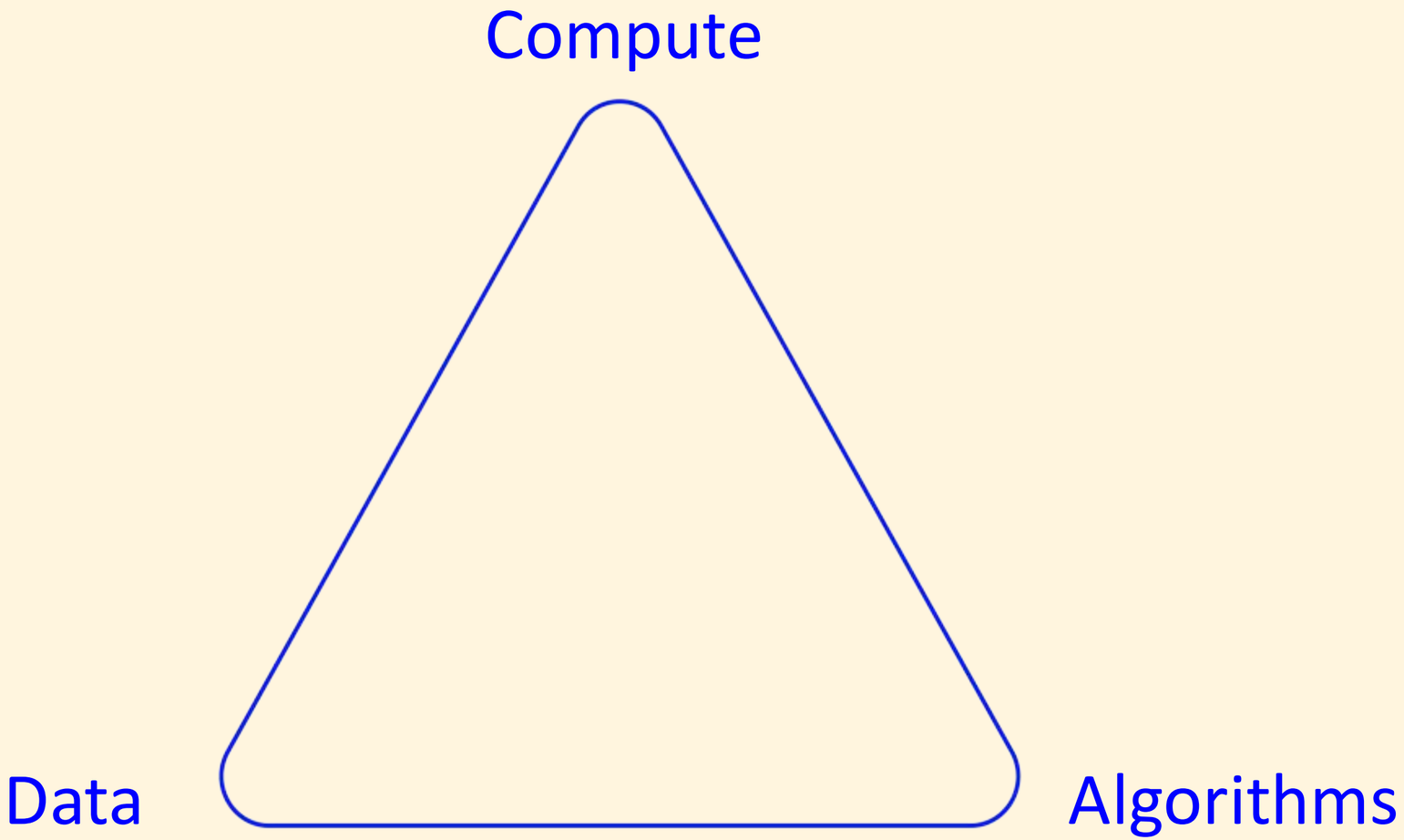
Uses neural networks to solve an AI Problem

Data → Neural Networks → Prediction

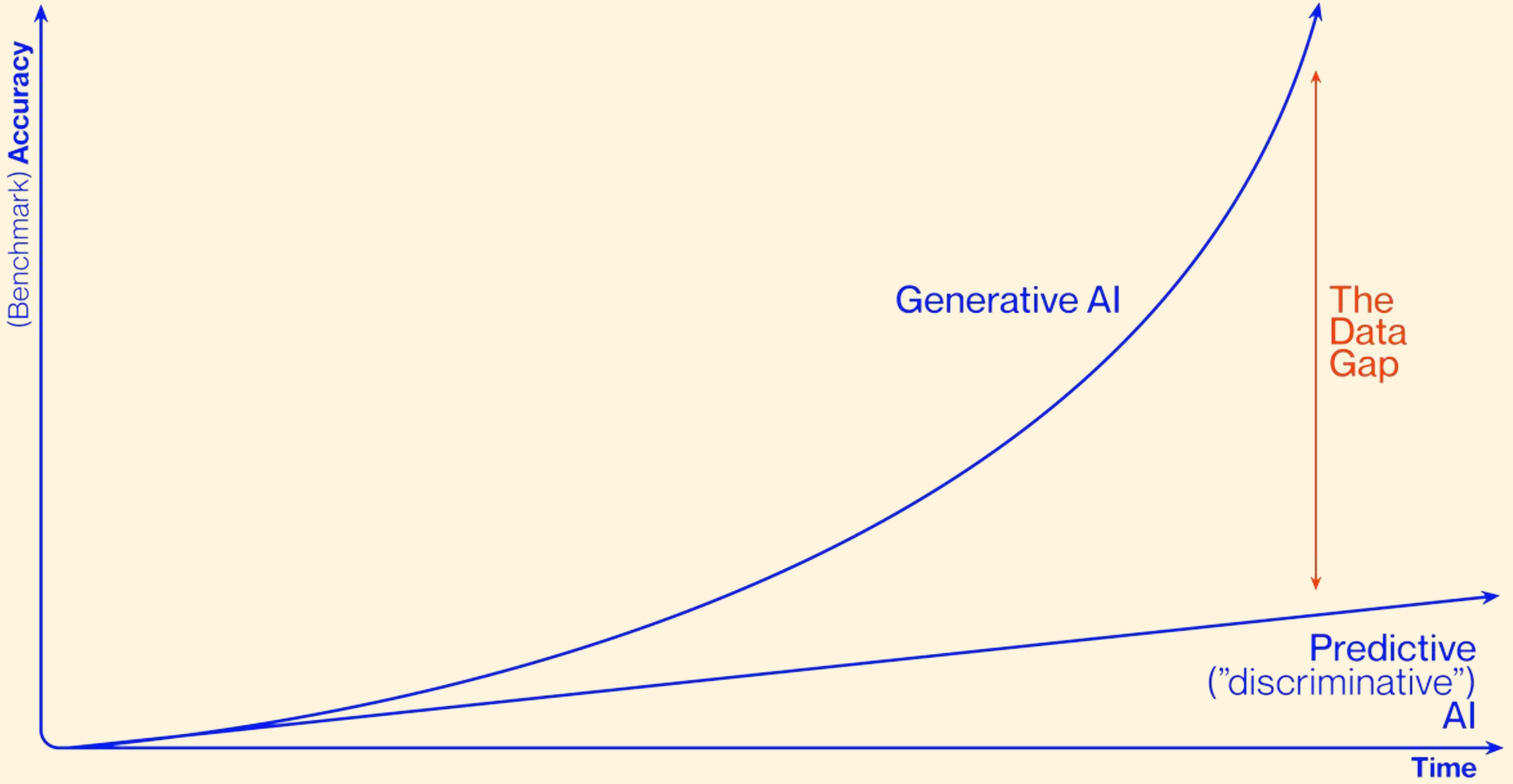
Learns patterns and trends from the training data using neural networks. Understands the context to create new content that mimics human generated content

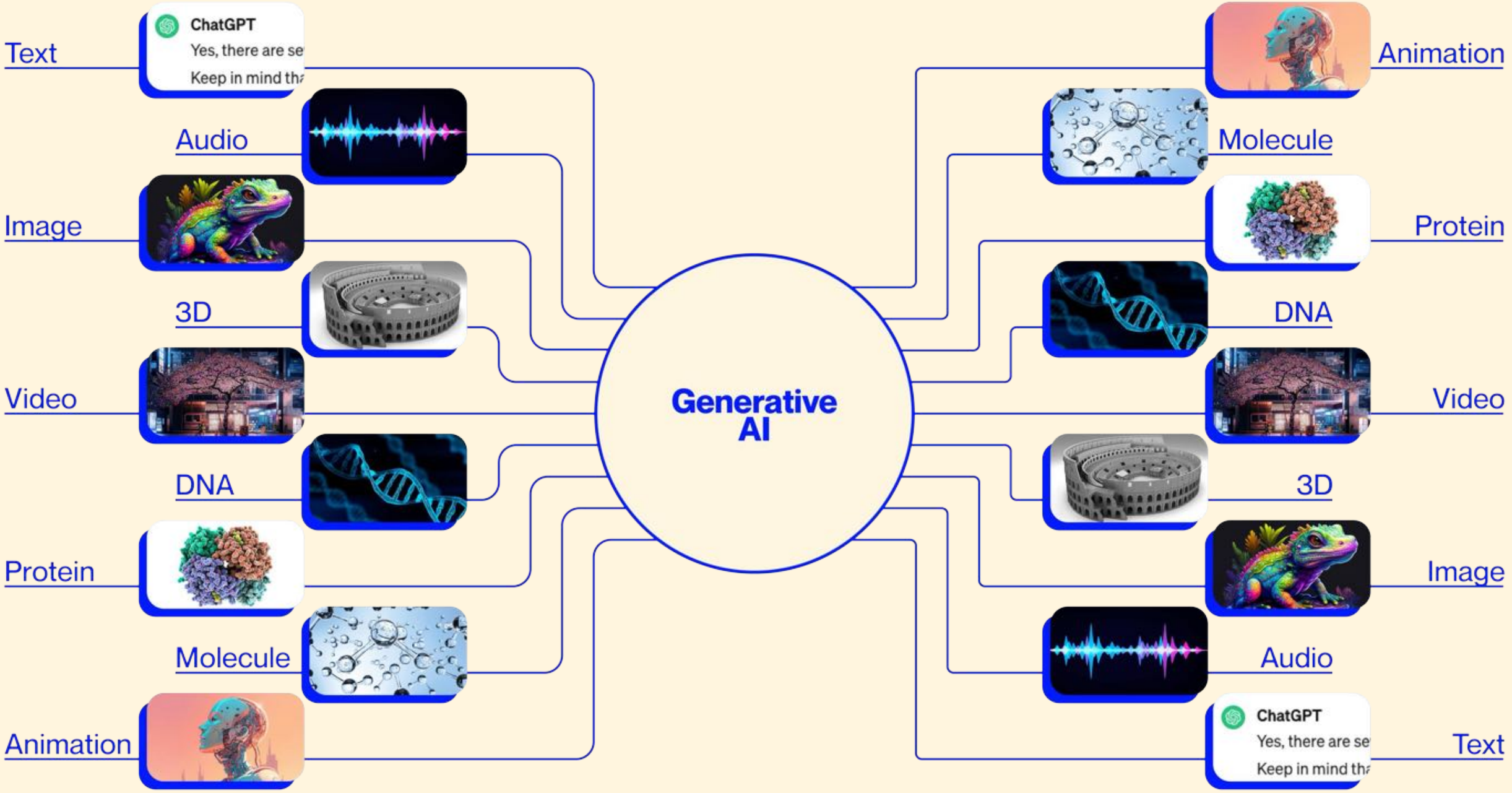
Training Data (a large dataset) → Neural Networks → understand context and generate new and unique content

Prerequisites for AI



The Data Gap


(Benchmark) Accuracy
Generative AI
The Data Gap
Predictive ("discriminative") AI
Time


Text
ChatGPT
Yes, there are se
Keep in mind tha
Audio
Image
3D
Video
DNA
Protein
Molecule
Animation
Generative AI
Animation
Molecule
Protein
DNA
Video
3D
Image
Audio
ChatGPT
Yes, there are se
Keep in mind tha
Text

Linas Beliūnas
@linas.beliunas

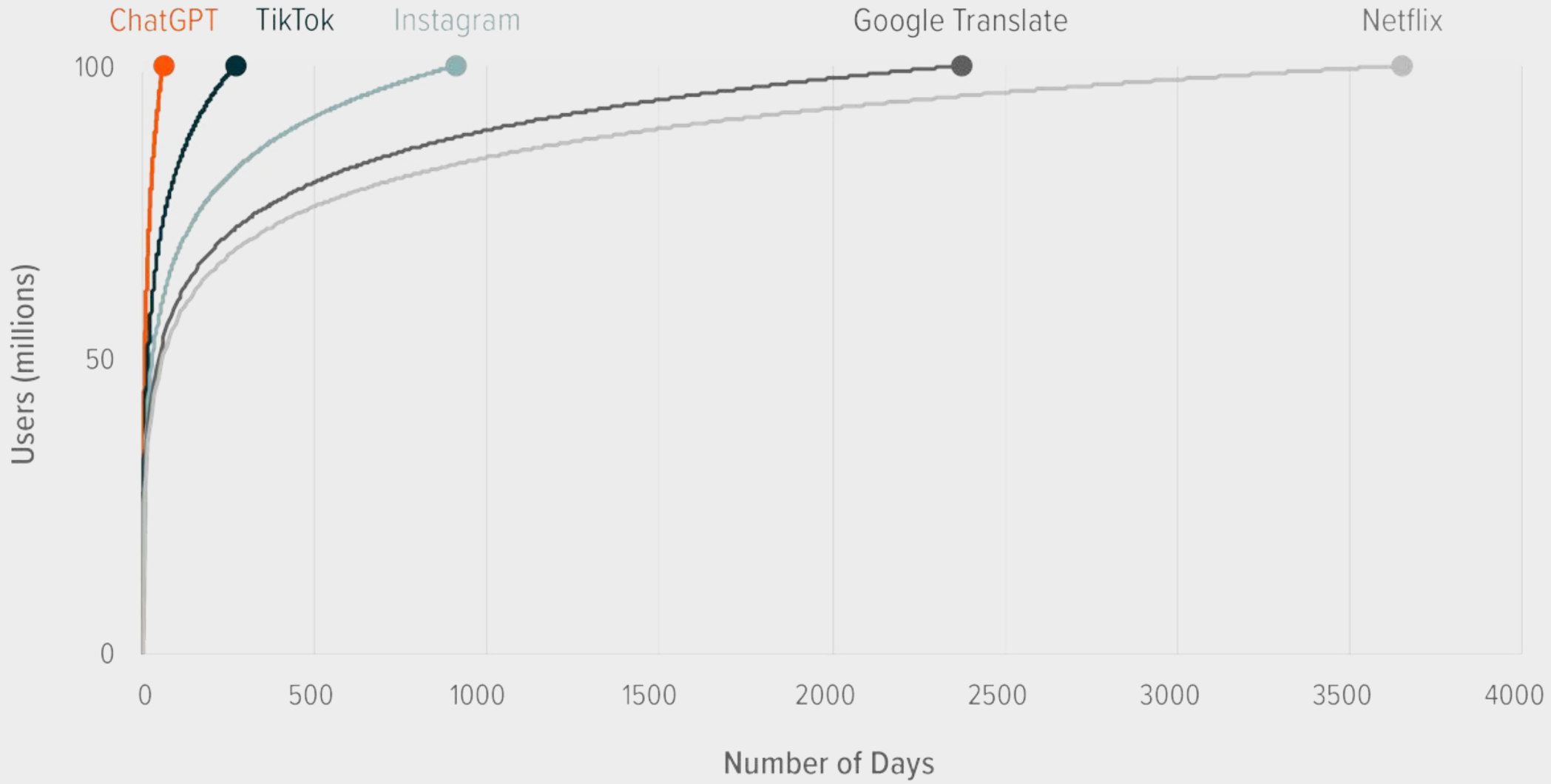
Time it took to reach **1 million users**:

Netflix - 3.5 years
Airbnb - 2.5 years
Facebook - 10 months
Spotify - 5 months
Instagram - 2.5 months
iPhone - 74 days
ChatGPT - 5 days

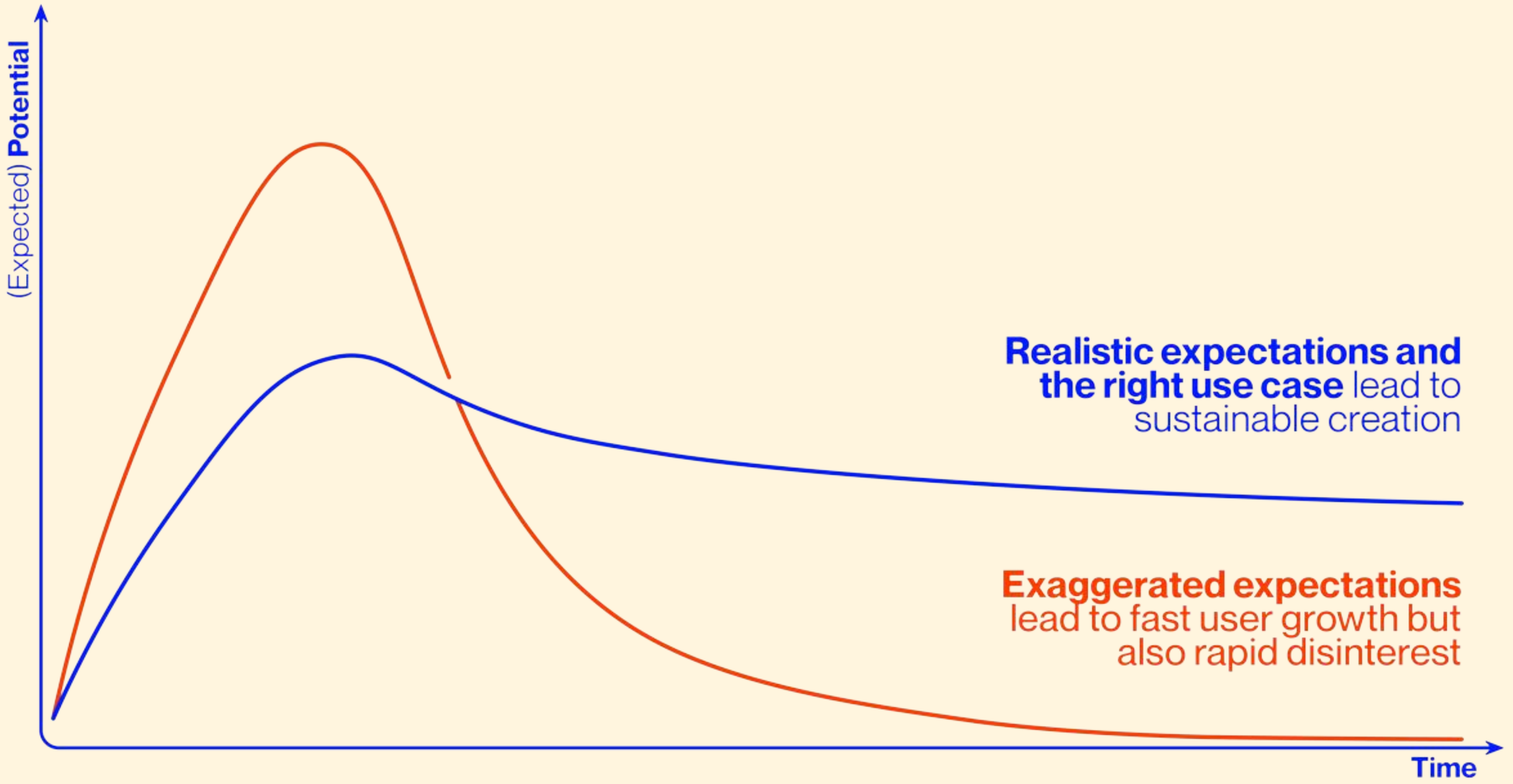
ChatGPT is one of those rare moments in technology that **will reshape everything** going forward.

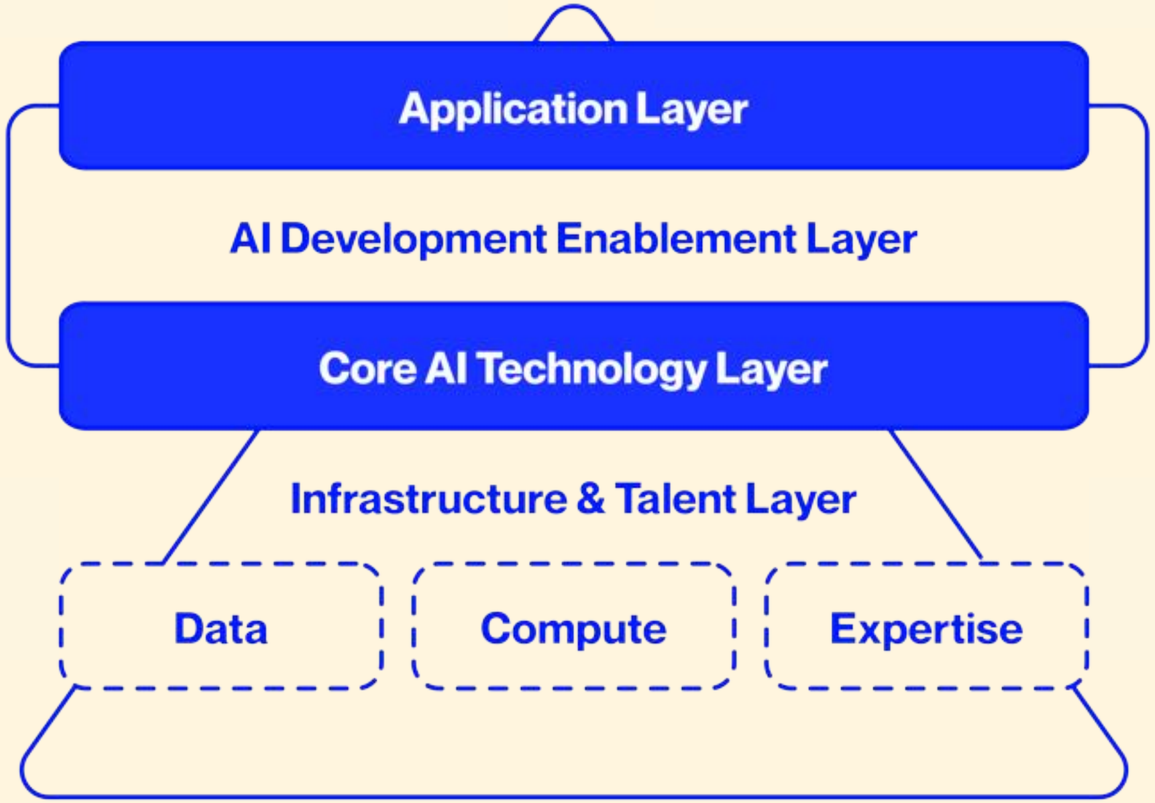
TIME IT TOOK COMPANIES TO REACH 100 MILLION USERS

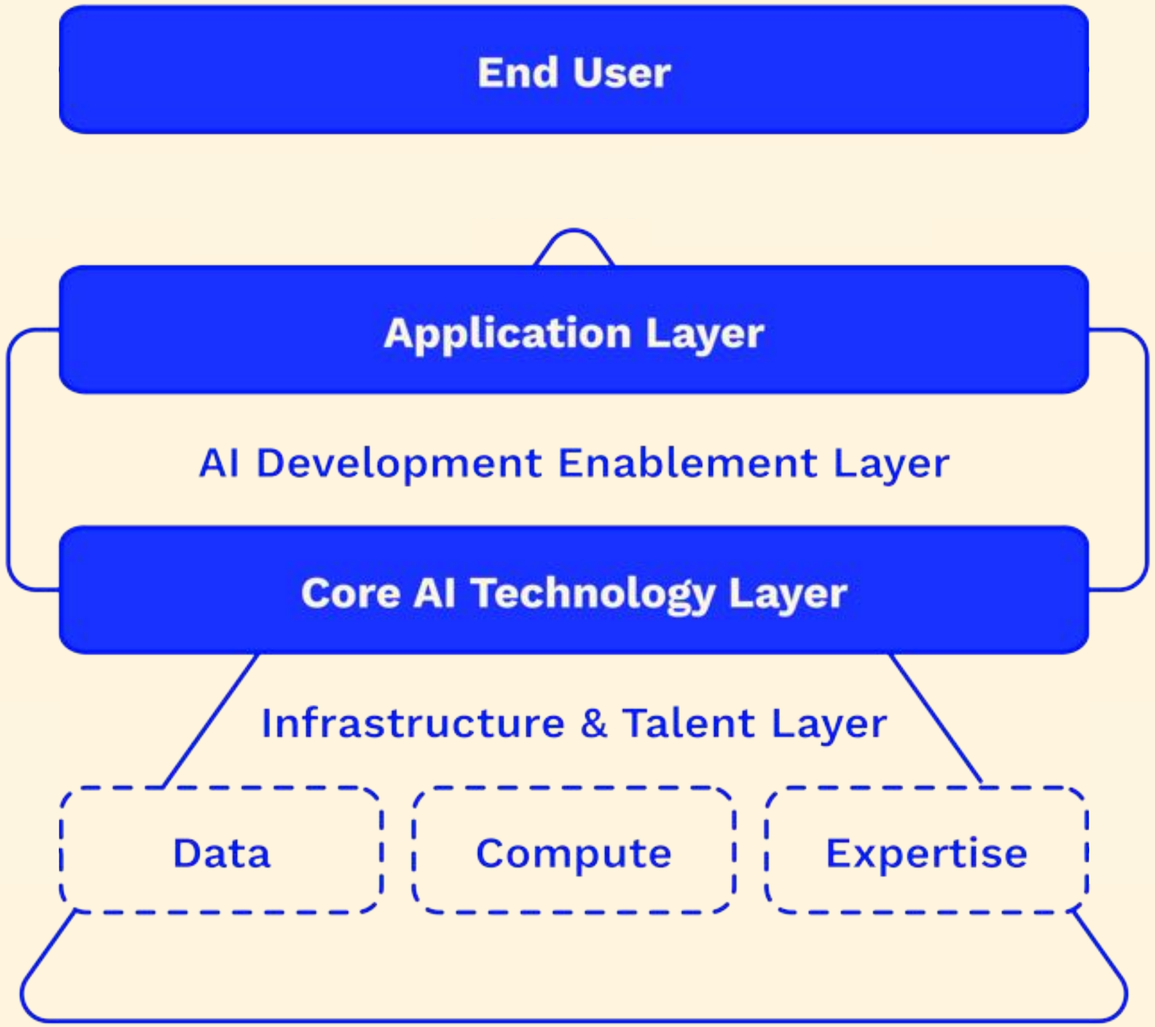
Sources: Global X ETFs with information derived from: BBC News. (2018, January 23). Netflix's history: From DVD rentals to streaming success; Cerullo, M. (2023, February 1). ChatGPT user base is growing faster than TikTok. CBS News.

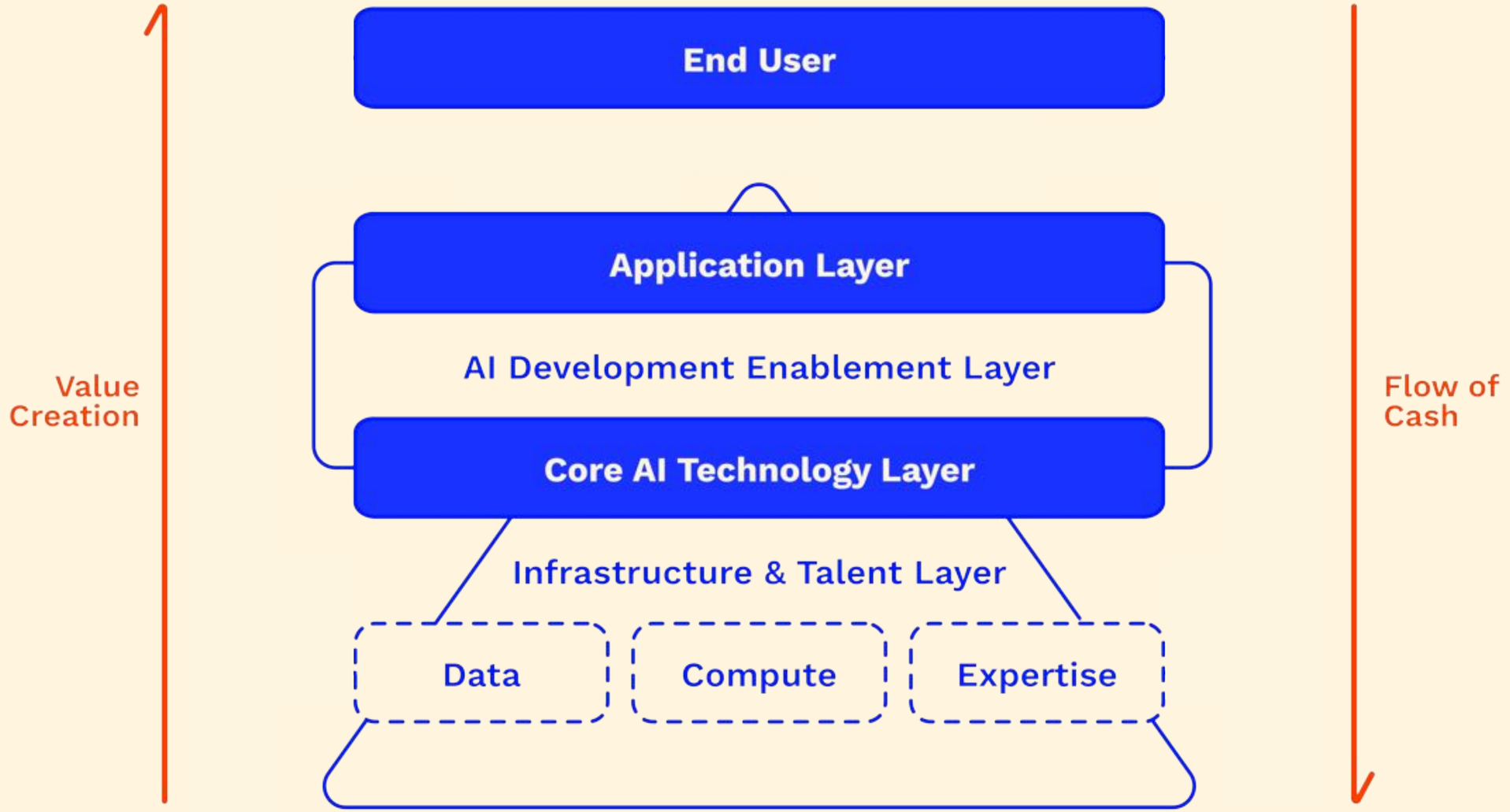


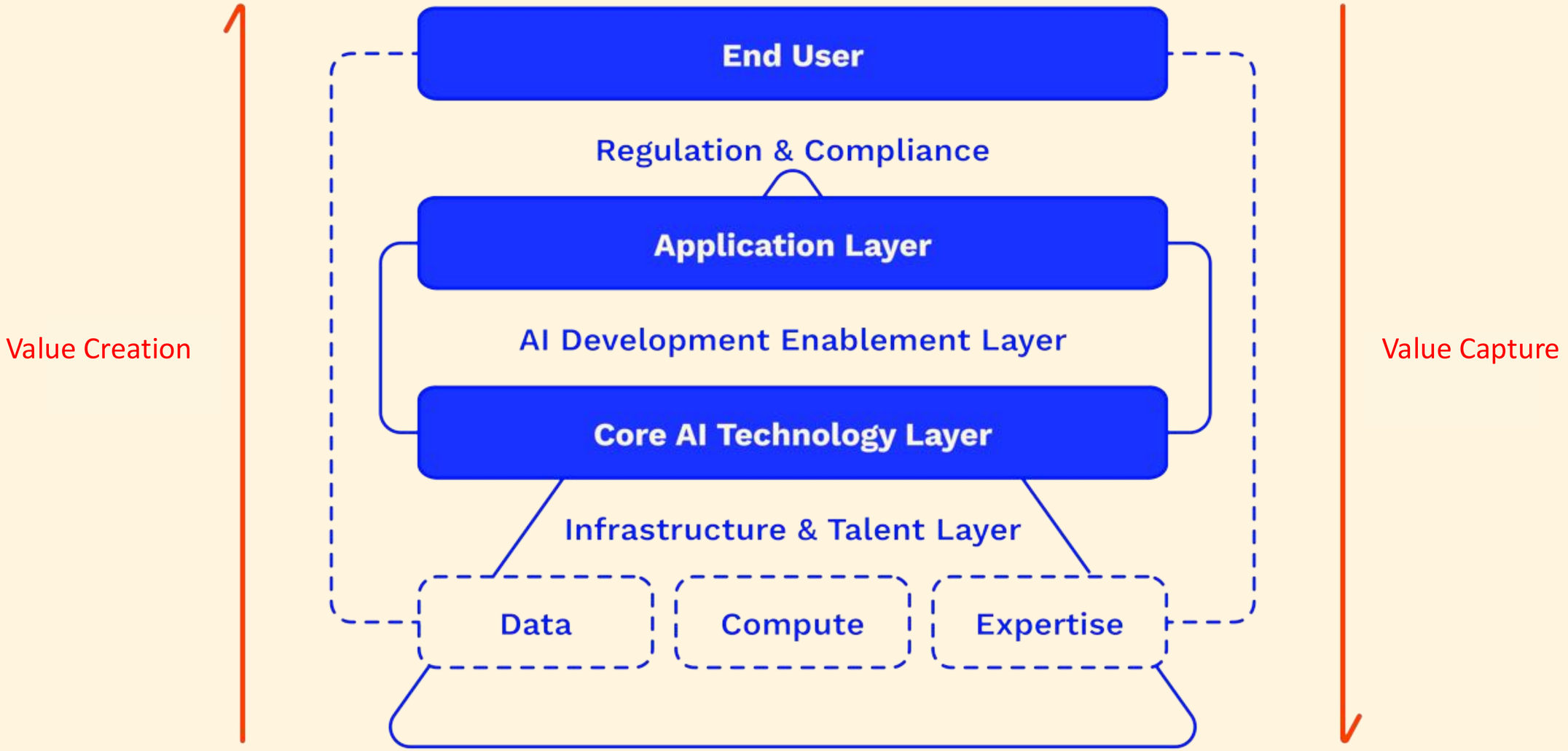
The GenAI Hype

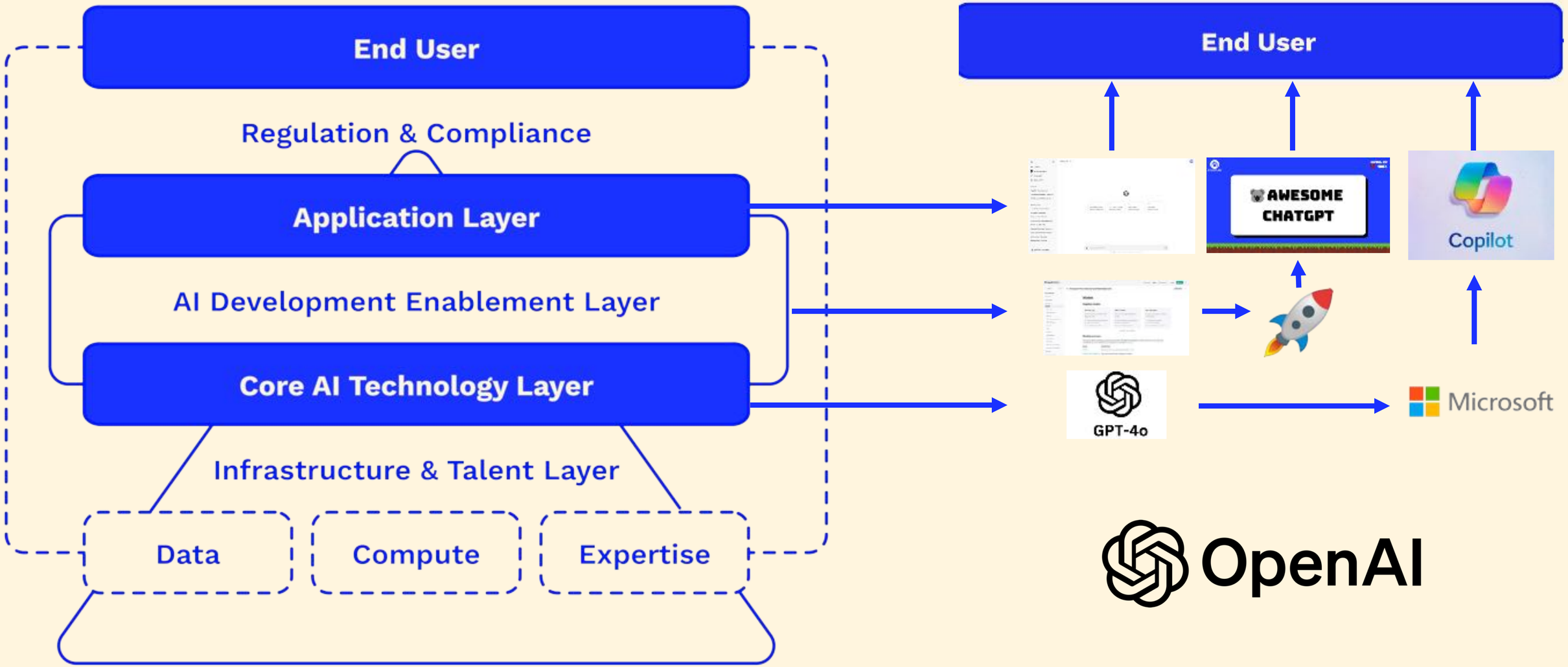



Application Layer
AI Development Enablement Layer
Core AI Technology Layer
Infrastructure & Talent Layer
Data
Compute
Expertise

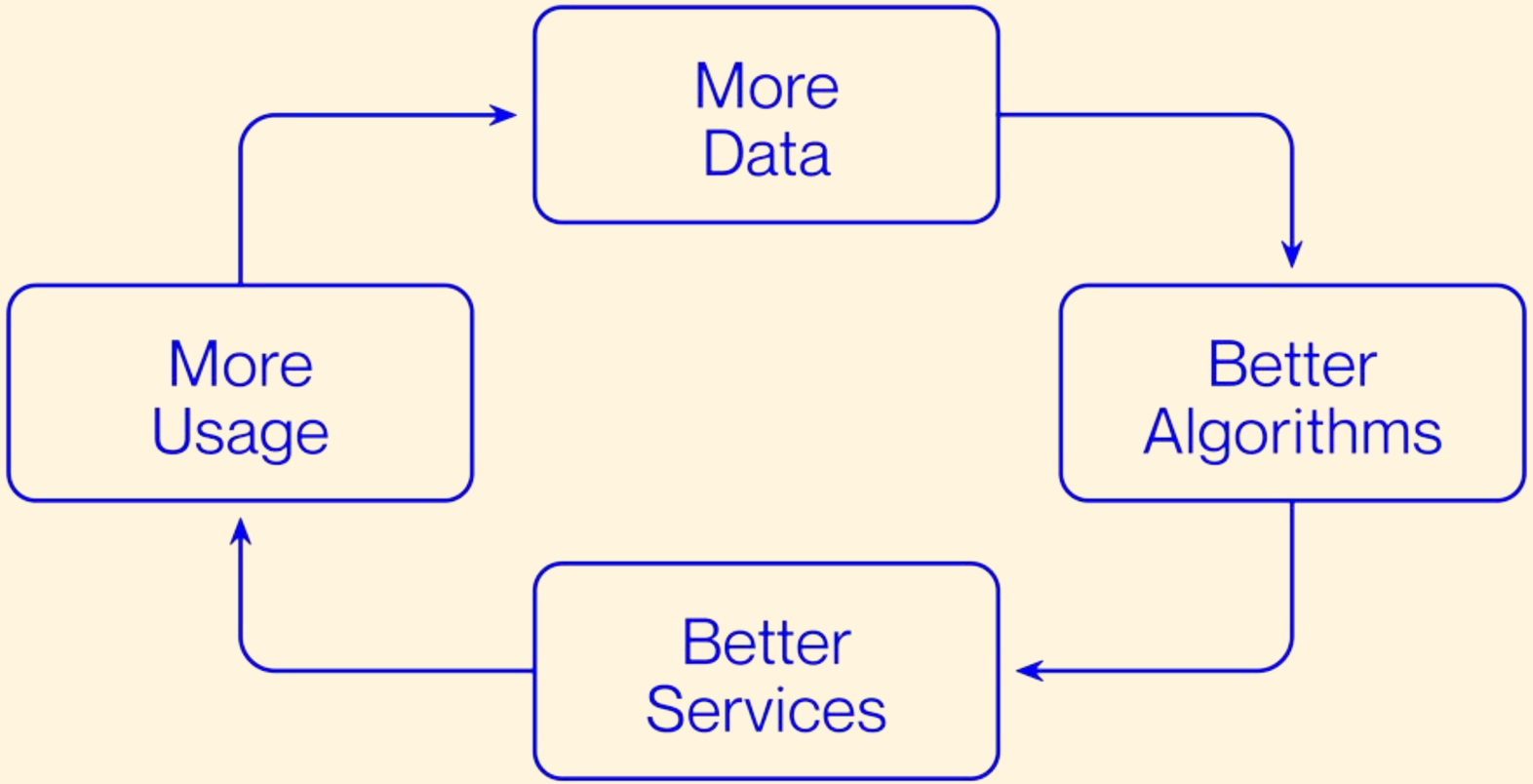

End User
Application Layer
AI Development Enablement Layer
Core AI Technology Layer
Infrastructure & Talent Layer
Data
Compute
Expertise

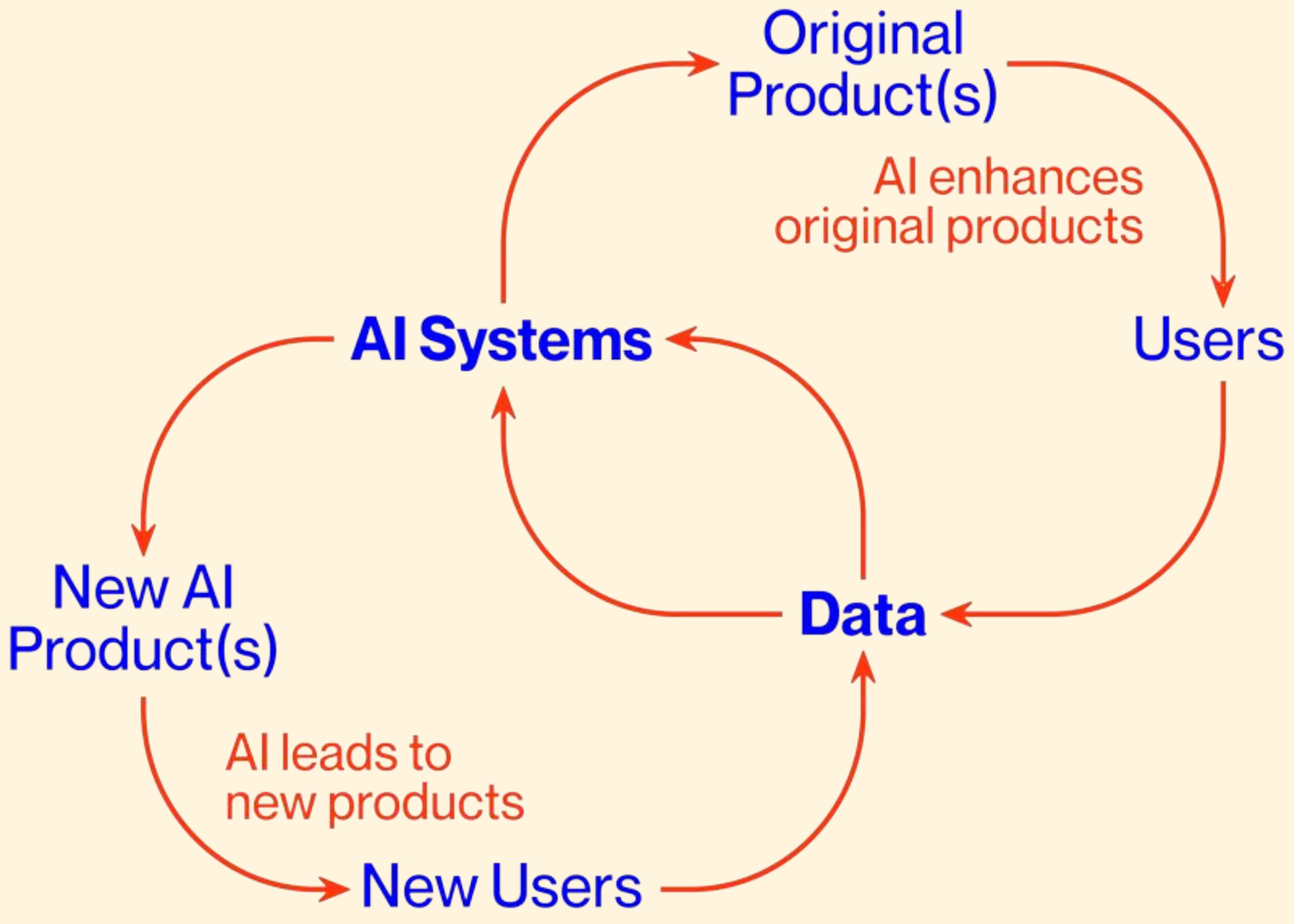

End User
Application Layer
AI Development Enablement Layer
Core AI Technology Layer
Infrastructure & Talent Layer
Data
Compute
Expertise
Value Creation
Flow of Cash


Value Creation
End User
Regulation & Compliance
Application Layer
AI Development Enablement Layer
Core AI Technology Layer
Infrastructure & Talent Layer
Data
Compute
Expertise
Value Capture


End User
Regulation & Compliance
Application Layer
AI Development Enablement Layer
Core AI Technology Layer
Infrastructure & Talent Layer
Data
Compute
Expertise
End User
AWESOME CHATGPT
Copilot
GPT-4o
Microsoft
OpenAI

The Virtuous Cycle of AI




Original
Product(s)
AI enhances
original products
AI Systems
Users
New AI
Product(s)
Data
AI leads to
new products
New Users

How AI Drives Value

slido

Please download and install the Slido app on all computers you use

What are the benefits of AI?

ⓘ Start presenting to display the poll results on this slide.

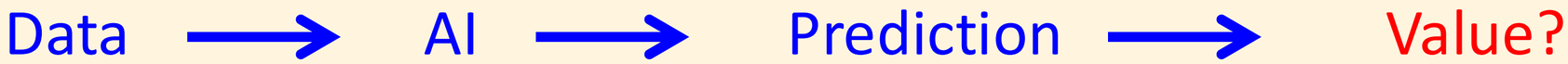

Data
AI
Prediction

Barack Obama
1600 Pennsylvania Ave ~~NW~~ NW
Washington, DC 20500

PORTLAND OR 970
23 JAN 2014 PM 3 L

Hugh Amick
v Letter, inc
509 Cascade Ave, Suite H
Hood River, OR 97031

9703120608080

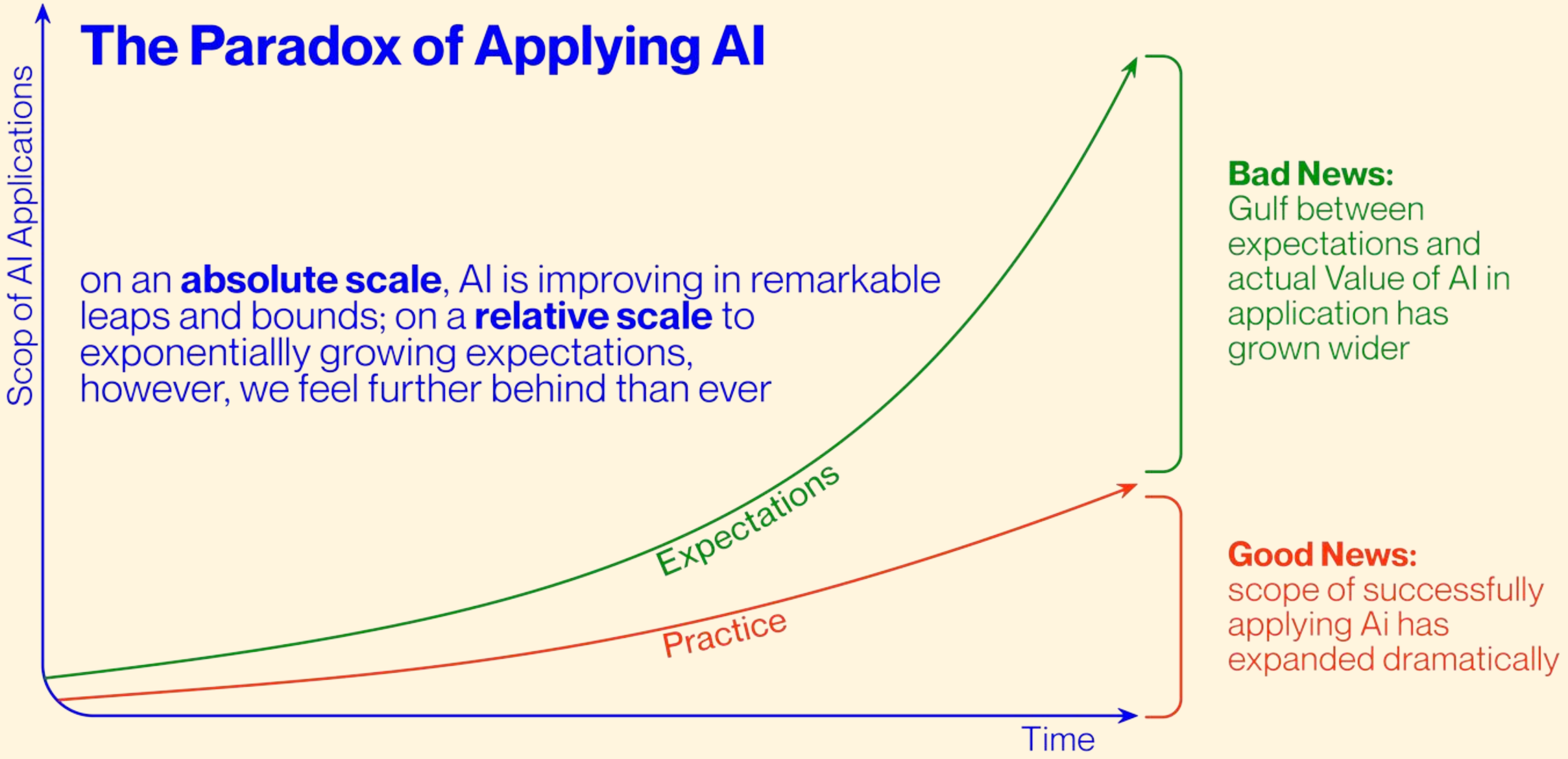

Data
AI
Prediction
Value?

Data → AI → Prediction → Value?

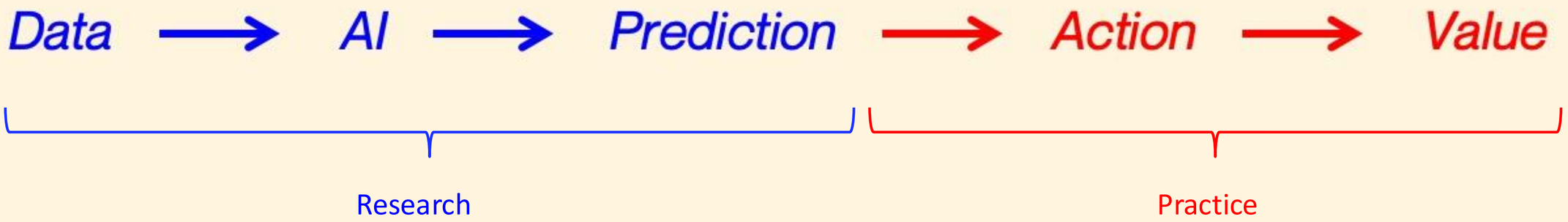

Data
AI
Prediction
Action

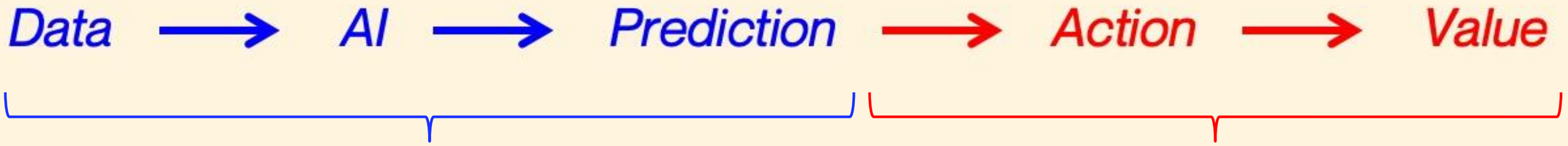

Data
AI
Prediction
Action
Value

The Paradox of Applying AI




Data
AI
Prediction
Action
Value


Data
AI
Prediction
Action
Value
Research
Practice



AI better detects prostate cancer on MRI than radiologists

Computer detects prostate cancer more often and has reduced false alarm

Date: June 12, 2024

Source: Radboud University Medical Center

Summary: AI detects prostate cancer more often than radiologists. Additionally, AI triggers false alarms half as often. This was a large-scale study where an international team transparently evaluated and compared AI with radiologist assessments and clinical outcomes.

Data → AI → Prediction → Action → Value

Research

Practice

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TECH

Here's why one tech investor thinks some doctors will be 'obsolete' in five years

PUBLISHED FRI, APR 7 2017•2:28 PM EDT | UPDATED FRI, APR 7 2017•5:15 PM EDT

Christina Farr

SHARE

Data → AI → Prediction → Action → Value

Research

Practice

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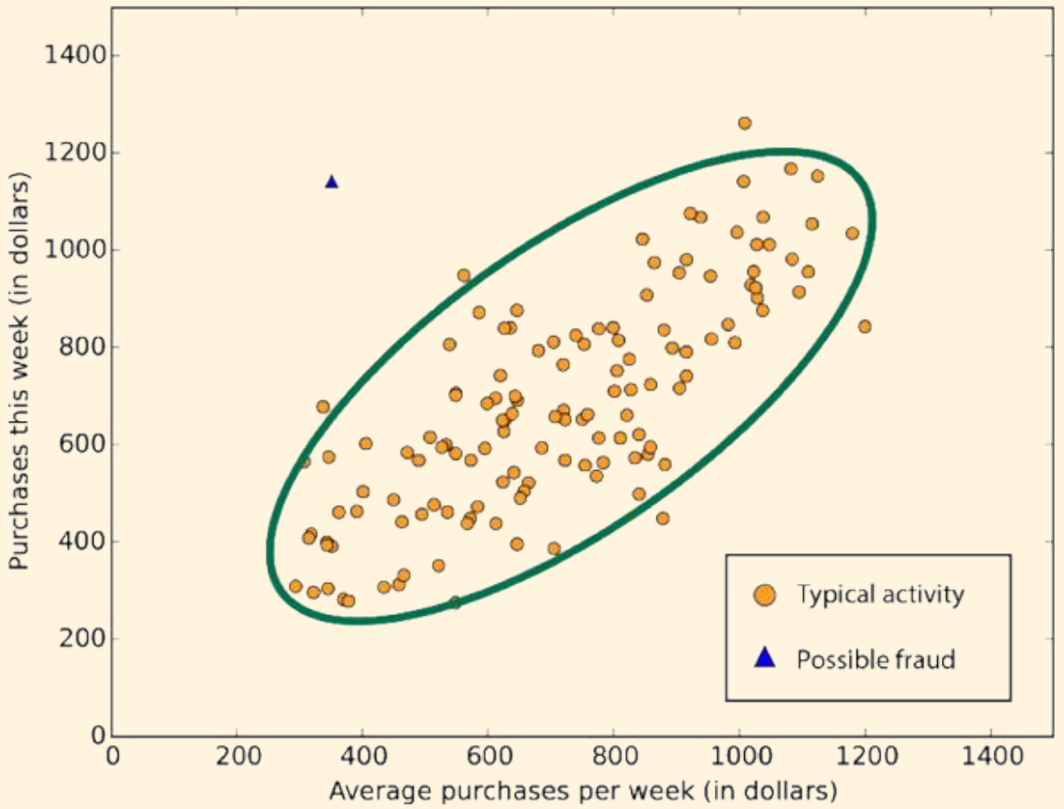
Christina Farr

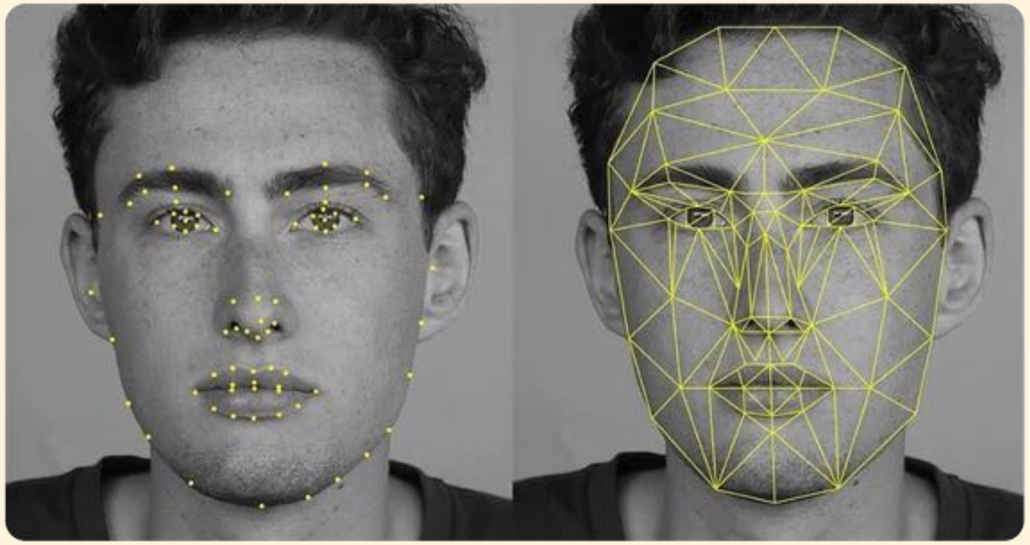
SHARE

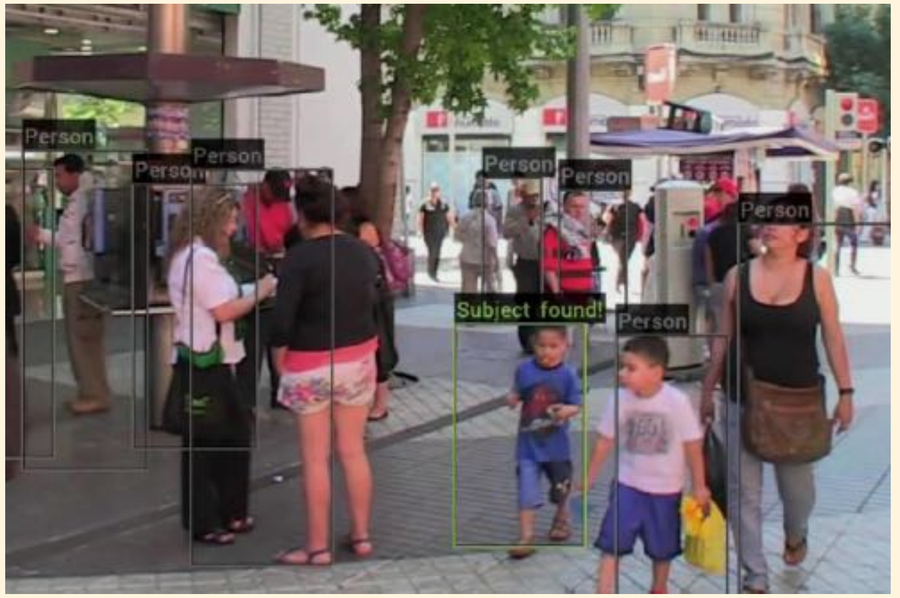

2015
SELF-DRIVING CARS IN 2 YEARS
CausalPython.io
imgflip.com
2016
RADIOLOGISTS OBSOLOLETE IN 5 YEARS
2024
RADIOLOGISTS IN REGULAR CARS DRIVING TO WORK

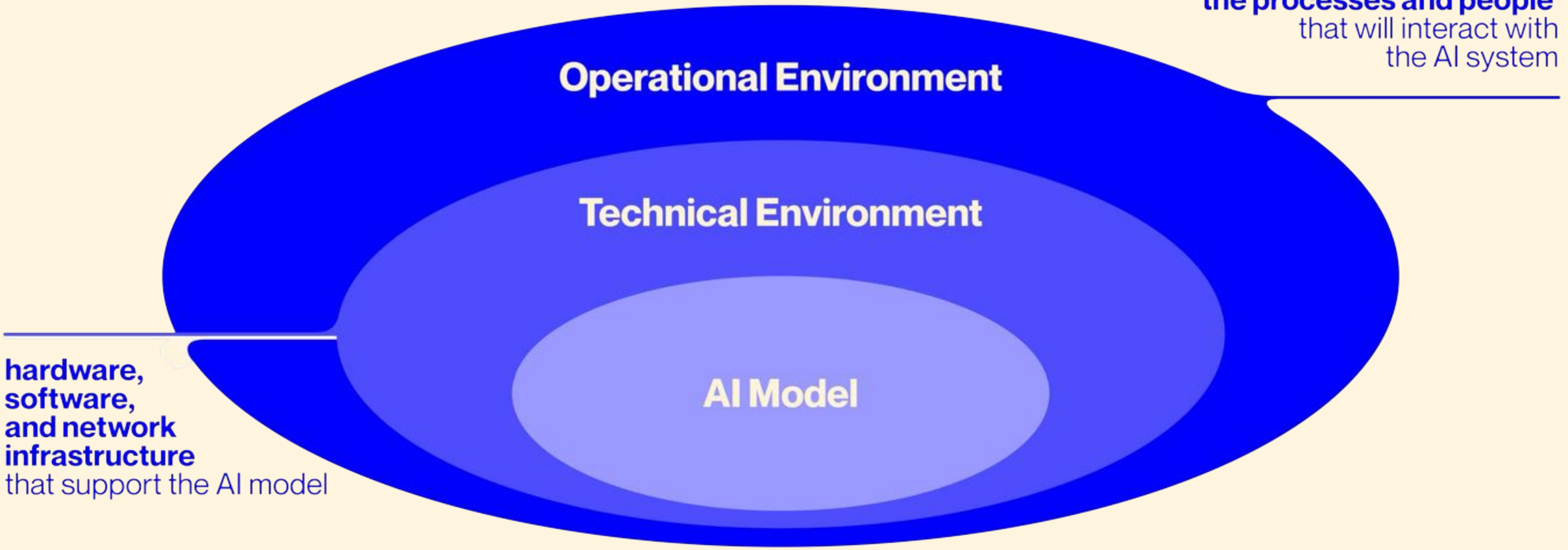


Model that predicts wther a transaction is fraudulent or not

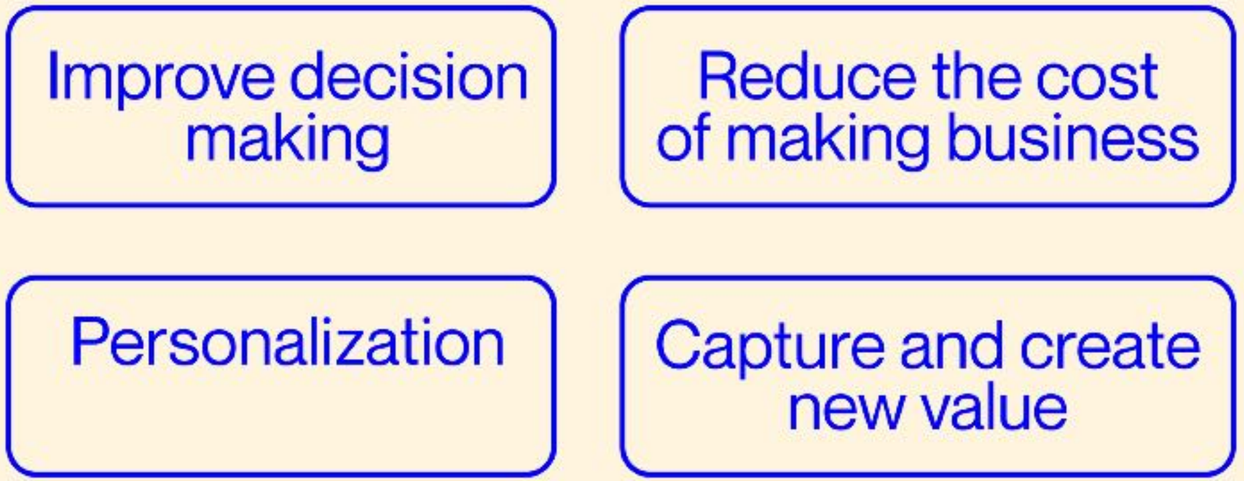
Inform Customer



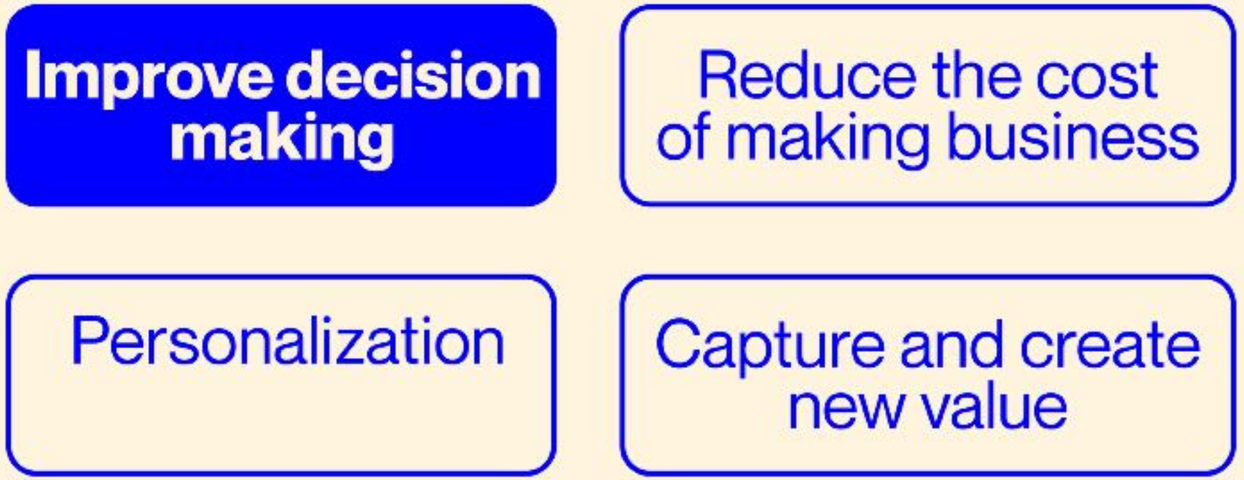

Person
Person
Person
Person
Person
Person
Subject found!
Person


Operational Environment
Technical Environment
AI Model
the processes and people
that will interact with
the AI system
hardware,
software,
and network
infrastructure
that support the AI model

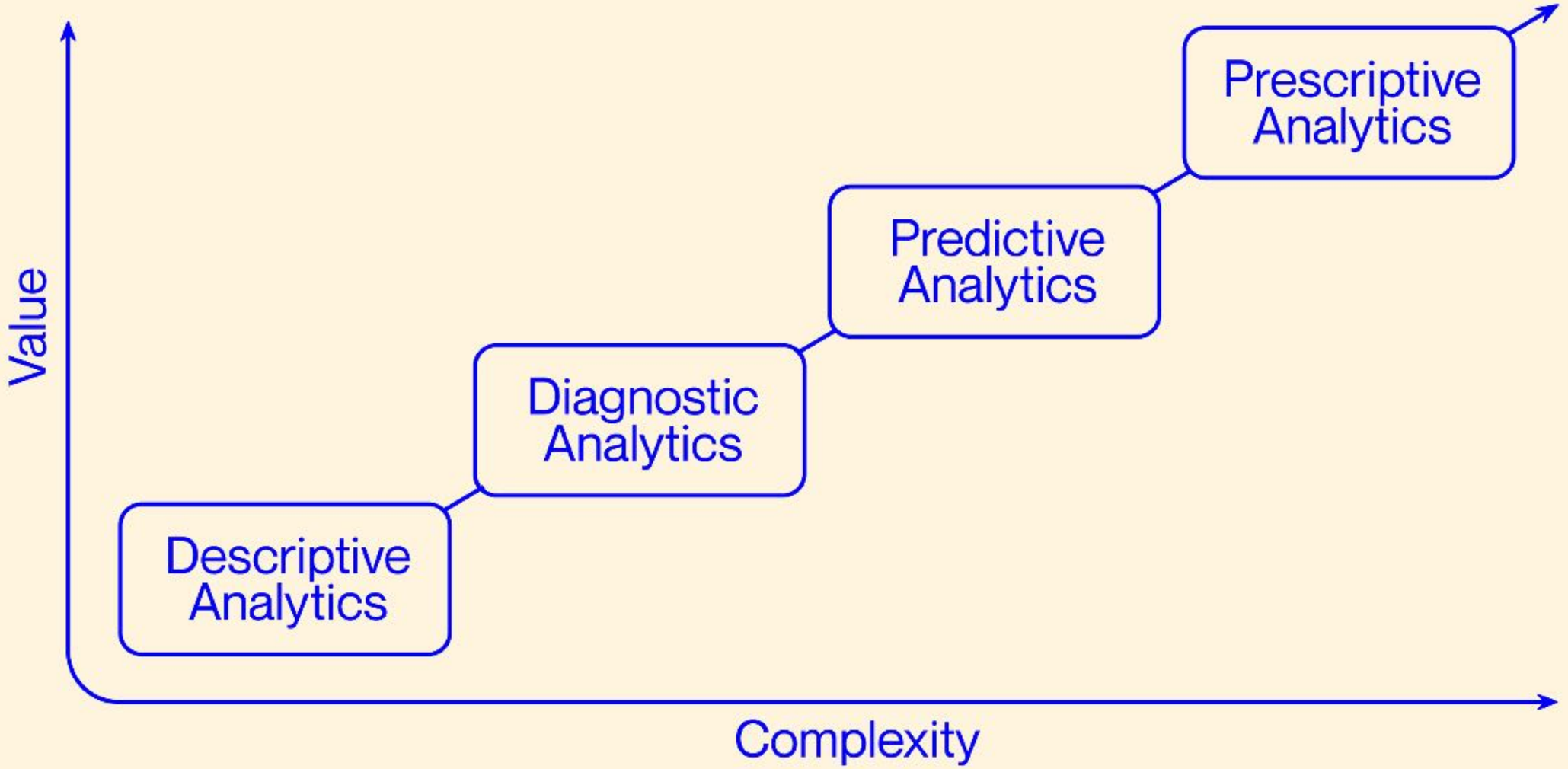
Key Benefits of AI



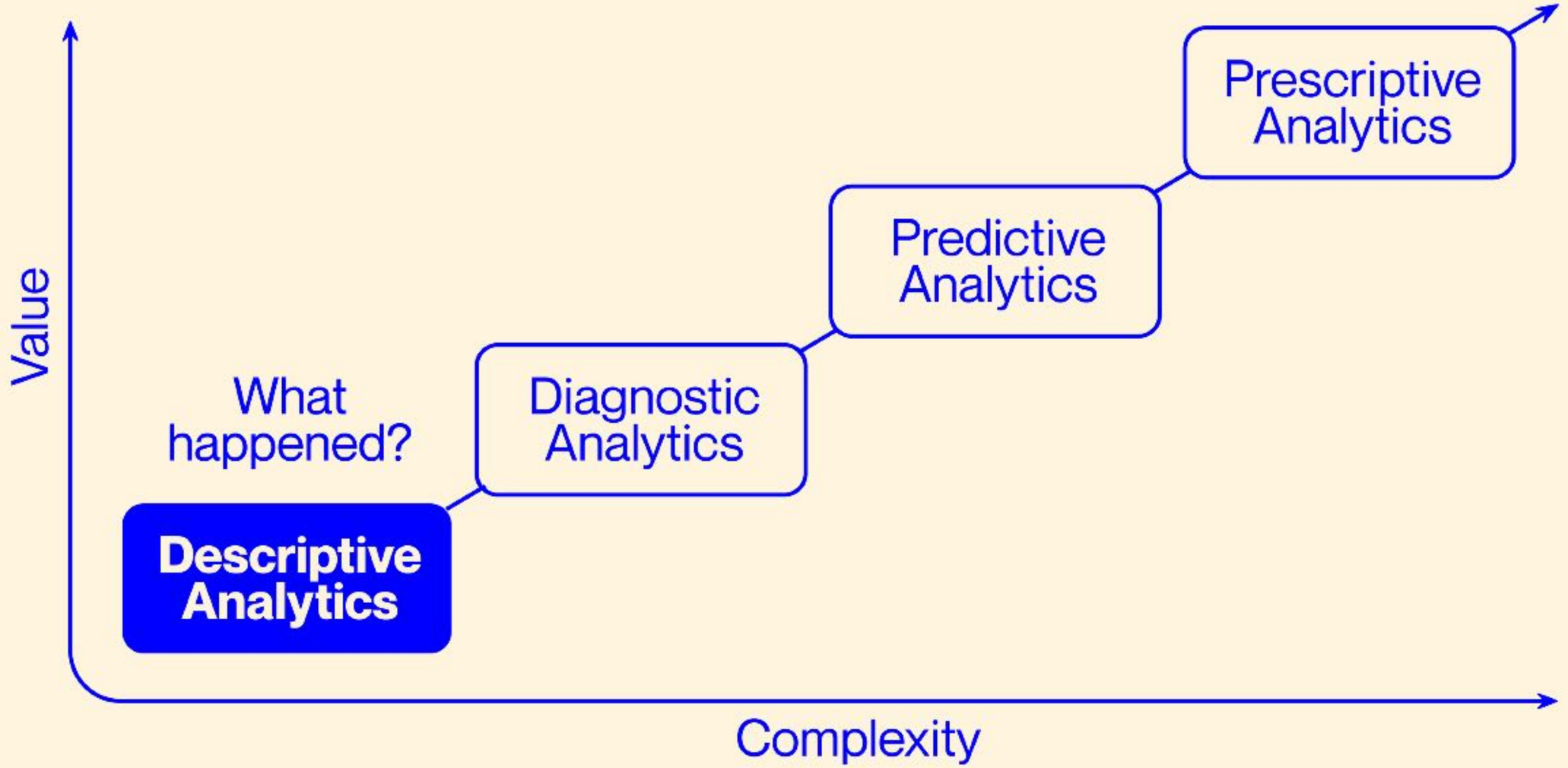
Key Benefits of AI



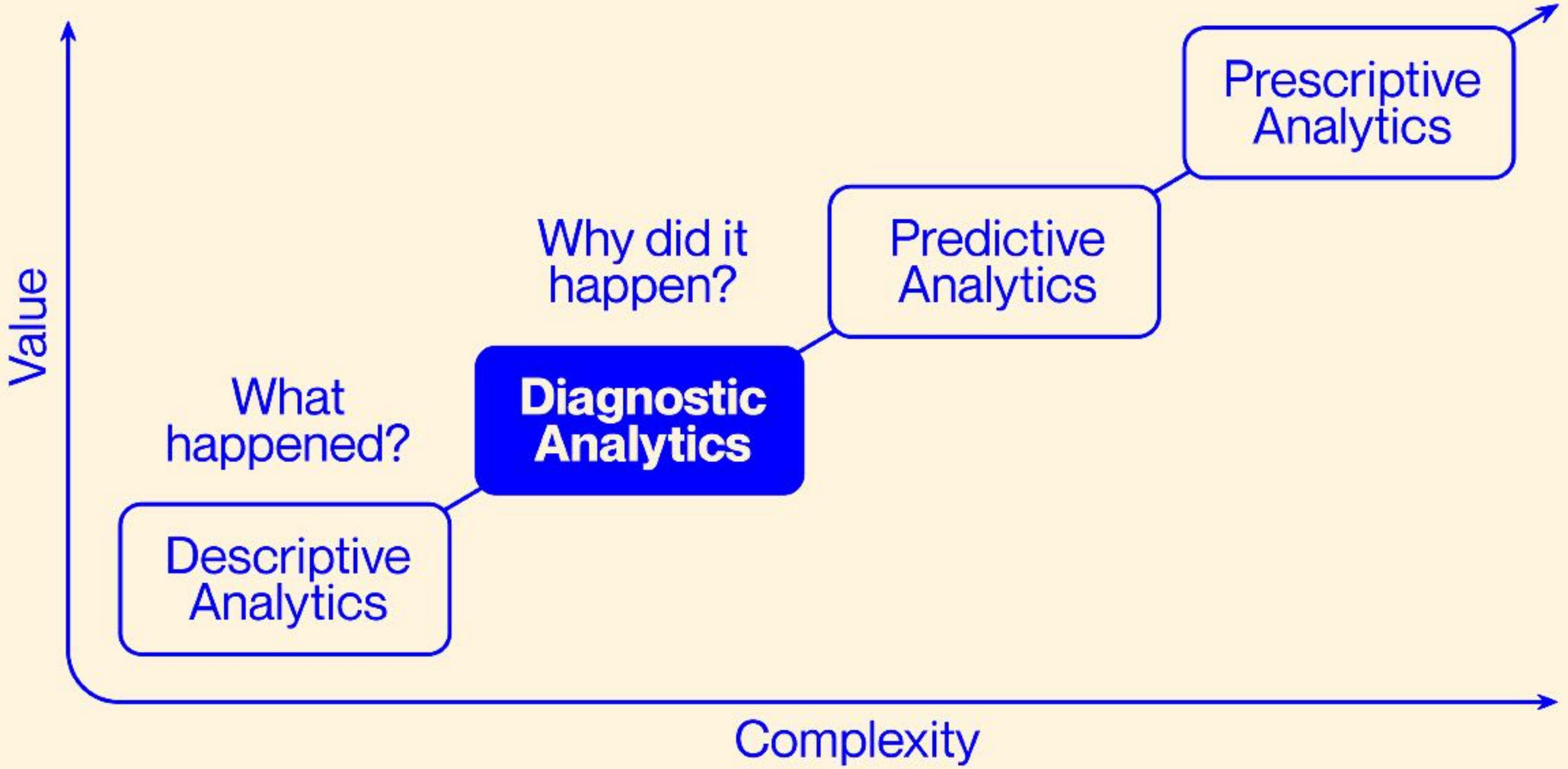
Decision Making



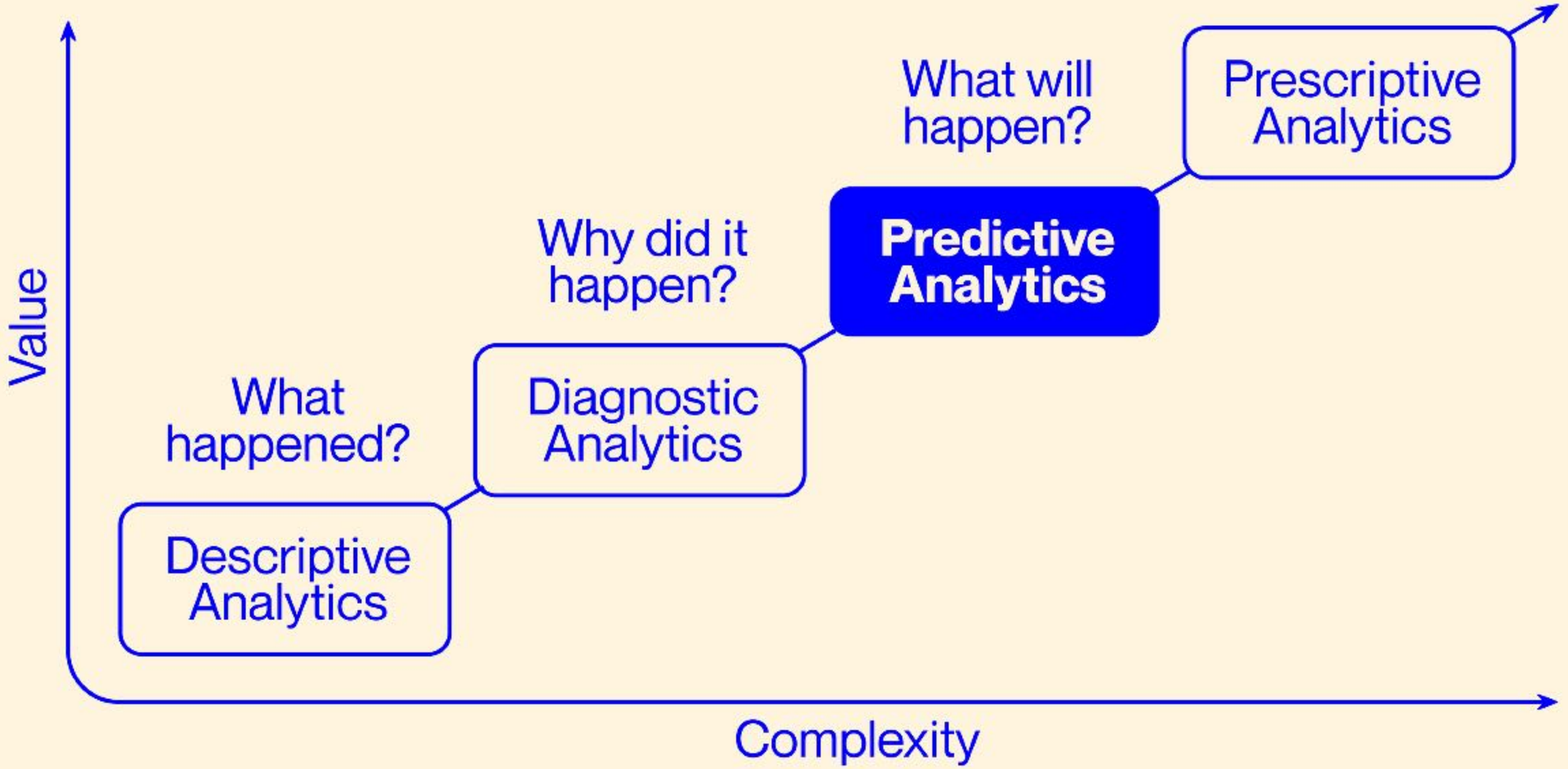
Decision Making



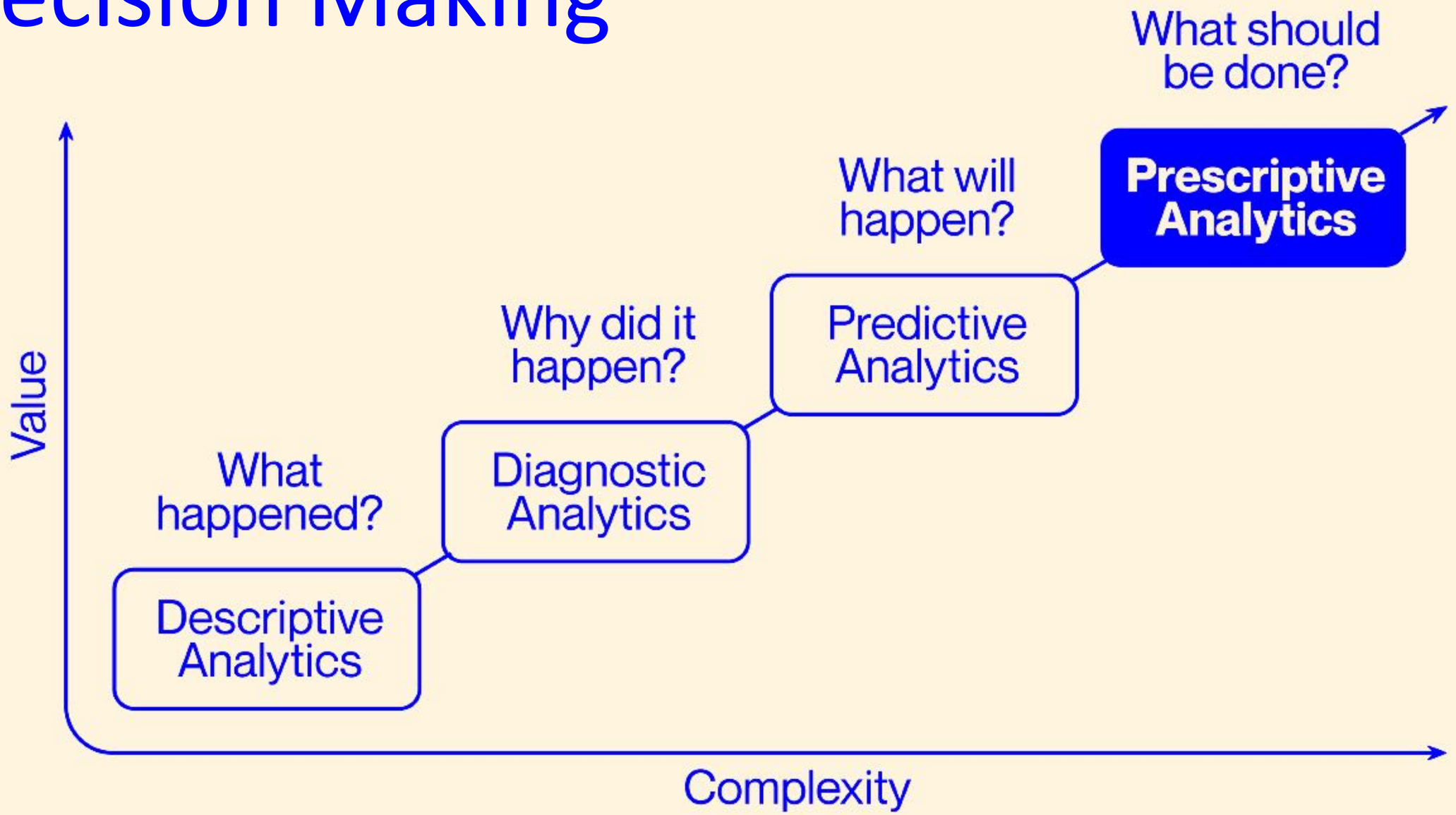
Decision Making



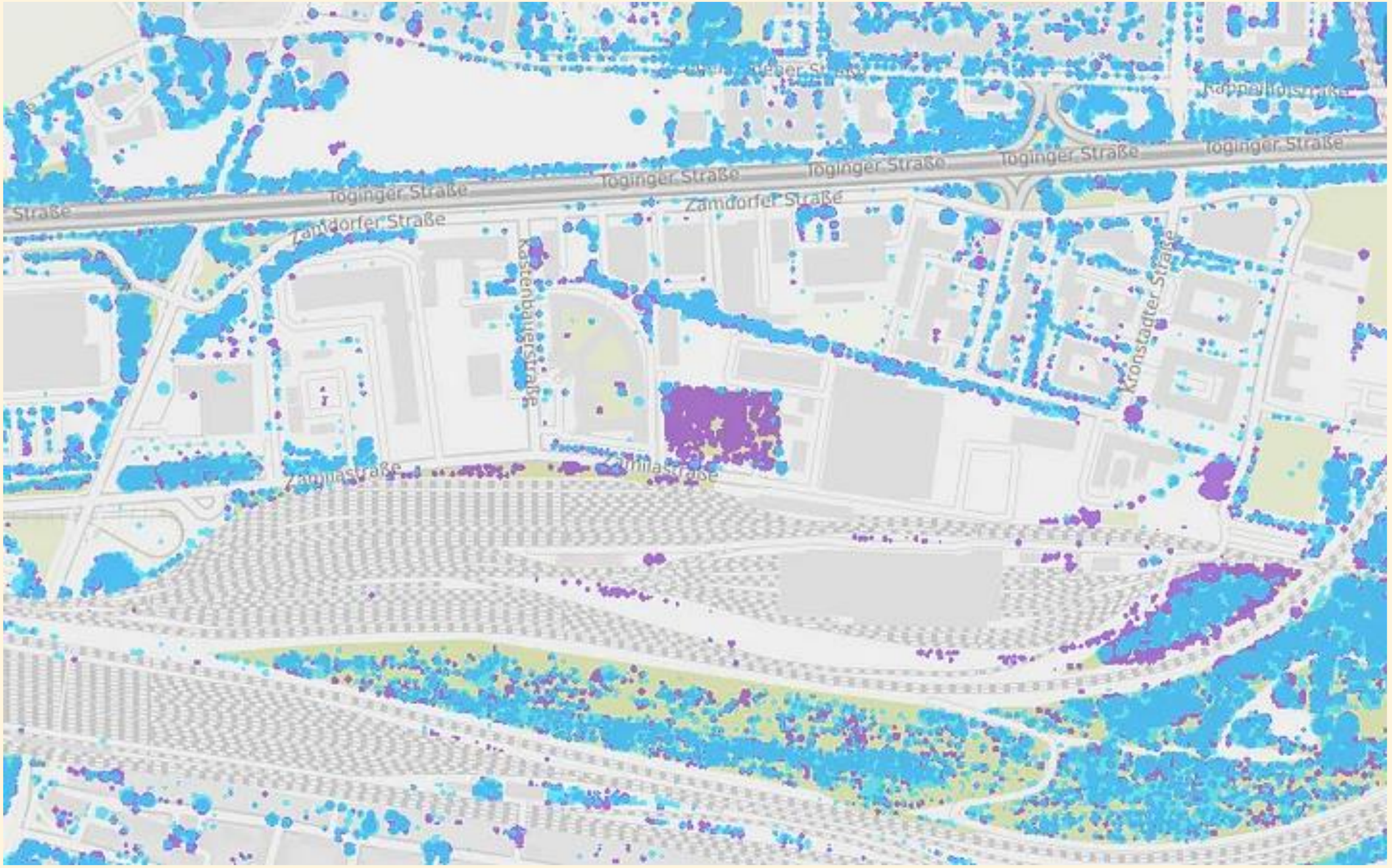
Decision Making



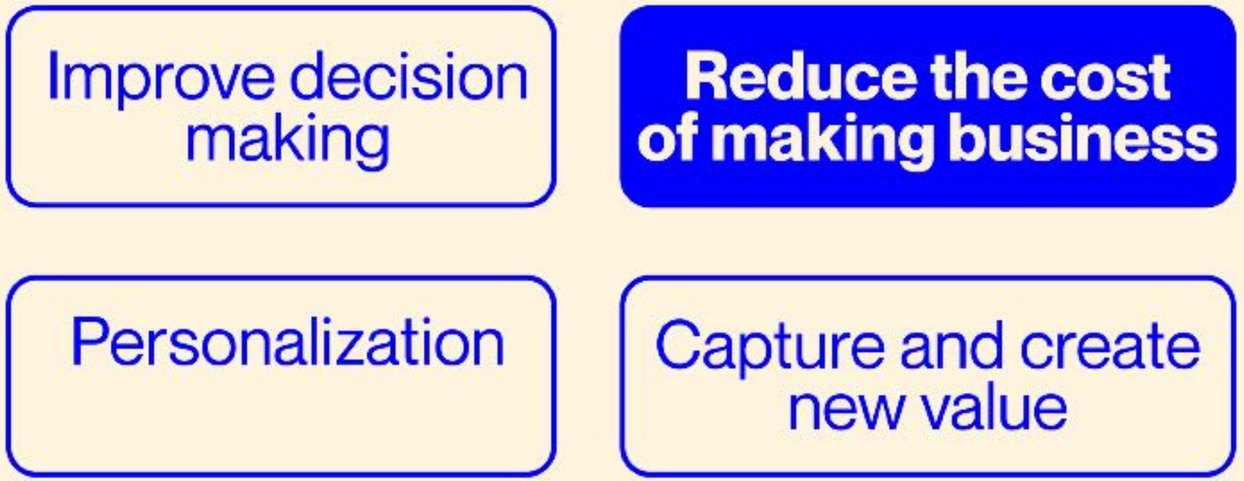
Decision Making



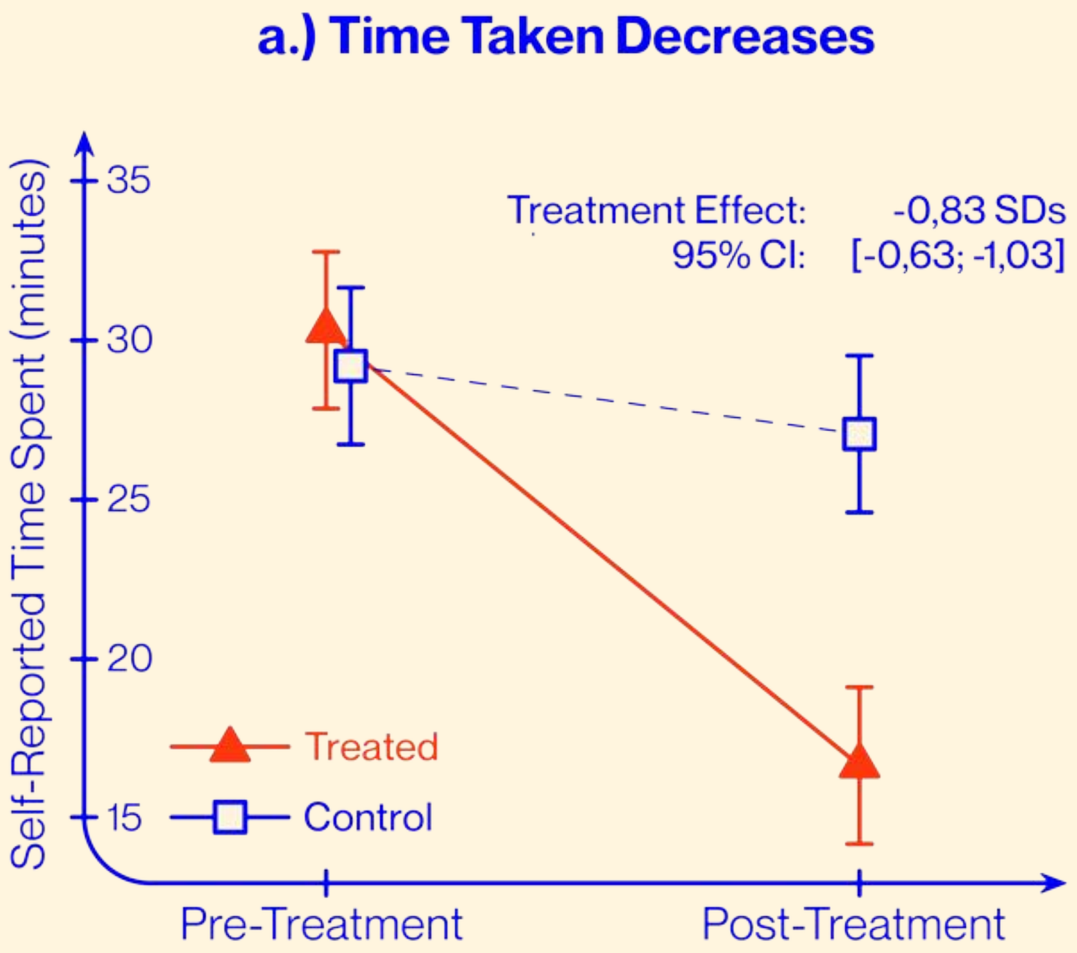

Schrammerstr.
Weinstr.
Landerlaftstr.
Weinstr.

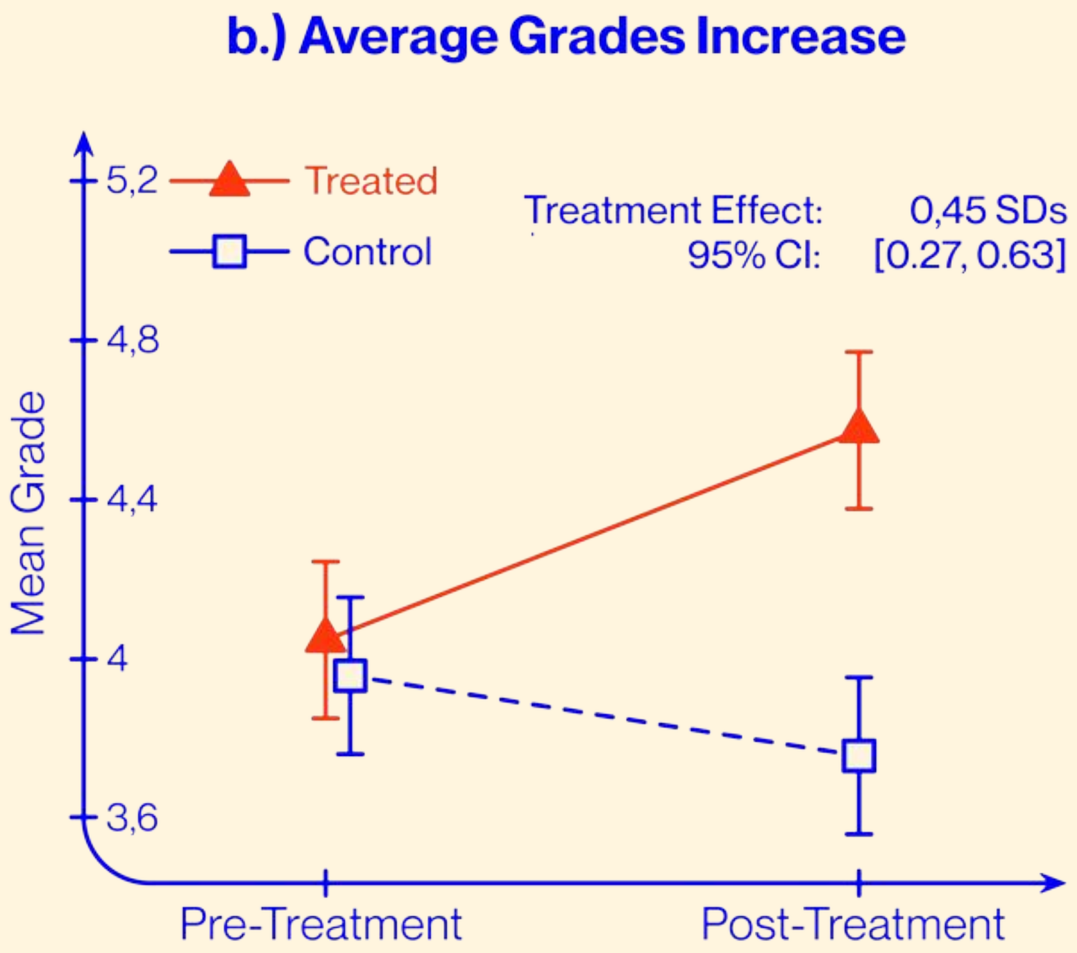

Töginger Straße
Töginger Straße
Töginger Straße
Töginger Straße
Töginger Straße
Zamdorfer Straße
Zamdorfer Straße
Kastenbauerstraße
Kronstadter Straße
Zamdastraße
Zamdastraße

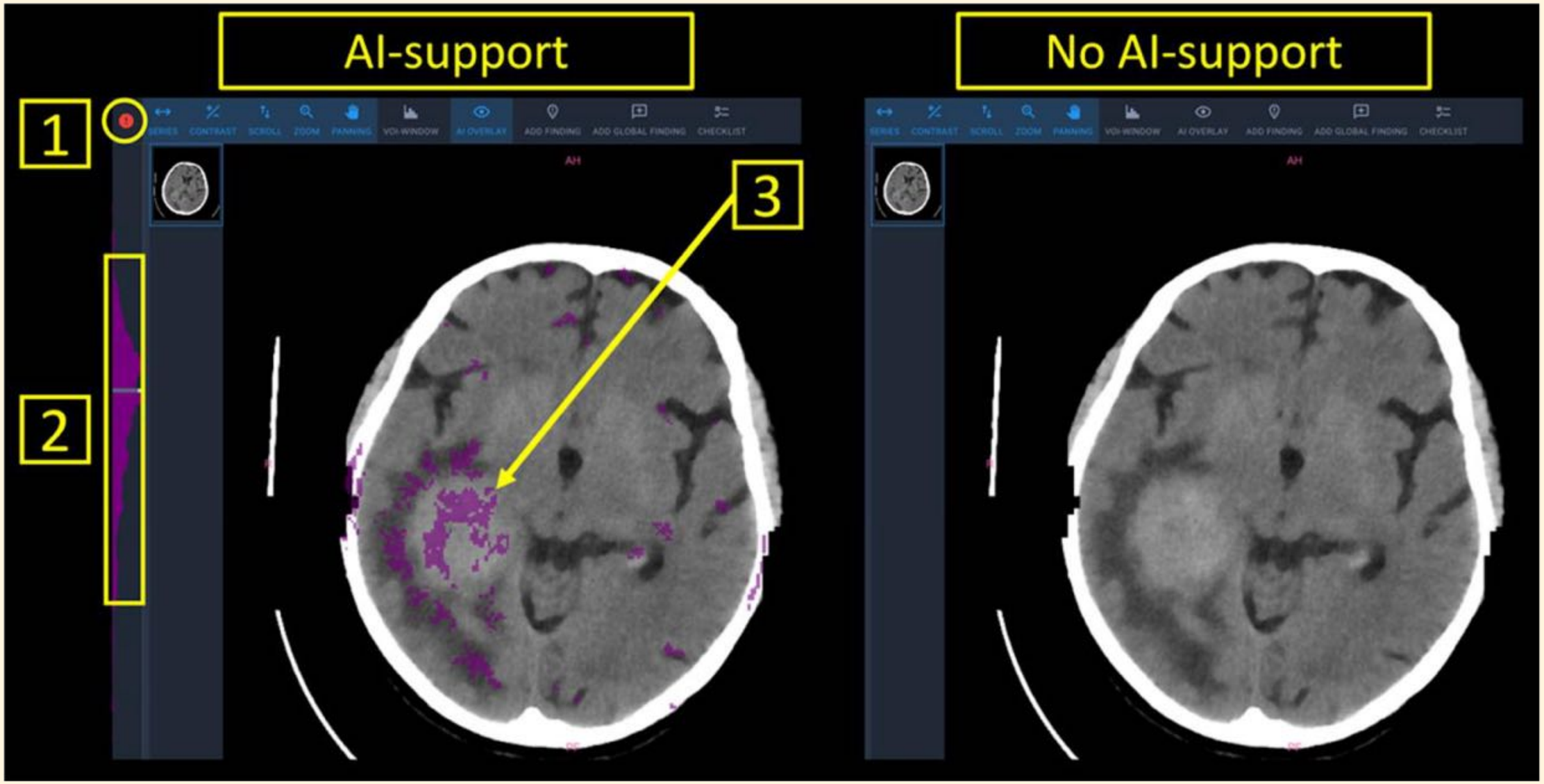
Key Benefits of AI



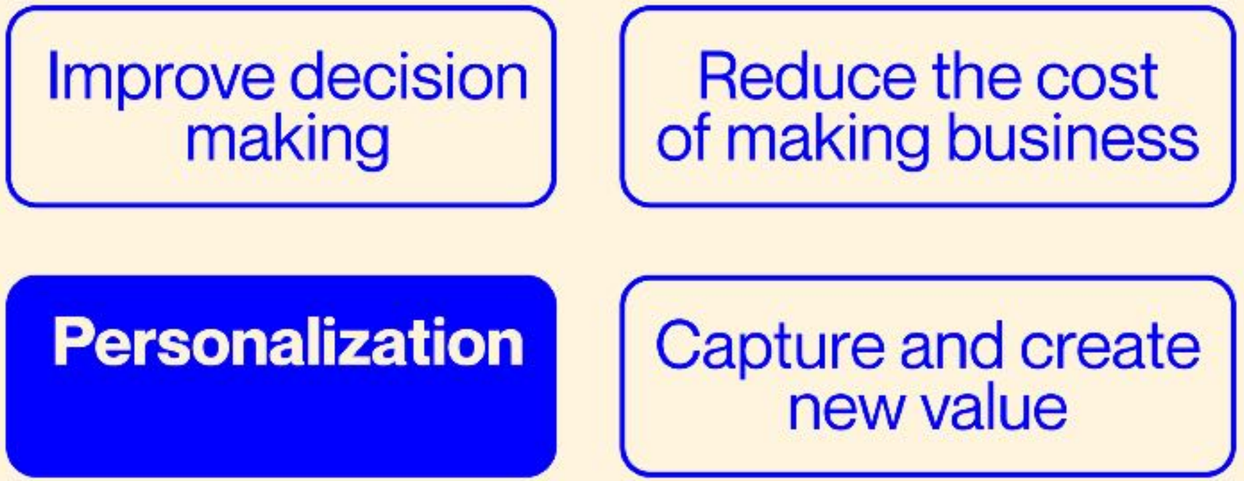
Treatment Effects on Productivity



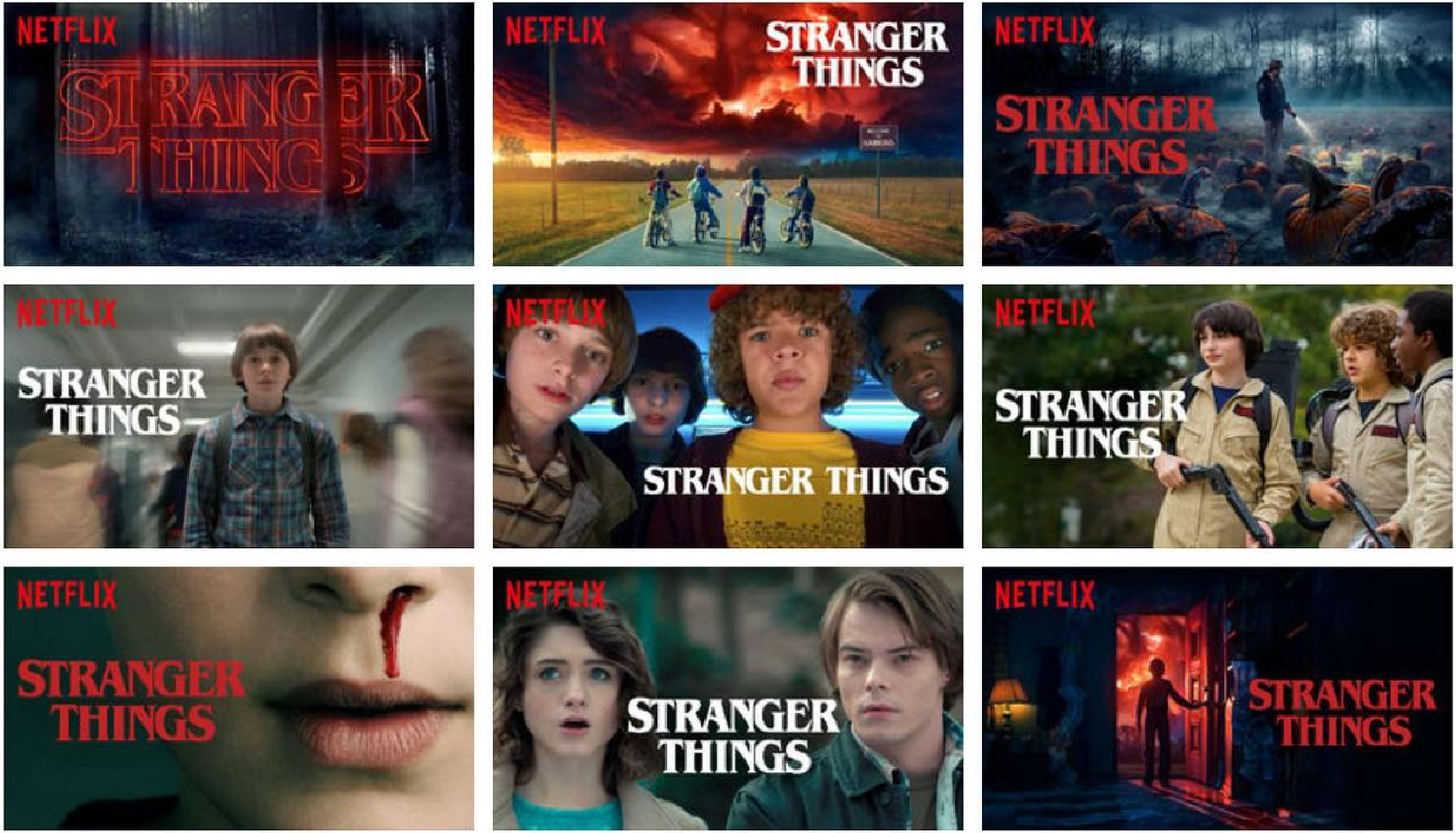



AI-support
No AI-support
1
2
3
SERIES
CONTRAST
SCROLL
ZOOM
PANNING
VOI WINDOW
AI OVERLAY
ADD FINDING
ADD GLOBAL FINDING
CHECKLIST
AH

Key Benefits of AI




NETFLIX ORIGINAL
STRANGER THINGS
95% Match 2016 1 Season 4K Ultra HD 5.1
When a young boy vanishes, a small town uncovers a mystery involving secret experiments, terrifying supernatural forces and one strange little girl.
Winona Ryder, David Harbour, Matthew Modine
TV Shows, TV Sci-Fi & Fantasy, Teen TV Shows
STRANGER THINGS
Popular on Netflix
NETFLIX STRANGER THINGS
NETFLIX BRIGHT
NETFLIX MARVEL'S THE PUNISHER
NETFLIX MINDHUNTER
NETFLIX THE CROWN
Recently Watched
NETFLIX THE MEYEROWITZ STORIES (NEW AND SELECTED)
NETFLIX AMERICAN VANDAL
NETFLIX STAR TREK: DISCOVERY
NETFLIX FULLER HOUSE
NETFLIX


NETFLIX
STRANGER THINGS
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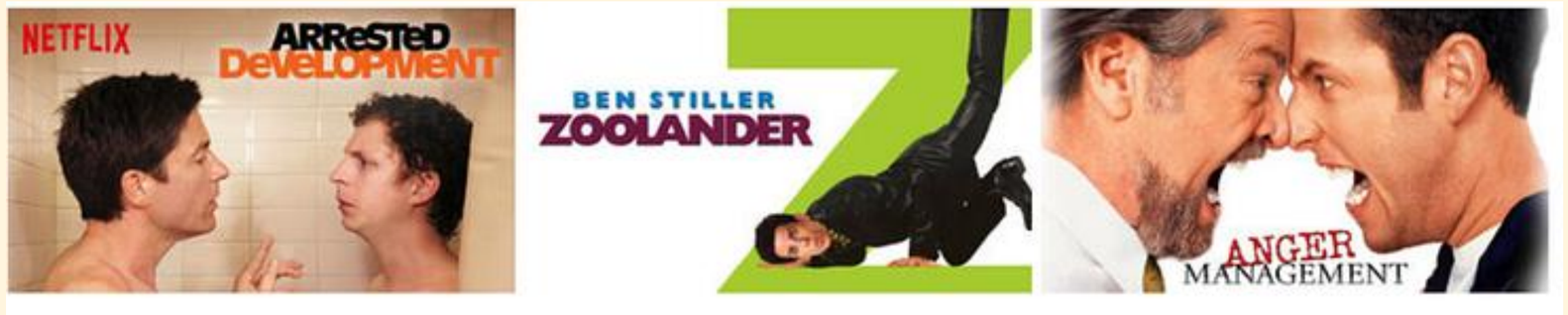
SERENDIPITY
Eternal Sunshine
of the spotless mind
While You Were Sleeping


GOOD WILL HUNTING


NETFLIX
ARRESTED DEVELOPMENT
BEN STILLER
ZOOLANDER
ANGER MANAGEMENT


GOOD WILL HUNTING


KILL BILL
VOLUME 2
prime
PAYCHECK

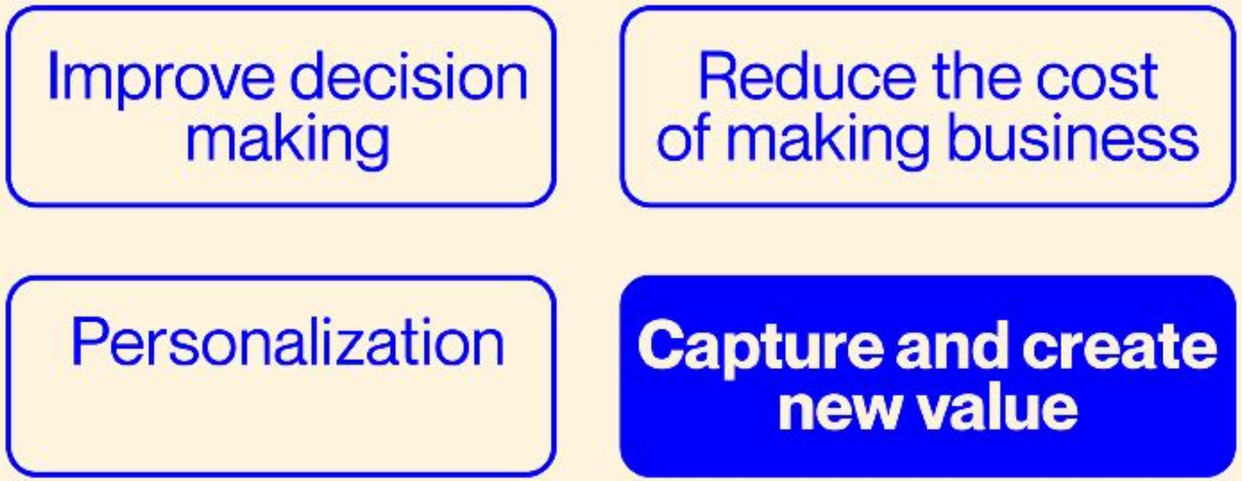

PULP FICTION

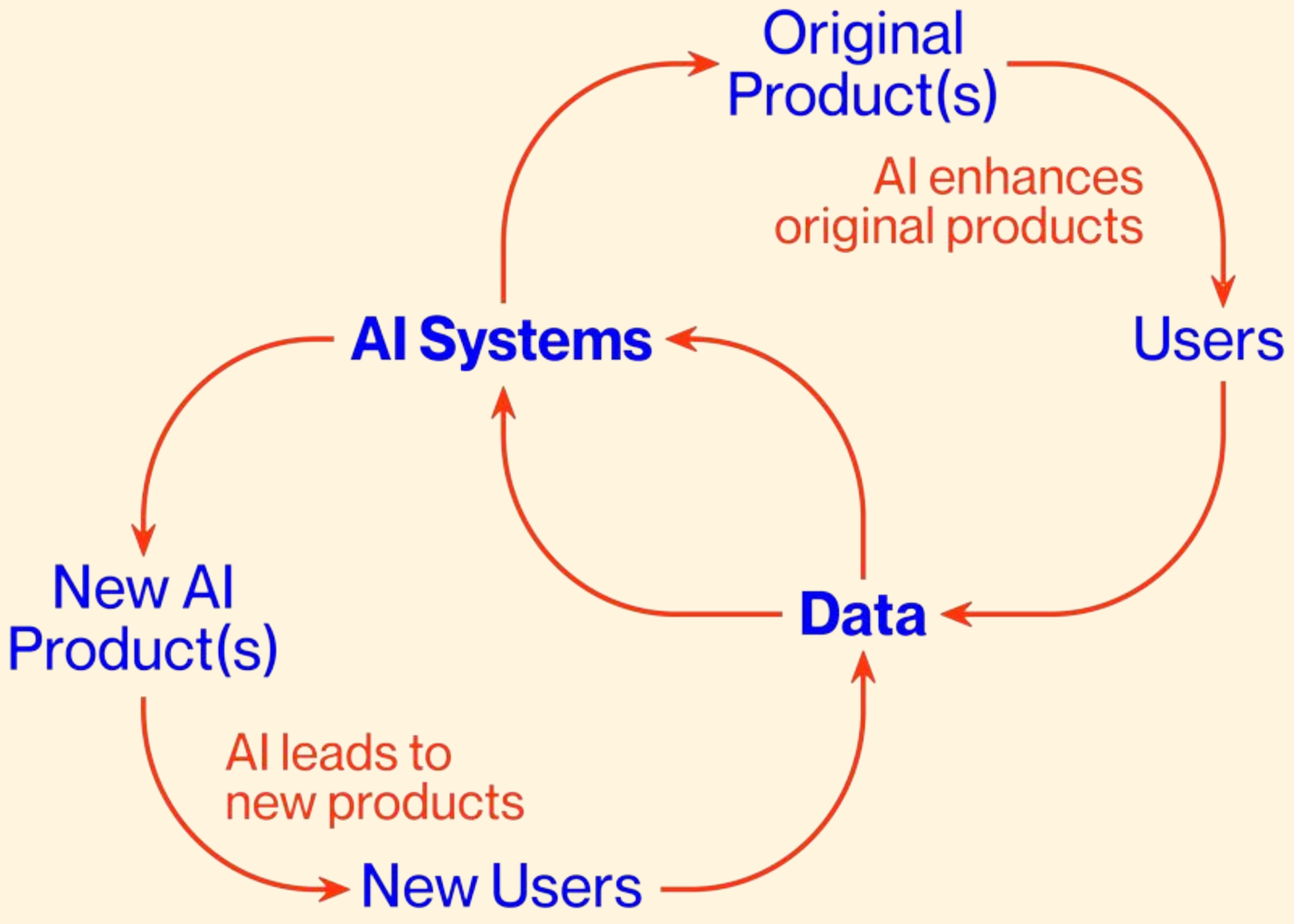

KILLING SEASON
JOHN TRAVOLTA
OLIVIA NEWTON-JOHN
GREASE
JOHN TRAVOLTA
Urban Cowboy


PULP FICTION


WDR
WDR aktuell

Key Benefits of AI



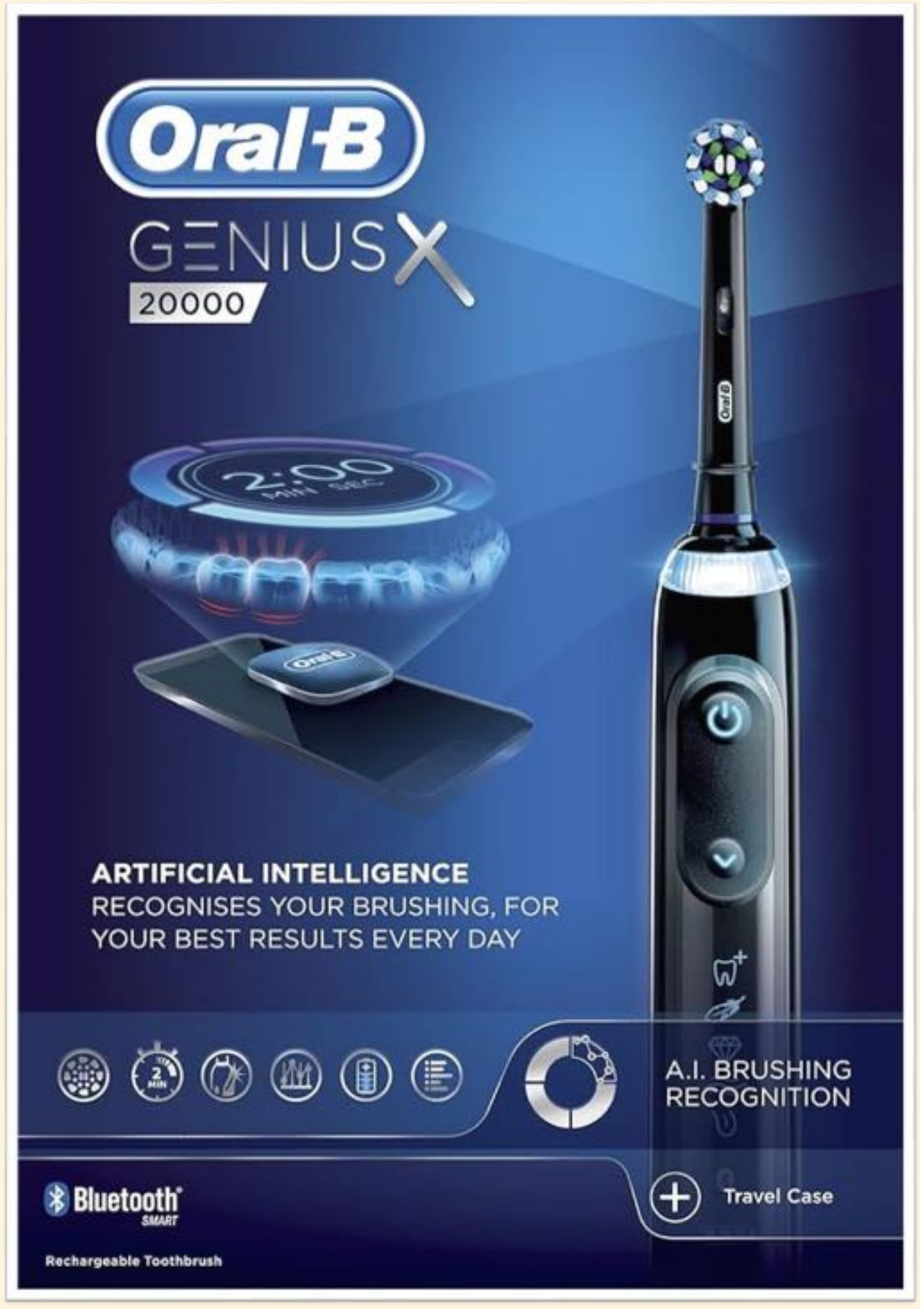

Original
Product(s)
AI enhances
original products
AI Systems
Users
New AI
Product(s)
Data
AI leads to
new products
New Users

Version

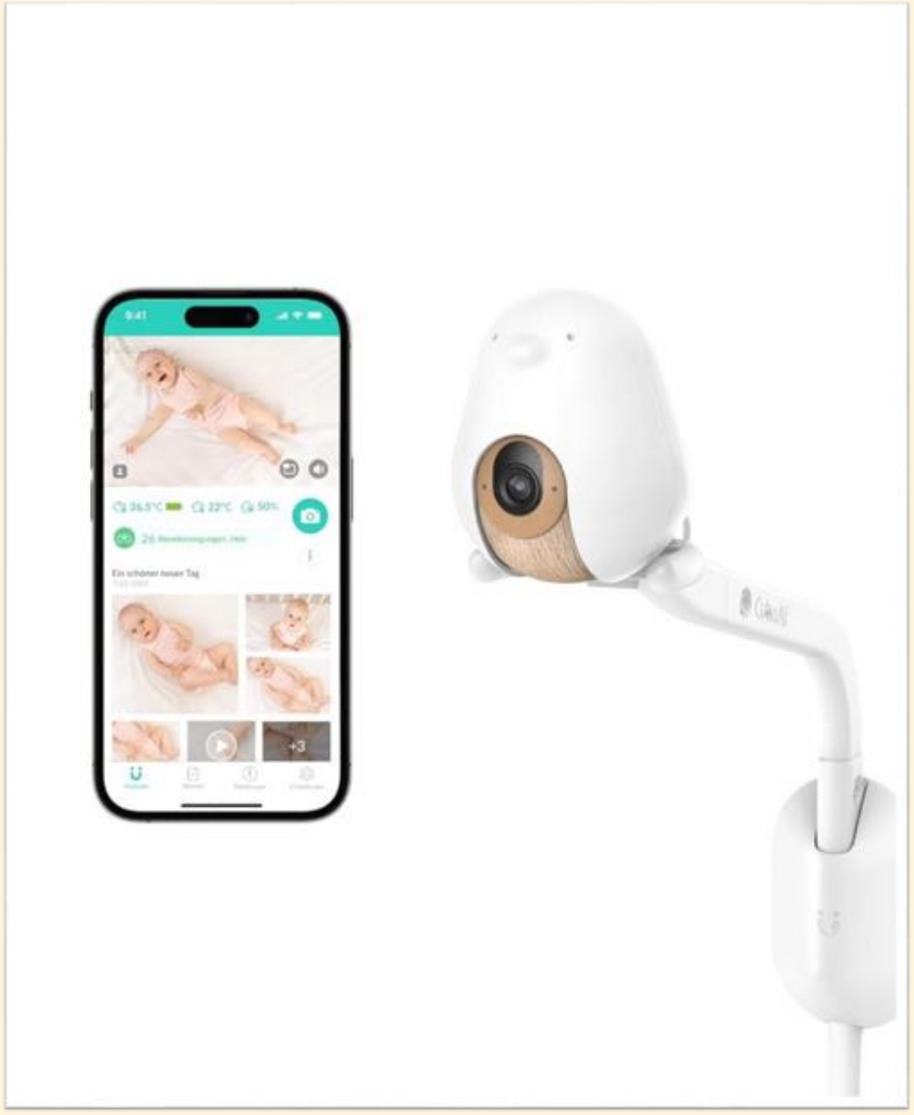
Lite (Everything but AI)

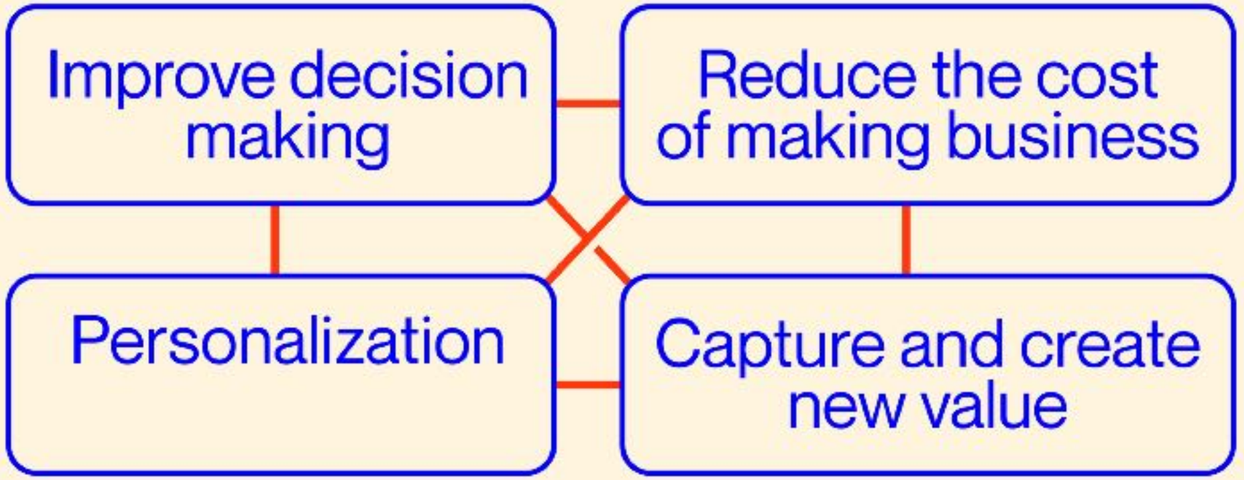
AI (6000+ Birds Species Identification)


netvue


Oral-B
GENIUS X
20000
2:00
MIN SEC
ARTIFICIAL INTELLIGENCE
RECOGNISES YOUR BRUSHING, FOR
YOUR BEST RESULTS EVERY DAY
A.I. BRUSHING
RECOGNITION
Bluetooth
SMART
Travel Case
Rechargeable Toothbrush

VS



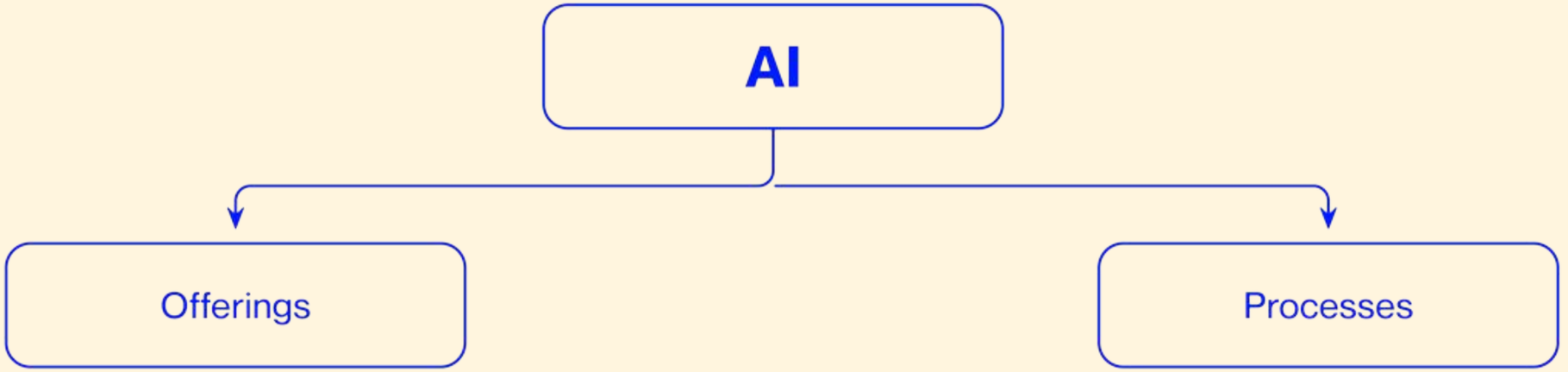

Improve decision making
Reduce the cost of making business
Personalization
Capture and create new value

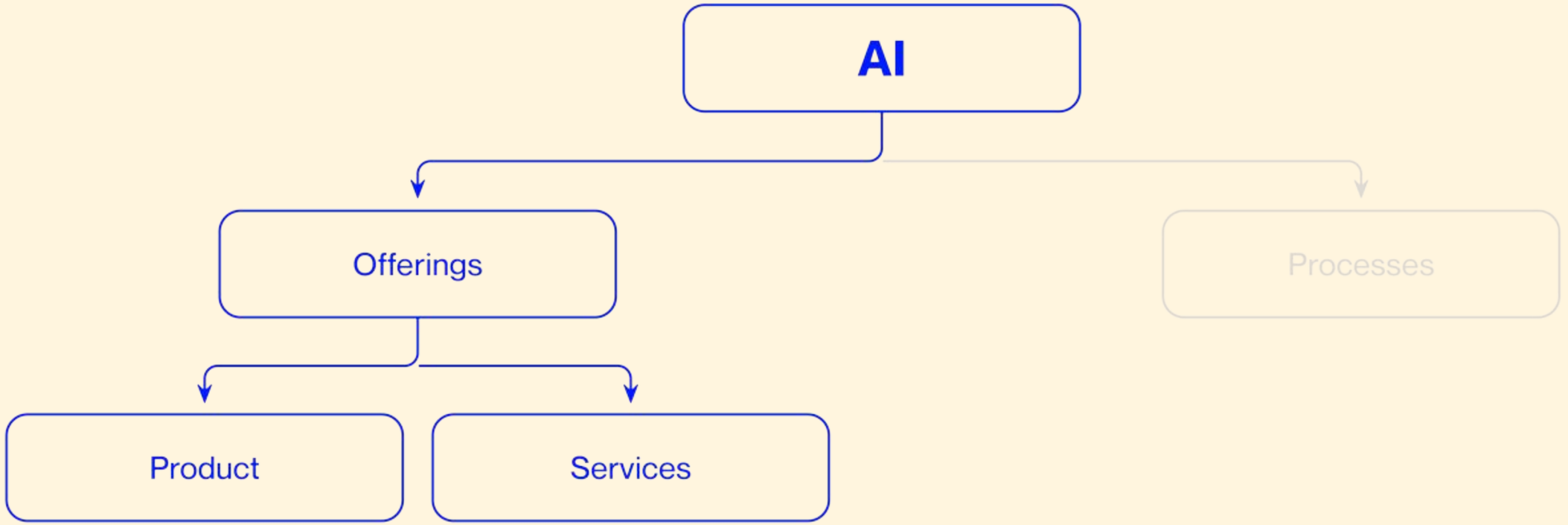
How to apply AI?

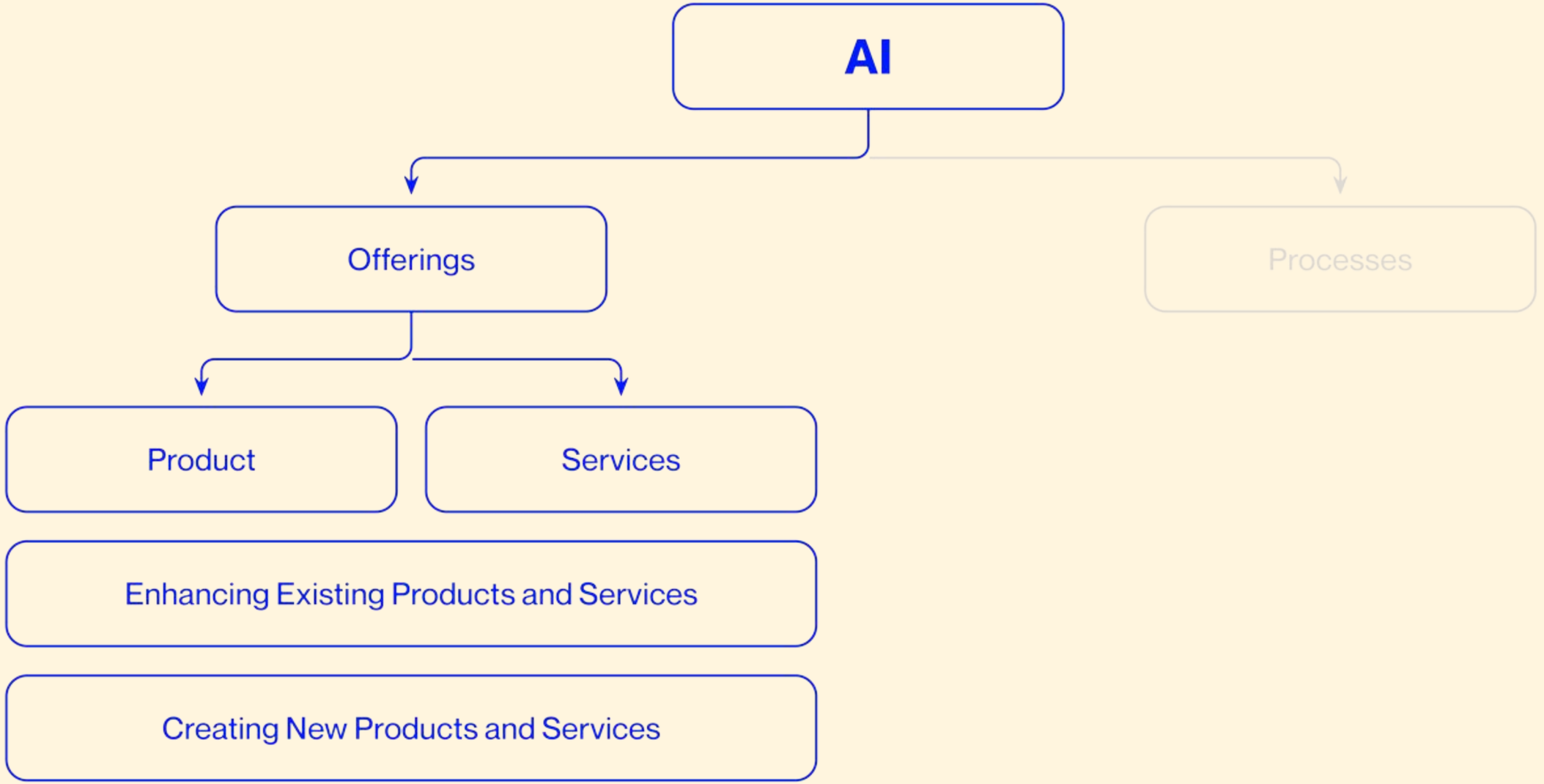
slido

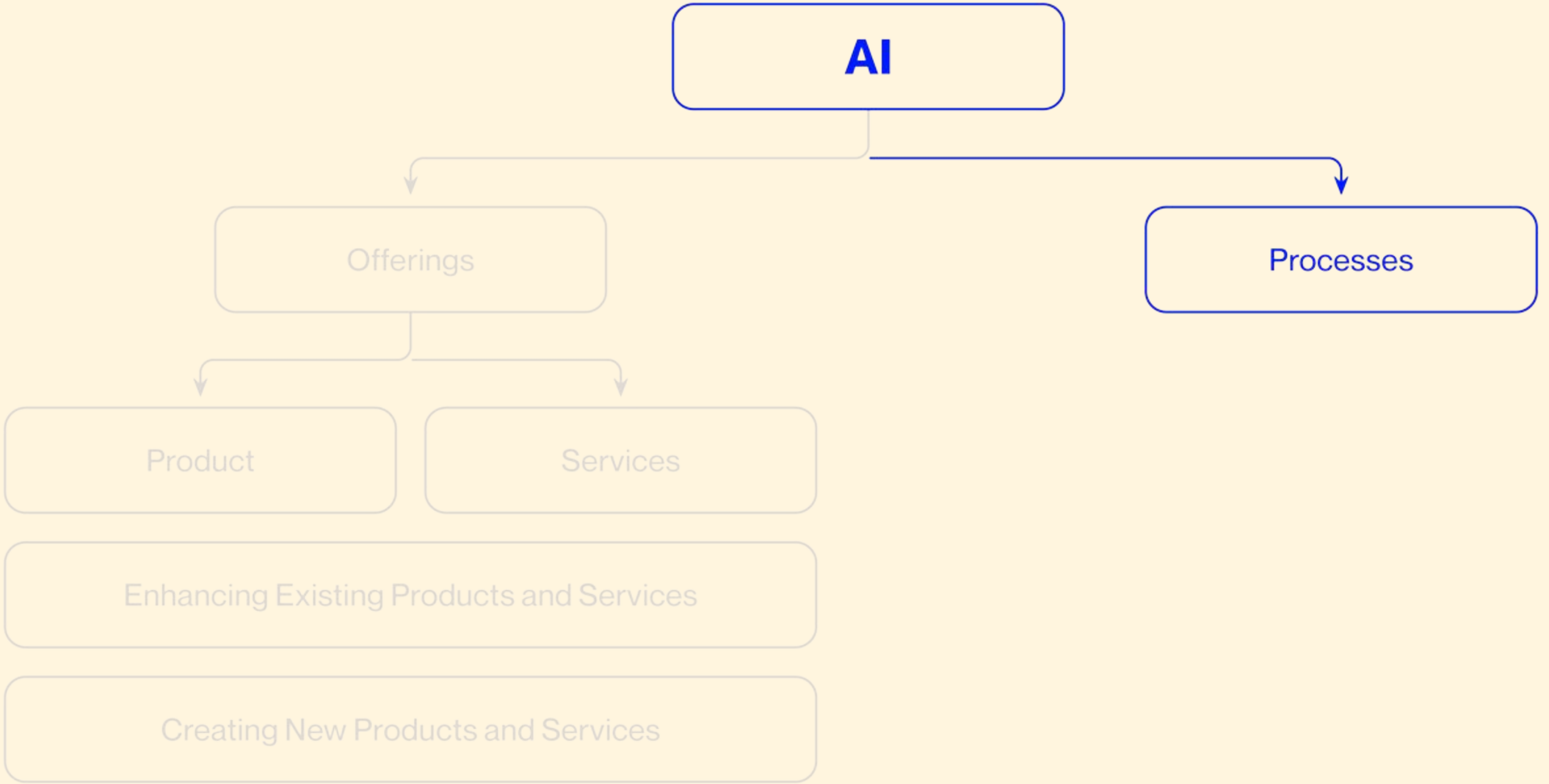
What are challenges when it comes to the adoption of AI?

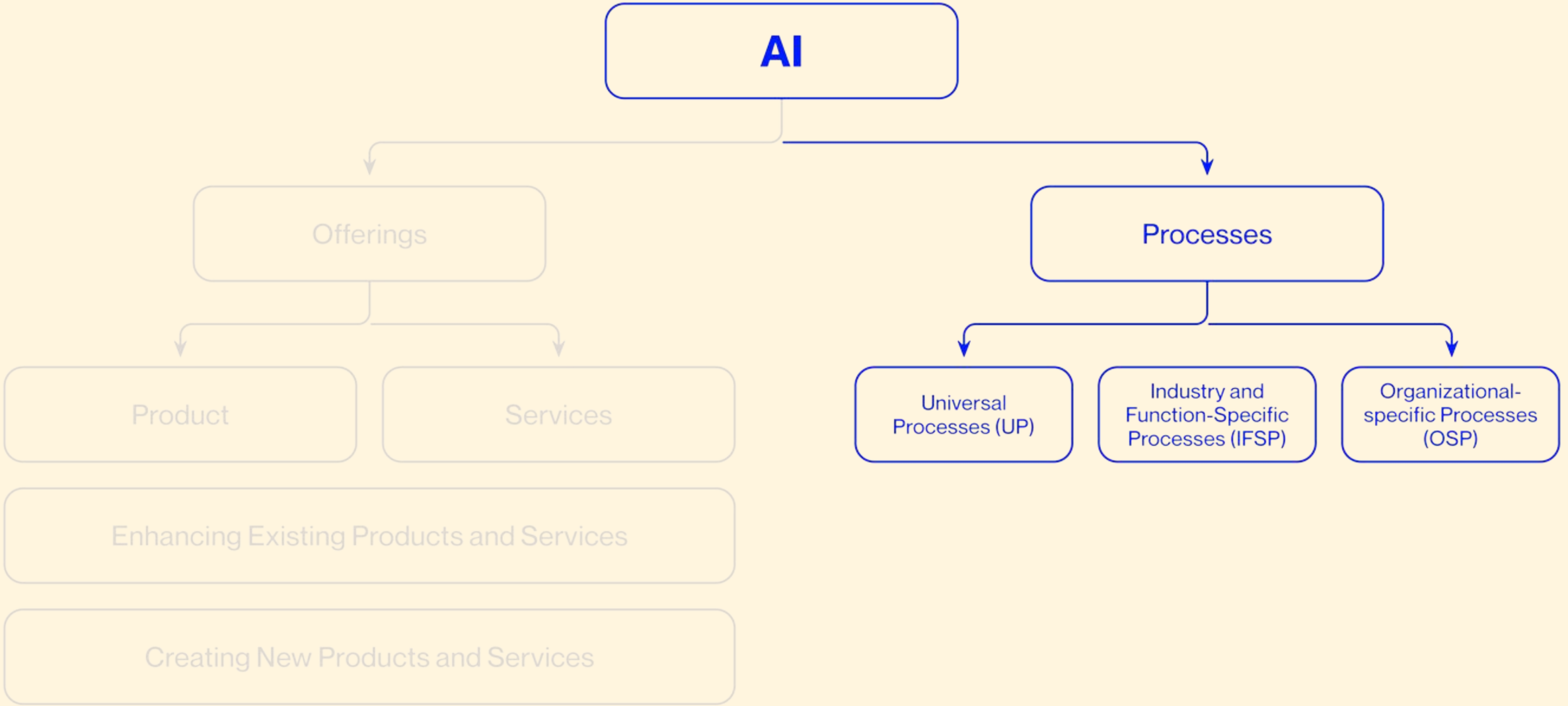
ⓘ Start presenting to display the poll results on this slide.

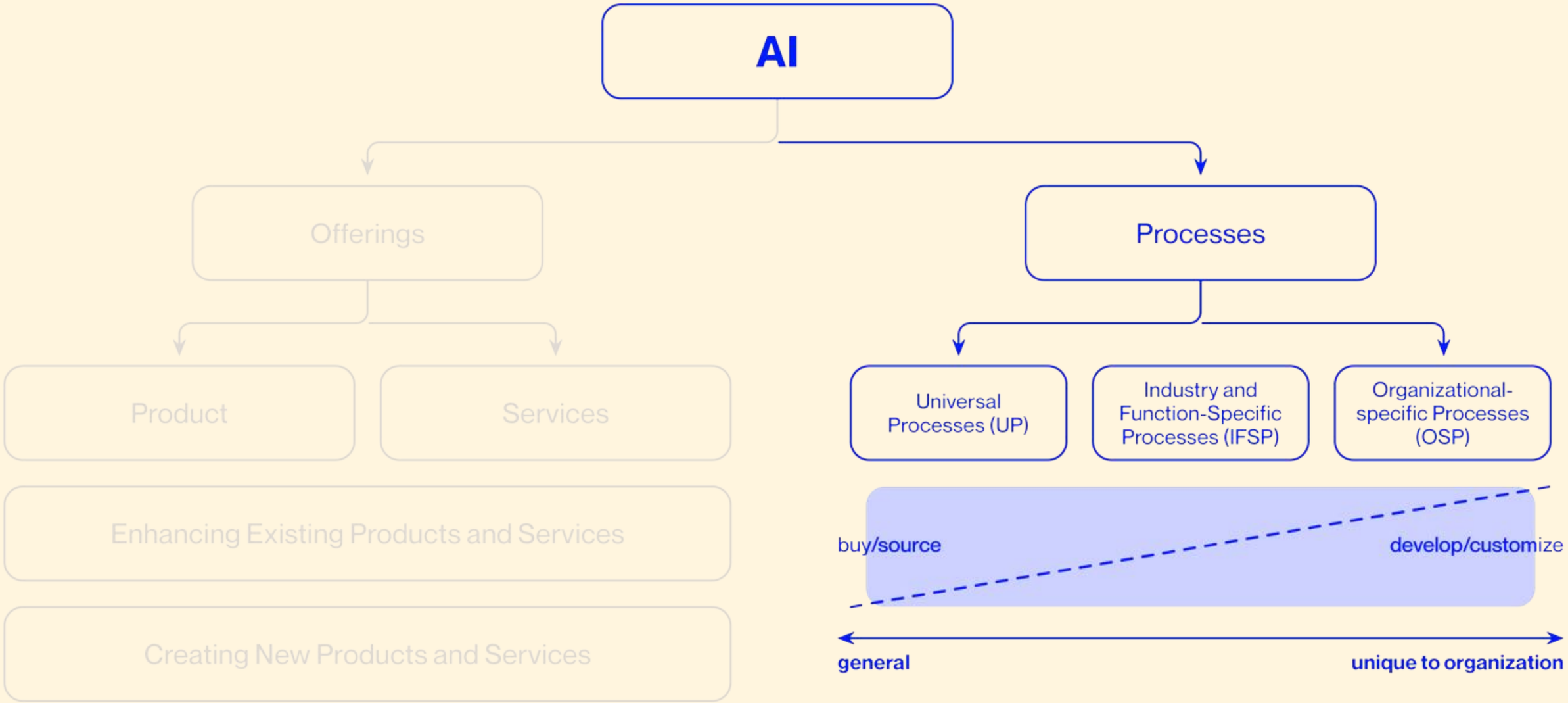

AI
Offerings
Processes


AI
Offerings
Processes
Product
Services

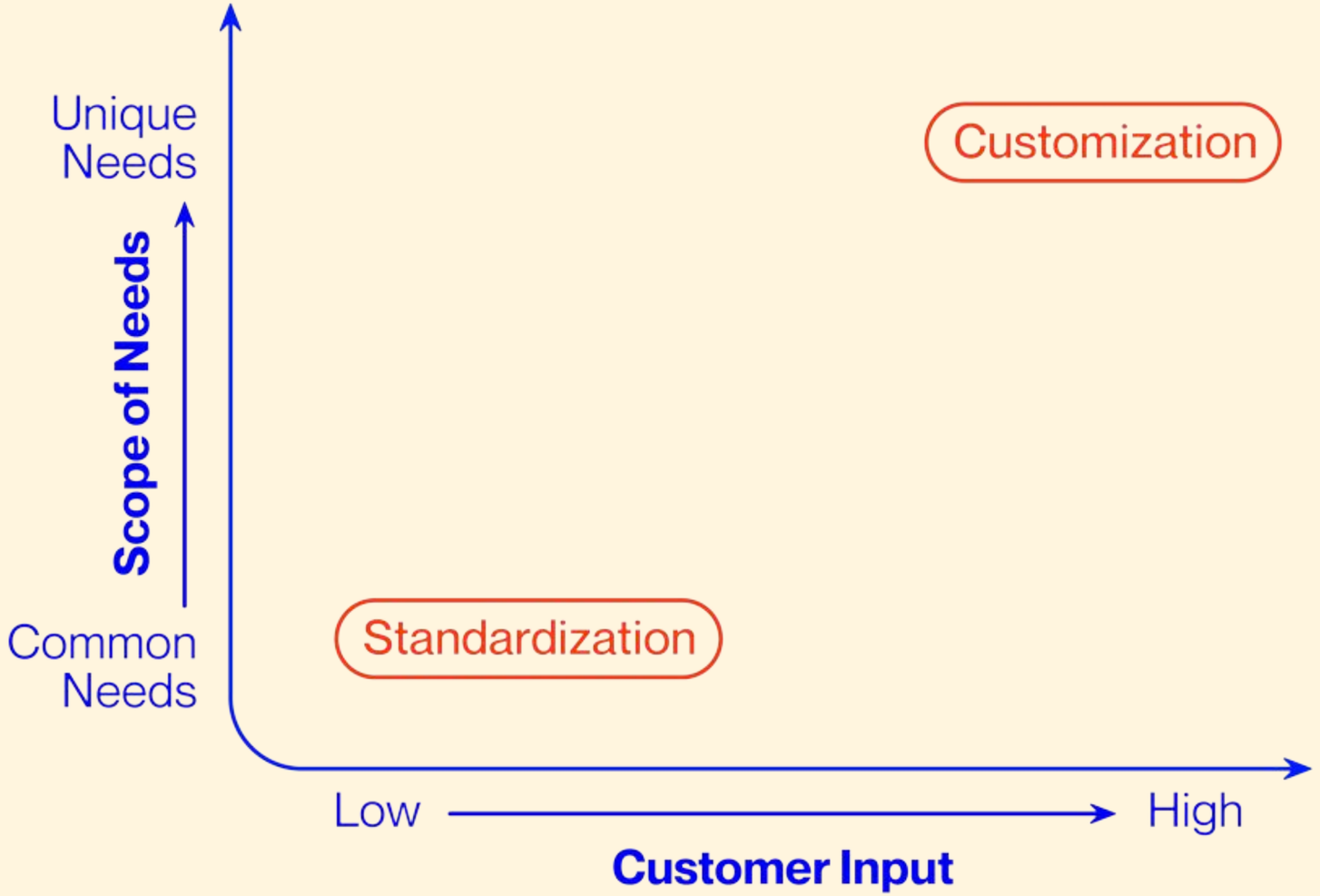

AI
Offerings
Processes
Product
Services
Enhancing Existing Products and Services
Creating New Products and Services

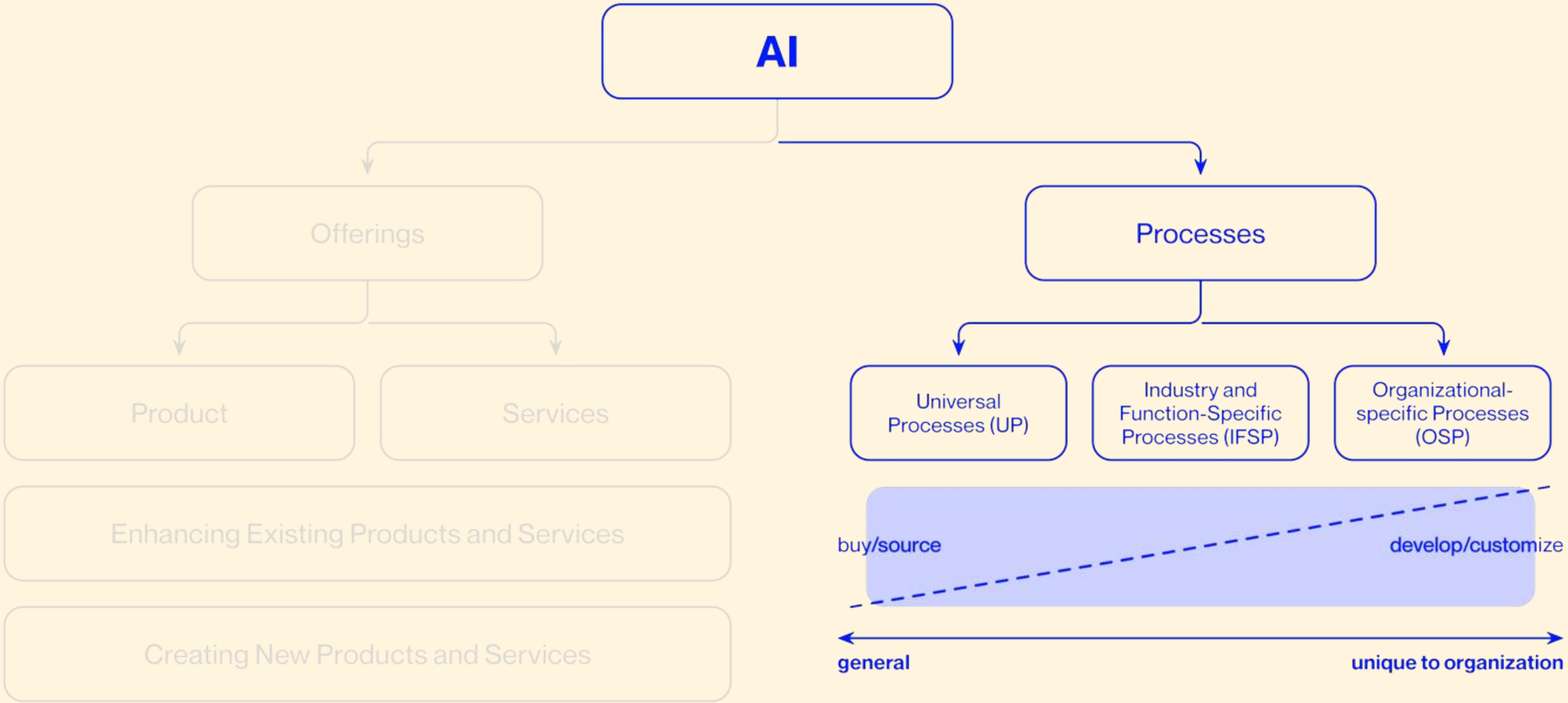

AI
Offerings
Processes
Product
Services
Enhancing Existing Products and Services
Creating New Products and Services

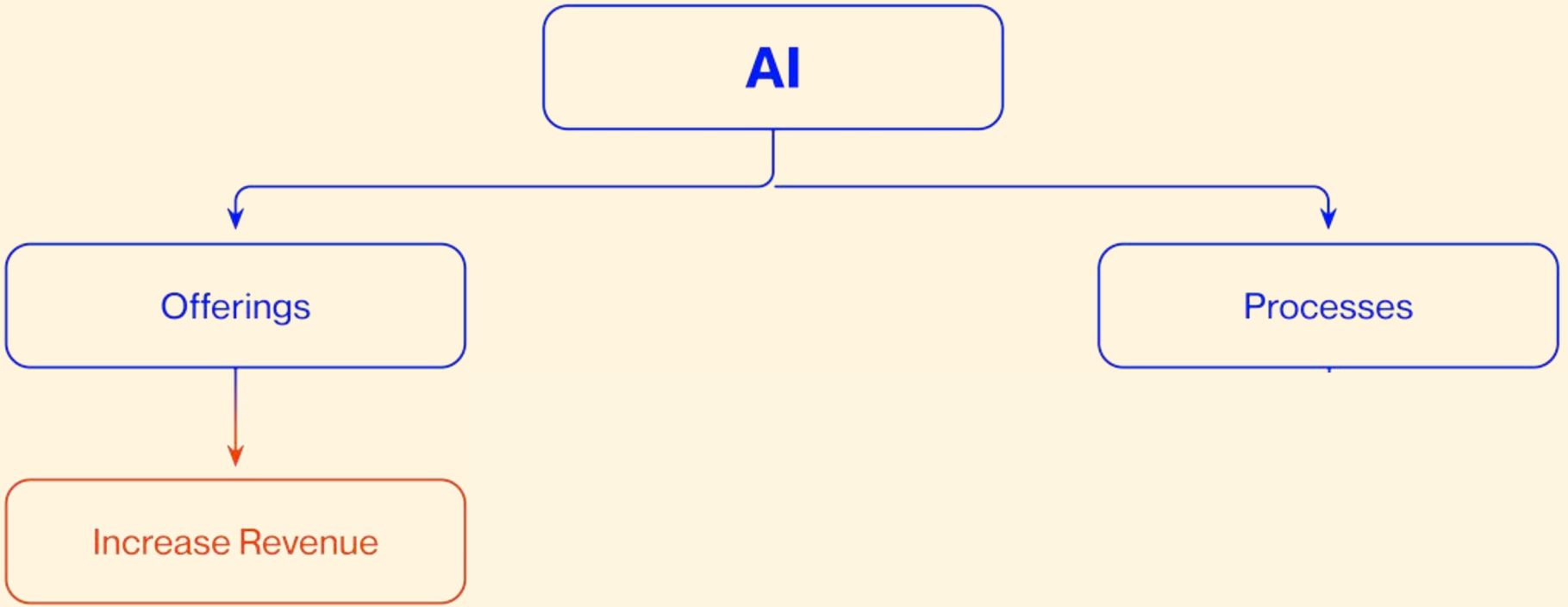

AI
Offerings
Product
Services
Enhancing Existing Products and Services
Creating New Products and Services
Processes
Universal Processes (UP)
Industry and Function-Specific Processes (IFSP)
Organizational-specific Processes (OSP)


AI
Offerings
Product
Services
Enhancing Existing Products and Services
Creating New Products and Services
Processes
Universal Processes (UP)
Industry and Function-Specific Processes (IFSP)
Organizational-specific Processes (OSP)
buy/source
develop/customize
general
unique to organization

Customization vs. Standardization




AI
Offerings
Product
Services
Enhancing Existing Products and Services
Creating New Products and Services
Processes
Universal Processes (UP)
Industry and Function-Specific Processes (IFSP)
Organizational-specific Processes (OSP)
buy/source
develop/customize
general
unique to organization


AI
Offerings
Processes
Increase Revenue

Birdfy Feeder

Version

Lite (Everything but AI)

AI (6000+ Birds Species Identification)

★★★★★ (26)

€123,95 ~~€208,95~~ - €85,00 (41% off)

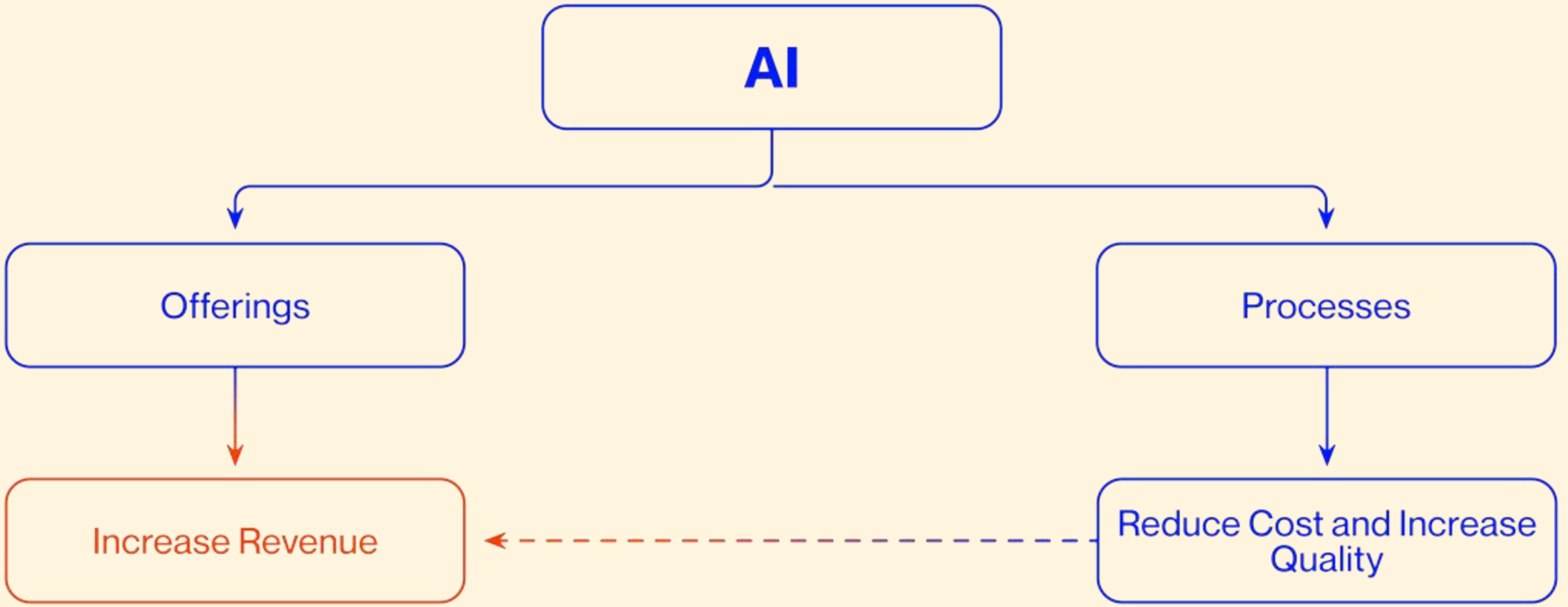
Version

Lite (Everything but AI)

AI (6000+ Birds Species Identification)

★★★★★ (26)

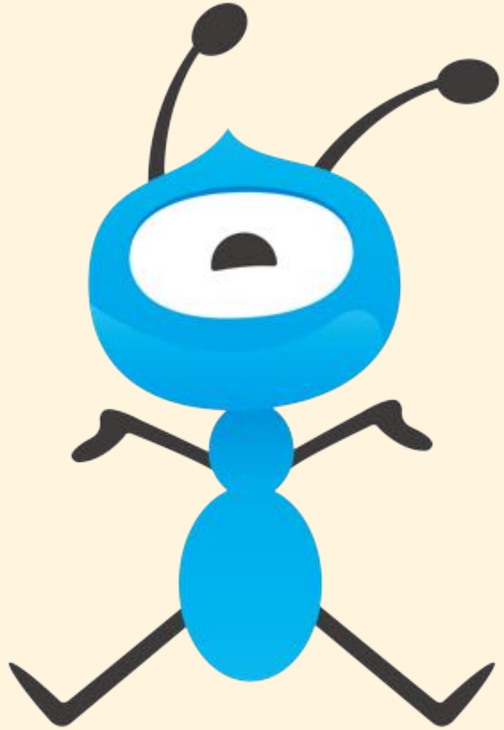
€161,95 ~~€237,95~~ - €76,00 (32% off)


AI
Offerings
Processes
Increase Revenue
Reduce Cost and Increase Quality

3 minutes application

1 second approval

0 manual labour



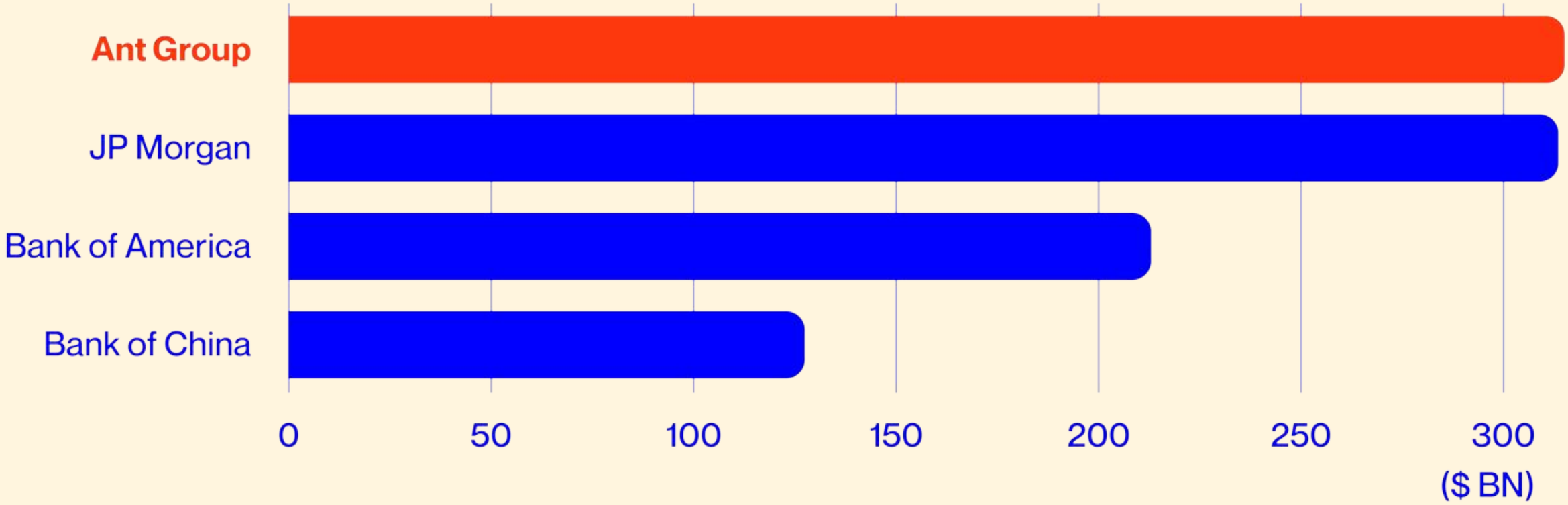
ANT FINANCIAL

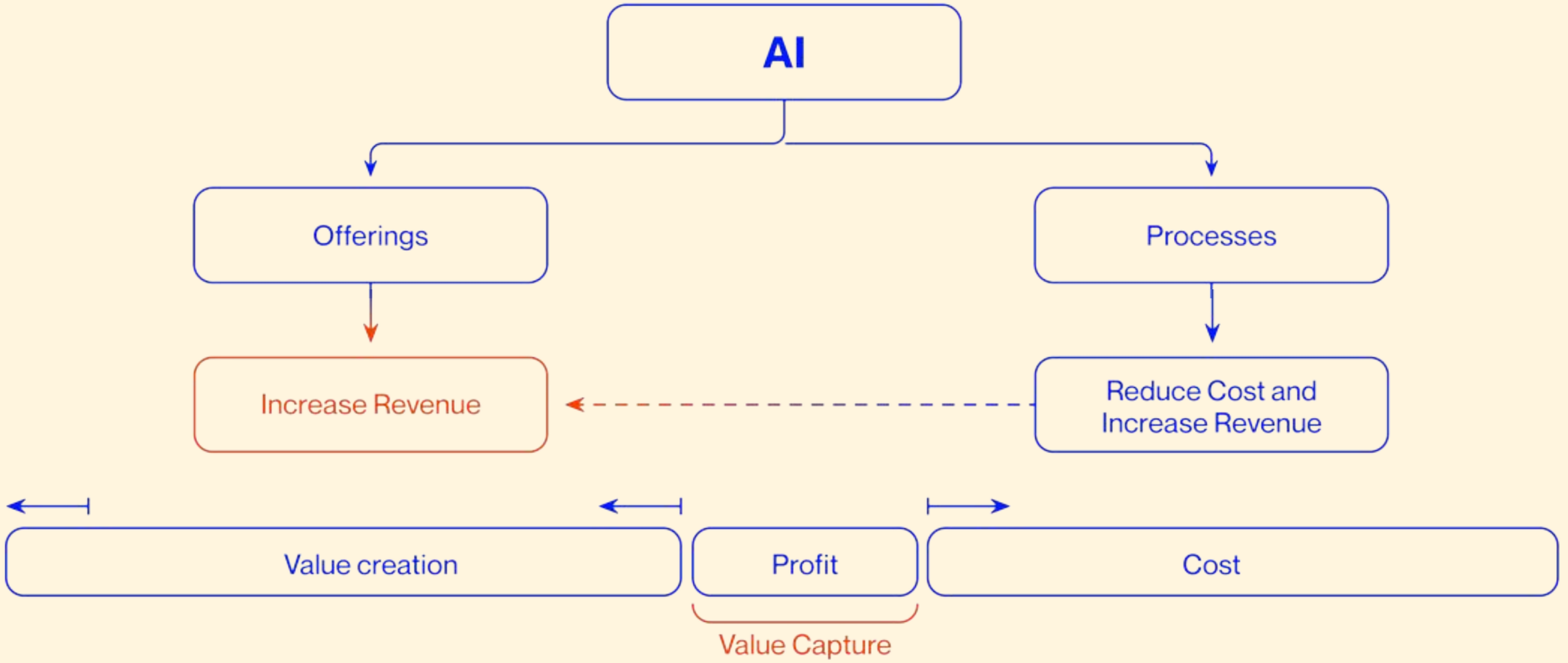
256.000
transactions/second processed*

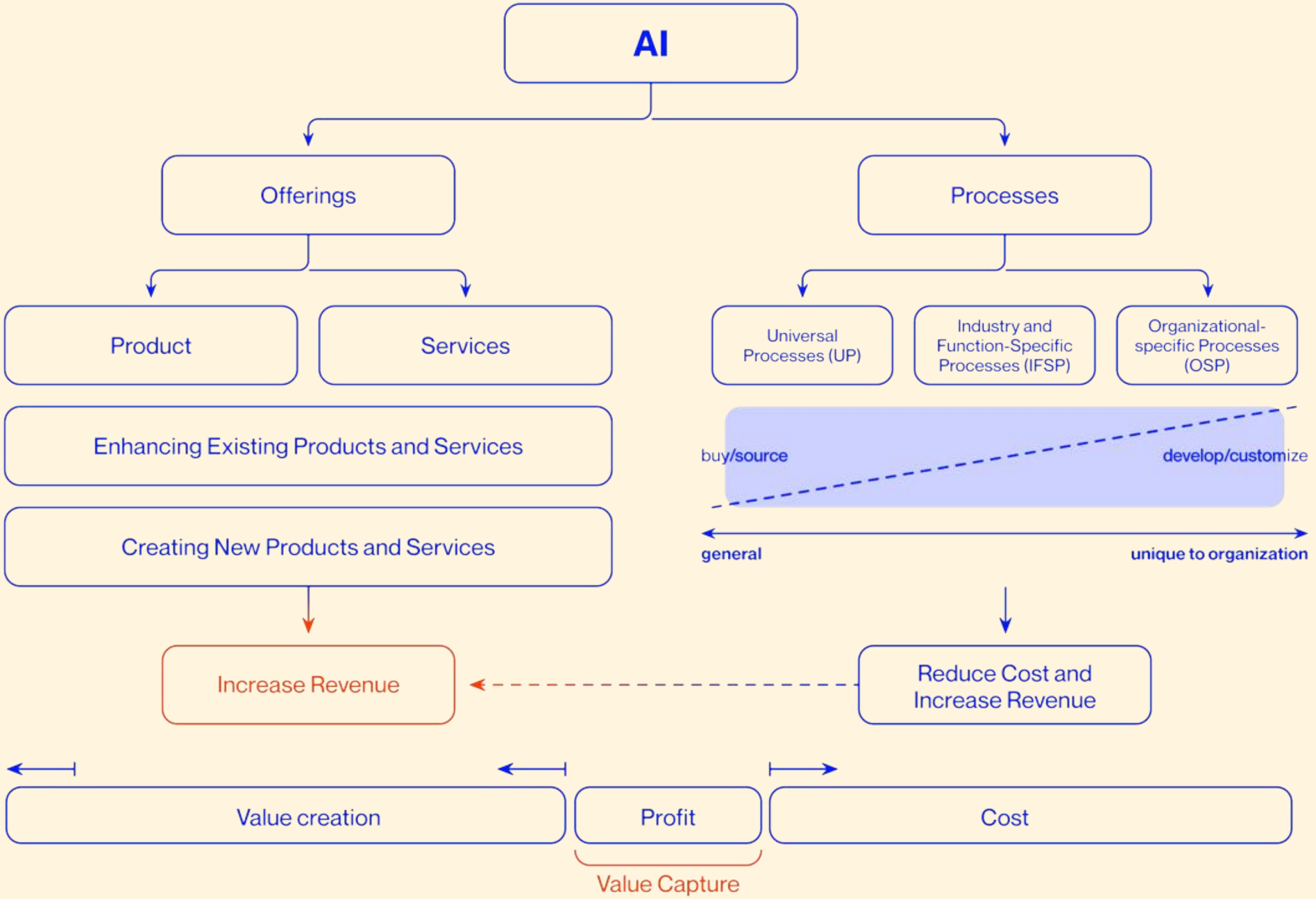
0,01
basis points fraud loss rate*

*2018

The Value of Ant Financial




AI
Offerings
Processes
Increase Revenue
Reduce Cost and
Increase Revenue
Value creation
Profit
Cost
Value Capture


AI
Offerings
Processes
Product
Services
Universal Processes (UP)
Industry and Function-Specific Processes (IFSP)
Organizational-specific Processes (OSP)
Enhancing Existing Products and Services
buy/source
develop/customize
Creating New Products and Services
general
unique to organization
Increase Revenue
Reduce Cost and Increase Revenue
Value creation
Profit
Cost
Value Capture


xpand

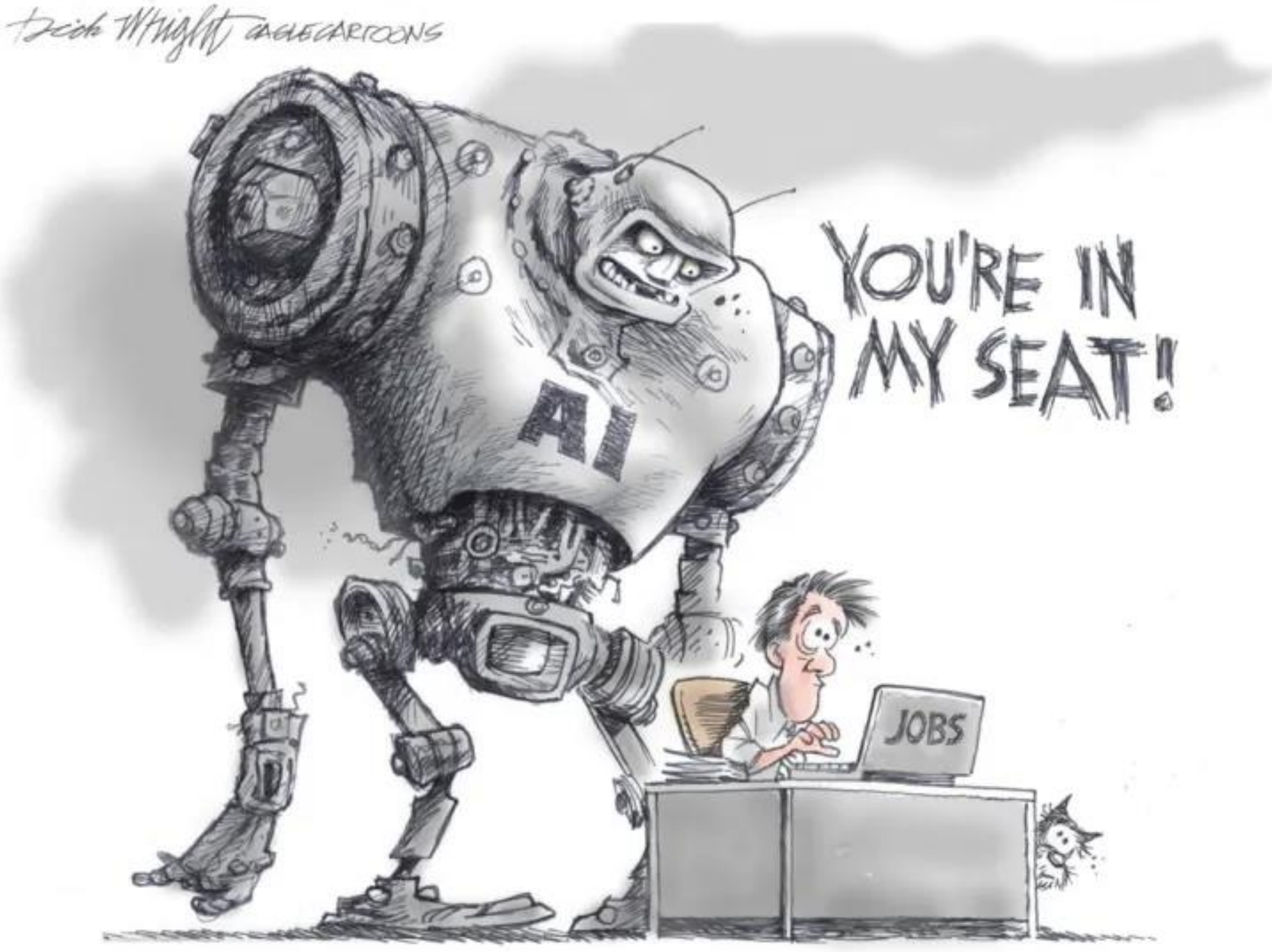
Harvard Business Review

Business And Society

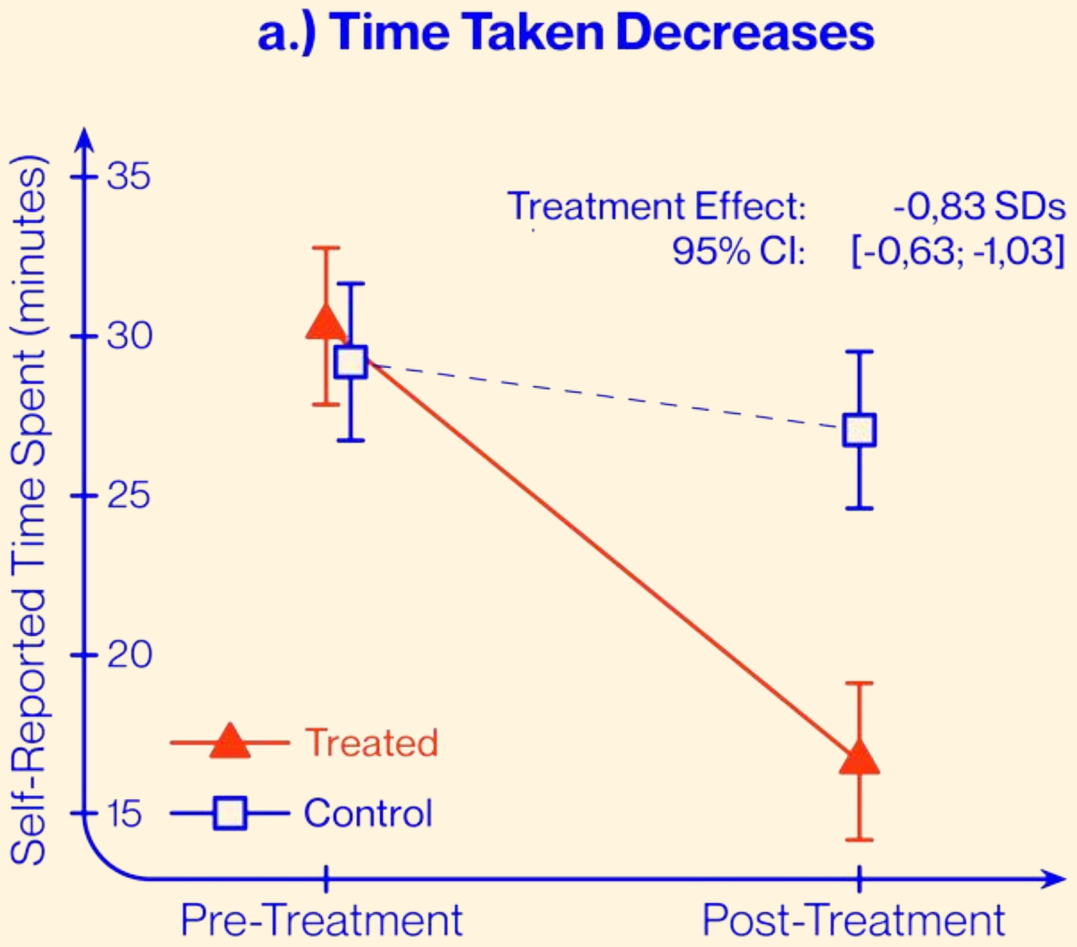
AI Won't Replace Humans — But Humans With AI Will Replace Humans Without AI

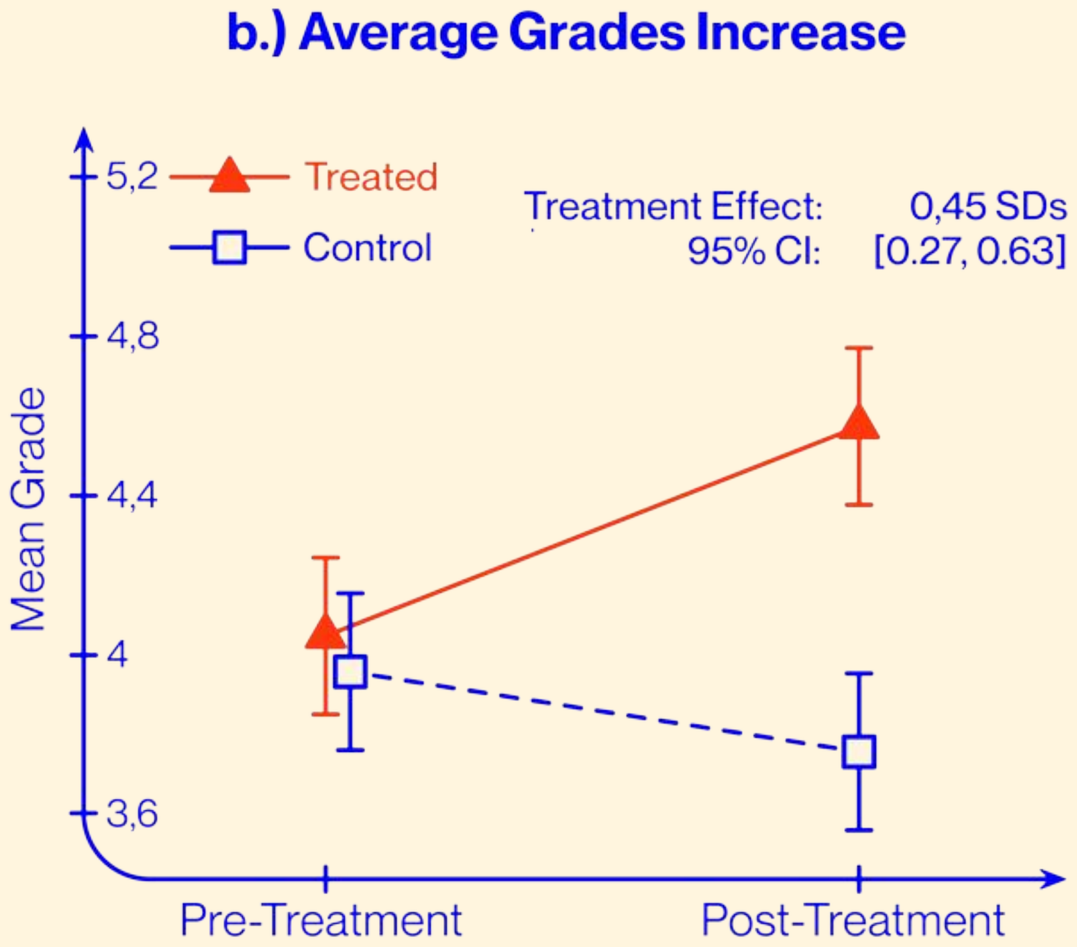
August 04, 2023

How AI is Going to Change Jobs


Dick Wright DAGLECARTOONS
AI
YOU'RE IN MY SEAT!
JOBS

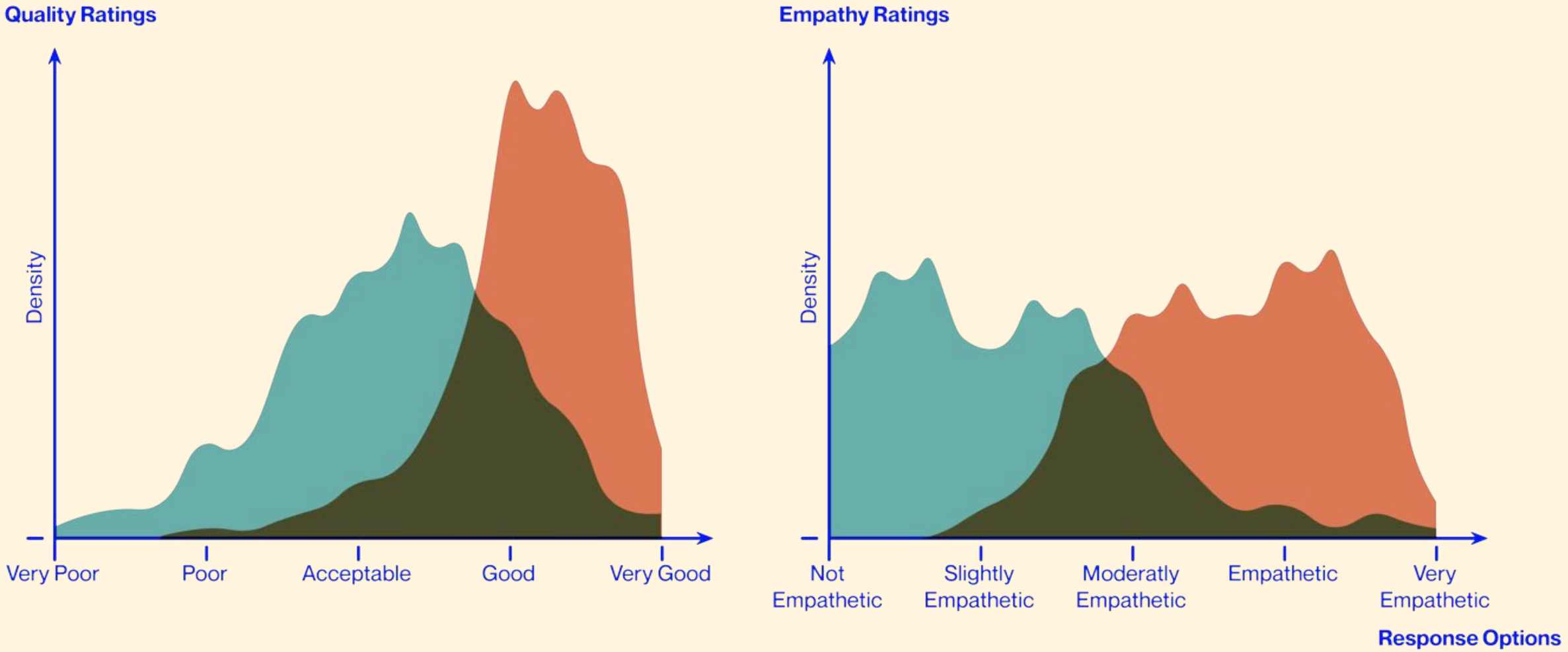
ChatGPT's Effects on Productivity



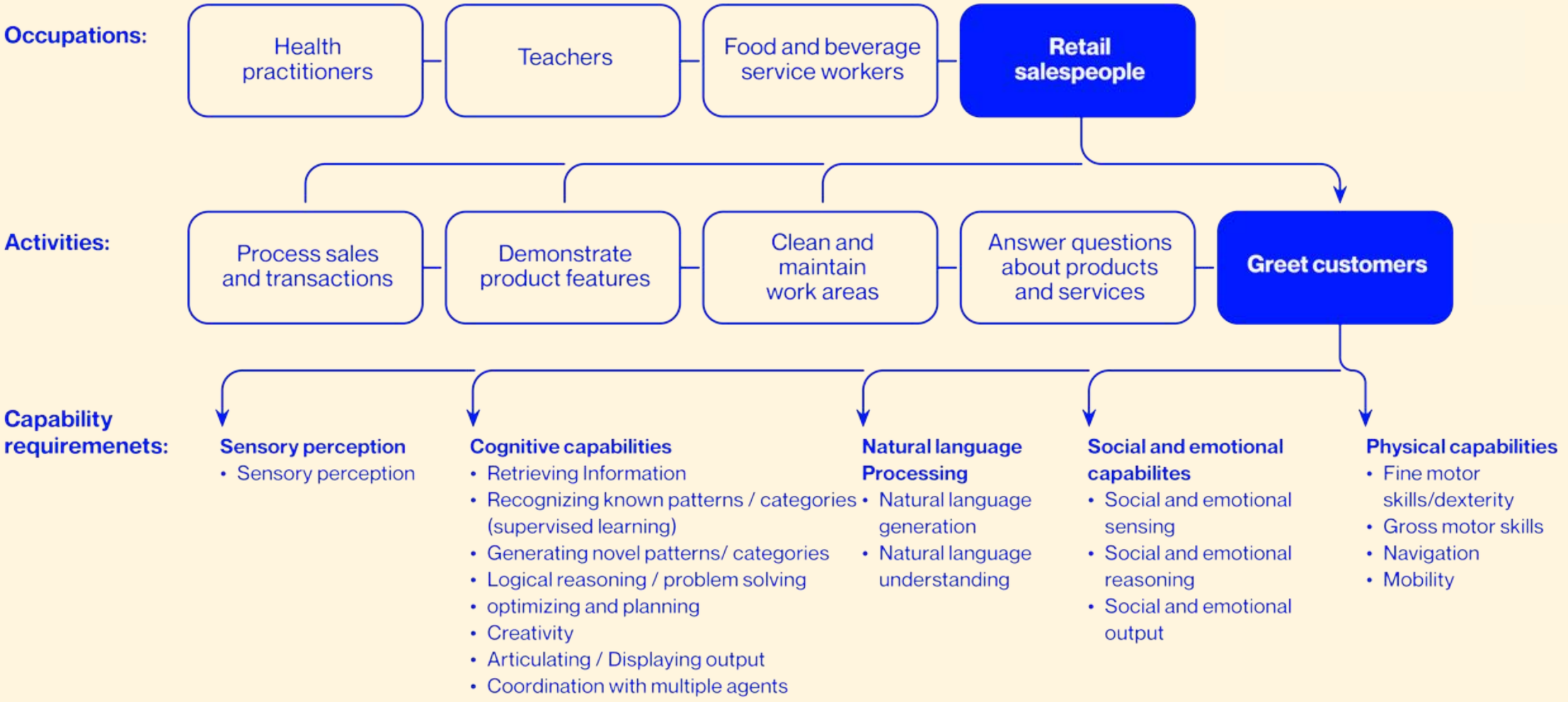


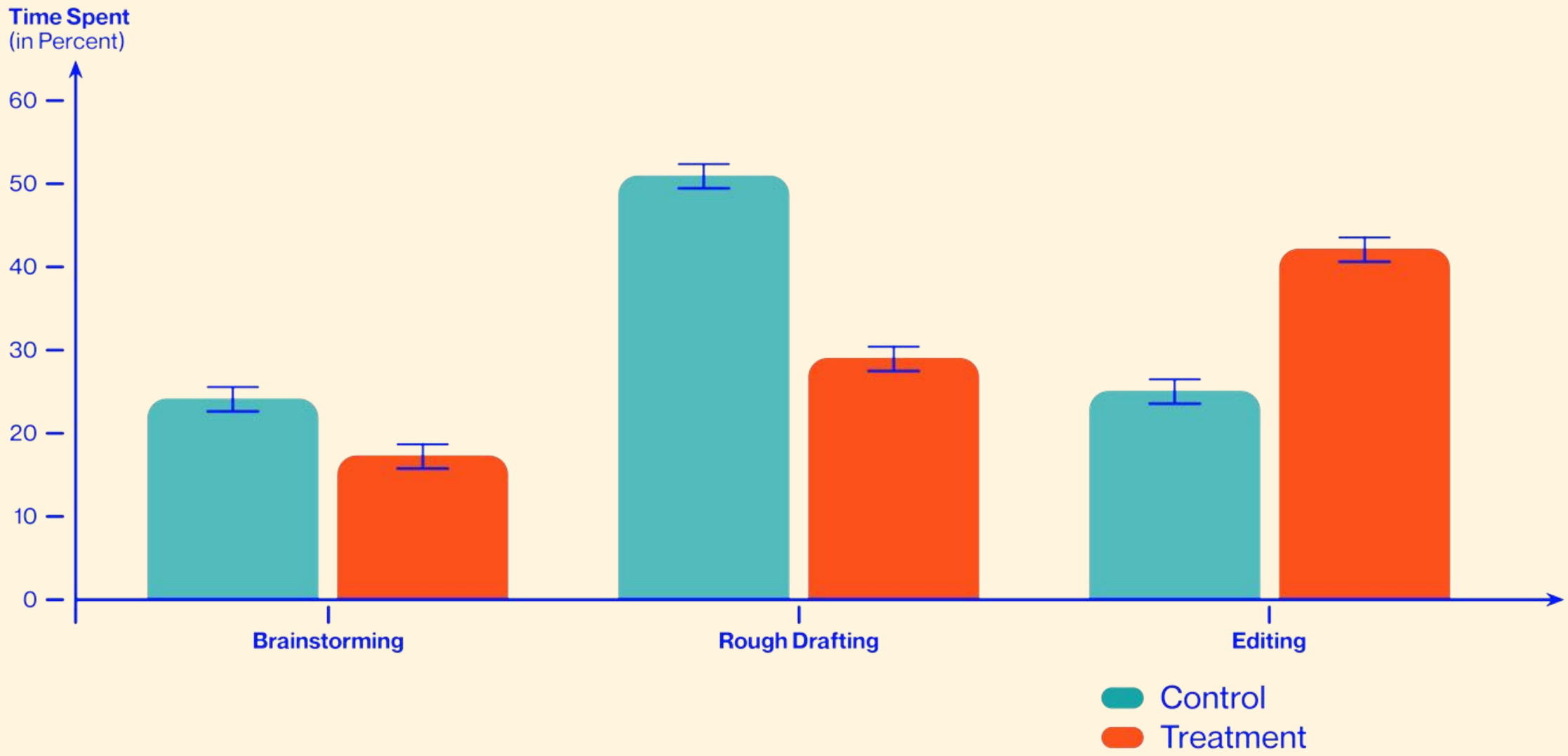
Source: Noy, S., & Zhang, W. (2023). *Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence*. Working Paper, Massachusetts Institute of Technology.

Comparing Physicians and AI

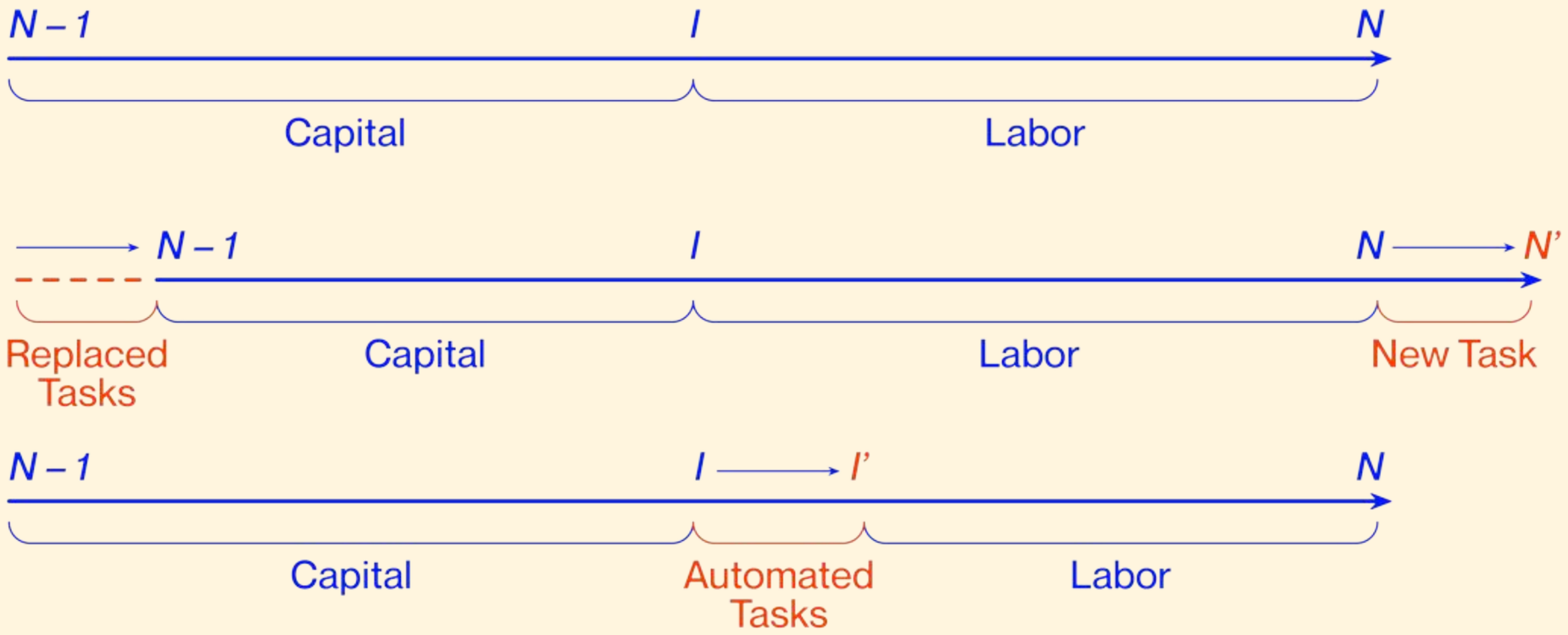


Source: Ayers, J. W., Poliak, A., Dredze, M., et al. (2023). *Comparing Physician and Artificial Intelligence Chatbot Responses to Patient Questions Posted to a Public Social Media Forum*. JAMA Internal Medicine, 183(6), 589-596..


Occupations:
Health practitioners
Teachers
Food and beverage service workers
Retail salespeople
Activities:
Process sales and transactions
Demonstrate product features
Clean and maintain work areas
Answer questions about products and services
Greet customers
Capability requiremenets:
Sensory perception
• Sensory perception
Cognitive capabilities
• Retrieving Information
• Recognizing known patterns / categories (supervised learning)
• Generating novel patterns/ categories
• Logical reasoning / problem solving
• optimizing and planning
• Creativity
• Articulating / Displaying output
• Coordination with multiple agents
Natural language Processing
• Natural language generation
• Natural language understanding
Social and emotional capabilites
• Social and emotional sensing
• Social and emotional reasoning
• Social and emotional output
Physical capabilities
• Fine motor skills/dexterity
• Gross motor skills
• Navigation
• Mobility



Source: Noy, S., & Zhang, W. (2023). *Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence*. Working Paper, Massachusetts Institute of Technology.


N – 1
I
N
Capital
Labor
N – 1
I
N
N'
Replaced Tasks
Capital
Labor
New Task
N – 1
I
I'
N
Capital
Automated Tasks
Labor

Harvard Business Review

Business And Society

AI Won’t Replace Humans — But Humans With AI Will Replace Humans Without AI

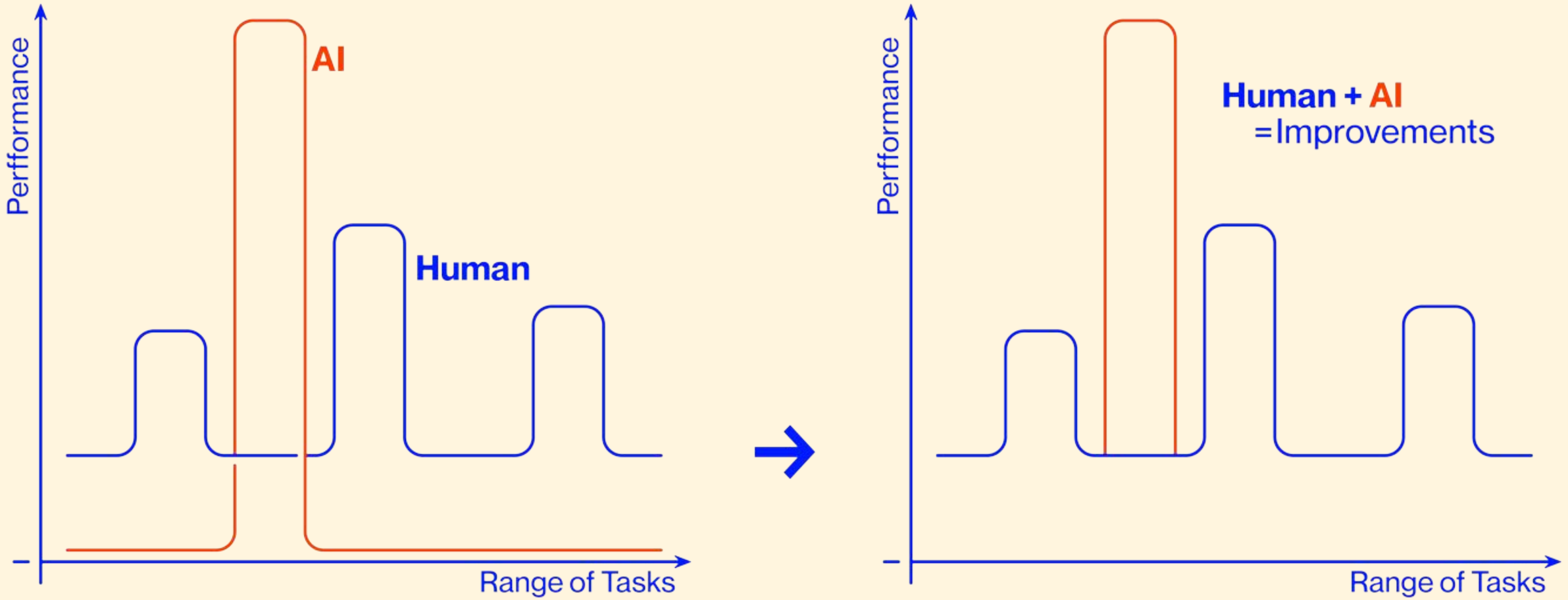
August 04, 2023

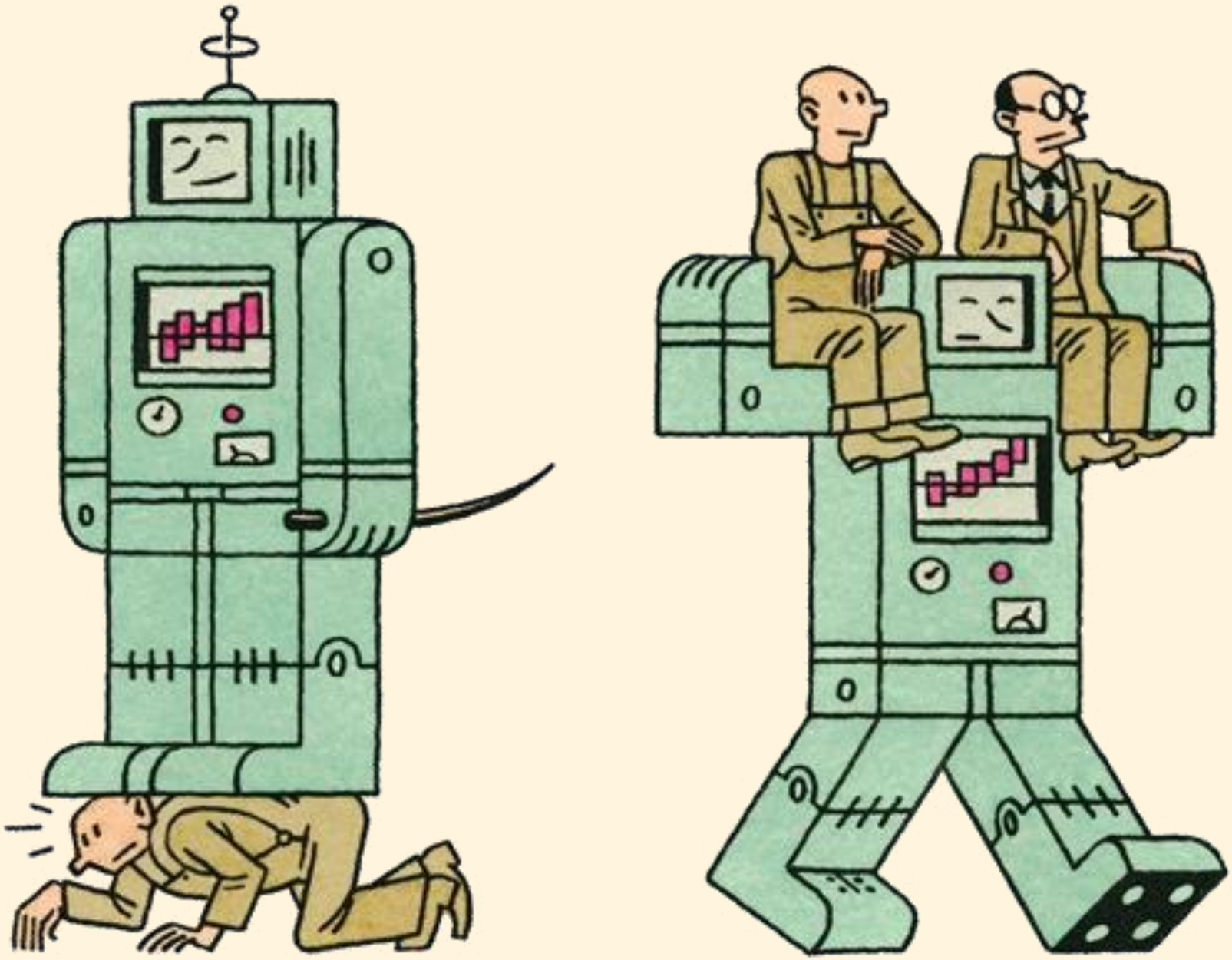
slido

Please download and install the Slido app on all computers you use

How often do you use ChatGPT?

ⓘ Start presenting to display the poll results on this slide.


Perfformance
AI
Human
Range of Tasks
Perfformance
Human + AI
=Improvements
Range of Tasks



Pre-Workshop Homework

I. AI Maturity Self-Assessment

Objective: Reflect on your organization's current position in terms of AI adoption.

Instructions:

AI Maturity Evaluation:

- **Definition:** AI Maturity refers to the extent to which your organization is prepared to implement and leverage AI technologies.
- **Task:** Rate your organization's AI maturity on a scale of 1 to 5 (where 1 is the earliest stage and 5 is the most advanced).

II. Current AI Strategy and Initiatives

Objective: Analyze and articulate the current state of your AI strategy and initiatives.

Instructions:

Status Quo Analysis:

- **Task:** Describe your current AI strategy and initiatives. Outline the objectives, scope, and execution status.

III. Enabling Factors Analysis

Objective: Evaluate your organization's standing in relation to each AI enabling factor and identify the responsible person or division.

Instructions:

Enabling Factor Evaluation:

- **Task:** For each of the following enabling factors, provide a brief explanation of what the factor entails, rate your organization's current standing from 1 to 5, and identify the main person or division in charge.
    - **AI-Centric Culture:** A mindset within the organization that not only appreciates the transformative potential of AI but is also willing to adopt the changes and innovations that AI brings about, ensuring a receptive ground for AI projects.
    - **AI Organizational Structure:** The setup of a formal structure within the organization that can support and drive AI initiatives effectively, which may include specialized teams or centers of excellence dedicated to AI, ensuring there is clear ownership and accountability for AI projects.

- **AI Talent and Expertise:** The availability and development of the necessary skills and expertise within the organization to ideate, implement, and manage AI solutions, ensuring the human capital is in place to leverage AI technology effectively.
- **Data Strategy and Governance:** A framework that governs the collection, storage, processing, and usage of data in a manner that is ethical, secure, and efficient, ensuring high data quality and accessibility for AI applications.
- **AI Infrastructure and Architecture:** The necessary technical groundwork, including hardware, software, and network capabilities, that allows for the development, deployment, and scaling of AI applications within the organization.
- **AI Ecosystem Integration:** The organization's relationship with the broader AI market, including partnerships with tech providers, academic institutions, and engagement in industry consortia, which can help in keeping pace with AI advancements and integrating external innovations.

IV. AI Use Case Analysis

Objective: Prepare an AI use case that you have implemented, or are excited to implement, for presentation at the workshop.

Instructions:

Use Case Selection:

- **Task:** Choose one AI use case from your organization. This could be a project that has been implemented or one that is planned for the future.

Use Case Details:

- **Task:** Provide a comprehensive overview of the selected AI use case.
- **Components to Include:**
  - **Description of the Use Case:** What problem does it solve or what opportunity does it leverage?
  - **Input Data:** What data feeds into the use case?
  - **Machine Learning Capability:** Identify the ML capabilities used (refer to the provided reading material).
  - **Outcome and Action Triggered:** What actions are taken based on the AI's analysis or prediction?
  - **Value Generation:** What value does the use case create? How does it impact the P&L? Provide estimates if possible.

Day 1

Time	Topic	Format	Details	Questions
10:00 - 11:00	Introduction Round	Group Work (Split into 2 groups)	Participants share expectations, assess their organization's current AI stance, discuss personal AI knowledge, and present a recent or prospective AI use case. Goal: Foster mutual understanding and set the stage for collaboration.	
11:00 - 11:35	AI Strategy: Enabling Organizations	Lecture	Short lecture covering AI's role in enabling organizations, understanding AI maturity, building a vision for AI-enabled organizations, and formulating a comprehensive AI strategy.	
11:35 - 12:15	Vision Formulation for AI	Individual Work with Peer Support	Participants work in pairs but focus individually on developing an AI vision for their organization, with peers serving as sounding boards. Focus on vision's ambition, feasibility, and potential roadblocks.	
12:15 - 12:30	Group Presentation and Reflection	Group Work (Split into 2 groups)	Groups present their AI visions, reflecting on their ambitions and discussing potential failure points. This session encourages feedback and collaborative refinement of ideas.	
12:30 - 13:30	Lunch Break	Social Interaction		
13:30 - 14:00	AI-Centric Culture	Mixed Format	Lecture (7.5 mins): Introduction to fostering an AI-centric culture. Peer Discussion (7.5 mins): How does our current company culture support AI innovation? Action Plan (7.5 mins): Developing strategies to enhance AI culture. Slido (7.5 mins): Submit and vote on ideas. Questions include identifying AI champions, addressing misconceptions, and encouraging engagement.	1. How is AI perceived in your company's culture? 2. Can you describe a recent project where AI was integrated in your business? 3. What obstacles does your company face in adopting an AI-centric approach? 4. In what ways are AI-related outcomes communicated within your company? 5. What steps could be taken to enhance AI understanding in your company?
14:00 - 14:30	AI Organizational Structure	Mixed Format	Lecture (7.5 mins): Importance of a supportive AI organizational structure. Peer Discussion (7.5 mins): Who oversees AI initiatives? Action Plan (7.5 mins): Identifying structures that support AI projects. Slido (7.5 mins): Submit and vote on ideas. Questions cover idea-sharing paths, prioritization of AI projects, and ideal structures.	1. What's the current organizational model for AI in your company? 2. How are AI responsibilities and roles defined in your organization? 3. Can you identify any bottlenecks in the way your company organizes AI initiatives? 4. What would you change about your current AI organizational structure? 5. How does your company facilitate cross-departmental collaboration on AI projects?
14:30 - 15:00	AI Talent and Expertise	Mixed Format	Lecture (7.5 mins): Building or acquiring AI talent. Peer Discussion (7.5 mins): AI skills gaps and training. Action Plan (7.5 mins): Strategies for enhancing AI expertise. Slido (7.5 mins): Submit and vote on ideas. Questions focus on recruitment, training, staying updated, partnerships, and competency measurement.	1. How does your company identify AI talent needs? 2. What strategies are in place for developing AI expertise within your staff? 3. Are there opportunities for your employees to learn about AI? 4. How do you balance the decision to train existing staff in AI versus hiring new talent? 5. Can you share an example where AI talent made a significant impact in your company?
15:00 - 15:30	Data Strategy and Governance	Mixed Format	Lecture (7.5 mins): Establishing a robust data strategy. Peer Discussion (7.5 mins): Maintenance of data quality. Action Plan (7.5 mins): Developing a data governance model. Slido (7.5 mins): Submit and vote on ideas. Questions address data management practices, governance policies, privacy, security, and ethical considerations.	1. How does your company ensure the quality of data used for AI? 2. What governance structures are in place for data management? 3. How do you address data security and ethical concerns in AI? 4. Is there a clear data strategy that supports your AI initiatives? 5. How are data accessibility and interoperability handled in your company?

Day 1 (continued)

15:30 - 16:00	Break (Coffee and Cake)	Break	10-minute buffer followed by a 20-minute coffee and cake break, offering participants time to relax and network informally.	
16:00 - 16:30	AI Infrastructure and Architecture	Mixed Format	Lecture (7.5 mins): The foundation of AI technical infrastructure. Peer Discussion (7.5 mins): Evaluating current IT infrastructure for AI. Action Plan (7.5 mins): Planning for scalable AI infrastructure. Slido (7.5 mins): Submit and vote on ideas. Questions involve data storage, integration challenges, and cybersecurity in AI.	1. Is your current IT infrastructure equipped to support AI? 2. How do you assess the need for infrastructure updates in light of AI? 3. What challenges do you face in integrating AI technologies into your existing systems? 4. How is your data architecture designed to handle the demands of AI? 5. Can you give an example of how your technological infrastructure has enabled an AI project?
16:30 - 17:00	AI Ecosystem Integration	Mixed Format	Lecture (7.5 mins): Leveraging the broader AI ecosystem. Peer Discussion (7.5 mins): Strategic AI partnerships. Action Plan (7.5 mins): Identifying potential collaborations. Slido (7.5 mins): Submit and vote on ideas. Questions explore external AI knowledge, collaborations with startups and academia, and contributions to the AI ecosystem.	1. How does your company interact with the AI ecosystem? 2. What types of partnerships have you formed to advance your AI initiatives? 3. How do you leverage external AI innovations within your company? 4. What role does collaboration with academia play in your AI strategy? 5. How do you keep abreast of the evolving AI landscape through your ecosystem?
17:00 - 18:00	AI Ethics and Regulation	Lecture + Q&A	45-minute lecture on AI ethics and regulation, highlighting ethical principles, the regulatory landscape, and impacts on AI strategy. Followed by a 15-minute Q&A session for deeper engagement and clarification on these critical issues.	
19:00 - 21:45	Evening Networking	Networking and Dinner	Dinner starts with a 45-minute inspirational keynote, followed by a 2-hour networking session.	

Day 2

Time	Topic	Format	Details
09:00 - 09:10	Icebreaker	Interactive Activity	A quick, engaging activity to warm up the participants and set the stage for collaborative work.
09:10 - 09:25	AI Use Case Ideation - Lecture	Lecture	Introduce the process of AI use case ideation, focusing on identifying potential applications of AI.
09:25 - 09:35	AI Use Case Definition	Individual Work	Participants define the AI use case they've brought as homework, applying the concepts from the lecture.
09:35 - 09:50	Use Case Presentation	Group Work (4-5 per group)	Groups present their defined AI use cases, sharing and discussing with peers.
09:50 - 10:00	Evaluating Use Cases - Lecture	Lecture	Teach participants how to evaluate AI use cases based on economic value, feasibility, and prioritization.
10:00 - 10:25	Use Case Evaluation	Group Work with Canvas	Groups work on evaluating and prioritizing their use cases using the prioritization canvas.
10:25 - 10:30	Use Case Pitches	Presentation in Plenum	Each group briefly pitches their prioritized AI use case to the entire assembly.
10:30 - 10:40	Lecture and Q&A	Lecture + Q&A	Address any questions and provide additional insights into the use case evaluation process.
10:40 - 11:00	Break (Buffer included)	Break	Coffee and cake break, with a buffer to accommodate any session overruns.

Day 2 (continued)

11:00 - 11:20	ML Lifecycle: Scoping	Lecture + Group Work	A session to define the problem the AI will solve, with 7 minutes of lecture followed by 13 minutes of group work on the canvas.
11:20 - 11:40	ML Lifecycle: Data	Lecture + Group Work	Focus on data collection and preparation, with 7 minutes of lecture and 13 minutes of hands-on work on the canvas.
11:40 - 12:00	ML Lifecycle: Modelling	Lecture + Group Work	Discuss building and training the AI model, with 7 minutes of lecture and 13 minutes of practical canvas work.
12:00 - 12:20	ML Lifecycle: Deployment	Lecture + Group Work	Cover the integration of AI into operations, with 7 minutes of lecture and 13 minutes of application on the canvas.
12:20 - 12:40	ML Lifecycle: Usage	Lecture + Group Work	Ensure the AI system's effective use by end-users, with a lecture and group canvas work.
12:40 - 13:00	ML Lifecycle: Monitoring	Lecture + Group Work	Final section on overseeing the AI system's operation with a lecture and group activity.
13:00 - 13:15	Final Use Case Pitches	Presentation in Plenum	Final presentations from each group on their end-to-end AI use case implementation plan.
13:15 - 13:35	Feedback and Wrap-Up	Group Discussion	Feedback is shared, and the session is wrapped up with key takeaways and next steps.
13:35 - 14:35	Networking Lunch	Social Interaction	An opportunity for participants to network and discuss the day's activities over lunch.
14:35 - 14:45	Goodbye + Departure	Social Interaction	Farewell

Questions?