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AI in Finance Summit

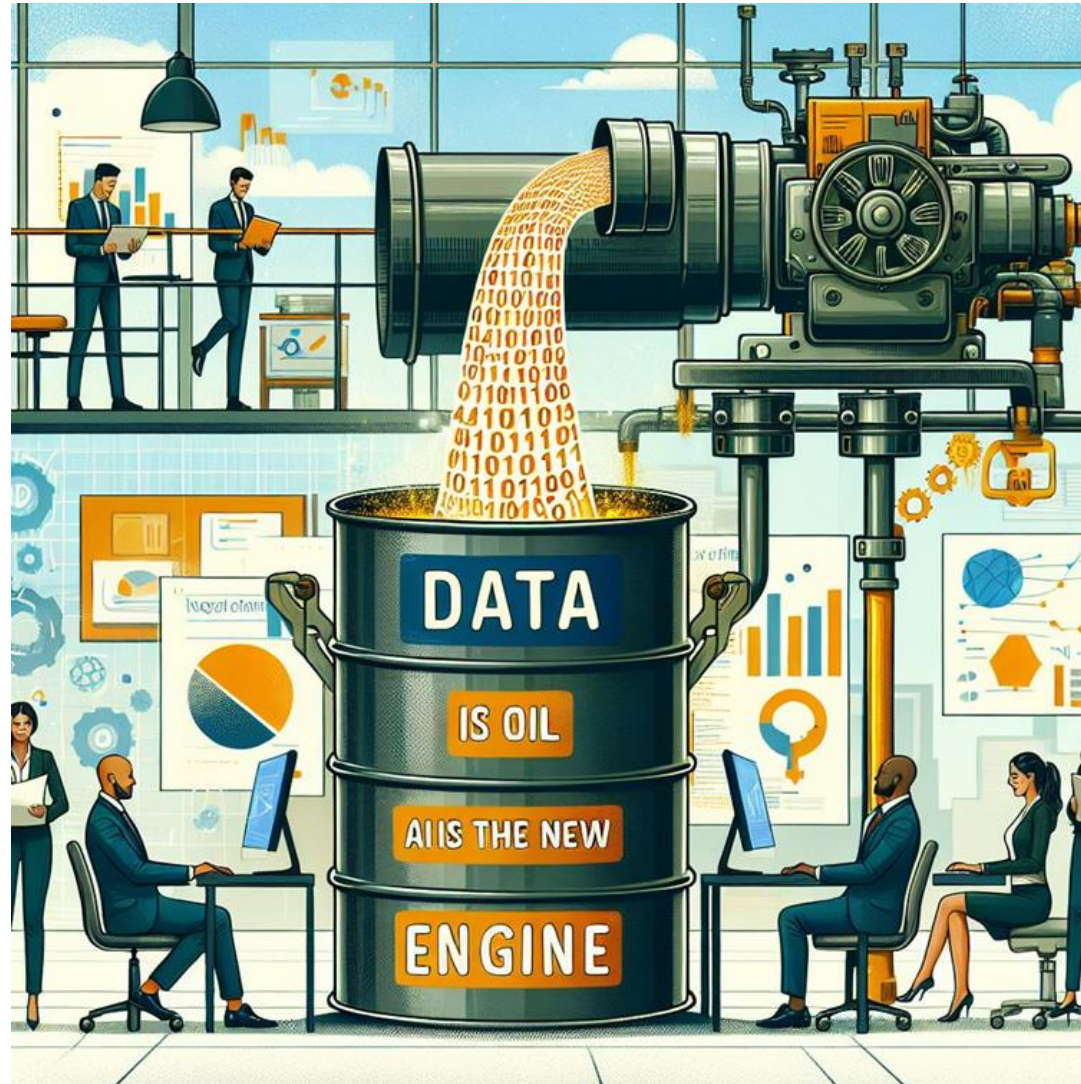
# When Not to Use (Generative) AI

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For Industry Professional Use Only

# Motivation and Vision – Part 1



Source: Microsoft Copilot

## Motivation and Vision – Part 2



Source: @histoftech. (2024, October 23). Post content. Mastodon. <https://mastodon.social/@histoftech/110712567796610184>

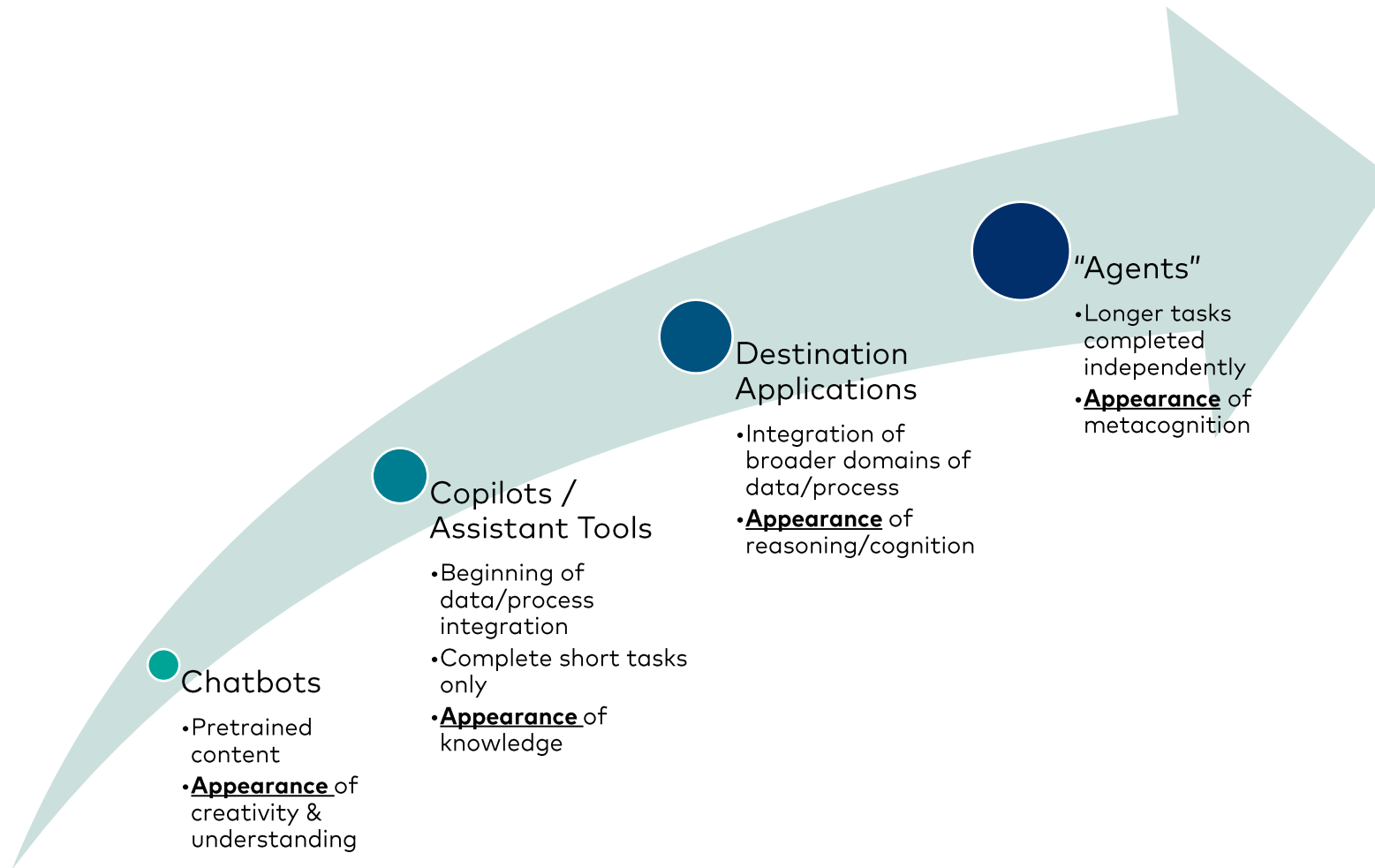
# Agenda

1. AI: The Appearance of Intelligence
2. Pitfalls of Uncritical AI Adoption
3. A More Balanced Approach



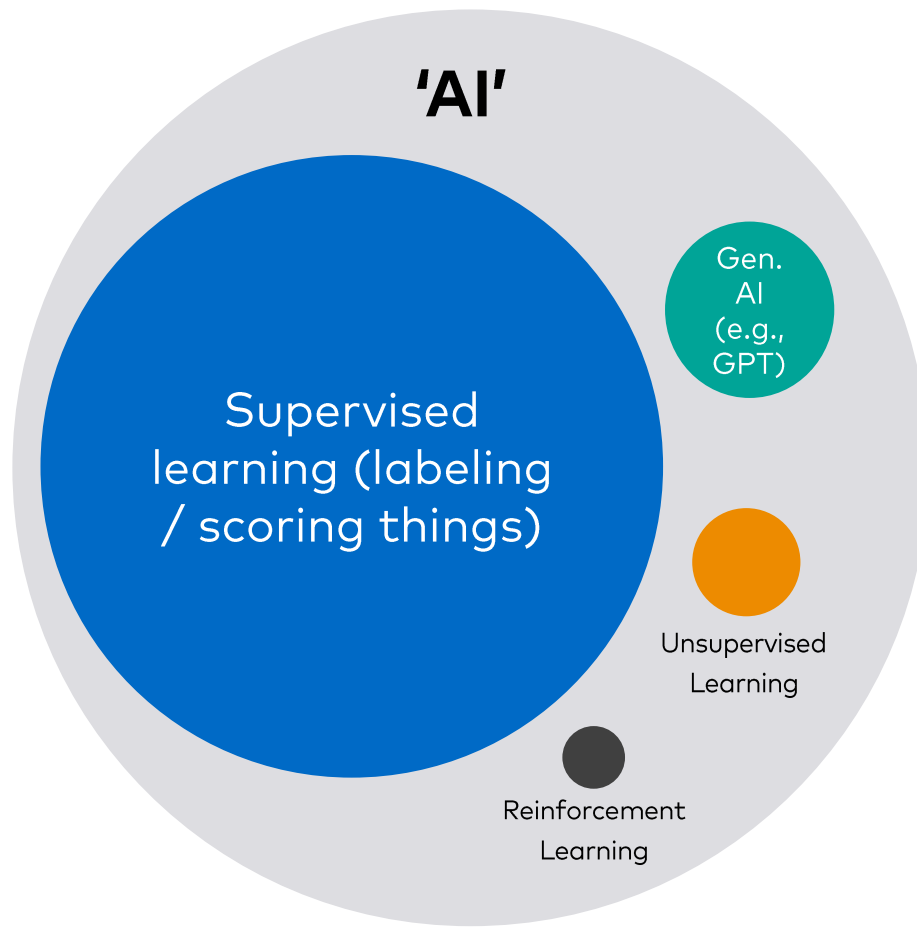


# An Appearance of Intelligence



# Definition and Prevalence of AI Today

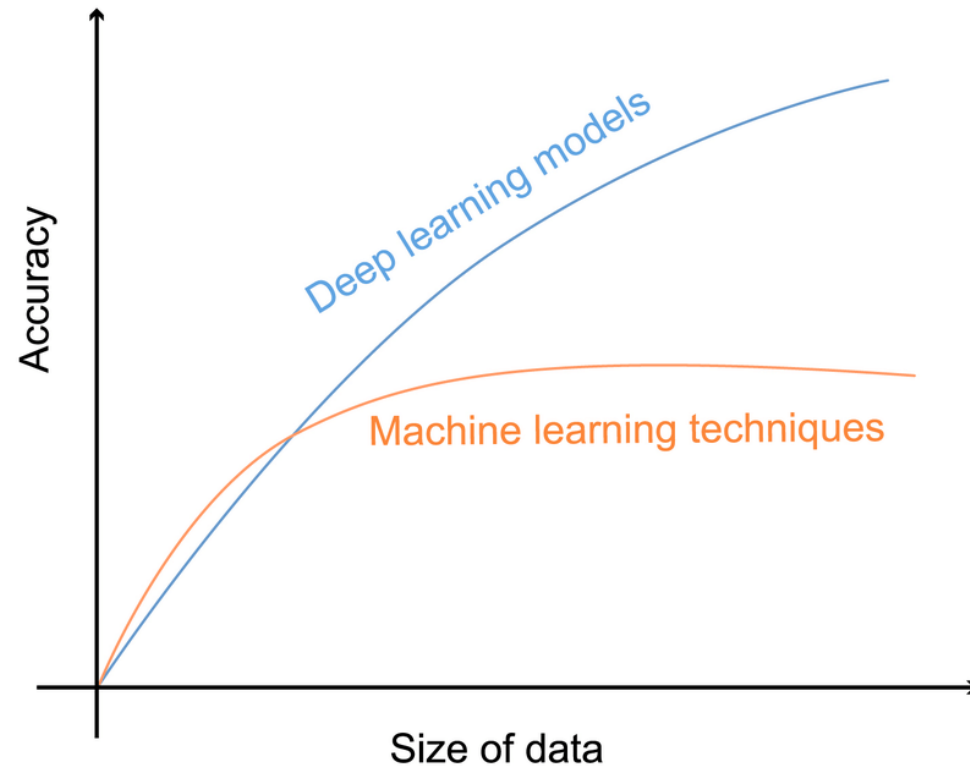
AI is a set of diverse [tools](#) designed for perform complex tasks using machine learning



Source: Andrew Ng, "Generative AI for Everyone." October 2023

- **Hype:** attention is primarily on Generative AI (including prompt-based large language models), but traditional supervised machine learning continues to dominate real world use cases, new investment, and value created.
- **Accessibility:** The key opportunity in business adoption of generative AI is a much shorter build time, with development to deployment in hours to days, vs months for traditional AI. This is because the models are pre-trained.
- **Room to grow:** Unique to certain large models including most generative AI, large models continue to become more effective with scale and data.
- **ROI:** Unlike other projects, successful generative AI applications start with a narrow & concrete use case, not open-ended design.

# All AI Models Have Limits



Source: Es-sabery, Hair et al., Sentence-Level Classification Using Parallel Fuzzy Deep Learning Classifier. 2021

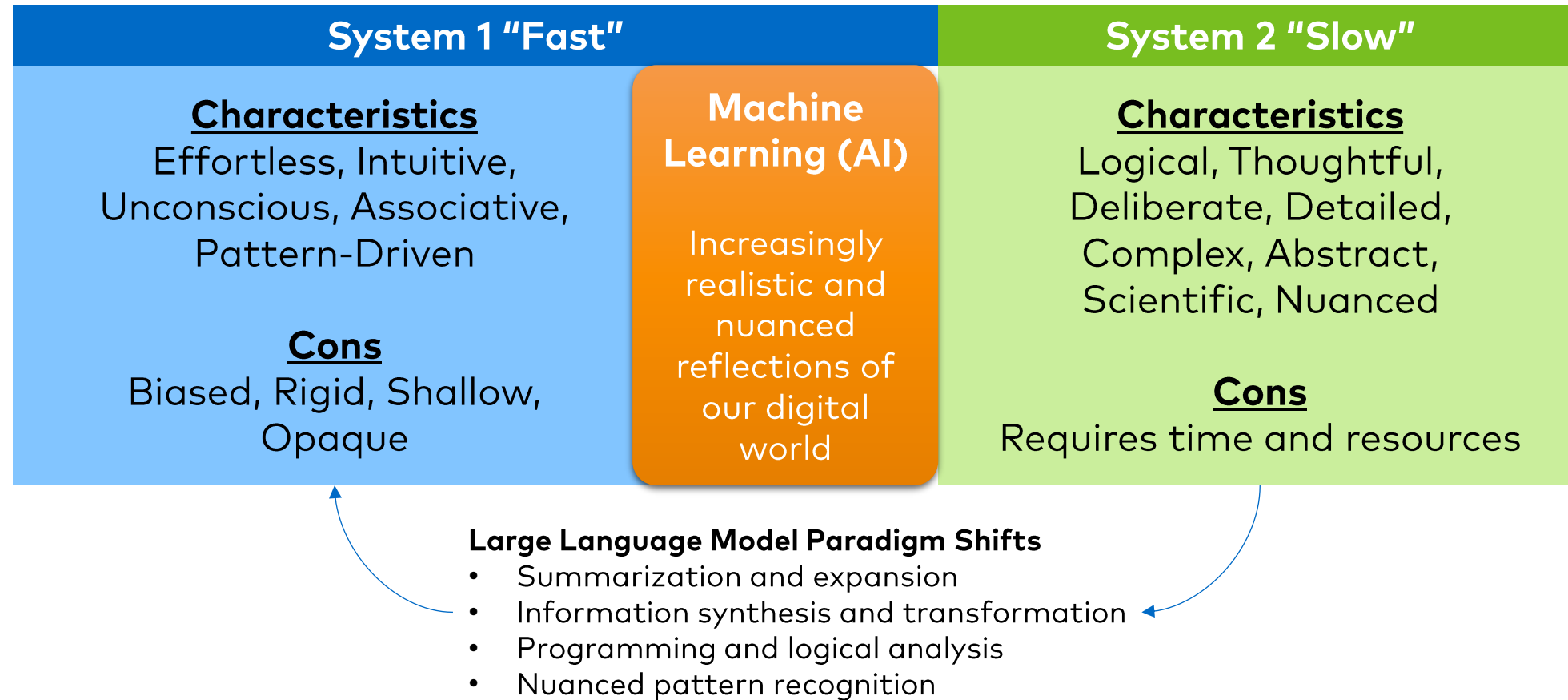
Traditional (smaller) AI models deliver specialized, limited results and taper off in effectiveness.

Larger models appear to have a much higher ceiling in effectiveness and generalist potential as more data is used to train them. The models themselves are undergoing continuous evolution.

Models reflect and simulate patterns in data, language data reflects and simulates patterns of human thought. Do language models simulate human thought?

# Advanced Machine Learning Value Proposition

Redefining and Accelerating "Slow" Thinking, Building Knowledge, and Making Better Decisions



Source: Kahneman, Daniel. Thinking, Fast and Slow. Farrar, Straus and Giroux, 2011.



# Pitfalls of Uncritical AI Adoption

Where AI is not the (whole) answer



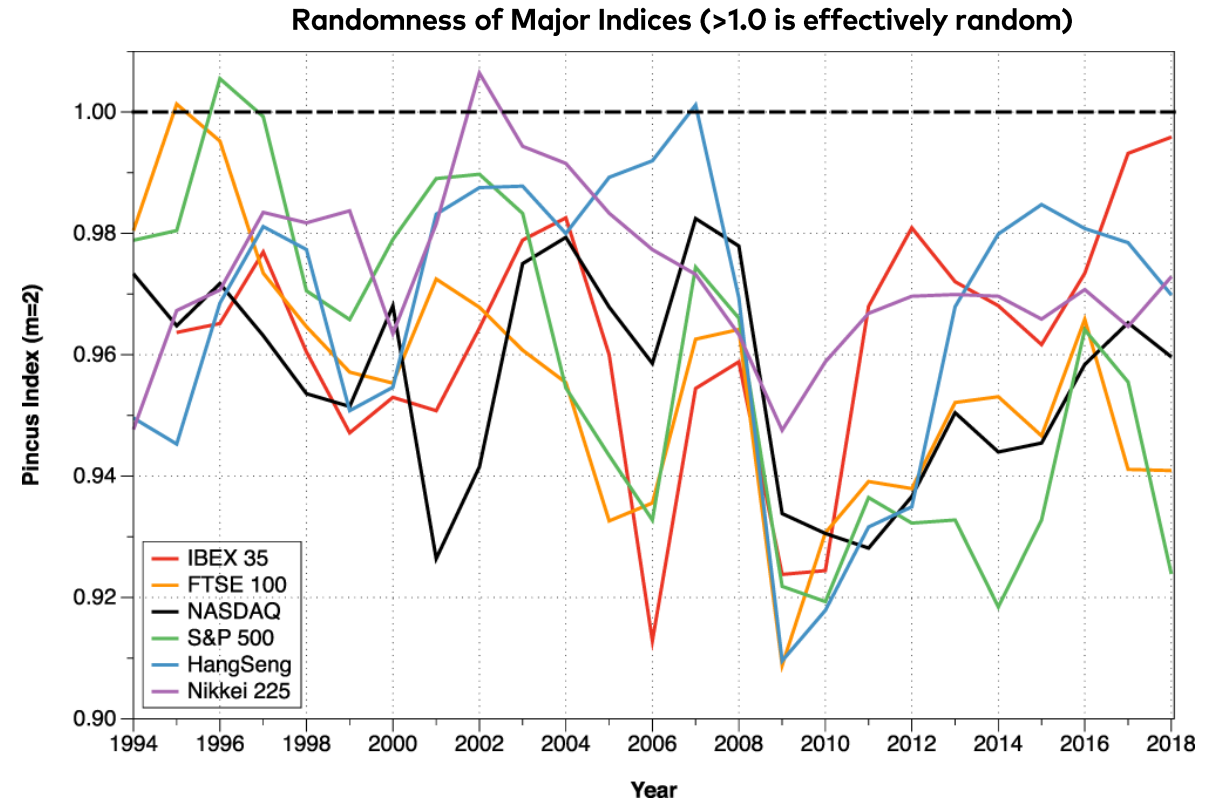
# The Financial Data Dilemma

Machine learning models work well in high signal to noise domains.

- However, financial data tends to be high noise to signal, where predictability is quickly and continually absorbed by the market.

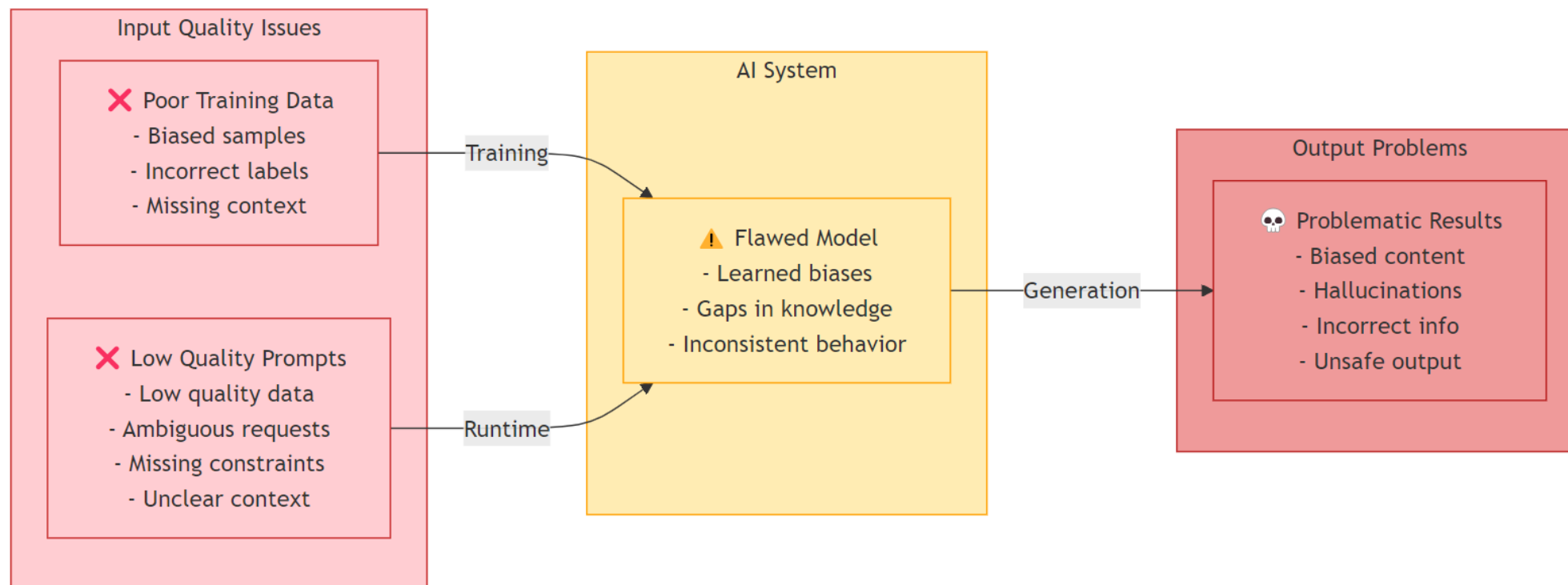
The industry is subject to a high standard of fiduciary and regulatory need for transparency.

- But models are increasingly complex with evolving interpretability challenges.



# Situations Where Data or Process Quality is Unacceptable

Garbage In, Garbage Out x2



# Situations Requiring Nuanced Human Judgement

Complex problems are often ill-defined from start to goal, and require dynamic human judgement\*

Complex Problem Solving (CPS):	Characteristics of Complex Problems:	Limitations of AI in CPS:	Importance of Human Judgment:
<ul style="list-style-type: none"> <li>• CPS involves overcoming barriers between a given state and a desired goal state through behavioral and cognitive, multi-step activities.</li> <li>• The process is dynamic, with changing and often opaque elements.</li> </ul>	<ul style="list-style-type: none"> <li>• Complex problems are characterized by their dynamic nature, intransparency, and the need for adaptive strategies.</li> <li>• These problems often require a deep understanding of context and the ability to adjust strategies as new information emerges.</li> </ul>	<ul style="list-style-type: none"> <li>• AI systems may lack the <b>flexibility</b> and <b>adaptability</b> needed to handle the dynamic and often unpredictable nature of complex problems.</li> <li>• While AI can assist in certain aspects, it cannot fully replace the nuanced judgment and adaptability of human problem solvers.</li> </ul>	<ul style="list-style-type: none"> <li>• Human expertise is crucial in CPS due to the <b>complexity and variability</b> of problems.</li> <li>• AI may struggle with the nuanced understanding required for these tasks, highlighting a need for human intervention.</li> </ul>

\*Dörner, Dietrich, and Joachim Funke. "Complex Problem Solving: What It Is and What It Is Not." *Frontiers in Psychology*, vol. 8, 2017, <https://www.frontiersin.org/articles/10.3389/fpsyg.2017.01153/full>

# Two Kinds of Opportunity



## Suppose you had a limitless supply of enthusiastic students who:

- Have read almost all digitized text and books in the world in all major languages (and remember a tiny part of it)
- Can work tirelessly, around the clock
- Know nothing about your motivations and specific goals
- Perform well without guidance 80% of the time, but are spectacularly wrong 20% of the time

## *Would you trust them to:*

- A) *Work independently on long, open-ended, and complicated processes*
- B) *Work in parallel on short, specific tasks that can be critiqued, or where flawed results are acceptable, but breadth is valuable*

# Two Kinds of Opportunity

Example: Multi-modal models and new use cases

**COVID-19 Vaccination Record Card**

Please keep this record card, which includes medical information about the vaccines you have received.  
Por favor, guarde esta tarjeta de registro, que incluye información médica sobre las vacunas que ha recibido.

Last Name: 11/2 MI

First Name: \_\_\_\_\_

Patient number (medical record or IIS record number): \_\_\_\_\_

Vaccine	Product Name/Manufacturer	Lot Number	Date	Healthcare Professional or Clinic Site
1 <sup>st</sup> Dose COVID-19	Pfizer	ER8730	4/8/21	BAY EDEN
2 <sup>nd</sup> Dose COVID-19	Pfizer	EW0158	4/29/21	BAY EDEN @11:41
Other				

Output the contents as a table.

Here's the content of the COVID-19 Vaccination Record Card in a table format based on what's visible in the image:

Vaccine	Product Name/Manufacturer	Lot Number	Date	Healthcare Professional or Clinic Site
1st Dose	Pfizer	ER8730	4/8/21	BAY EDEN
2nd Dose	Pfizer	EW0158	4/29/21	BAY EDEN @11:41



# Positioning on the Technological Curve

Generative (Language) AI is to words as calculators are to numbers



*When will adoption help drive faster or better decisions?*

*Are there dependencies that justify earlier adoption? Are there false leads that justify waiting?*

AstraZeneca AZN LN - Excel																											
File	Home	Insert	Draw	Page Layout	Formulas	Data	Review	View	Help	Analyst	Share	Comments															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
1	AstraZeneca plc																										
2	Ticker: AZN LN																										
3	Last Price (GBP)		7,172.00		366		305		305		31		31		32		366		90		91		92		93		
4			Dec16		Dec17		Dec18		Dec19		Mar20		Dec20		Dec20		Dec20		Mar21		Apr21		Sep21		Dec21		
5	Model Share Currency: USD		Dec16		FY2017		FY2018		FY2019		Qo-20		Qo-20		Qo-20		FY2020		FY2020		Qo-20		Qo-20		Qo-20		
6	Growth Analysis																										
7	Operating Revenue Growth, %		19.8%		18.0%		49.8%		42.8%		31.2%		28.4%		21.3%		27.0%		25.2%		11.1%		12.3%		17.9%		
8	Cardiovascular & Metabolic Diseases Revenue Growth, %		14.5%		10.5%		7.7%		34.8%		0.8%		6.1%		2.6%		57.7%		62.2%		3.3%		6.6%		7.9%		
9	Respiratory Revenue Growth, %		-4.7%		-1.0%		4.4%		9.8%		20.9%		-10.8%		-12.0%		-0.6%		-0.6%		-7.2%		-1.7%		-3.6%		
10	Other Revenue Growth, %		-20.1%		-18.0%		-18.1%		50.9%		-3.3%		-12.1%		0.4%		-42.3%		-49.6%		-19.4%		-19.0%		-7.4%		
11	Total Revenue Growth, %		-4.4%		-2.3%		-1.7%		39.4%		15.7%		7.8%		2.7%		11.4%		9.3%		13.7%		18.3%		23.2%		
12	Total Constant Currency Revenue Growth, %		-5.0%		-2.0%		-2.0%		13.0%		17.0%		11.0%		3.0%		10.0%		10.0%								
13	Segmented Results - Revenue Breakdown (\$)																										
14	Oncotherapy Revenue, mm		3,383		4,024		6,028		6,667		2,502		2,609		2,831		2,908		10,850		2,879		3,059		3,338		
15	Cardiovascular & Metabolic Diseases Revenue, mm		8,115		7,266		6,710		4,376		1,701		1,799		1,794		1,842		7,096		1,718		1,875		1,935		
16	Respiratory Revenue, mm		4,753		4,706		4,911		5,391		1,551		1,117		1,161		1,528		5,357		1,449		1,098		1,120		
17	Pipeline Risk-Adjusted Revenue, mm																		600		900		800		800		
18	Other Revenue, mm		5,067		4,156		3,400		5,131		557		563		734		733		2,187		449		456		680		
19	Product Revenue, mm		21,119		20,152		21,049		21,565		6,311		6,648		6,520		7,811		25,990		7,115		7,368		7,872		
20	Externalization Revenue, mm		1,681		2,311		1,941		819		43		227		91		309		100		100		100		100		
21	Total Revenue, mm		23,802		22,465		22,990		24,384		6,354		6,275		6,538		7,410		26,117		7,225		7,468		7,972		
22	Segmented Results - Revenue Breakdown by Product (\$)																										
23	US oncology revenue, mm		893		1,120		2,412		3,449		970		981		1,127		1,172		4,250		1,255		1,296		1,434		
24	Europe oncology revenue, mm		731		885		1,053		1,423		446		442		475		575		1,538		539		547		586		
25	Established R&D oncology revenue, mm		814		891		1,035		1,384		395		436		452		493		1,756		584		604		675		
26	Emerging markets oncology revenue, mm		961		1,255		1,518		2,211		711		709		977		868		2,506		792		750		859		
27	Total oncology revenue, mm		3,383		4,024		6,028		6,667		2,502		2,609		2,831		2,908		10,850		2,879		3,059		3,338		
28	US oncology revenue growth, %		72.7%		25.4%		115.4%		41.0%		26.0%		15.3%		22.8%		28.6%		23.2%		29.8%		32.1%		30.8%		
29	Europe oncology revenue growth, %		15.6%		20.7%		19.0%		35.1%		42.0%		31.5%		26.6%		45.2%		36.1%		18.6%		13.8%		12.4%		
30	Established R&D oncology revenue growth, %		22.1%		9.7%		25.9%		53.0%		17.9%		3.3%		6.8%		17.4%		10.9%		5.1%		6.5%		5.1%		

# Positioning on the Technological Curve

**Supply growth:** Computing power 2x every 2 years.

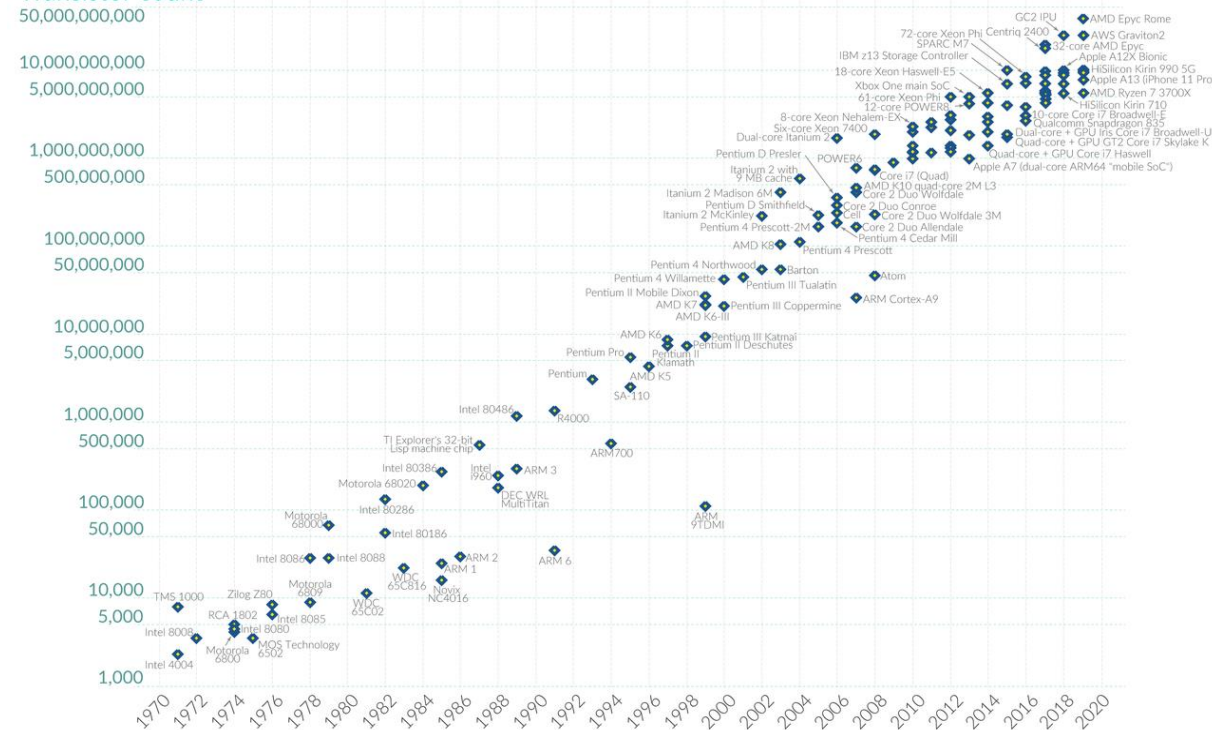
**Demand growth:** Biggest Language AI models >10x every 2 years.

### Microchip Size (Supply)

Moore's Law: The number of transistors on microchips doubles every two years

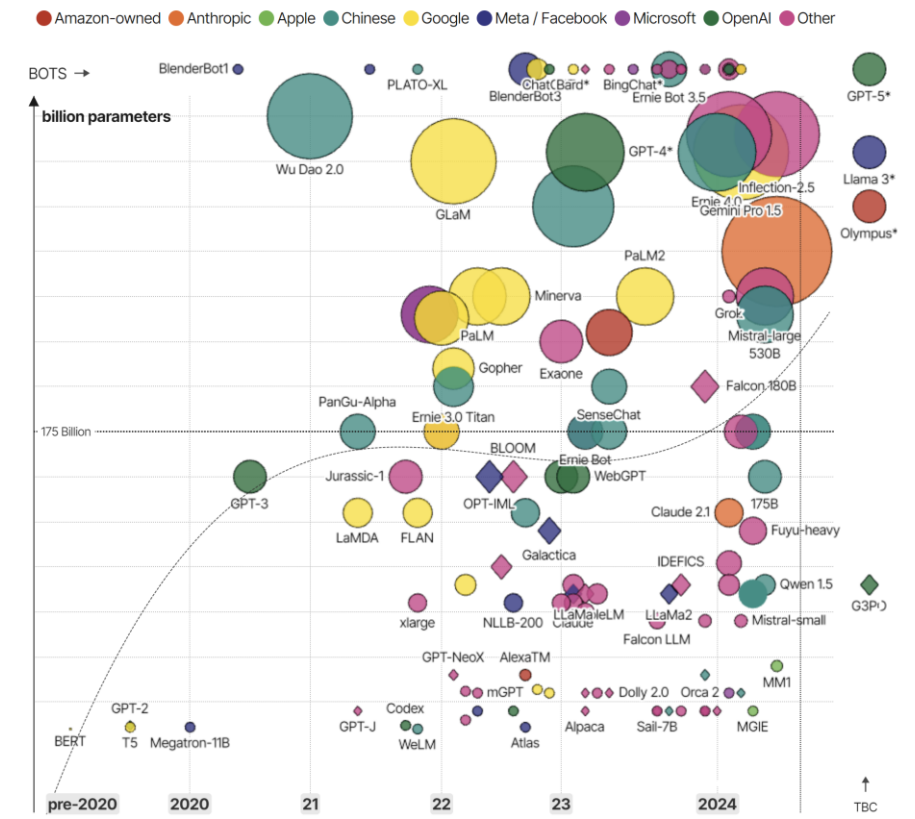
Moore's law describes the empirical regularity that the number of transistors on integrated circuits doubles approximately every two years. This advancement is important for other aspects of technological progress in computing – such as processing speed or the price of computers.

## Transistor count



Data source: Wikipedia ([wikipedia.org/wiki/Transistor\\_count](https://wikipedia.org/wiki/Transistor_count))      Year in which the microchip was first introduced  
OurWorldinData.org – Research and data to make progress against the world's largest problems.      Licensed under CC-BY by the authors Hannah Ritchie and Max Roser.

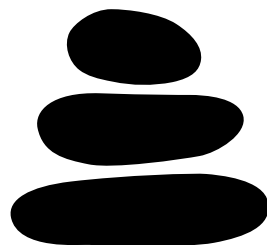
## AI Model Size (Demand)



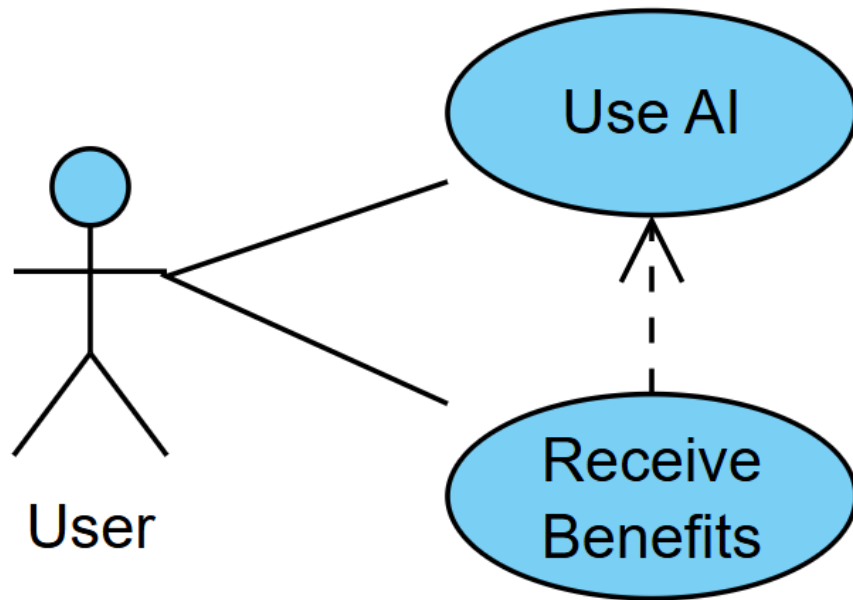
David McCandless, Tom Evans, Paul Barton  
Information is Beautiful // UPDATED 20th Mar 24

\* = parameters undisclosed // see the data

# A Balanced Approach



## Start with a Concrete Use Case



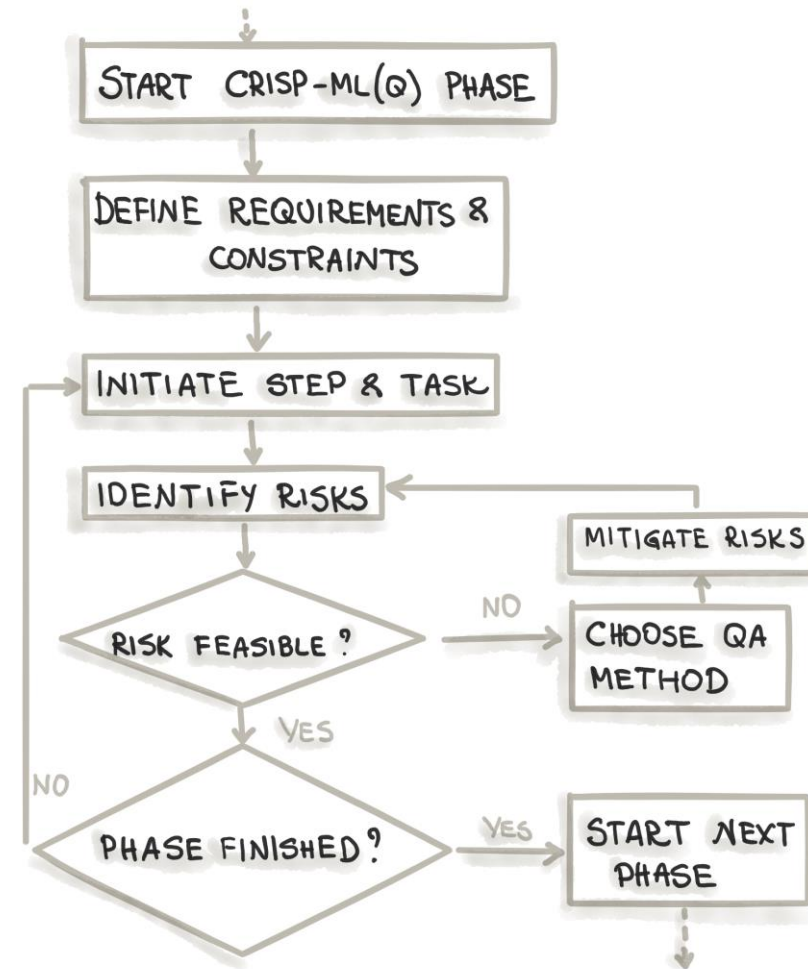
(Not a concrete AI use case)

As with a good hypothesis, we believe a good use case should be:

1. Testable
2. Unambiguous
3. Discrete and completable
4. Valuable

# Proactive Risk Management

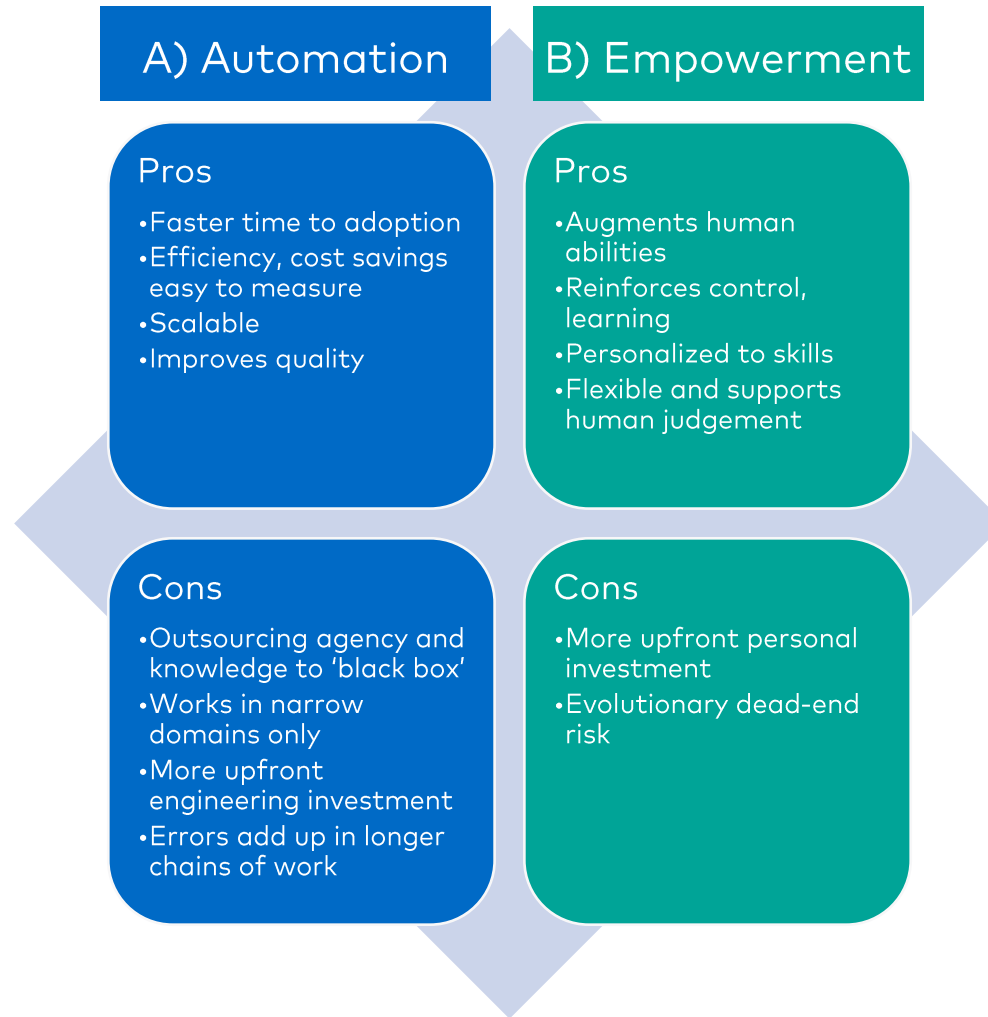
- Identify potential risks early, implement mitigation strategies where appropriate to set up guardrails
- Address and monitor proactively pitfalls such as quality, bias, and reproducibility
- We believe quality and risk management is not a one-time activity at the outset, but rather, a continuous process with feedback loops





# Automation vs Empowerment

Trade-off in risks, effort, and agency



## In Polen's view, a nuanced approach is ideal

- Deploy AI automation for repetitive, mature, and routine tasks to improve efficiency, quality, and minimize costs, but ensure tasks are sufficiently shallow.
- Encourage training and AI empowerment to enhance human performance in areas that still require creativity, critical thinking, and nuanced decision-making.
- Beware of data and process consistency and quality, and keep the big picture in mind.



# Thank You

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