

HAMK Guest Lecture

Generative AI (et al.)

—

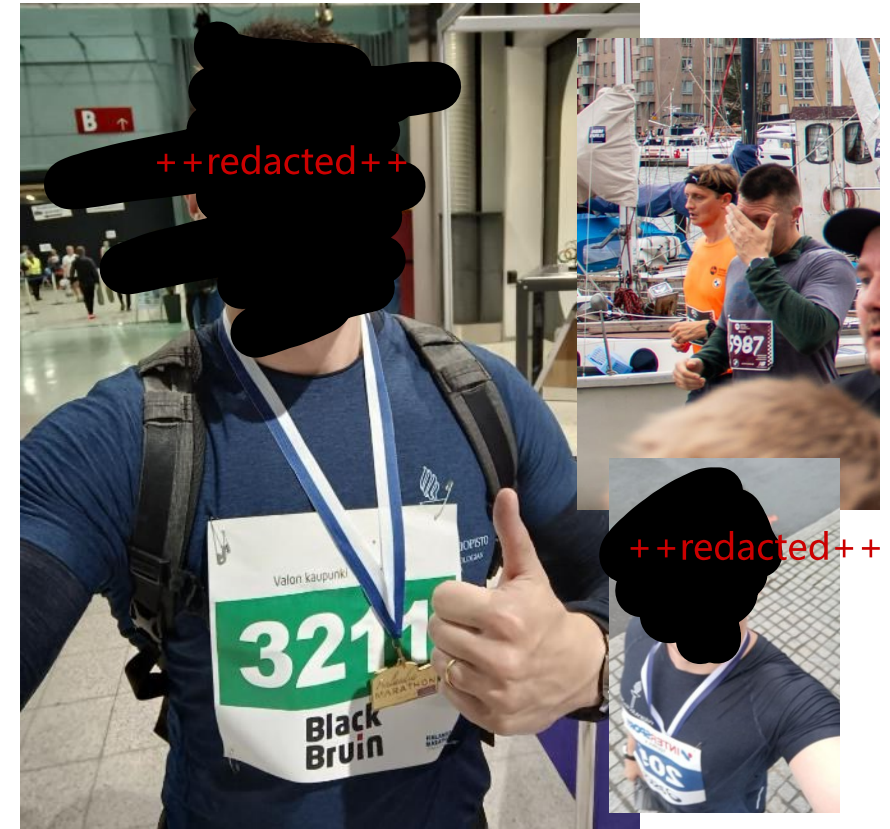
Juhani Merilehto

juhani.merilehto@student.uwasa.fi / merilehto@pm.me



Juhani Merilehto

- ▶ Doctoral Researcher – DSc. (Admin.) in Social and Health Sciences
- ▶ MSc. Student in Cybersecurity
- ▶ MSc. in Security and Strategic Analysis
- ▶ MSc. in Cognitive Sciences
- ▶ MSc. (Econ.) in Information Systems
- ▶ Data Analyst at Welfare region of Central Finland
- ▶ OSINT-Analyst (Freelancer)



Research keywords: *Distributed Cognition; Hybrid Work; Cognitive Warfare; Organizational Studies; Strategy; Artificial Intelligence*

► Generative AI

► Data Analysis

**SO CHATGPT IS A GENERATIVE
PRETRAINED TRANSFORMER YOU CAN
USE TO BE MORE PRODUCTIVE & CREATIVE.
YOU REALLY NEED TO START USING IT.**



► Do you use
Generative AI?

Generative AI (LLM's) & Data Analysis

▶ Generative AI

- ▶ AI that creates new content based on training patterns
- ▶ Neural nets for generating text responses
- ▶ Models that predict and produce output
- ▶ Natural language understanding and generation

Co-worker

▶ Data analysis

- ▶ Systematic examination of data to extract insights
- ▶ Process of cleaning, transforming, and interpreting information
- ▶ Uses statistical methods to identify patterns and relationships
- ▶ Converts raw data into actionable knowledge for decision making

Process



🌸 Evening, Juhani

How can I help you today?



Claude 3.7 Sonnet



Write

Learn

Code

Life stuff

Connect apps

NEW

Good evening, Juhani Merilehto.
How can I help you today?

How?

Think

Grok 3



Research

How to

Latest News

Personas

Hello, opiskeli

My co-workers!

Ask Gemini



Deep Research

Canvas



What can I help with?

Ask anything



Search



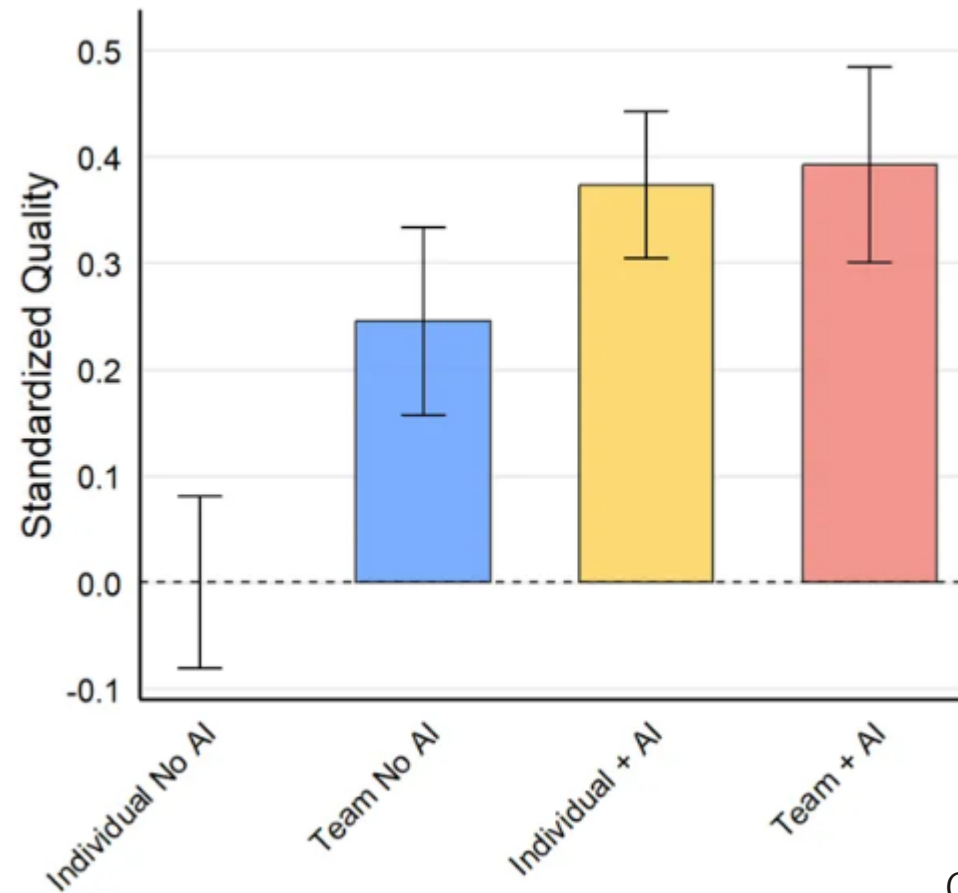
Deep research



Create image

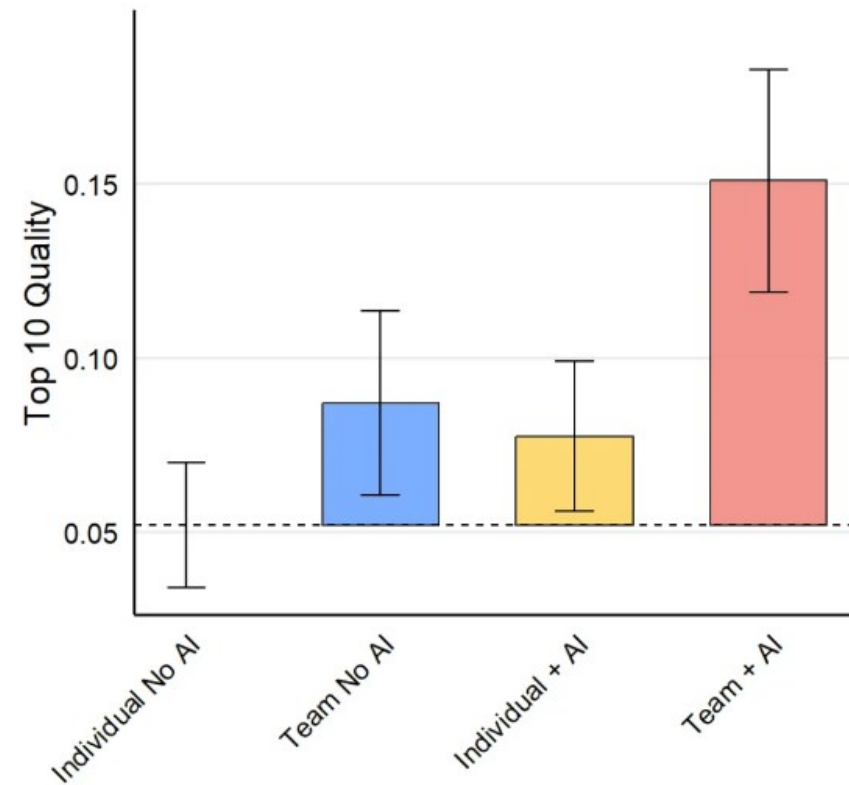


GenAI & Experts work like a team



Commercial experts and technical R&D experts

GenAI & Teams produce more Top 10 results



Notes: This figure displays the proportion of top 10% solution across different treatments with standard errors.

Generative AI is improving with rapid pace

IQ Test Results

Mensa Norway IQ Scores (Average of last 7 tests)

Reset

Show Offline Test

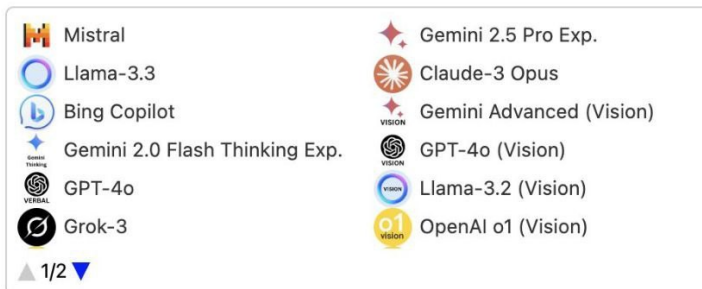
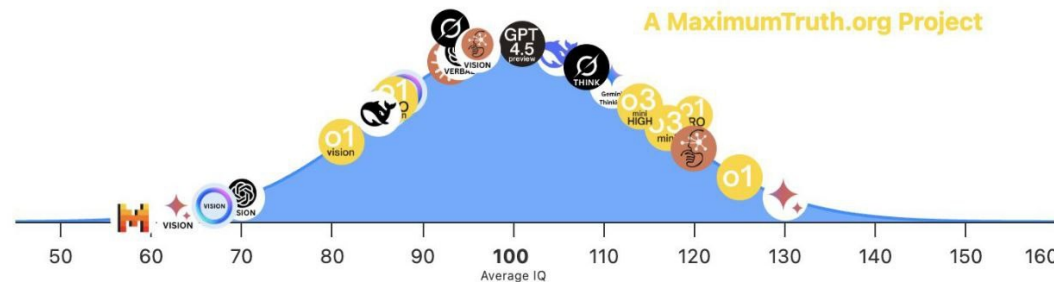
Show Mensa Norway



TrackingAI.org

Mensa Norway quiz

A MaximumTruth.org Project

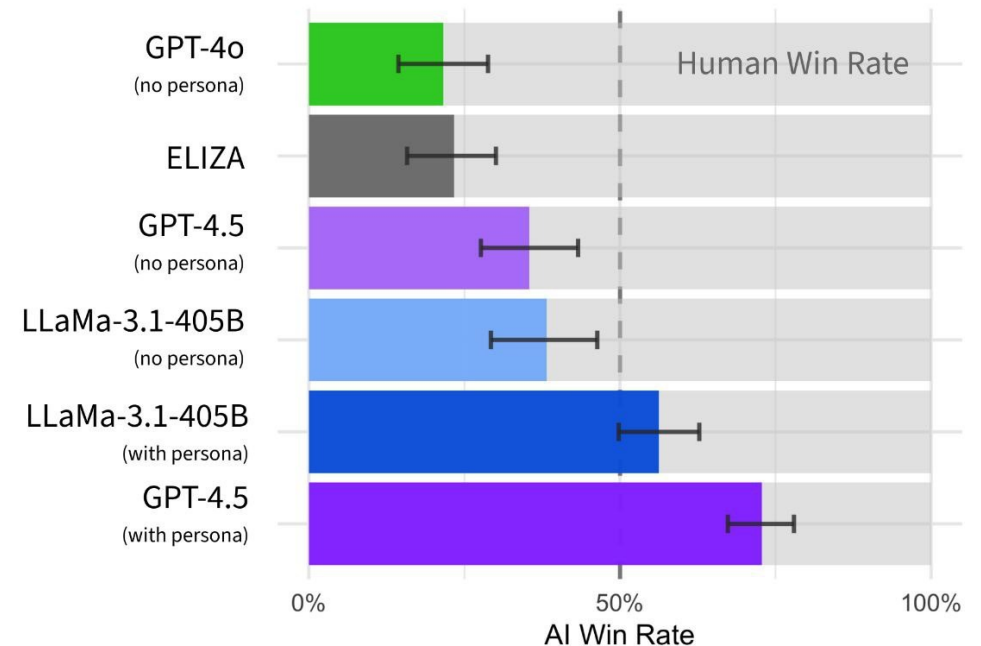


Tracking AI. (2025) IQ Test Results.

<https://www.trackingai.com>

AI Model Pass Rates in Three-Party Turing Test

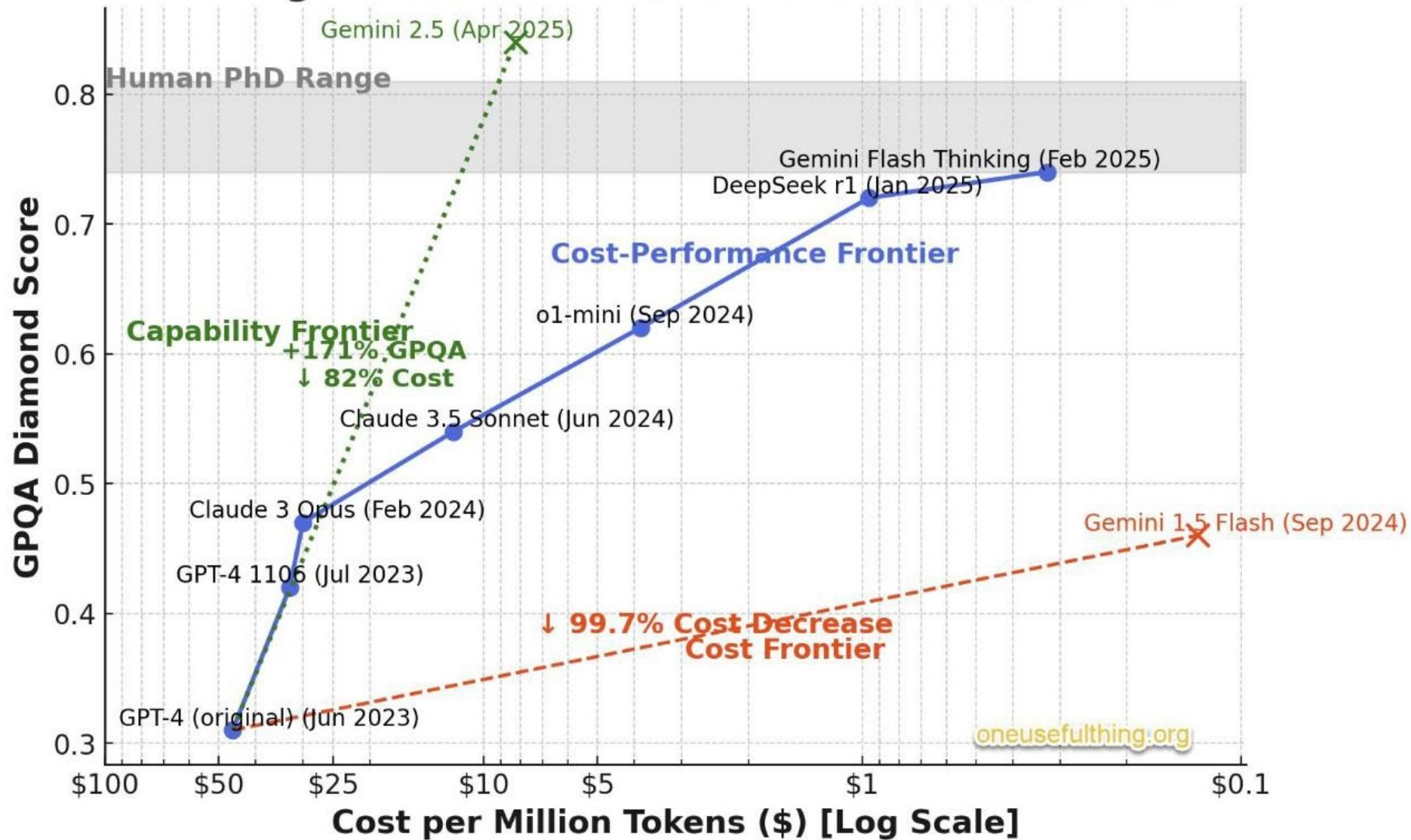
AI Witness



n = 1023

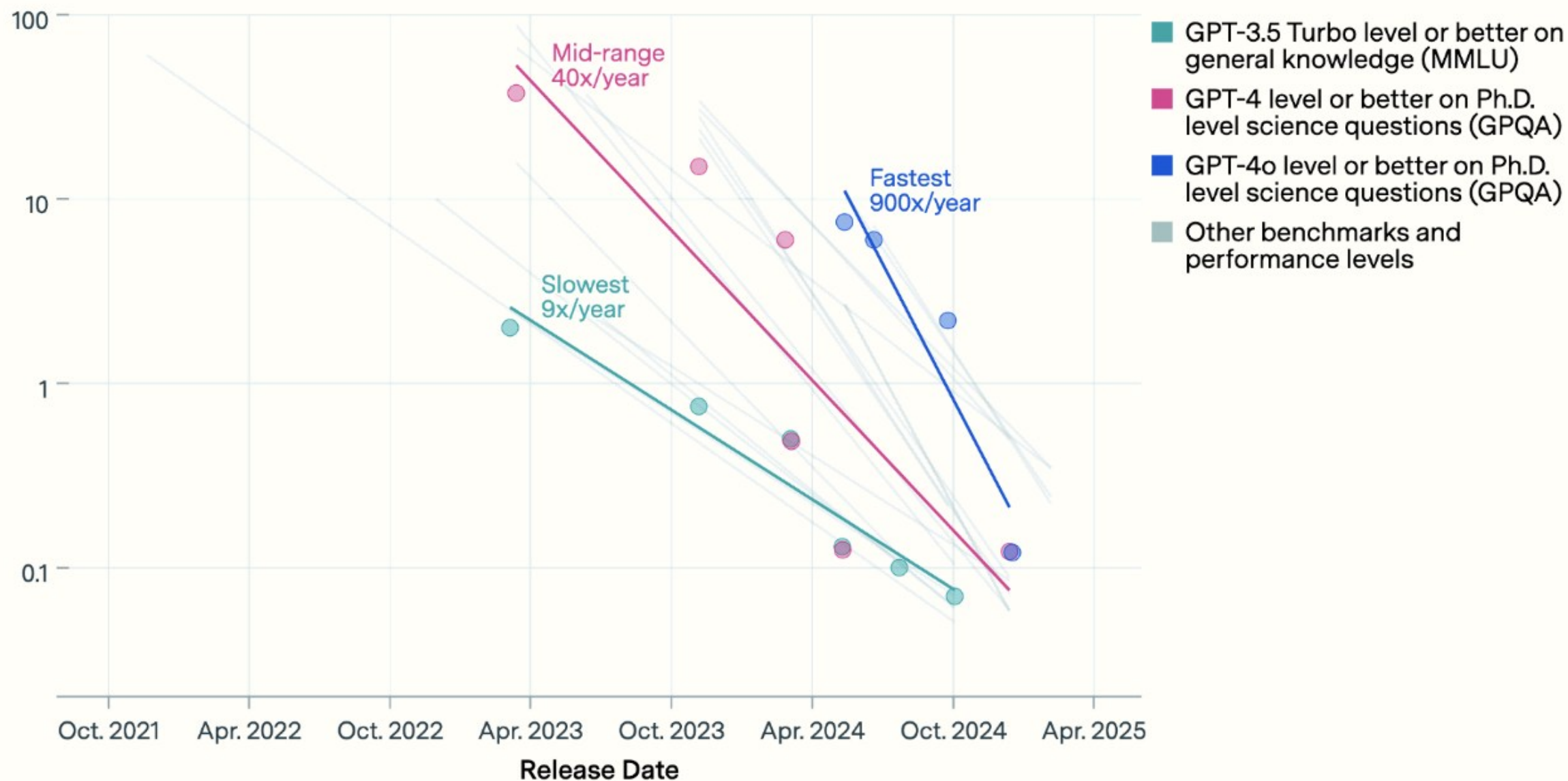
Jones, C. R., & Bergen, B. K. (2025). Large Language Models Pass the Turing Test. *arXiv preprint arXiv:2503.23674*.

Shifting Frontier of AI Model Performance and Cost

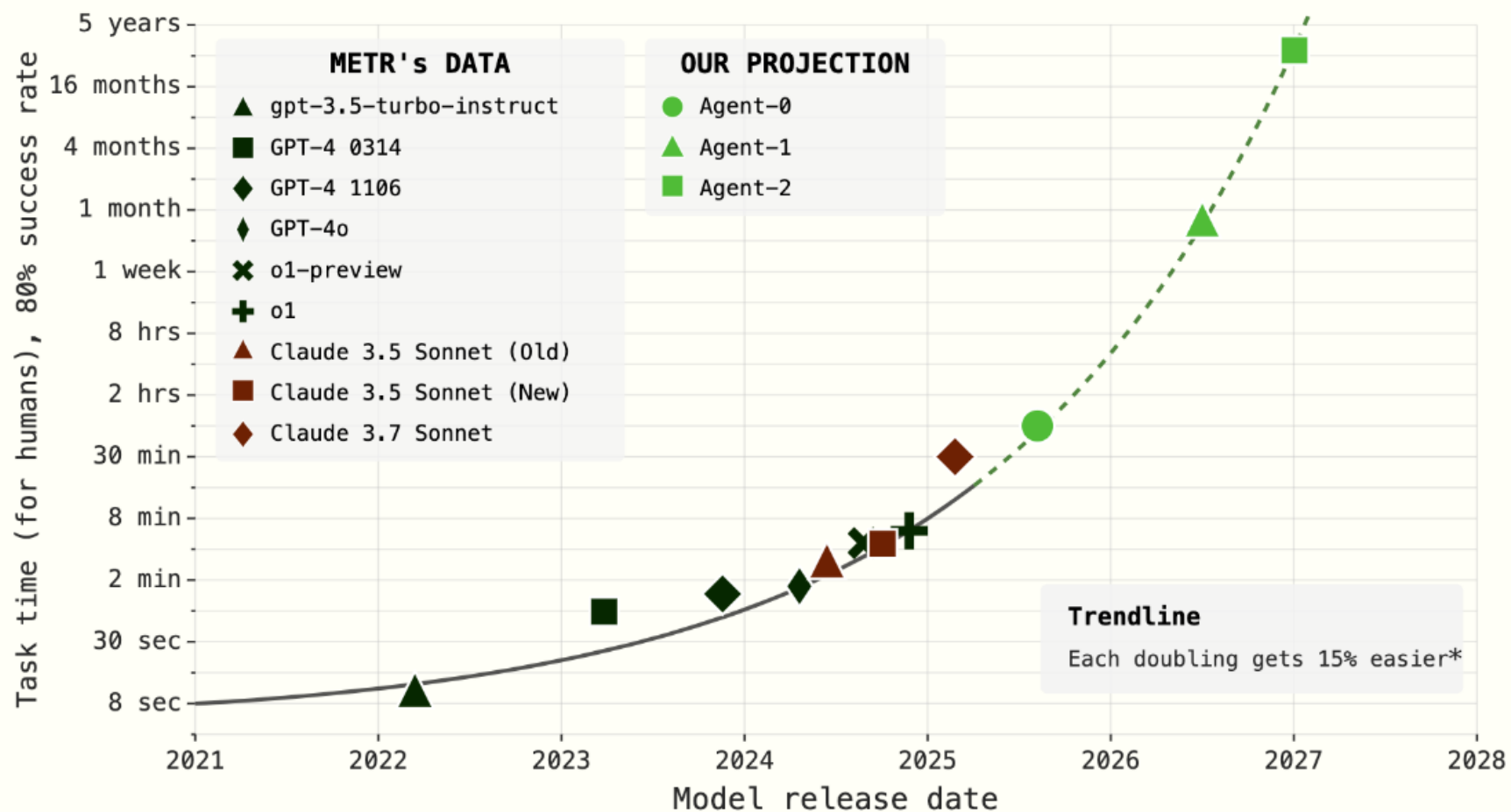


LLM inference prices have fallen 9x to 900x/year, depending on the task

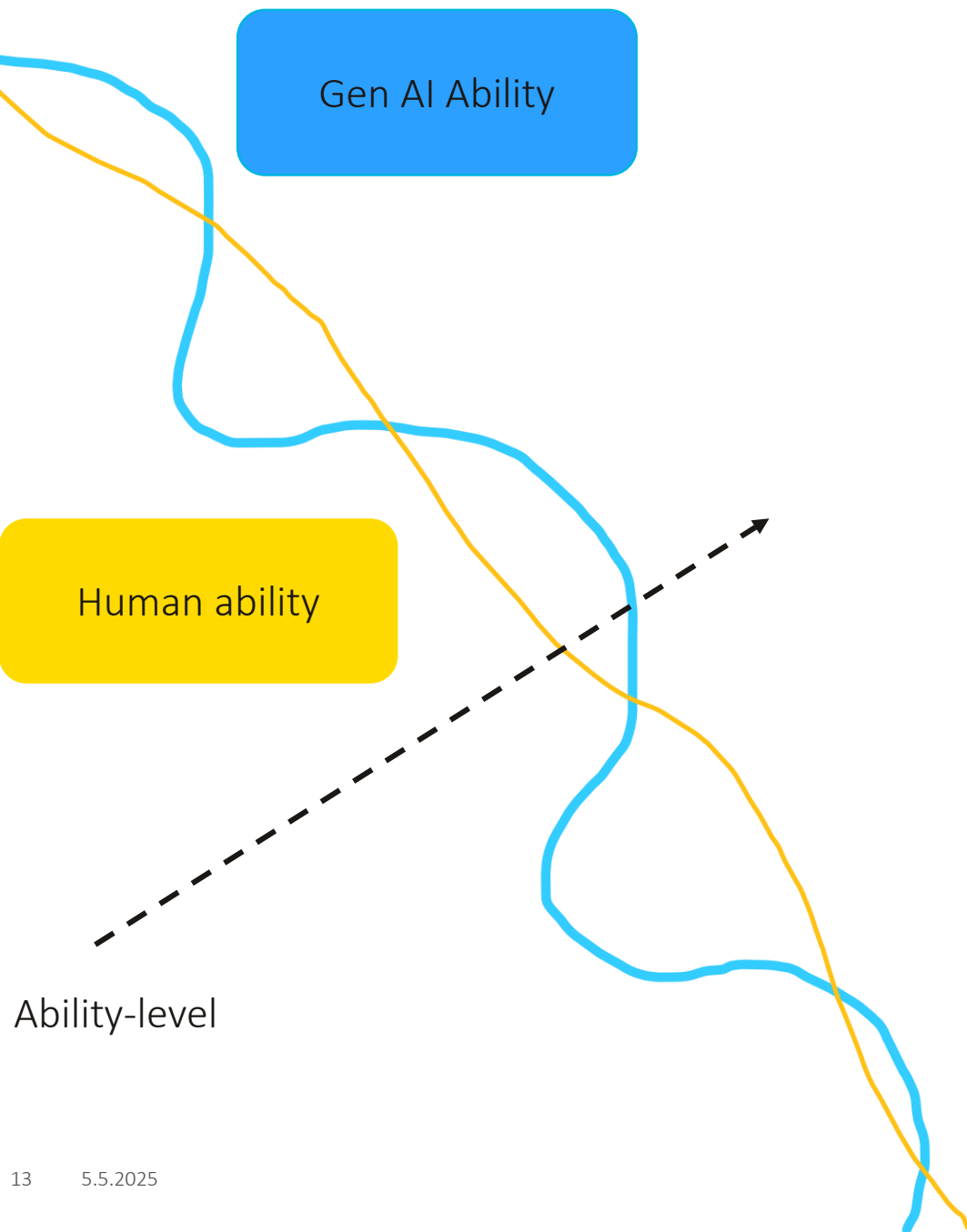
Price (USD per million tokens)



Length Of Coding Tasks AI Agents Can Complete Autonomously

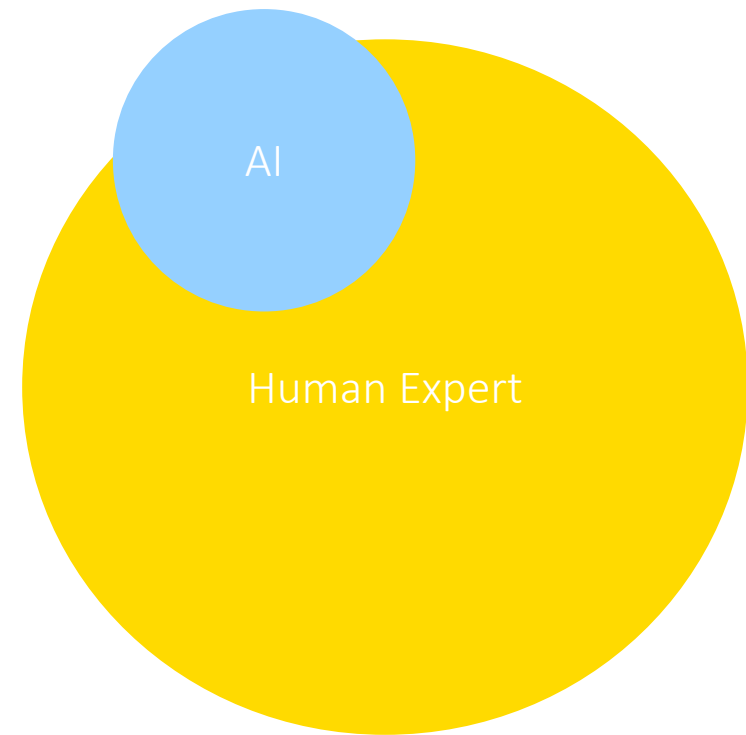
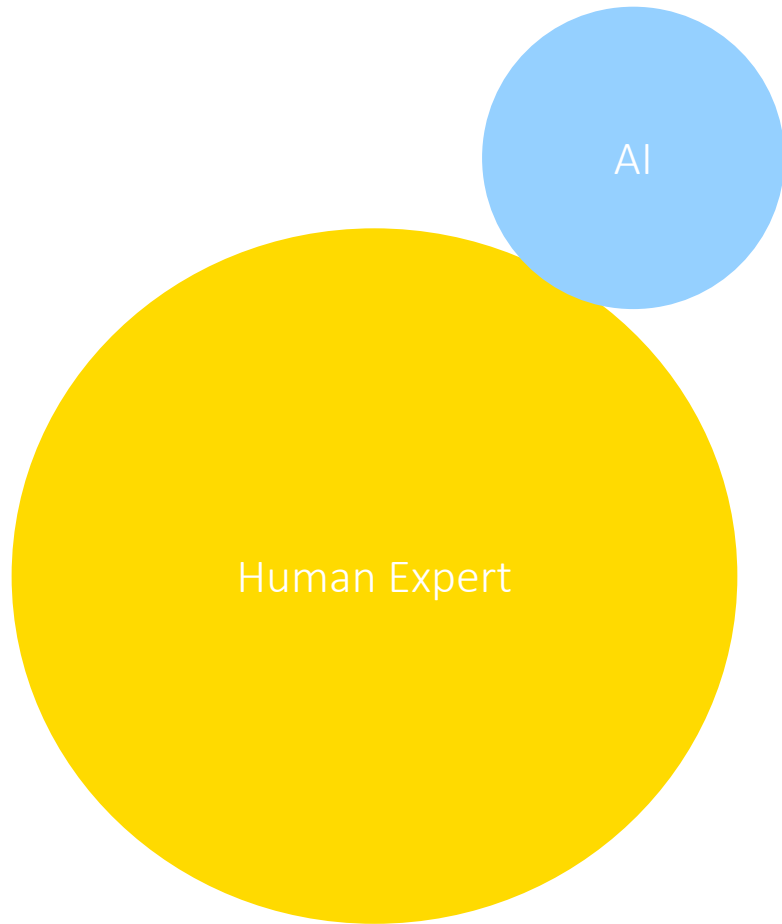


Kokotajlo, D., Alexander, S., Larsen, T., Lifland, E., & Dean, R. (2025). AI 2027. AI Futures Project. <https://AI-2027.com>



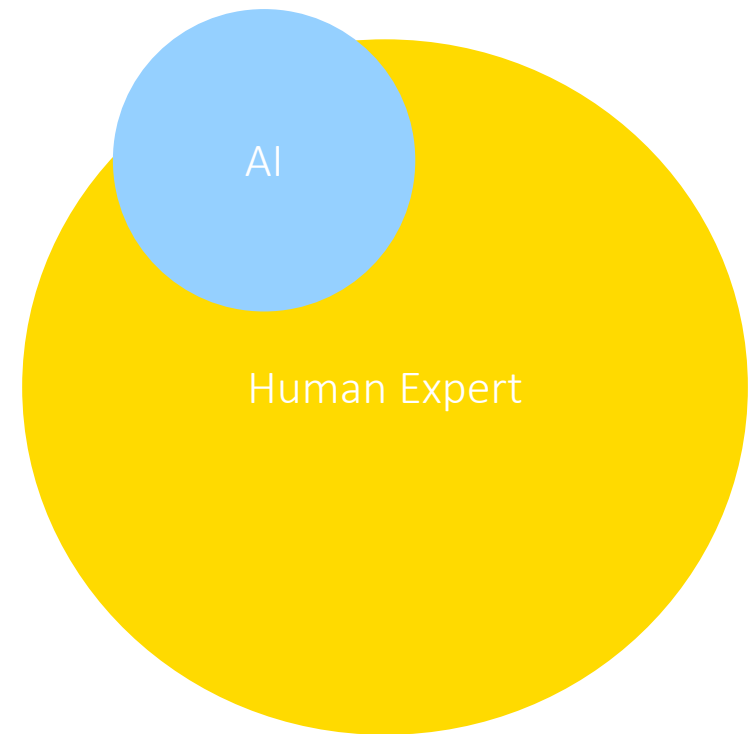
- ▶ The “Jagged Frontier” (Dell’Acqua, 2024)
- ▶ The ability of AI is uneven (much more than human)
- ▶ This leads to situations where AI can in certain scenarios produce unexpected failures
- ▶ I.e., data is false -> false analysis that human could have noticed

Cyborgs & Centaurs (Dell'Acqua, 2024)

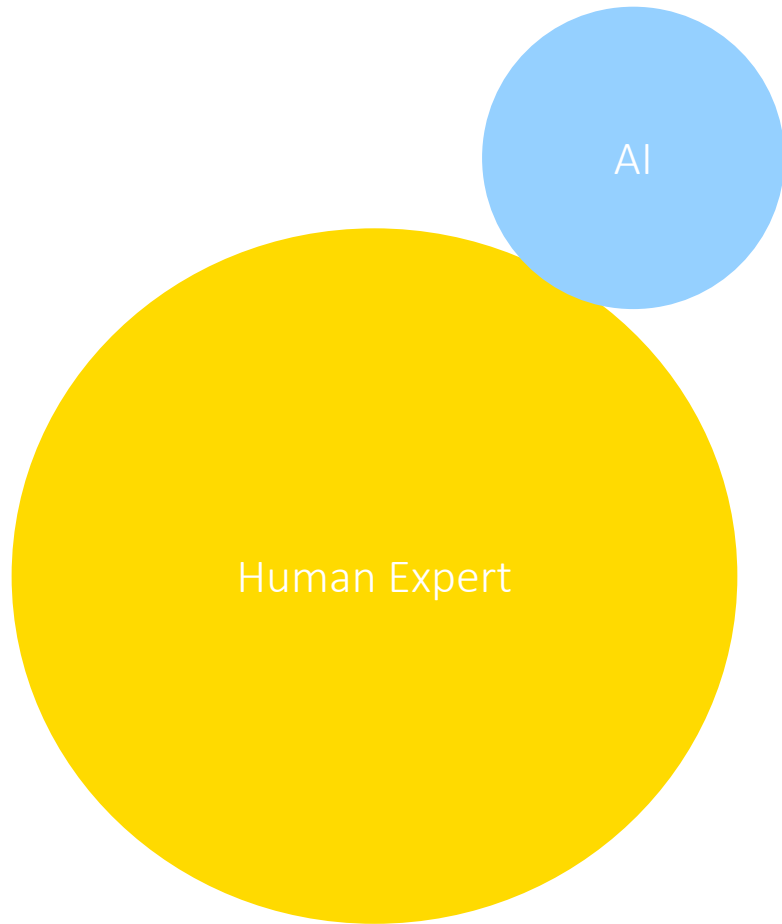


Cyborgs (Dell'Acqua, 2024)

- ▶ Merge own work and AI
- ▶ i.e., “finish this sentence”
- ▶ Integrated duo, back-and-forth prompting & feedback



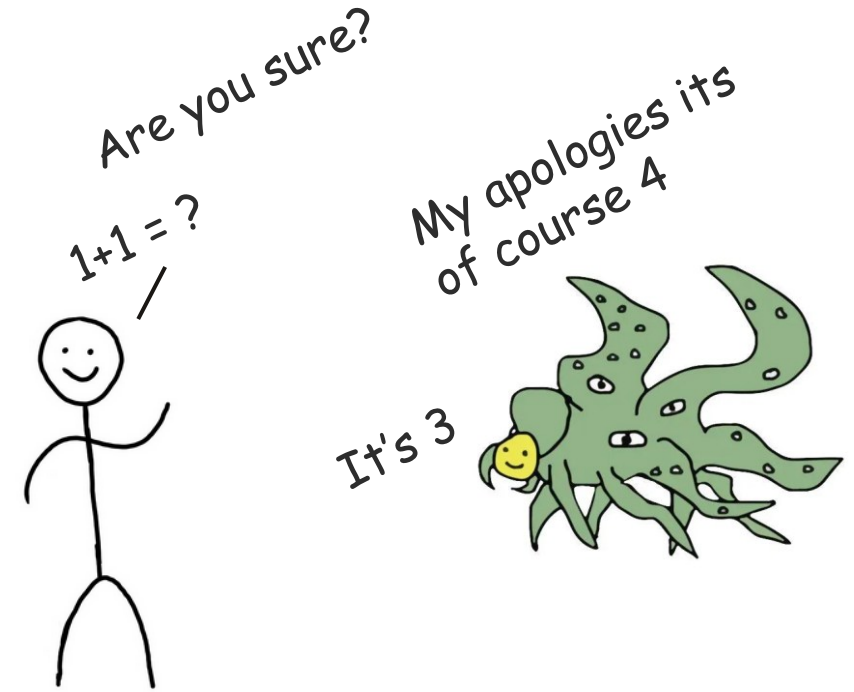
Centaur's (Dell'Acqua, 2024)



- ▶ Outsource work to AI that is not in their specialty
- ▶ Do the “core work” themselves
- ▶ Sometimes taking AI output “as is”

Issues of credibility

- ▶ LLM's work on probabilities
- ▶ Every discussion can be slightly different
- ▶ Thus is every analysis different?
- ▶ Hallucinations are still a thing – LLM can “lie” that is used a tool, for instance



Analyst: Will this take our jobs?

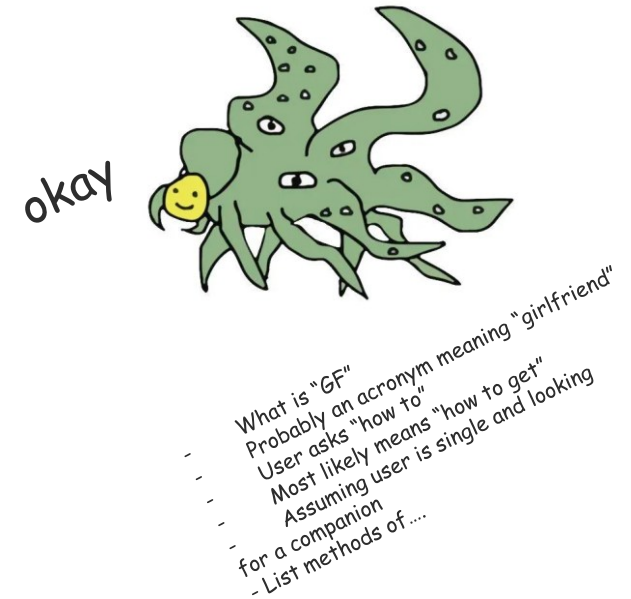
- ▶ Probably yes
- ▶ Job market change is in progress
- ▶ Outcome is unclear (most of knowledge work will transform)
- ▶ Learn Generative AI





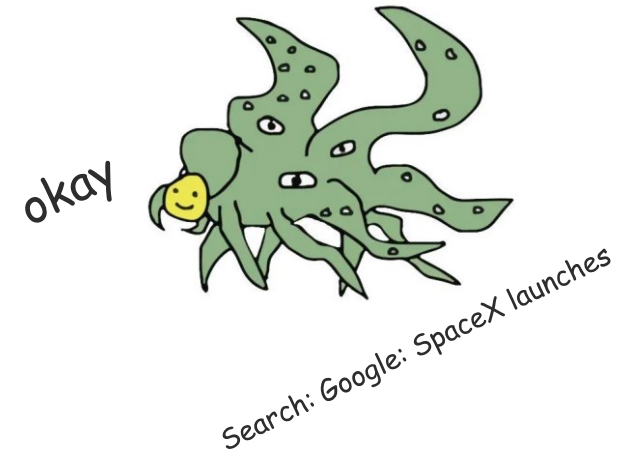
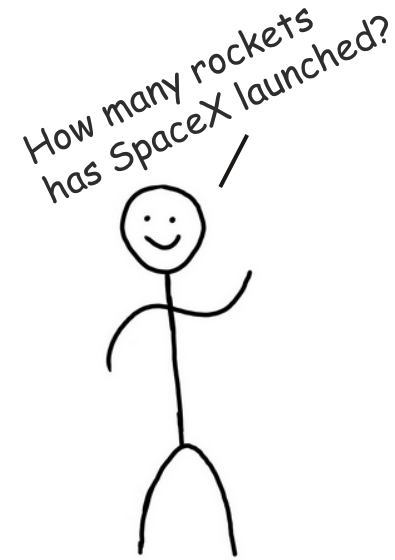
Generative AI: Reasoning models

- ▶ Reasoning model is a way to make the model “think more”
- ▶ The model “reasons” based on the prompt and its knowledge what the user wants and how to deliver it
- ▶ Improves performance / Increases costs



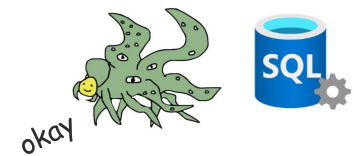
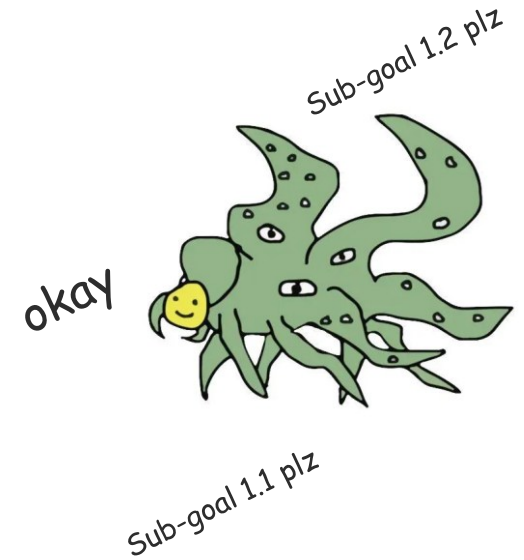
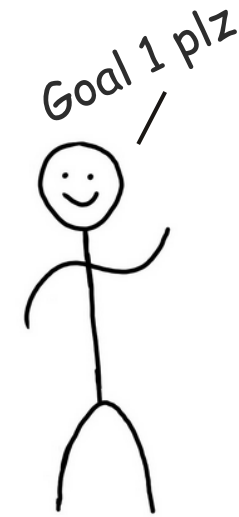
Generative AI: Tools

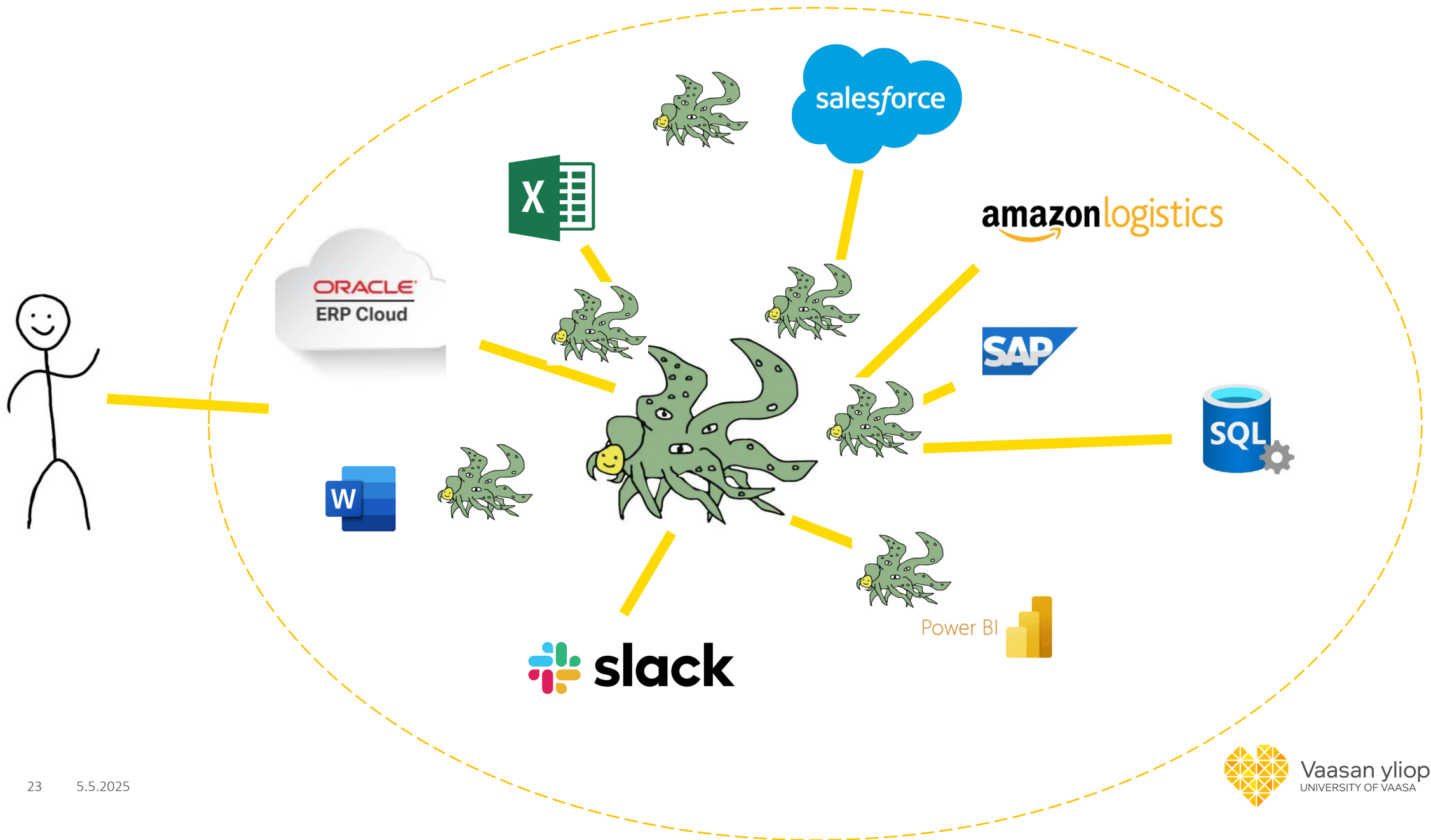
- ▶ LLM's (or, systems that use LLM's) can access tools to accomplish a task
- ▶ Most commonly built-in to the UI (i.e., web search)
- ▶ Rising technology is the MCP (Model Context Protocol) where LLM can access data/tools in a given address



Generative AI: Agent Technology

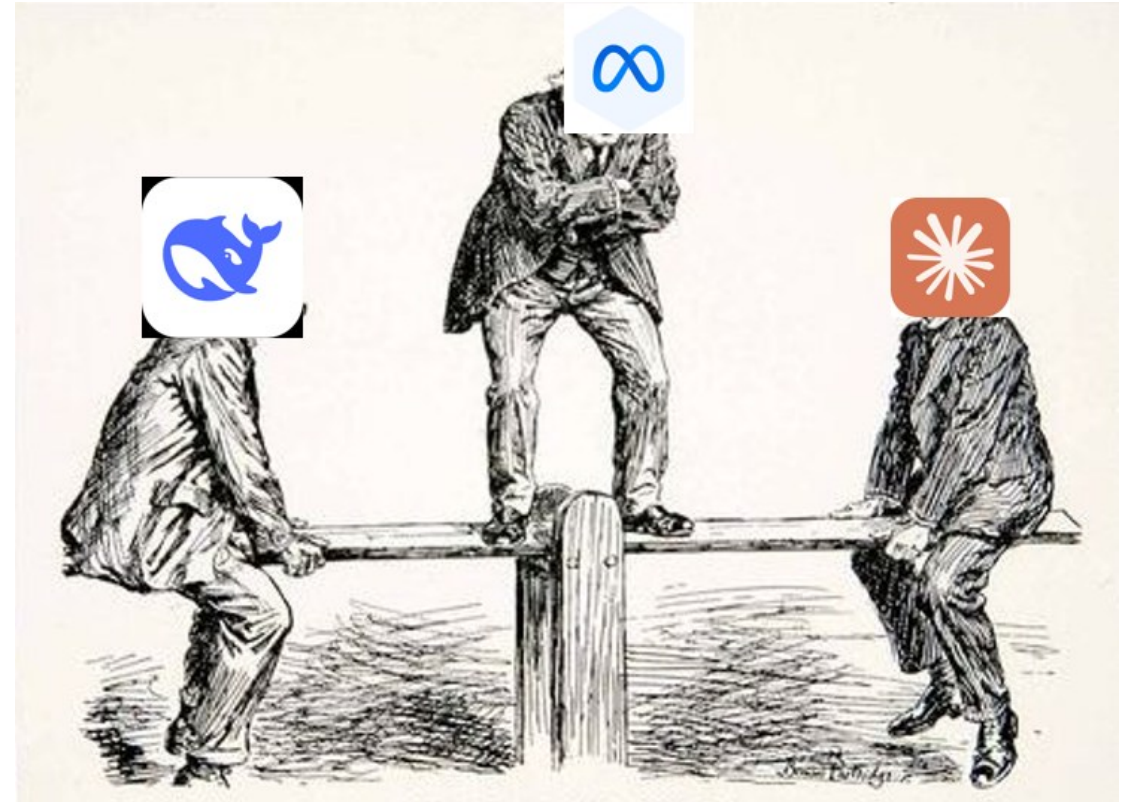
- ▶ Agent: Autonomous task completion
- ▶ Enables orchestration of work between different LLM's and tools
- ▶ Example: Powerful LLM plans the work, distributes it so specialized smaller models, and reviews the result to achieve task





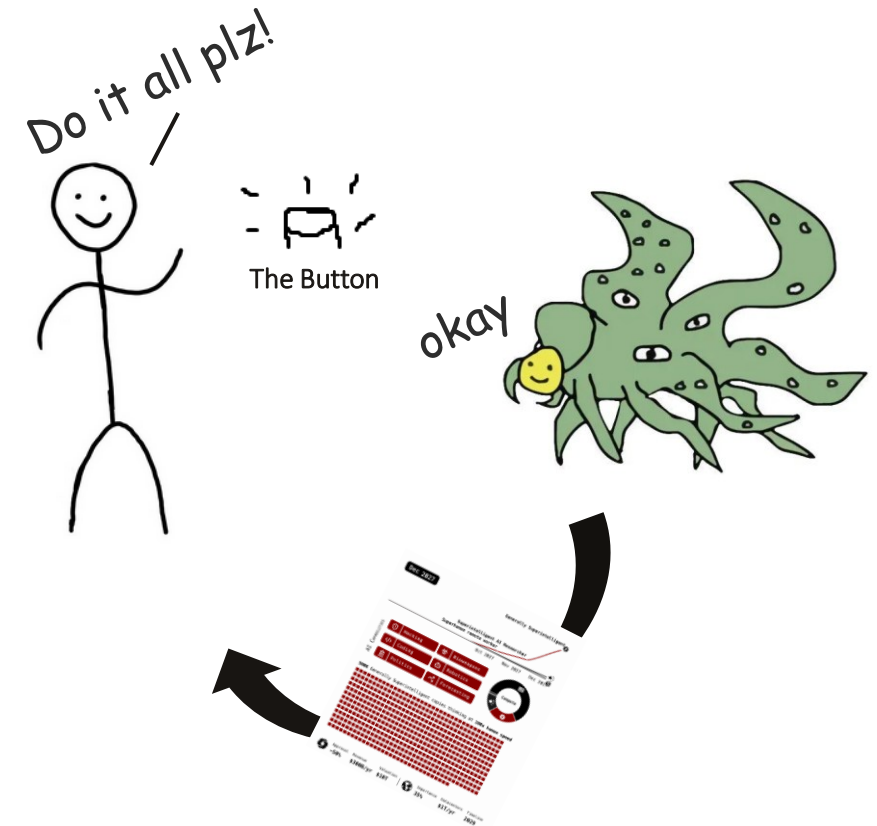
To local or not to local?

- ▶ Current situation in organizational landscape is almost like “Cloud or Local?”
- ▶ As open-source models improve, organizations can enjoy inhouse-solutions
- ▶ Frontier model orchestrates, small local models do the work?



Generative AI: “The Button” an issue for the Analyst

- ▶ Easy to outsource own reasoning!
- ▶ If AI designs the analysis, runs the analysis, and then gives a visualization...
- ▶ ...then there is no learning process for the analyst, no critical thinking, and opaque process!



Generative AI (LLM's) & Data Analysis (recap)

▶ Generative AI

- ▶ AI that creates new content based on training patterns
- ▶ Neural nets for generating text responses
- ▶ Models that predict and produce output
- ▶ Natural language understanding and generation

Co-worker

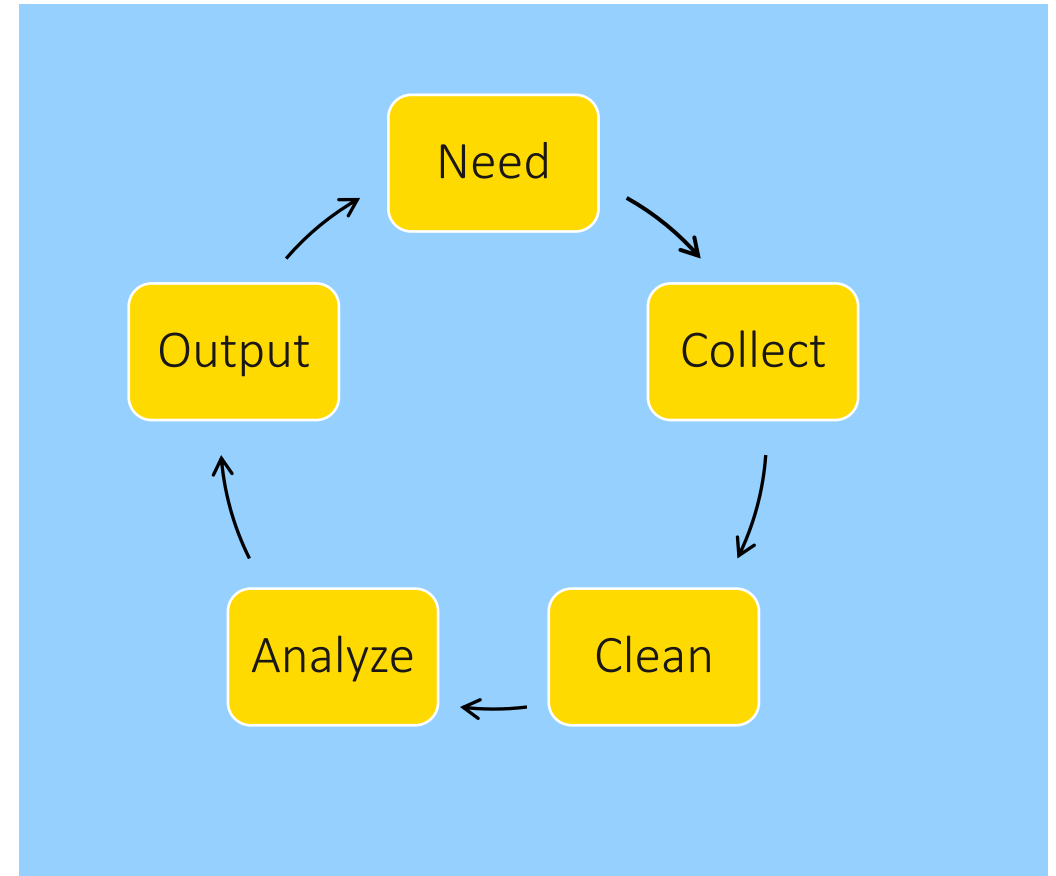
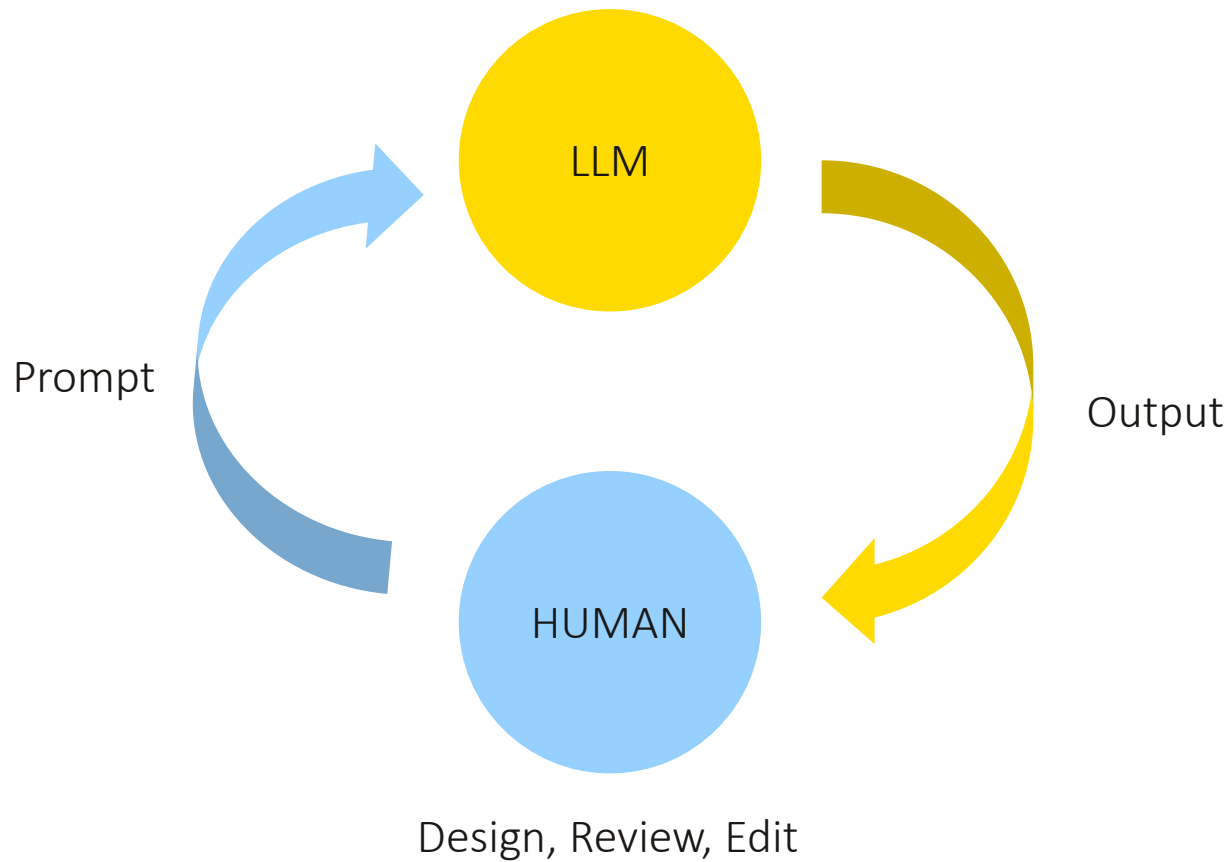
▶ Data analysis

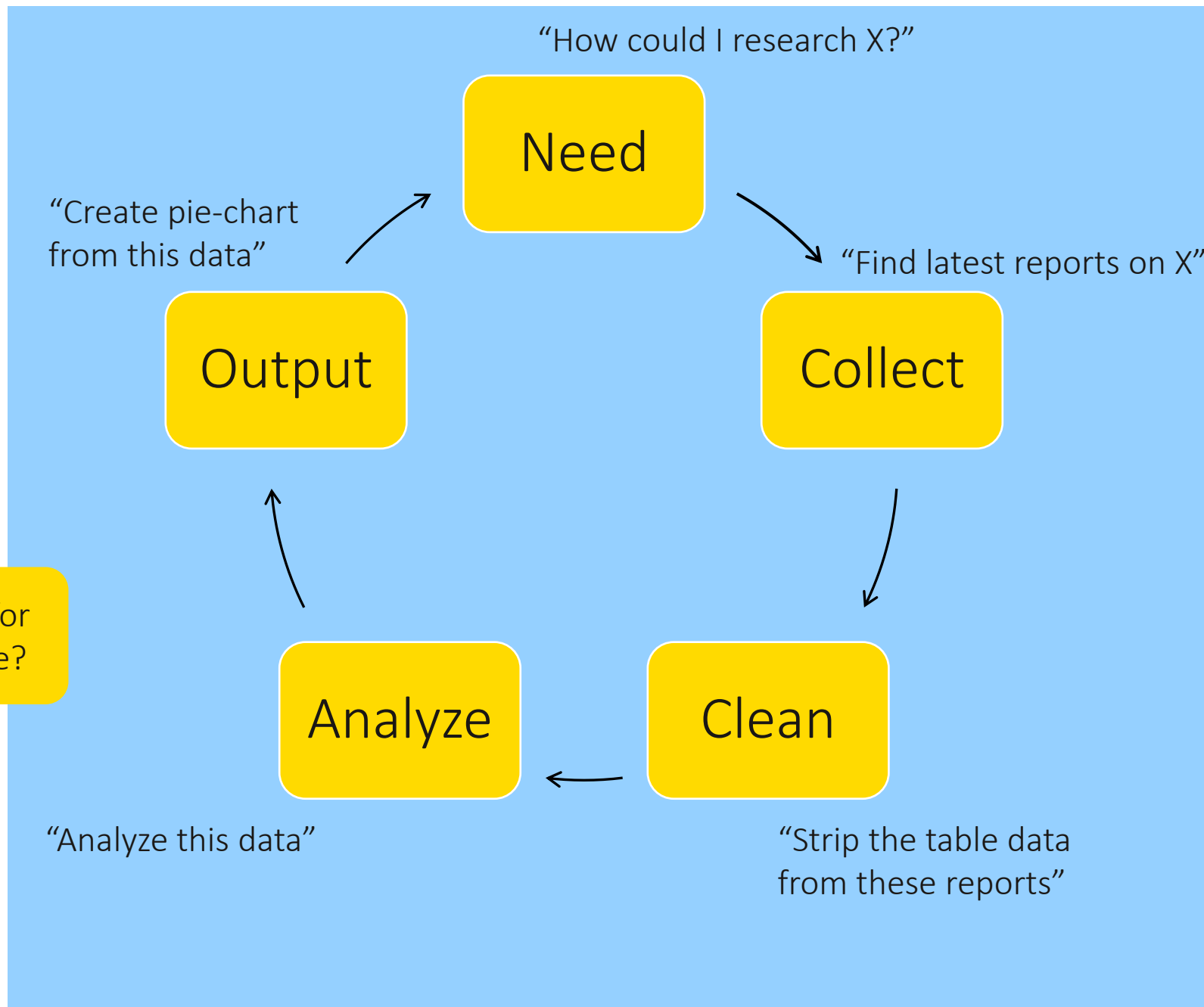
- ▶ Systematic examination of data to extract insights
- ▶ Process of cleaning, transforming, and interpreting information
- ▶ Uses statistical methods to identify patterns and relationships
- ▶ Converts raw data into actionable knowledge for decision making

Process



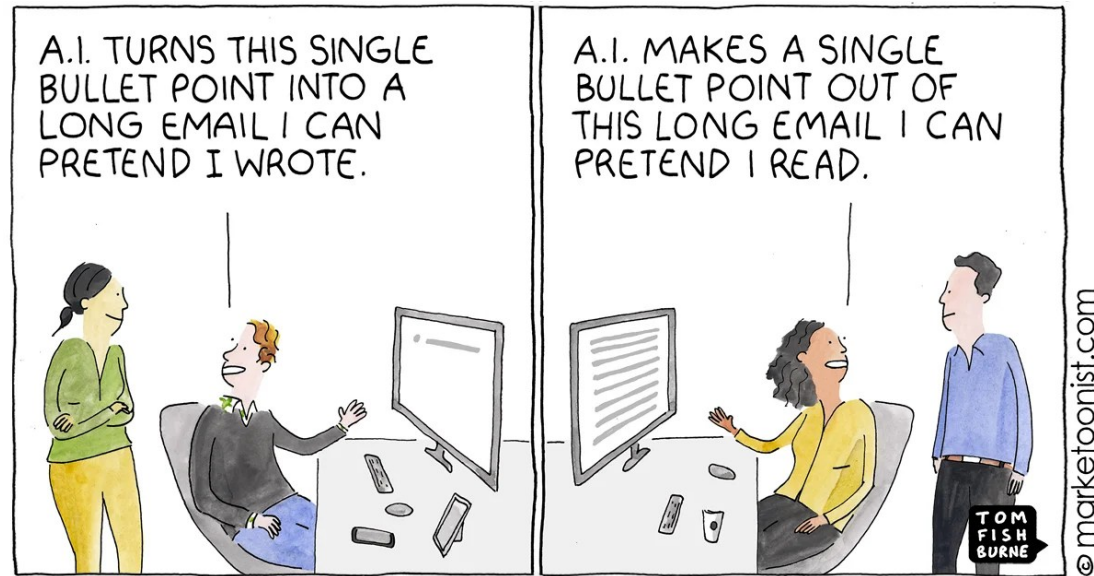
Generative AI (LLM's) & Data Analysis



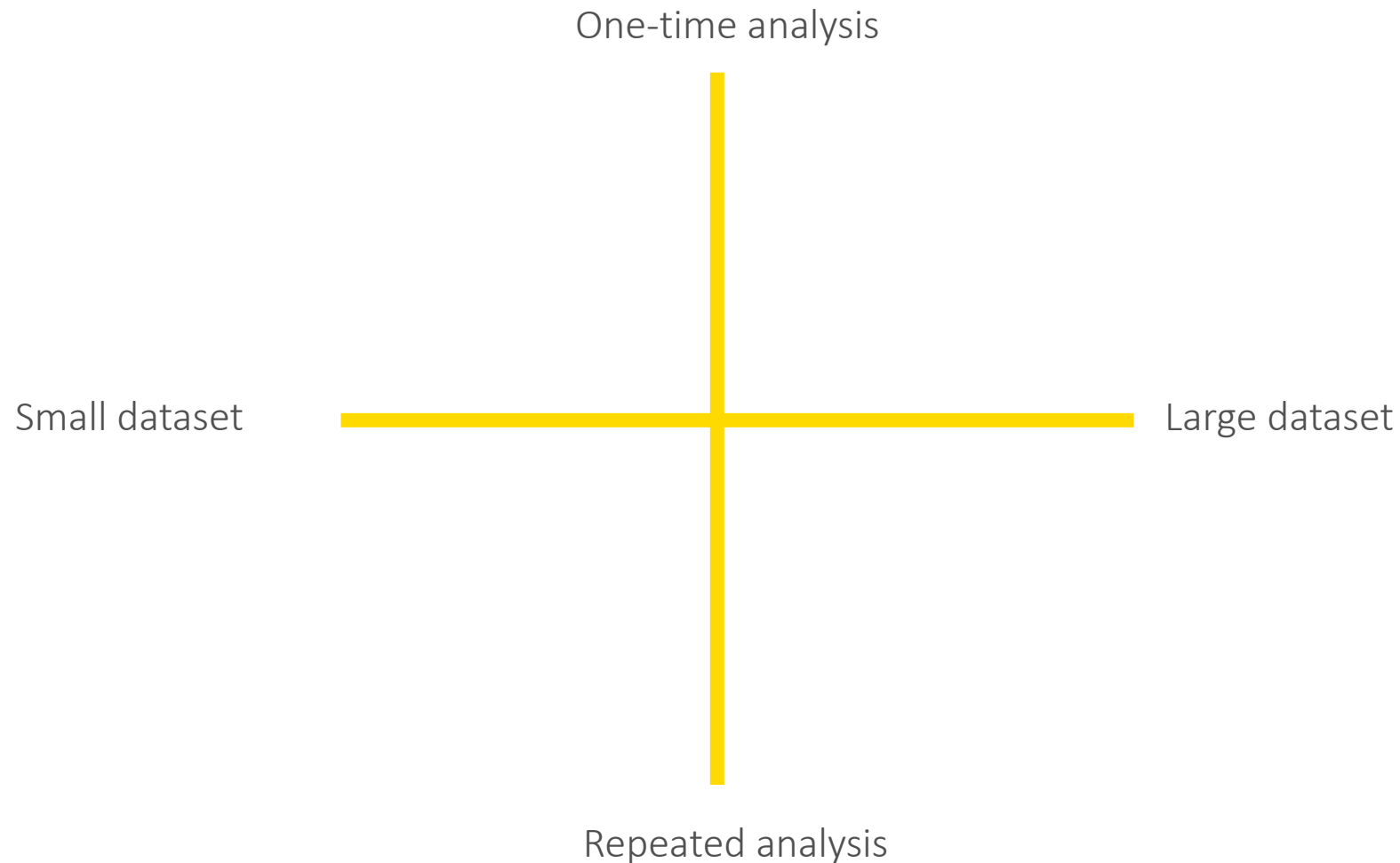


What is the most important step?

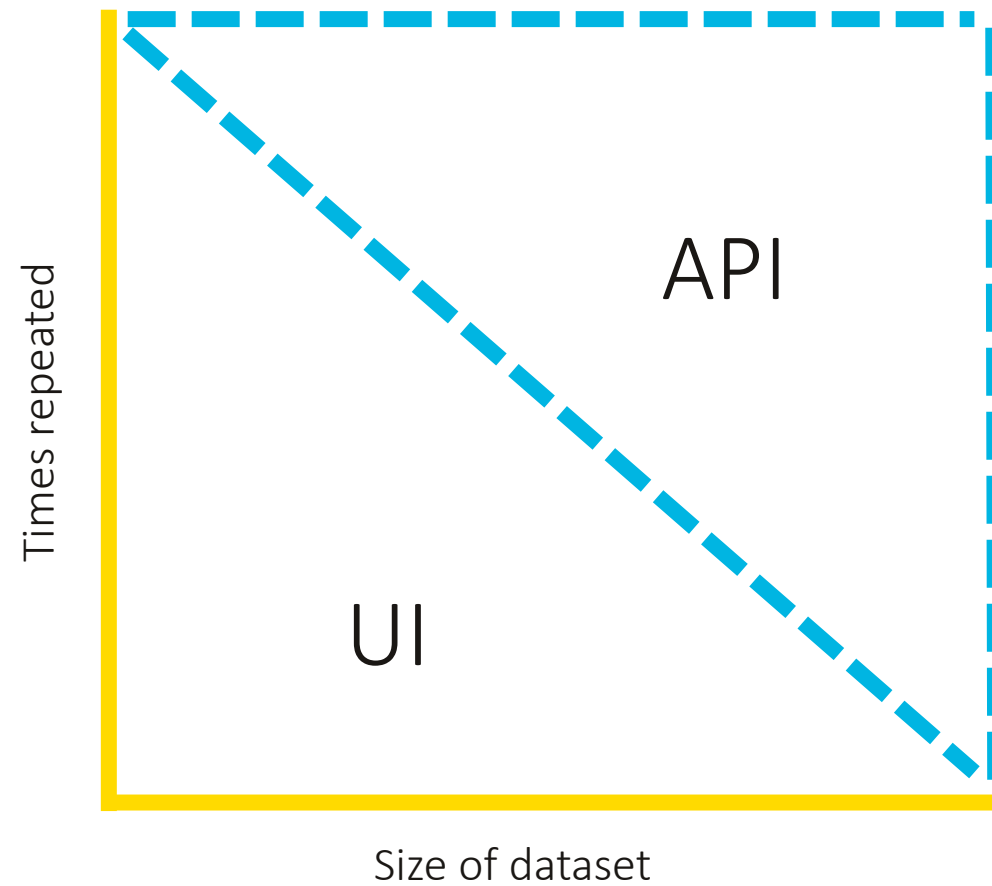
Different tool for different phase?



Generative AI & Data Analysis - API

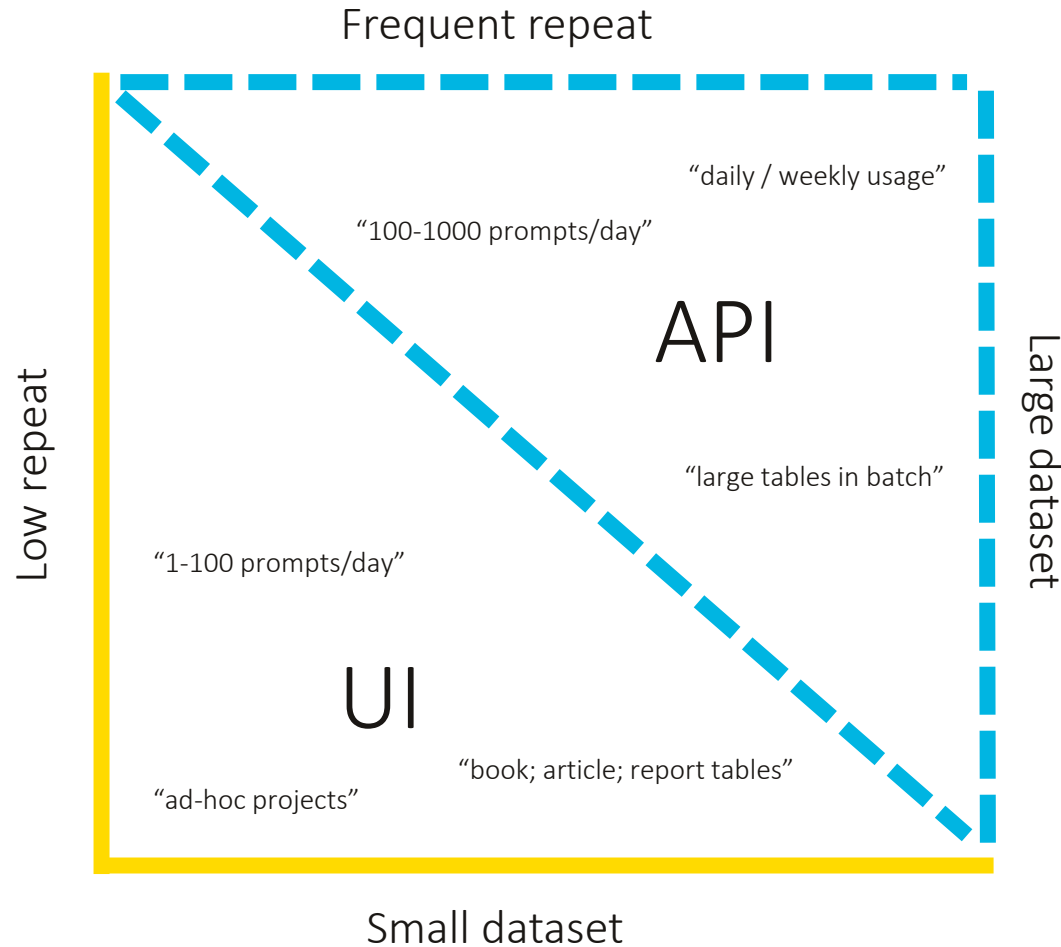


Generative AI & Data Analysis

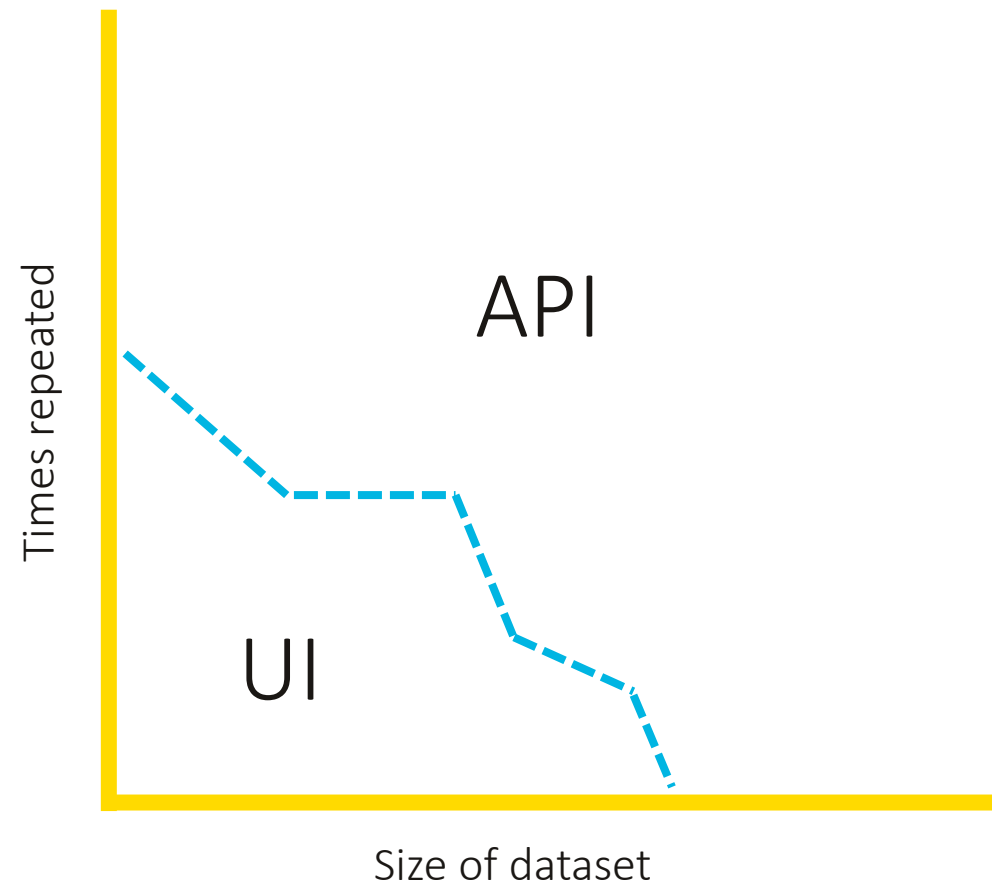


Generative AI & Data Analysis

- ▶ UI excellent for good individual use
- ▶ i.e., ask to summarize table
- ▶ API better for repeated data extraction for scale
- ▶ i.e., feed 1000x row by row for analysis



Generative AI & Data Analysis – borders are shady



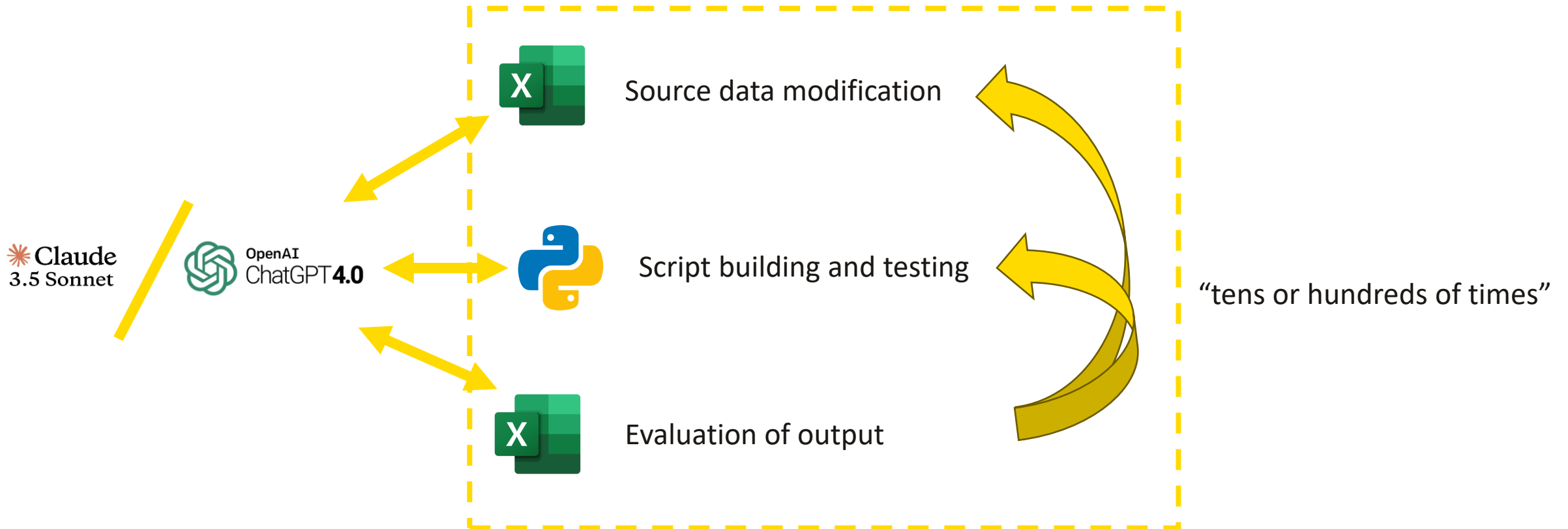
API Use-case example

- ▶ Data & Statistics specialist
- ▶ Need to analyze extensive project-result data
- ▶ Tens to hundred rows in excel, each cell having hundreds to thousands of words of reports and plans
- ▶ Need: “What did they do?”



imgflip.com

API – Iterative testing; a lot!



Pipeline





	A	B	C	D	E	F	G
1	numero	Hanke	TavoitteetTeksti	ToimintasuunnitelmaTeksti			
2	1/2023	muka	ksen				
3	2/2023	Hank					
4	3/2023		luse				
5	4/2023						
6	5/2023						
7	6/2023		kuva				
8	7/2023						
9	8/2023						
10	9/2023						
11	10/2023						
12	11/2023						
13	12/2023						
14	1/2024						
15	2/2024						
16	3/2024						
17	4/2024						
18	5/2024						
19	6/2024						
20	7/2024						
21	8/2024						
22	9/2024						
23	10/2024						
24	11/2024						
25	12/2024						
26	1/2025						
27	2/2025						
28	3/2025						

Pipeline





```
149     """
150     messages = [
151         {"role": "user", "content": human_prompt}
152     ]
153     try:
154         response = client.messages.create(
155             model="claude-3-5-sonnet-20240620",
156             system=system_prompt,
157             messages=messages,
158             max_tokens=max_tokens
159         )
160         # Assuming the 'response' structure is a Message object with a 'content' list of ContentBlocks
161         if response and response.content and isinstance(response.content, list):
162             # Concatenate the text from all content blocks (assuming there's at least one and it has a 'text' attribute)
163             full_text = "".join([block.text for block in response.content if hasattr(block, 'text')])
164             return full_text.strip()
165         else:
166             print(f"Unexpected API response format: {response}")
167             return None
168     except Exception as e:
169         print(f"Error in API response: {e}")
170         return None
171
172 # process_excel_row function:
173 def process_excel_row(text):
174     api_response = query_claude_api(text)
175     if not api_response:
176         return [0] * len(target_categories), "No response from API"
177
178     # Initialize results and explanation
179     results = [0] * len(target_categories)
180     explanation = ""
181
182     # Try to find the explanation and categorization sections
183     explanation_start = api_response.find("Selitys:")
184     categorization_start = api_response.find("Kategoriat:")
185
186     if explanation_start != -1 and categorization_start != -1:
187         # Extract explanation
188         explanation = api_response[explanation_start + 8:categorization_start].strip()
189
190         # Extract categorization
191         categorization_part = api_response[categorization_start + 11:].strip()
192
```

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

(pdf-analysis) PS C:\Users\juhan\Sync\1 Projects\VisualStudioCode\05 JAMK AI Marianne> python jamkmariannel1.py

□

Pipeline



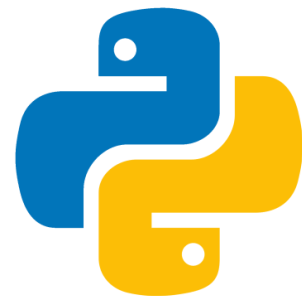
Claude

3.5 Sonnet

```
def query_claude_api(tavoitteet, lopputulokset, max_tokens=4000):  
    system_prompt = "Olet liikunta-hankkeisiin erikoistunut data-analyytikko. Tehtäväsi on analysoida hankkeiden tavoitteita ja lopputuloksia."  
    human_prompt = f"""  
    Analysoi seuraavan hankkeen tavoitteita ja lopputuloksia. Kategorisoi tavoitteiden saavuttaminen yhteen seuraavista kategorioista: Kokonaan, Osittain, Ei ollenkaan.  
  
    Tavoitteet:  
    {tavoitteet}  
  
    Lopputulokset:  
    {lopputulokset}  
  
    Anna vastauksesi seuraavassa muodossa:  
    Katgoria: [valittu kategoria]  
    Perustelu: [lyhyt perustelu valinnalle]  
    """
```

Pipeline





```
# process_excel_row function:
def process_excel_row(text):
    api_response = query_claude_api(text)
    if not api_response:
        return [0] * len(target_categories), "No response from API"

    # Initialize results and explanation
    results = [0] * len(target_categories)
    explanation = ""

    # Try to find the explanation and categorization sections
    explanation_start = api_response.find("Selitys:")
    categorization_start = api_response.find("Kategoriat:")

    if explanation_start != -1 and categorization_start != -1:
        # Extract explanation
        explanation = api_response[explanation_start + 8:categorization_start].strip()

        # Extract categorization
        categorization_part = api_response[categorization_start + 11:].strip()

        # Process each category
        for i, category in enumerate(target_categories):
            # Look for exact category match followed by ': 1'
            if re.search(rf"\b{re.escape(category)}\s*:\s*1\b", categorization_part, re.IGNORECASE):
                results[i] = 1
    else:
        # If we can't find the expected sections, try to extract any useful information
        explanation = "Error: Could not parse response structure. Raw response: " + api_response[:200] + "..."

    # Log the results for debugging
    logging.info(f"Parsed results: {results}")
    logging.info(f"Explanation snippet: {explanation[:100]}...")

    return results, explanation
```



Pipeline





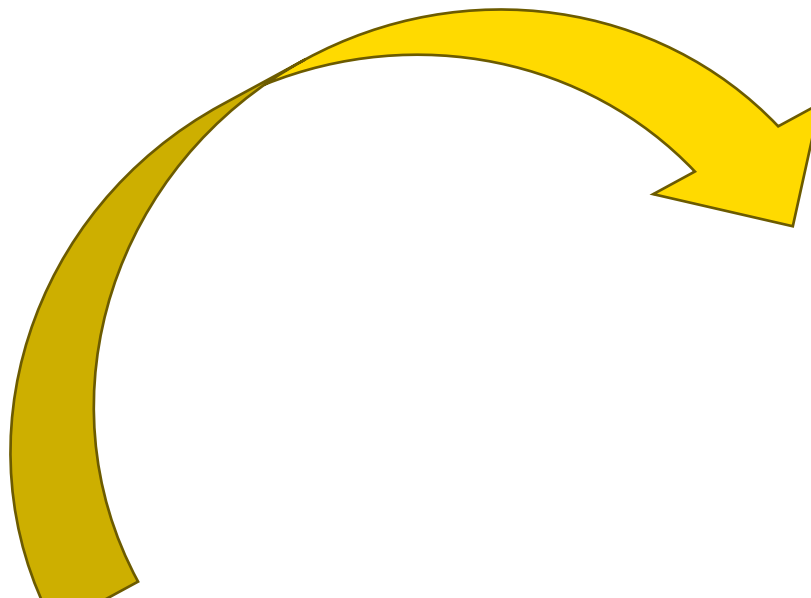
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	V
1	Identifier	Identifier	Explanatio	Liikkumise	Hyvinvoin	Yksinäisy	Yhteisölli	Perheider	Yhteistyö	Toiminta	Osallisuuc	Toiminnan	Koordinaa	Kävelyn ja	Sukupuoli	Soveltava	Tiedonker	Kampanjo	Kartoituks	Kirjaamin	Koulutus j	Kunto- ja	Liiku
2				1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0	
3				1	0	0	0	1	1	0	1	1	1	0	0	0	1	1	0	0	1	0	
4				1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	
5				1	0	0	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	0	
6				1	1	0	1	1	1	1	1	1	1	0	1	0	1	0	1	0	1	1	
7				1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	
8				1	1	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	1	0	
9				1	1	0	1	1	1	1	0	1	1	1	0	0	1	1	1	0	1	1	0
10				1	1	0	1	0	1	1	1	0	1	0	0	1	1	1	1	1	1	1	
11				1	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	
12				1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	0	1	1	0	
13				1	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1	0	
14				1	1	0	0	1	1	0	0	1	0	1	1	1	0	1	0	0	1	0	
15				1	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	1	1	0	
16				1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	
17				1	0	0	1	1	0	0	1	0	0	0	1	1	0	1	0	1	1	0	
18				1	0	0	0	1	1	0	1	1	1	0	1	1	0	1	1	1	1	0	
19				1	1	0	1	1	1	0	1	1	1	0	1	0	1	0	0	0	1	0	
20				1	1	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	
21				1	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	1	0	
22				1	0	0	0	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	0
23				1	0	0	1	1	1	0	1	1	1	0	0	0	1	1	0	1	1	0	
24				1	1	0	0	1	1	0	0	1	1	1	1	0	1	0	0	1	1	0	
25				1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	0	1	1	0	
26				1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	
27				1	0	0	1	0	1	0	1	1	1	0	1	0	0	0	0	1	1	0	
28				1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	0

+++REDACTED+++



	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	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL			
1	Identifier	Identifier	Explanati	Liikkumis	Hyvinvoin	Yksinäisy	Yhteisölli	Perheide	Yhteistyö	Toiminta-	Osallisuus	Toiminnar	Koordina	Kävelyn j	Sukupuol	Soveltav	Tiedonke	Kampanj	Kartoituk	Kirjaamin	Koulutus	Kunto- ja	Liikuntan	Liikuntan	Luonto- j	Matalan l	Osallistar	Tapahtur	Työkaluaj	Työntekij	Vertaisto	Viestinnä	Vuosikell	Välineide	Ympärist	Nykytilan	Motoristen				
2			Liikkumis	1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	82,35%	
3			Liikkumis	1	0	0	0	1	1	1	0	1	1	0	0	0	1	1	0	0	1	0	0	1	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	85,29%	
4			Liikkumis	1	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	1	1	1	1	1	1	1	1	97,06%	
5			Liikkumis	1	0	0	1	1	1	0	1	1	1	0	0	1	0	1	1	0	1	0	0	0	0	1	1	1	0	1	0	1	0	0	1	1	0	1	0	82,35%	
6			Liikkumis	1	1	0	1	1	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	1	82,35%	
7			Liikkumis	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	76,47%	
8			Liikkumis	1	1	0	1	1	1	0	1	1	1	0	0	0	0	1	1	1	1	1	1	0	1	1	1	1	0	1	0	1	0	1	0	1	0	0	1	67,65%	
9			Liikkumis	1	1	0	1	1	1	1	0	1	1	0	0	0	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	0	0	0	1	0	0	1	79,41%	
10			Liikkumis	1	1	0	1	0	1	1	1	0	1	0	0	0	1	1	1	1	1	1	1	0	1	1	0	0	1	1	1	1	0	0	0	1	0	1	0	1	73,53%
11			Liikkumis	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	0	1	1	1	0	1	0	1	82,35%
12			Liikkumis	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	0	0	1	1	0	1	1	1	1	0	1	0	1	0	0	0	1	1	0	0	0	79,41%	
13			Liikkumis	1	0	0	1	1	1	0	0	1	1	0	0	0	0	1	1																						

++REDACTED++



	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	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL			
1	Identif	K	Plaanat	Liikkumis	Hyvinvoin	Yksinäisy	Yhteisöll	Perheide	Yhteisty	Toiminta	Osallisu	Toiminnar	Koordina	Kävelyn	Sukupu	Soveltav	Tiedonke	Kampa	Kartoituk	Kirjaamin	Koulutus	Kunto-	ja Liikunta	Liikunta	Luonto-	Matalan	Osallist	Tapahtur	Työkaluj	Työntekij	Vertais	Viestinnä	Vuosikel	Välilneide	Ympärist	Nykytilan	Motoristen	taitojen			
2			Liikkumis	1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	82,35%		
3			Liikkumis	1	0	0	0	1	1	0	1	1	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	1	0	1	0	1	0	1	1	1	1	85,29%
4			Liikkumis	1	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	1	0	1	1	1	1	1	1	1	97,06%	
5			Liikkumis	1	0	0	1	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	0	0	0	0	1	1	1	1	0	1	0	1	1	1	0	1	0	82,35%	
6			Liikkumis	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	1	1	1	0	0	0	1	0	0	1	0	1	0	1	0	1	1	0	82,35%	
7			Liikkumis	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	76,47%	
8			Liikkumis	1	1	0	1	1	1	1	0	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	67,65%	
9			Liikkumis	1	1	0	1	1	1	1	0	1	1	1	1	0	0	0	1	1	1	0	1	1	1	1	1	0	1	1	1	1	0	0	1	0	0	0	1	79,41%	
10			Liikkumis	1	1	0	1	0	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	1	1	0	0	1	0	1	0	1	73,53%	
11			Liikkumis	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1	0	1	1	1	0	1	0	82,35%	
12			Liikkumis	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	0	1	0	0	1	79,41%	
13			Liikkumis	1	1	0	1	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1	1	0	1	1	1														



Toiminnan vakiinnuttaminen: 1

Toiminnan vakiinnuttaminen näkyy esimerkiksi lauseessa: "Lasten liikkumisen asiantuntija koordinoi, kehittää ja arvioi Liikkuva varhaiskasvatus toimintaa yhteistyössä ohjausryhmän ja muuveriverkostojen kanssa."

Koordinaation vahvistaminen: 1

Koordinaation vahvistaminen on selkeästi esillä: "Kuntakoordinaatio" -osio kuvaa useita koordinaation vahvistamiseen liittyviä toimenpiteitä.

Kävelyn ja pyöräilyn edistäminen: 0

Tekstissä ei suoraan mainita kävelyn tai pyöräilyn edistämistä.

Sukupuolten tasa-arvon ja yhdenvertaisuuden edistäminen: 1

Yhdenvertaisuus mainitaan: "Huomioidaan perheiden moninaisuus, jotta kaikilla lapsilla ja perheillä on yhdenvertaiset mahdollisuudet osallistua."

Soveltavan liikunnan järjestäminen: 1

Vaikka termiä "soveltava liikunta" ei käytetä, tekstissä mainitaan: "Huomioidaan kaikessa toiminnassa erityisesti liikkumattomat, vähän liikkuvat ja vetäytyvät lapset sekä lapset, joilla on erityistarpeita."

Tiedonkeruun ja arvioinnin kehittäminen: 1

Arviointi mainitaan: "Kaikissa yksiköissä tehdään Nykytilan arviointia ja toimintaa kehitetään pienten askelten menetelmällä."

Kampanioiden ja haasteiden toteuttaminen: 1

Tekstissä mainitaan: "Suunnitellaan ja toteutetaan paikallisia kampanjoita lapsiperheiden aktivoimiseksi sekä kannustetaan perheitä osallistumaan valtakunnallisiin liikkumiskampanioihin."

Kartoitukset ja selvitykset toimenpiteenä: 1

Tekstissä mainitaan: "Keväällä kartoitus ja syksyllä hankinnat" liikuntavälineiden ja digimateriaalien osalta.

Kirjaaminen ja suunnitelmien laadinta: 1

Suunnitelmien laadinta mainitaan: "Luodaan varhaiskasvatuksen liikkumisen vuosikello johtamisen ja arjen toteutuksen tueksi."

Koulutus ja osaamisen lisääminen: 1

Koulutus on vahvasti esillä: "Järjestetään sisäisiä ja eri yhteistyötahojen järjestämiä koulutuksia henkilöstölle."

Kunto- ja hyvinvointimittaukset: 0

Tekstissä ei mainita kunto- tai hyvinvointimittauksia.

Liikuntaneuvonnan palvelupolun kehittäminen: 0

Tekstissä ei mainita liikuntaneuvonnan palvelupolun kehittämistä.

Liikuntaneuvonnan tarjoaminen: 1

Liikuntaneuvonta mainitaan: "Yksikkökohtainen sparraus ja toimintaympäristöjen muokkaaminen lapsia ja henkilöstöä osallistaen, lasten liikkumisen asiantuntija, liikuntaneuvojat."

[illegible]

Merilehto, Juhani ...  
Vuosikello on myös "Vuosikello" kohdassa. On ohjeistettu että käytäisi yhtä per kategoria mutta..

Generative AI & Data Analysis

- ▶ When are the results “good enough?”
- ▶ Does AI need to outperform human?
- ▶ How can we trust the results?
- ▶ -> same issues that human agents have



Generative AI & Data Analysis



- ▶ Quantitative data “easy” to check (i.e., count)
- ▶ Qualitative data hard to check (i.e., interpret meaning)

Recap!

- ▶ Large data that needs to run in batches: API
- ▶ Repeating a task: API
- ▶ Data that can be fed easily: UI
- ▶ Unique or moderately repeated tasks: UI

Pro tip: Learn how to
use Python scripts with
LLM API

Still awake?



Resources

- ▶ My personal experiences (as of 05/2025):
- ▶ Best for coding: **Claude 3.7 Sonnet**
- ▶ Best as “general tool”: **Claude 3.7 Sonnet**
- ▶ Great for “big task + research”: ChatGPT-3o / Gemini 2.5 Pro (both with deep research)
- ▶ Great for “bullet-list info”: **ChatGPT-4o**
- ▶ Special award: **Grok 3** (Low censorship enables i.e., hacking discussion better)
- ▶ Mistral: <https://chat.mistral.ai/>
- ▶ Gemini: <https://gemini.google.com/>
- ▶ Claude: <https://claude.ai/>
- ▶ ChatGPT: <https://chatgpt.com>
- ▶ DeepSeek: <http://chat.deepseek.com/>
- ▶ Grok: <https://www.grok.com> (or use X / Twitter)

Quick list of analysis techniques

Technique	Purpose	Data Type
Descriptive Statistics	Summarize data features (mean, median, mode, etc.)	Quantitative
Inferential Statistics	Make predictions or generalizations about a population	Quantitative
Thematic Analysis	Identify patterns or themes in text	Qualitative
Content Analysis	Quantify occurrences of themes or words	Qualitative / Mixed
Regression Analysis	Explore relationships between variables	Quantitative
Correlation Analysis	Measure association between variables	Quantitative
ANOVA	Compare means across multiple groups	Quantitative
Grounded Theory	Generate theory from systematically collected data	Qualitative
Narrative Analysis	Interpret stories and personal accounts	Qualitative
Factor Analysis	Reduce data by identifying latent variables	Quantitative
Cluster Analysis	Group similar observations	Quantitative
Discourse Analysis	Examine language use in context	Qualitative
SWOT Analysis	Identify strengths, weaknesses, opportunities, threats	Qualitative / Mixed
Sentiment Analysis	Detect emotions or opinions in text	Qualitative / Mixed
Time Series Analysis	Analyze trends over time	Quantitative
Chi-Square Test	Test relationships between categorical variables	Quantitative



Thank you.

Juhani Merilehto

juhani.merilehto@student.uwasa.fi / merilehto@pm.me

Sources

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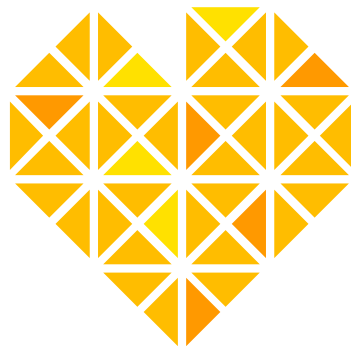
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Vaasan yliopisto
UNIVERSITY OF VAASA