



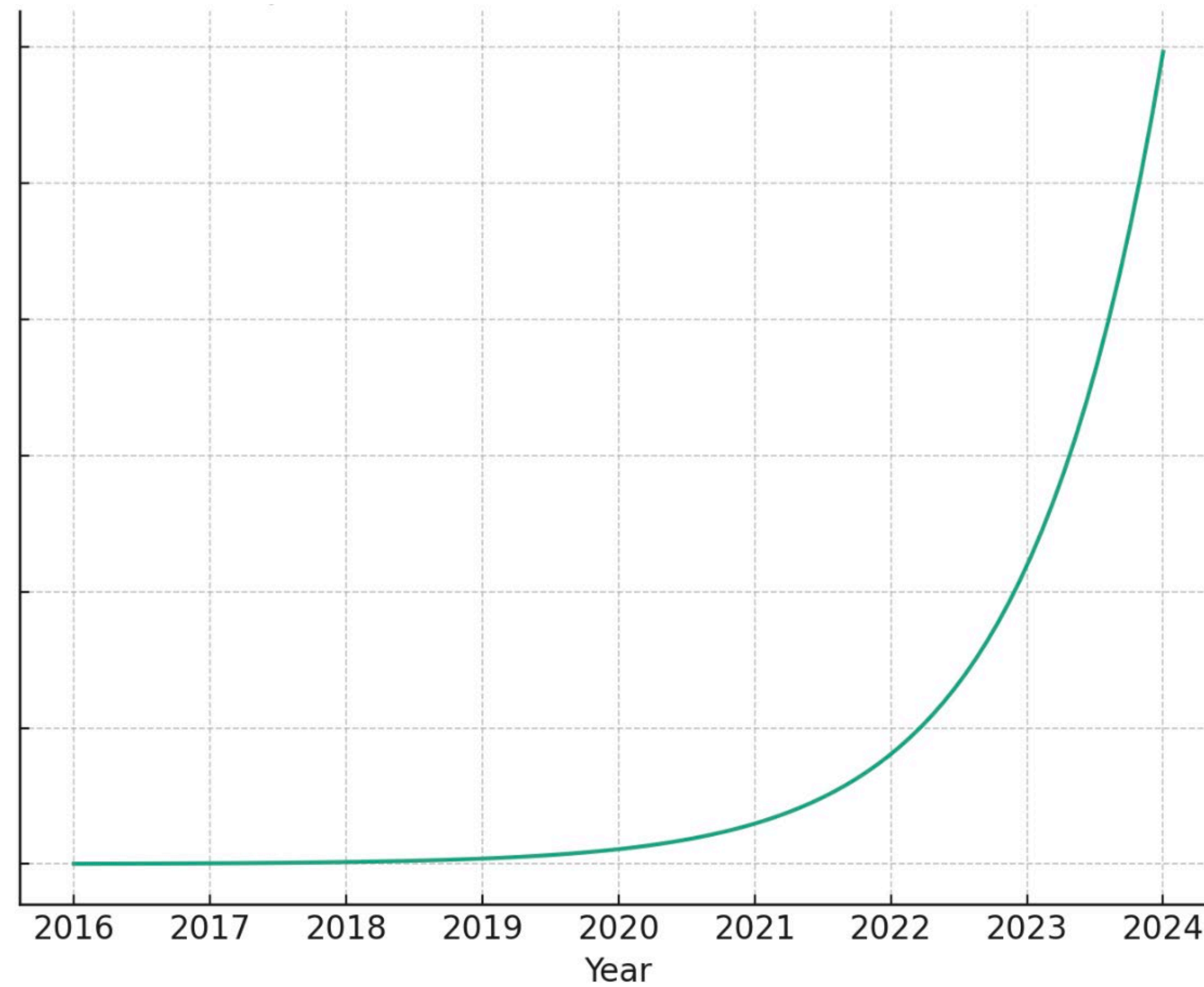
# What is AI and How to Exploit it?

Martin Musiol

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2024

# Generative AI is here to stay



# Martin Musiol

## YOUR INSTRUCTOR

- [Masters] TUM - ML/DL & parallel computing
- ML Research @Airbus R&D
- Data Scientist @frog design
- FOUNDER of GenerativeAI.net
- DS Manager & Member of the IBM TEC@IBM
- GenAI Lead EMEA @Infosys



**12**  
YEARS

**AI (ML & DS)**

... with experience in e.g. CV, NLP and GAI; in many sectors.

**50+**

**Conference presentations**

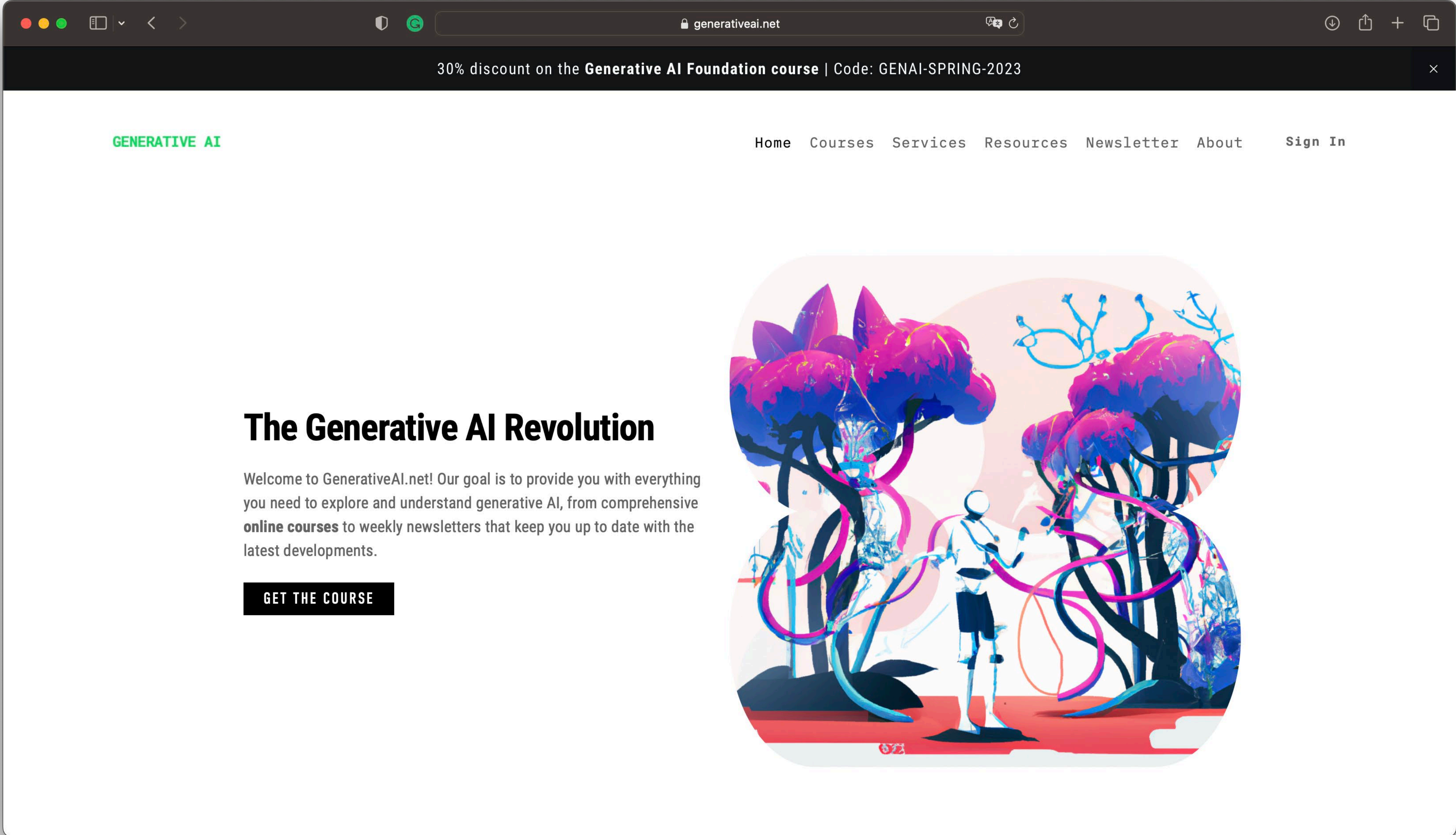
... about Generative AI starting in 2016.

**10k+**

**Mentees/ Students**

... coached/ trained/ mentored; in small group coaching sessions or 1-1 sessions.





30% discount on the **Generative AI Foundation course** | Code: GENAI-SPRING-2023

GENERATIVE AI

Home Courses Services Resources Newsletter About Sign In

# The Generative AI Revolution

Welcome to GenerativeAI.net! Our goal is to provide you with everything you need to explore and understand generative AI, from comprehensive **online courses** to weekly newsletters that keep you up to date with the latest developments.

GET THE COURSE



GENERATIVE AI

## The Generative

Welcome to GenerativeAI.net!  
you need to explore and understand  
**online courses** to weekly news  
latest developments.

GET THE COURSE

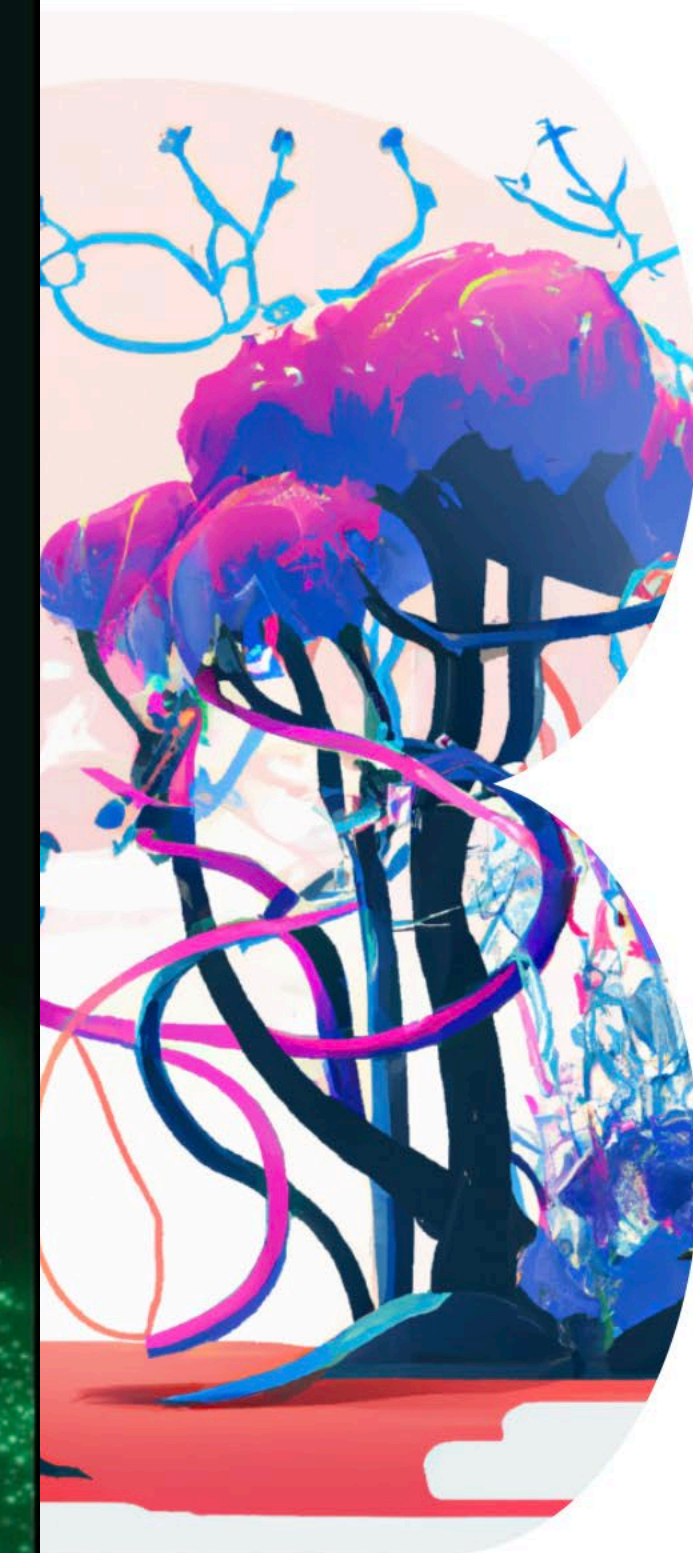
Martin Musiol

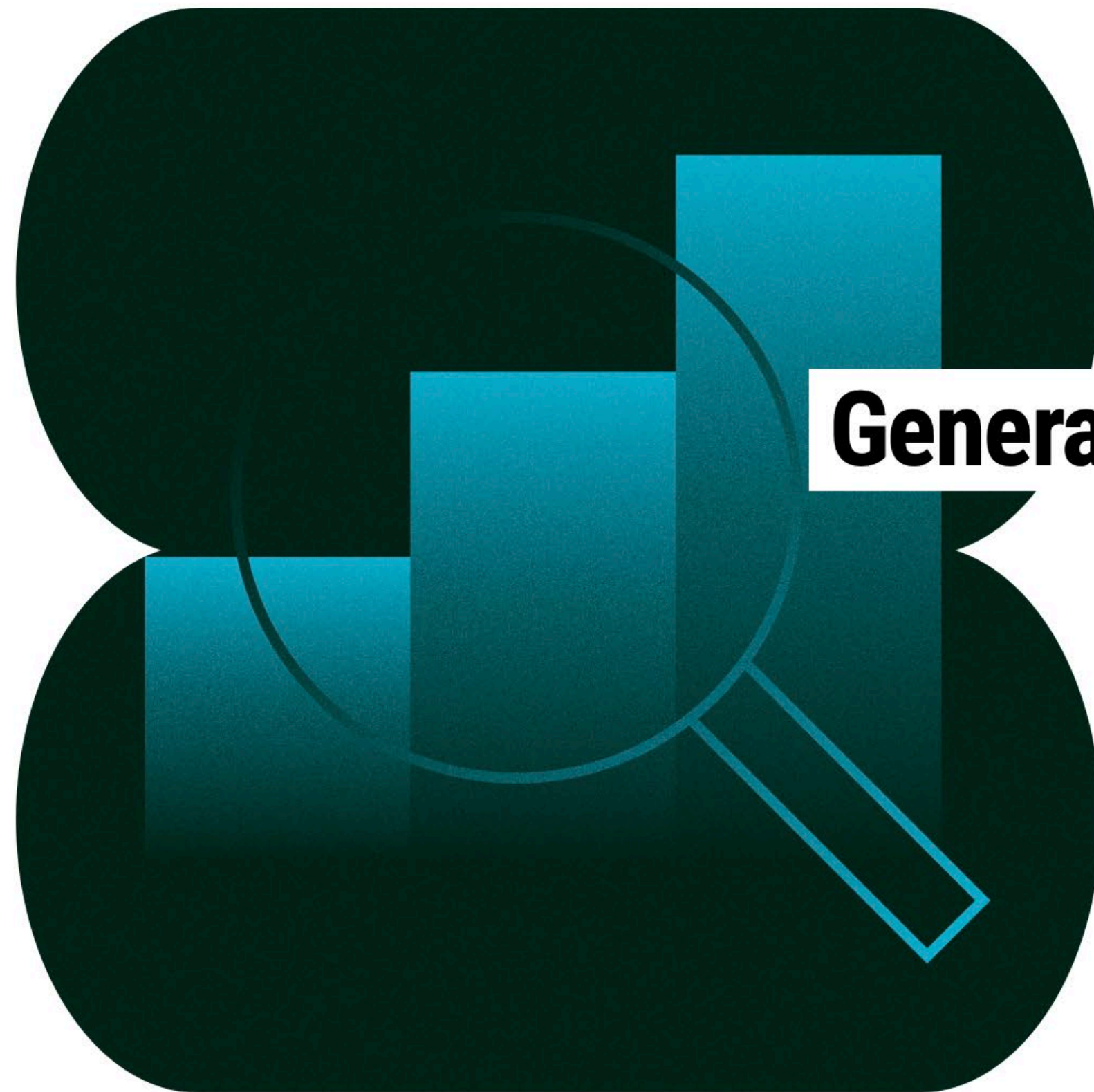
# GENERATIVE AI

Navigating the Course  
to the Artificial General  
Intelligence Future

WILEY

Resources Newsletter About Sign In





# Generative AI For Marketing

Unlock the Future of Digital Campaigns

GET THE COURSE

# Our Credentials with GPT

## WHERE WE STARTED...

Infosys, Tesla's Elon Musk & others commit \$1 bn to OpenAI

OpenAI is a non-profit artificial intelligence research company

Press Trust of India | New Delhi  
Last Updated at December 12, 2015 19:57 IST

## WHERE WE ARE...

Infosys has had a strong experience with a variety of transformer models including those from OpenAI.

### Honors:

- Won 'Similar Language Translation Task' Challenge in the 'World Machine Translation' Competition (WMT 2020).
- Published its paper at ACL. Infosys Machine Translation System for WMT20 Similar Language Translation Task
- Presented at EMNLP 2020
- 2022 - Secured a Gold Medal in Google's AI4Code competition on Kaggle

## OUR CLIENTS SO FAR:

**Morgan Stanley**

OpenAI – GPT3.5

Structured Knowledge  
Base Creation

**SIEMENS**  
*Ingenuity for life*

OpenAI – GPT3.5

Post Categorization  
f. Knowledge Mgmt

**Pfizer**

OpenAI – GPT3.5

Medical Text  
Summarization

**The Open University**

OpenAI – GPT3.5

Student Question Answering,  
Intent Mining of Voice Recordings

**syngenta** \*

OpenAI – Codex

Custom Code  
documentation

**verizon** \*

Meta – Transcoder

Custom Code  
migration

**Vanguard** \*

EleutherAI – GPT-J

Business Process  
Documentation

**Roche** \*

GPT-3.5

Test Script  
Rationalization

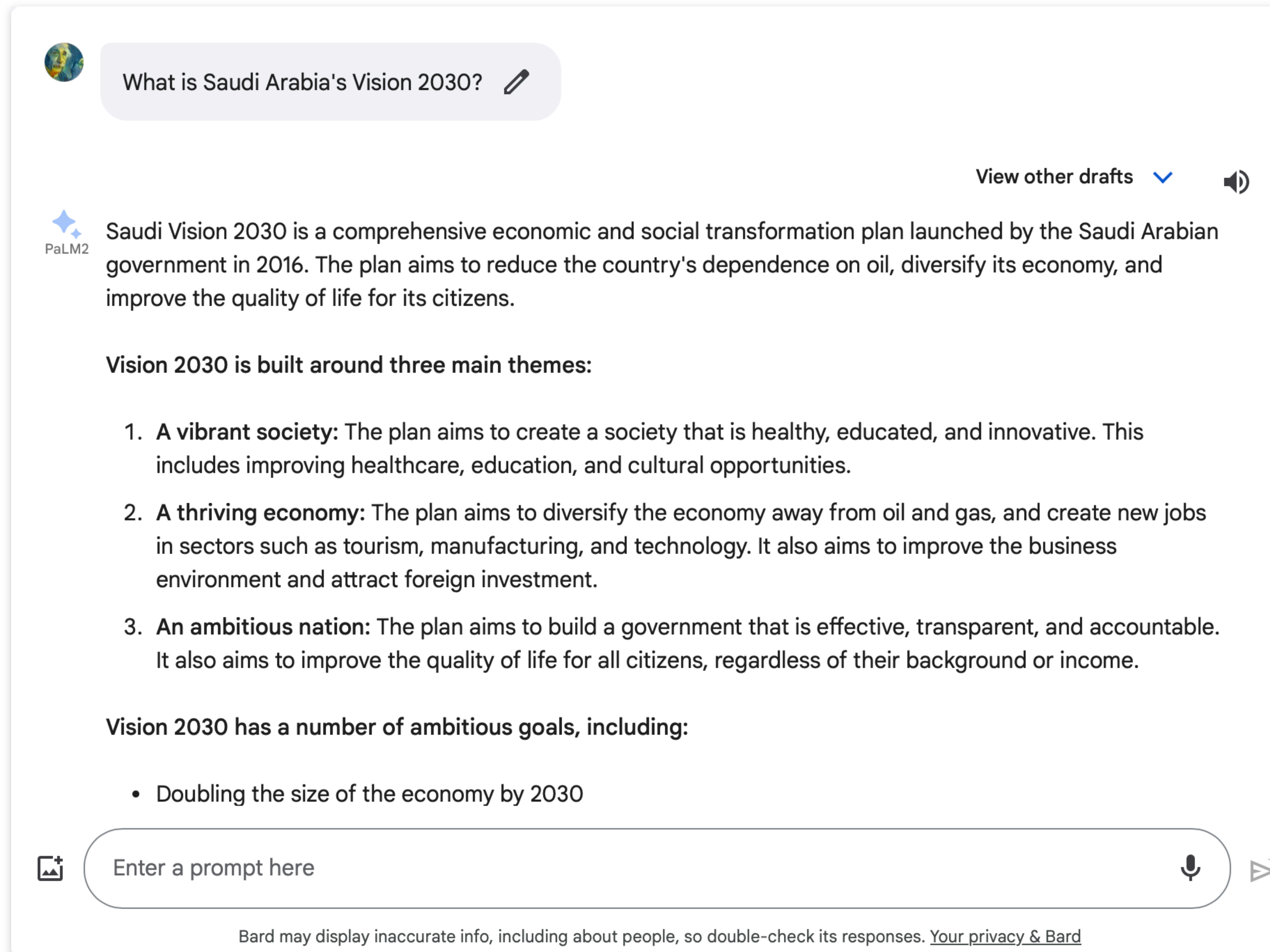


# GenAI's Broad Scope









# Text generation



The screenshot shows a user interface for a text generation model. At the top, a prompt is entered in a light blue rounded rectangle: "What is Saudi Arabia's Vision 2030?". To the right of the prompt are icons for "View other drafts" (a blue checkmark) and a speaker icon. Below the prompt, the model's response is displayed, starting with a blue star icon and the label "PaLM2". The response text is: "Saudi Vision 2030 is a comprehensive economic and social transformation plan launched by the Saudi Arabian government in 2016. The plan aims to reduce the country's dependence on oil, diversify its economy, and improve the quality of life for its citizens." This is followed by a bolded heading: "Vision 2030 is built around three main themes:". Below this heading is a numbered list of three items: 1. "A vibrant society: The plan aims to create a society that is healthy, educated, and innovative. This includes improving healthcare, education, and cultural opportunities." 2. "A thriving economy: The plan aims to diversify the economy away from oil and gas, and create new jobs in sectors such as tourism, manufacturing, and technology. It also aims to improve the business environment and attract foreign investment." 3. "An ambitious nation: The plan aims to build a government that is effective, transparent, and accountable. It also aims to improve the quality of life for all citizens, regardless of their background or income." Below the list is another bolded heading: "Vision 2030 has a number of ambitious goals, including:". This is followed by a bulleted list with one item: "Doubling the size of the economy by 2030". At the bottom of the interface is a text input field with the placeholder text "Enter a prompt here". To the left of the input field is an image icon, and to the right are a microphone icon and a send icon (a triangle with a plus sign). Below the input field, there is a small disclaimer: "Bard may display inaccurate info, including about people, so double-check its responses. [Your privacy & Bard](#)".

What is Saudi Arabia's Vision 2030? 

View other drafts  




 PaLM2 Saudi Vision 2030 is a comprehensive economic and social transformation plan launched by the Saudi Arabian government in 2016. The plan aims to reduce the country's dependence on oil, diversify its economy, and improve the quality of life for its citizens.

**Vision 2030 is built around three main themes:**

1. **A vibrant society:** The plan aims to create a society that is healthy, educated, and innovative. This includes improving healthcare, education, and cultural opportunities.
2. **A thriving economy:** The plan aims to diversify the economy away from oil and gas, and create new jobs in sectors such as tourism, manufacturing, and technology. It also aims to improve the business environment and attract foreign investment.
3. **An ambitious nation:** The plan aims to build a government that is effective, transparent, and accountable. It also aims to improve the quality of life for all citizens, regardless of their background or income.

**Vision 2030 has a number of ambitious goals, including:**

- Doubling the size of the economy by 2030

 Enter a prompt here  

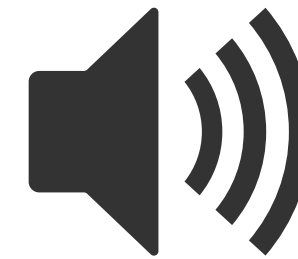
Bard may display inaccurate info, including about people, so double-check its responses. [Your privacy & Bard](#)

# Code generation

```
1 import datetime
2
3 def parse_expenses(expenses_string):
4     """Parse the list of expenses and return the list of triples (date, value, currency).
5     Ignore lines starting with #.
6     Parse the date using datetime.
7     Example expenses_string:
8         2016-01-02 -34.01 USD
9         2016-01-03 2.59 DKK
10        2016-01-03 -2.72 EUR
11    """
12    expenses = []
13    for line in expenses_string.splitlines():
14        if line.startswith("#"):
15            continue
16        date, value, currency = line.split(" ")
17        expenses.append((datetime.datetime.strptime(date, "%Y-%m-%d"),
18                        float(value),
19                        currency))
20    return expenses
```

 Copilot

# Sound generation

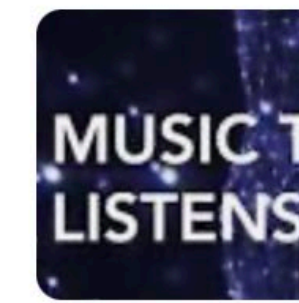


 MacRumors

## Apple Acquires AI Music Startup That Can Generate Dynamic Soundtracks

Apple has acquired AI Music, a startup that uses artificial intelligence to generate personalized soundtracks and adaptive music,...

7 Feb 2022

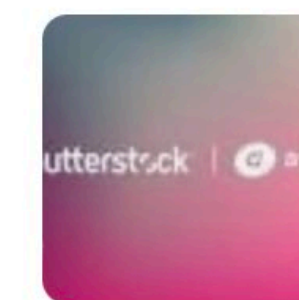


 PR Newswire

## Shutterstock Announces Acquisition of Amper Music

Shutterstock's acquisition of Amper strengthens its capabilities in artificial intelligence, particularly in content search and discovery of...

11 Nov 2020

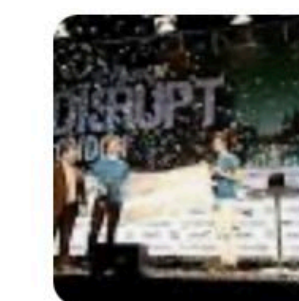


 TechCrunch

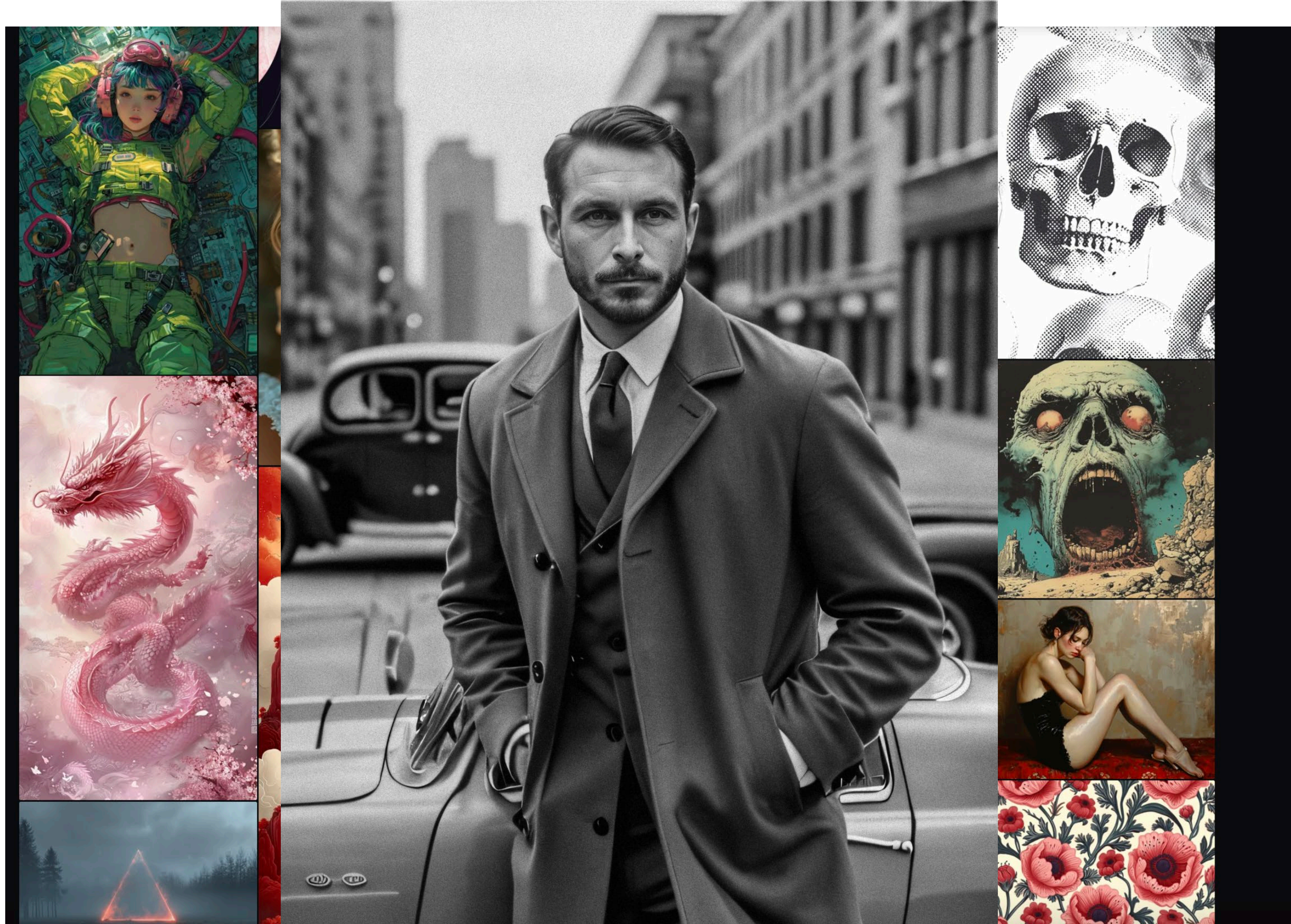
## It looks like TikTok has acquired Jukedeck, a pioneering music AI UK startup

It looks like TikTok has acquired Jukedeck, a pioneering music AI UK startup ... A key change is in the works for Jukedeck, a pioneering AI...

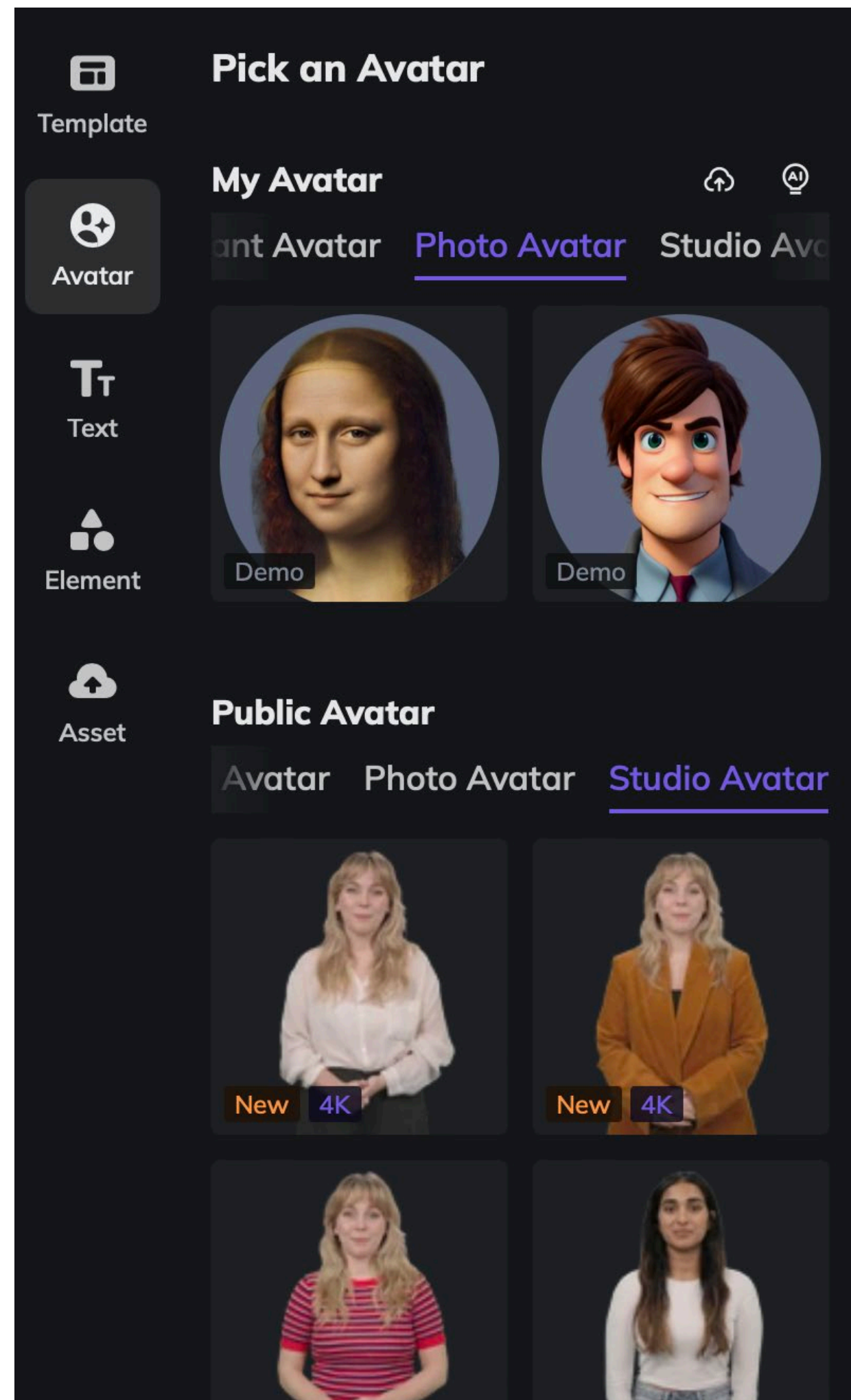
23 Jul 2019



# Image generation



# Video AI editing & avatars



# Video generation



# Video generation

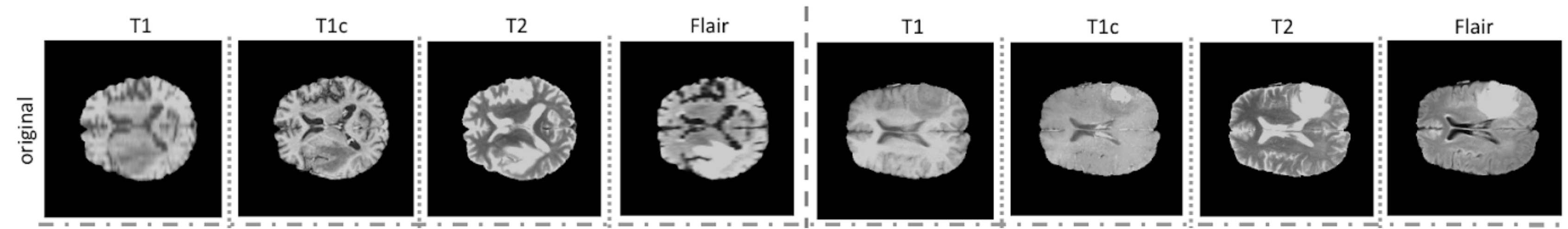


# 3D object generation -> virtual worlds

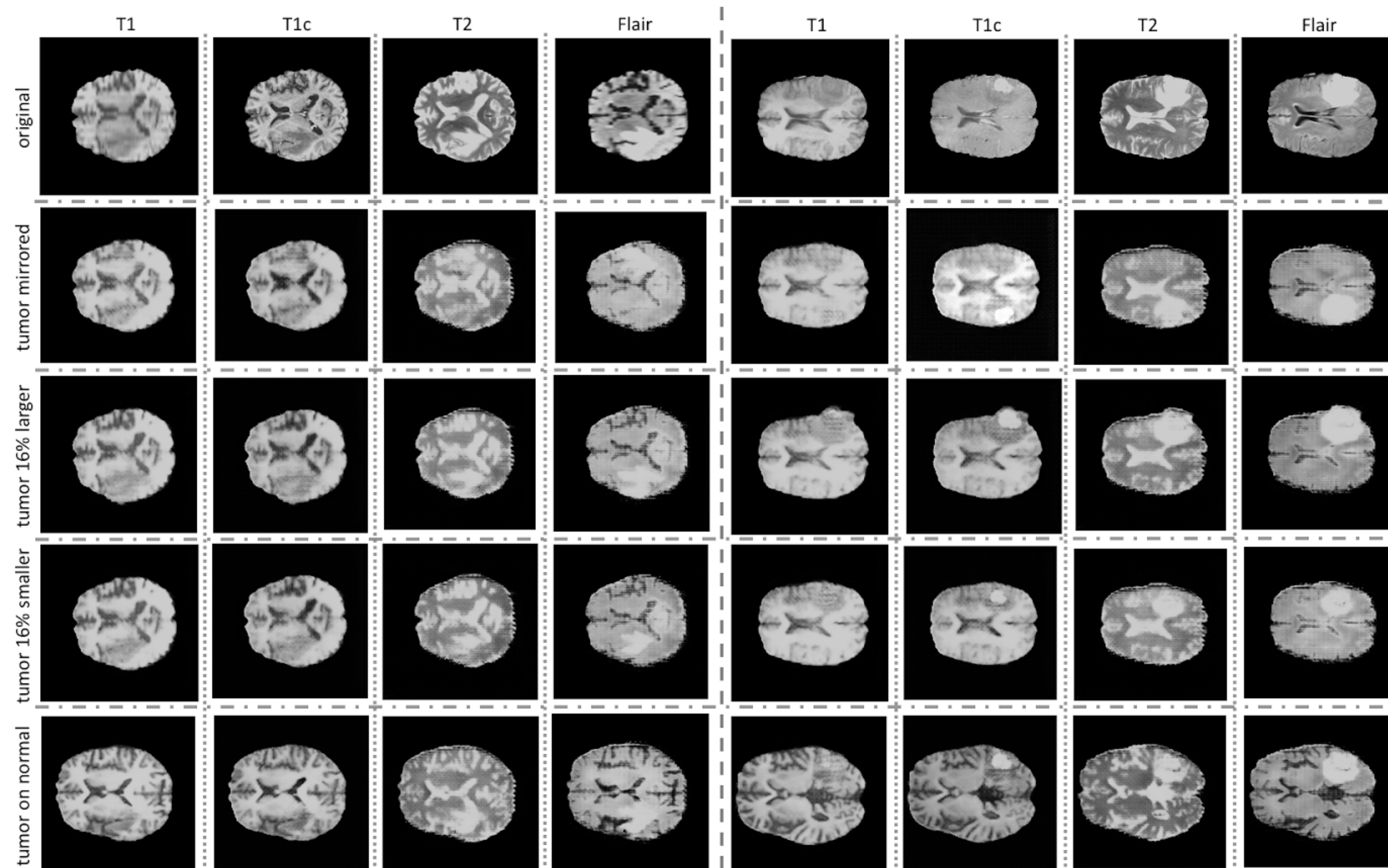





# Data augmentation



# Data augmentation



# GenAI in Science

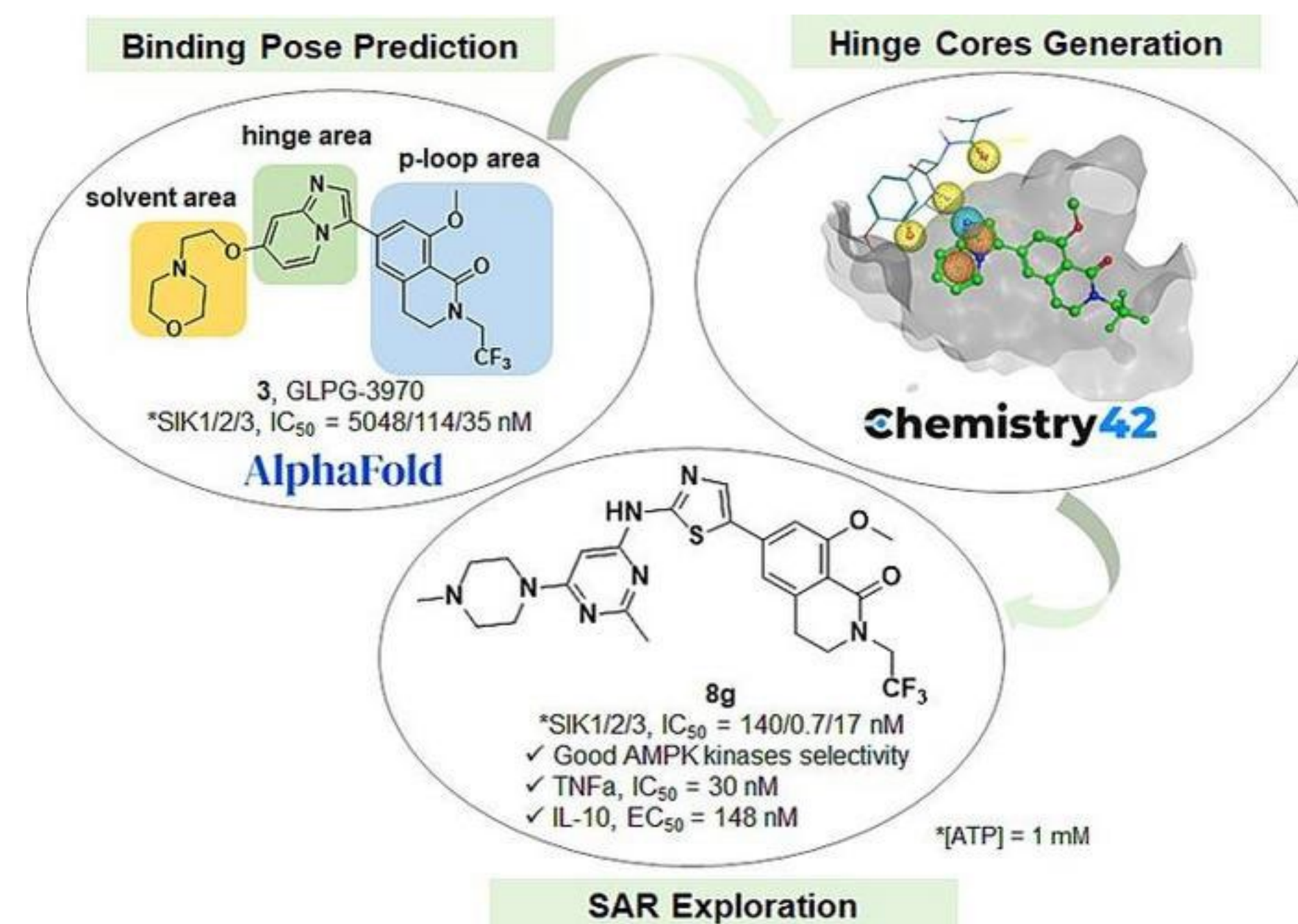
 **Google DeepMind**  
859,765 followers  
2h · 🌐

Introducing AlphaGeometry: an AI system that solves Olympiad geometry problems at a level approaching a human gold-medallist. 📐

It was trained solely on synthetic data and marks a breakthrough for AI in mathematical reasoning.

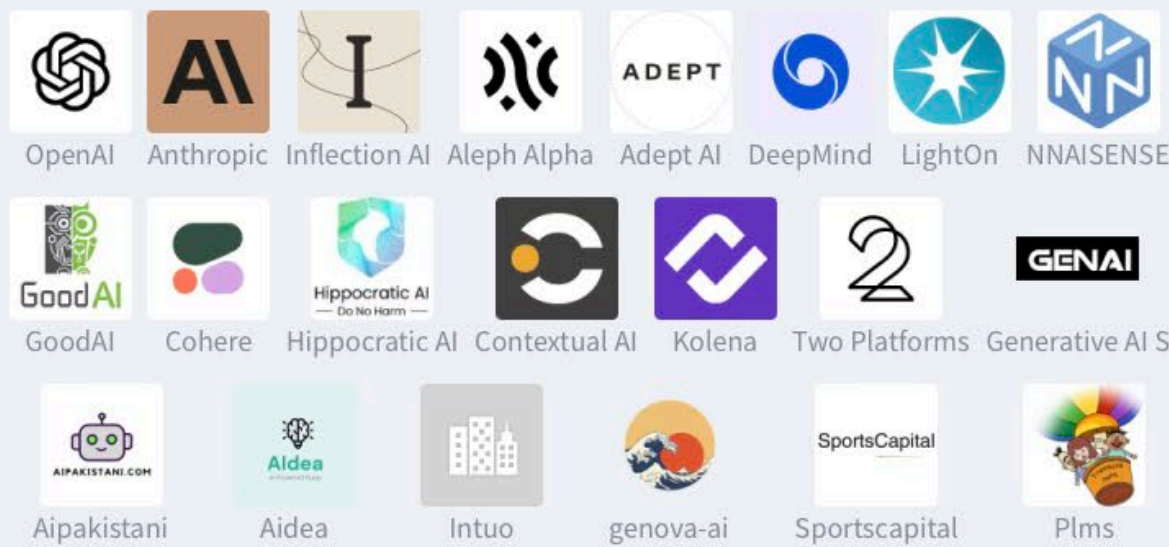
Find out more. → <https://lnkd.in/eknd6T76>

## Insilico Medicine's GenAI Drug Design Engine



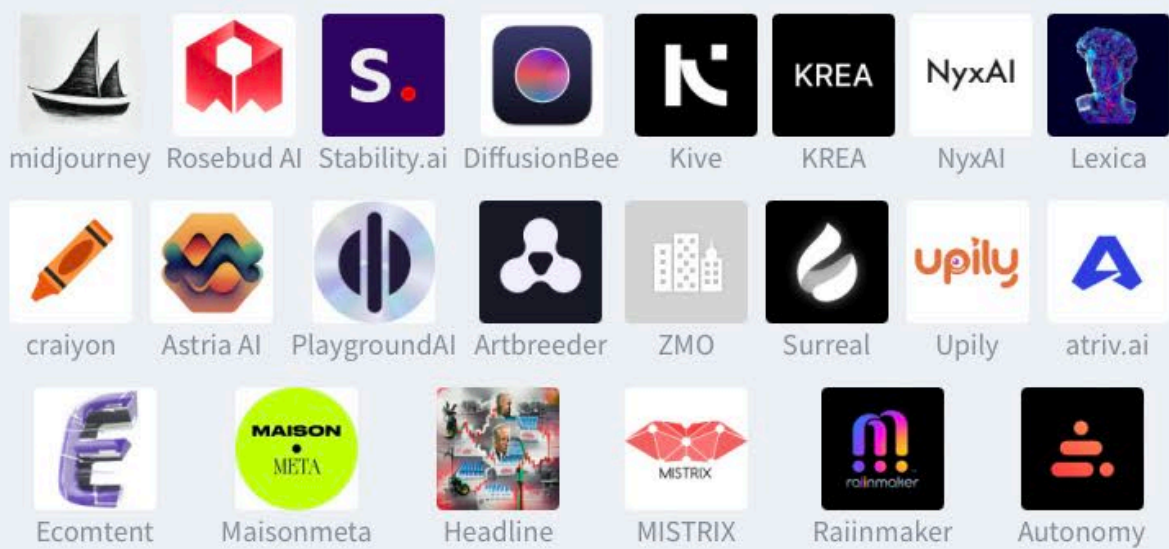
**General Intelligence/model makers**

Combined funding \$ 15B



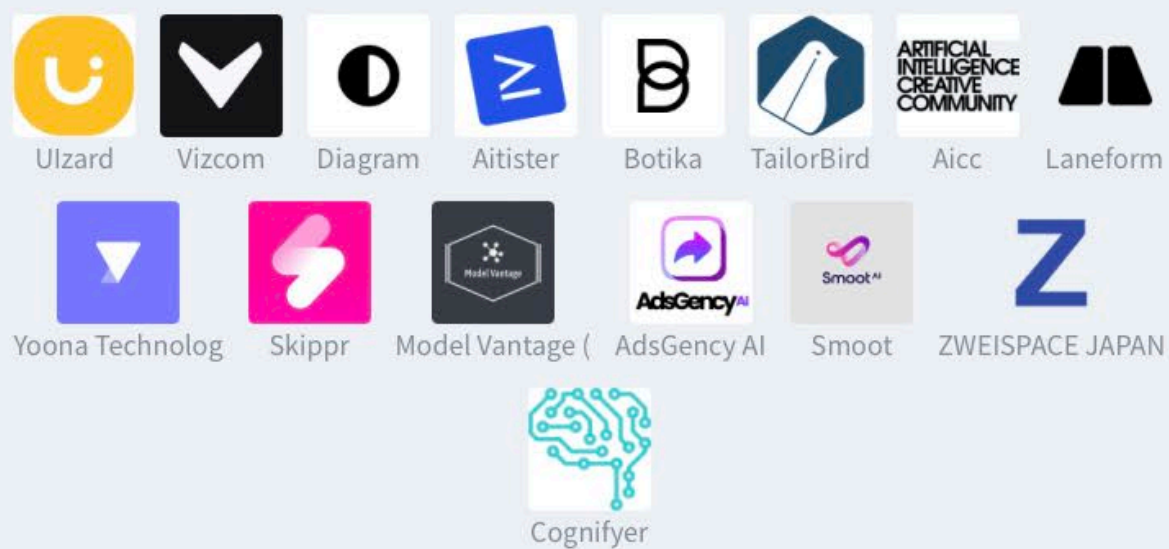
**Image: image generation**

Combined funding \$ 109M



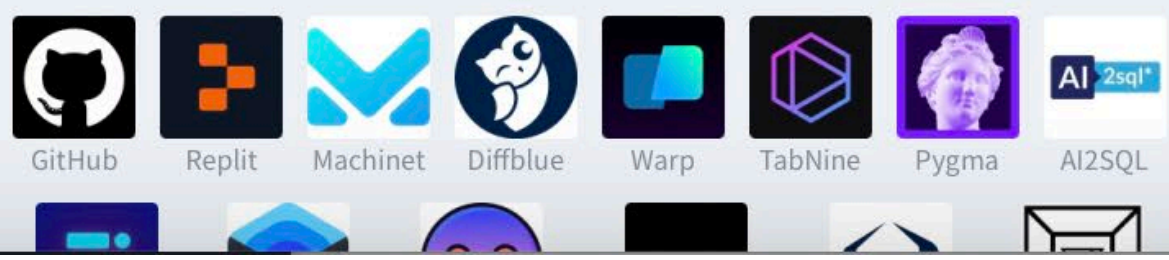
**Image: Design & marketing**

Combined funding \$ 17M



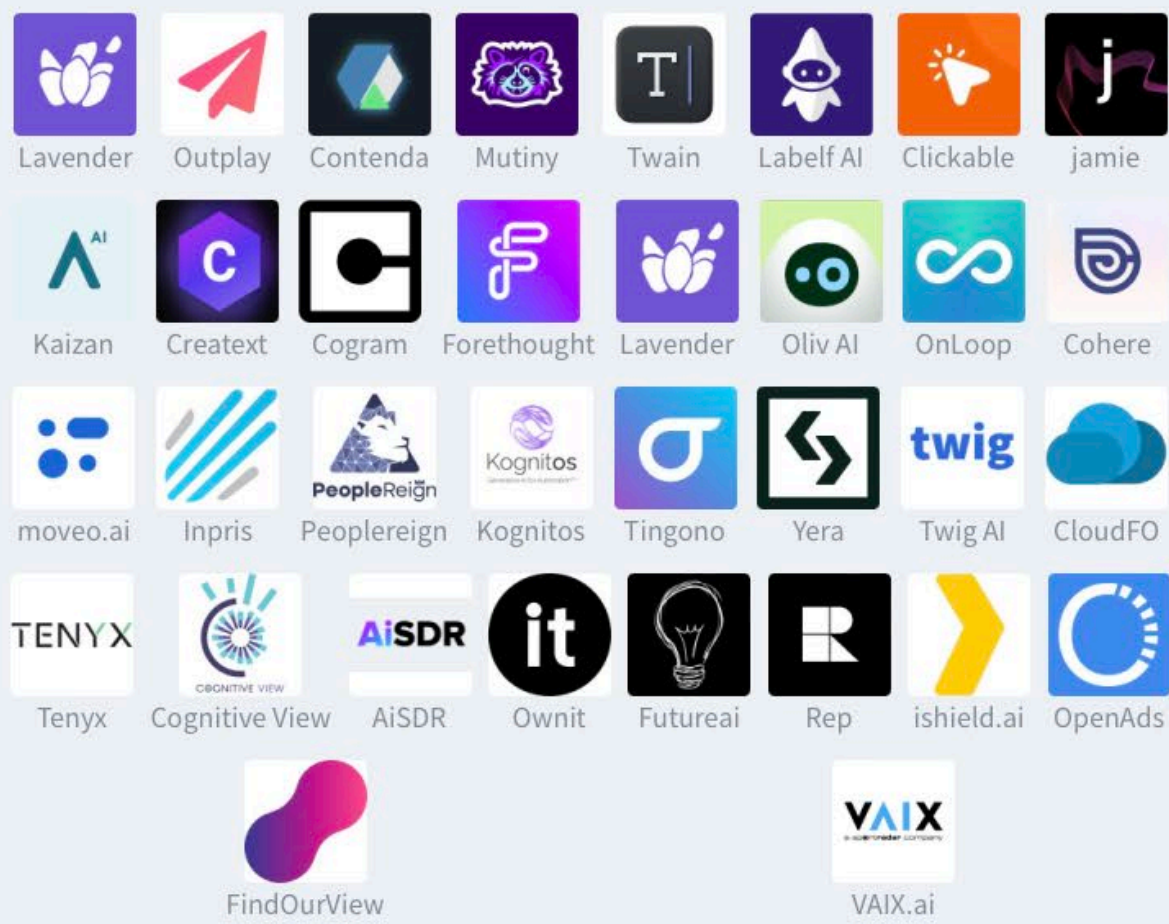
**Code: code generation**

Combined funding \$ 658M



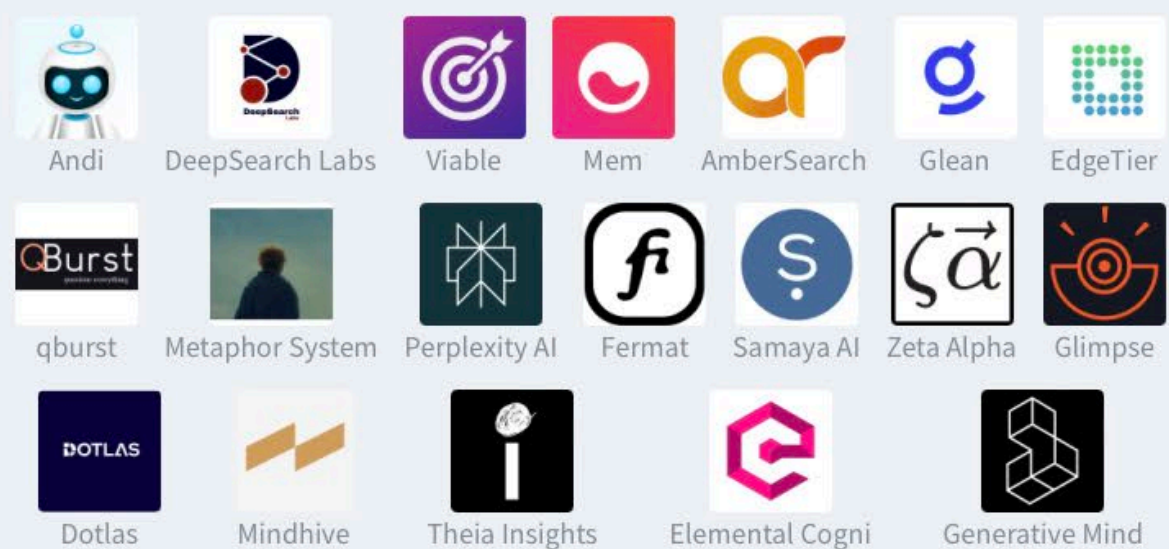
**Text: customer relations & other assistants**

Combined funding \$ 218M



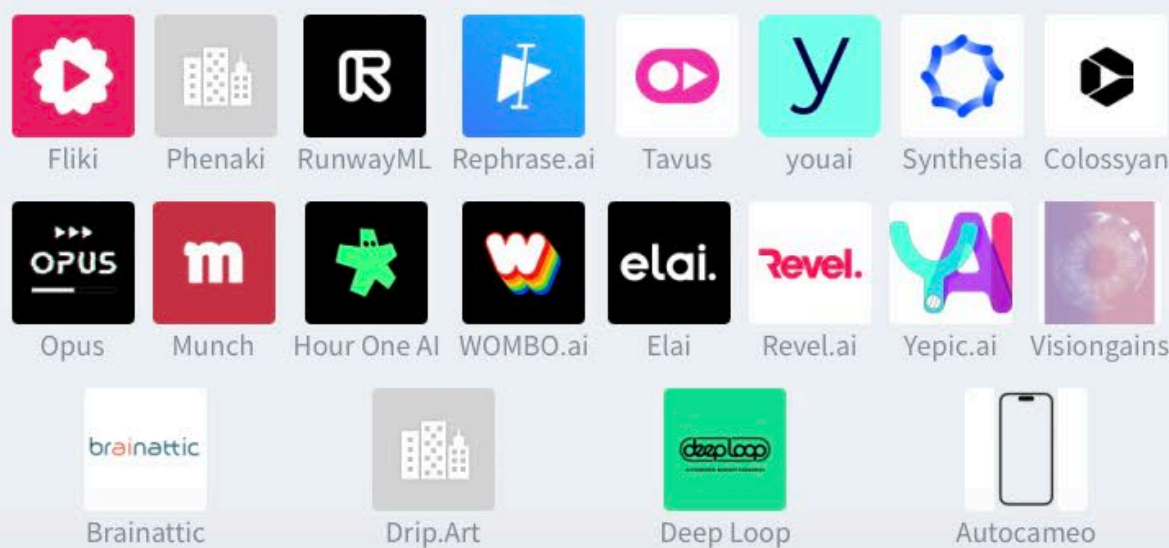
**Text: knowledge & research**

Combined funding \$ 399M



**Video**

Combined funding \$ 421M



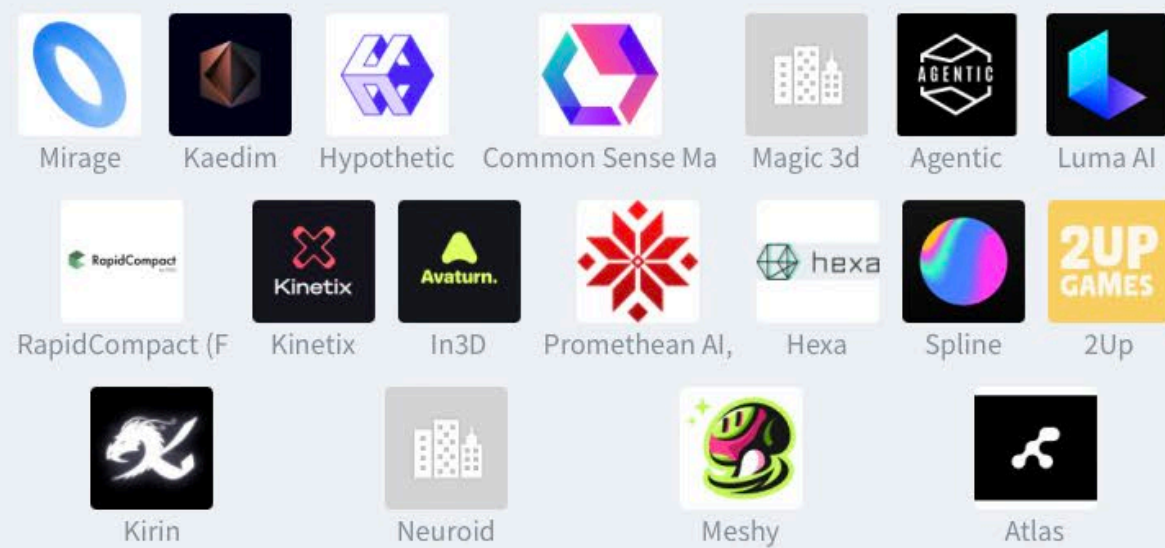
**Other(vertalized AI studios)**

Combined funding \$ 3.1M



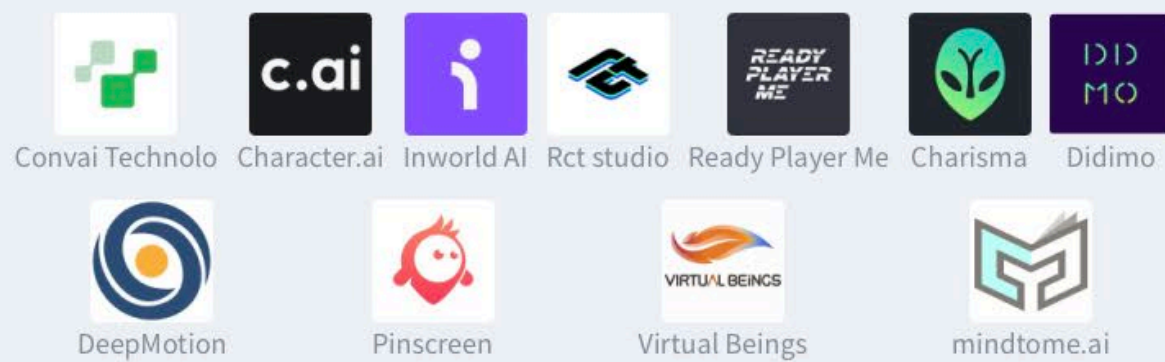
**Gaming & design: 3d assets & worlds**

Combined funding \$ 72M



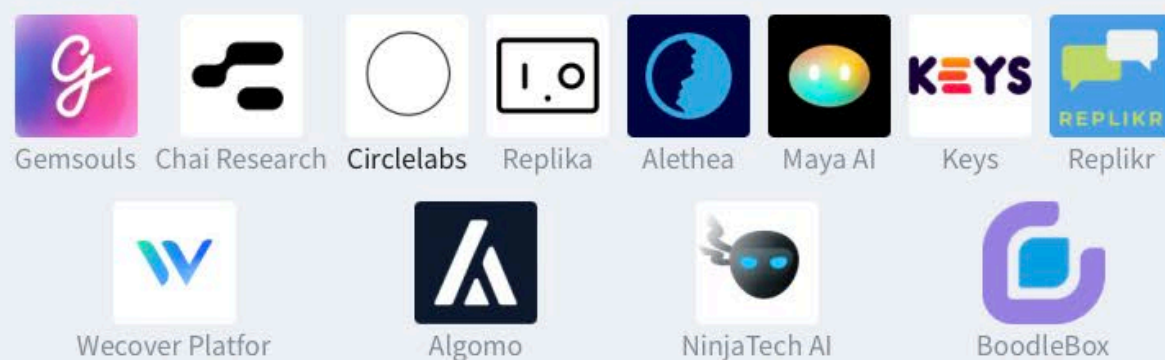
**Gaming: Characters / NPCs**

Combined funding \$ 353M



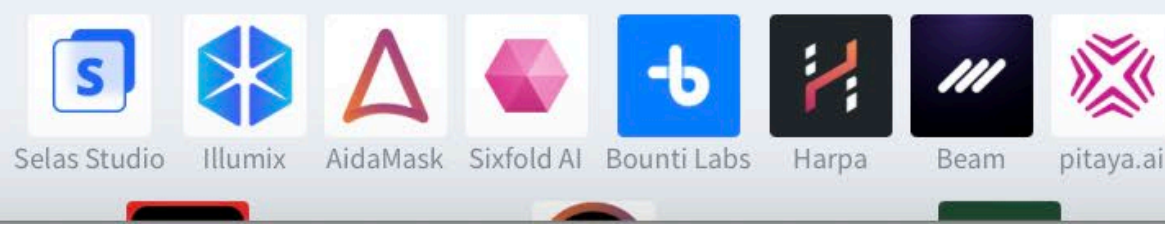
**Chat**

Combined funding \$ 18M



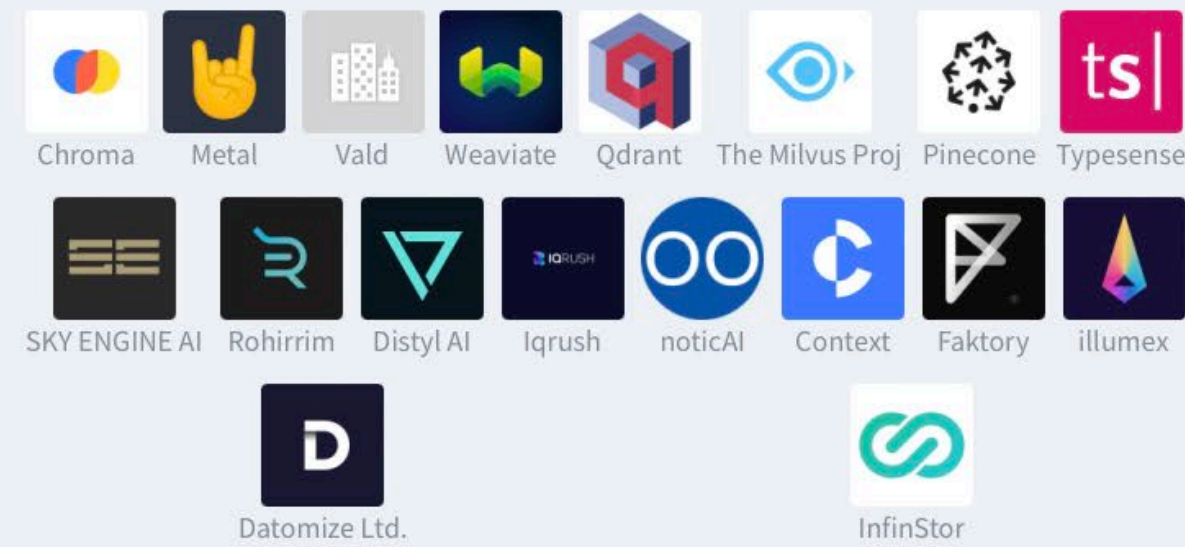
**B2B generative AI integration**

Combined funding \$ 33M



**LLMs tools: data and Embeddings Management**

Combined funding \$ 239M



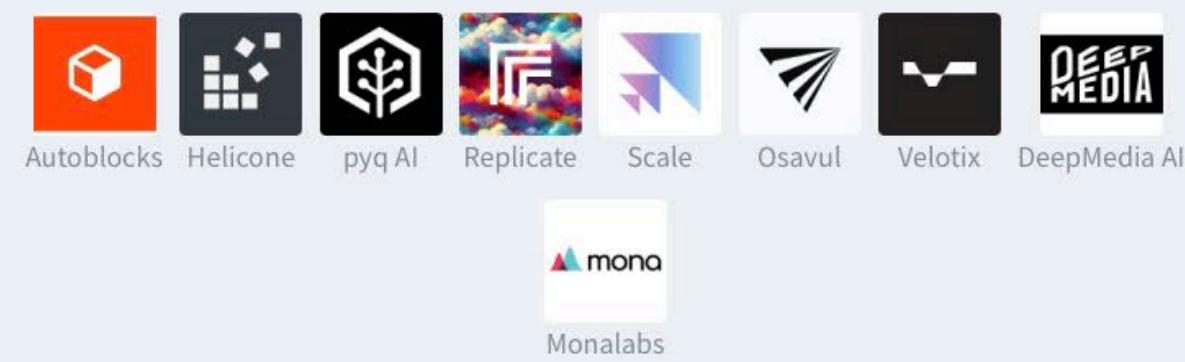
**LLMs tools: Fine-Tuning**

Combined funding \$ 56M



**LLMs tools: Deploy, Optimize and Monitor**

Combined funding \$ 599M

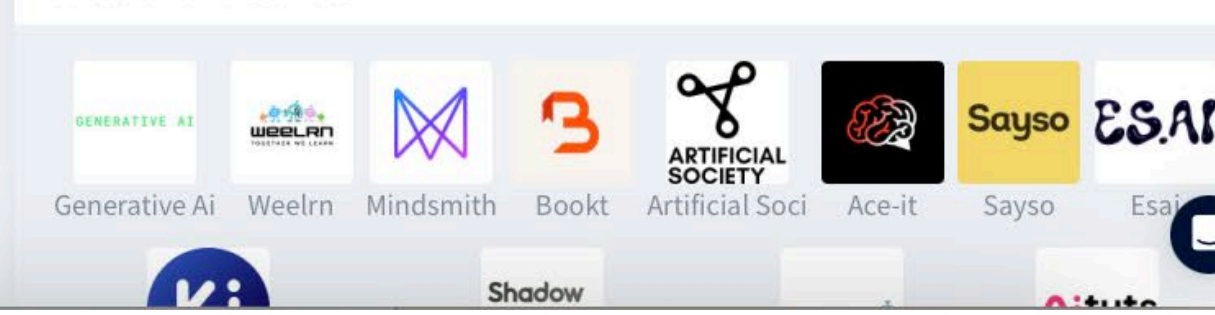



**LLMs tools: FM Programming Frameworks**

Combined funding \$ 23M



**Education and courses**

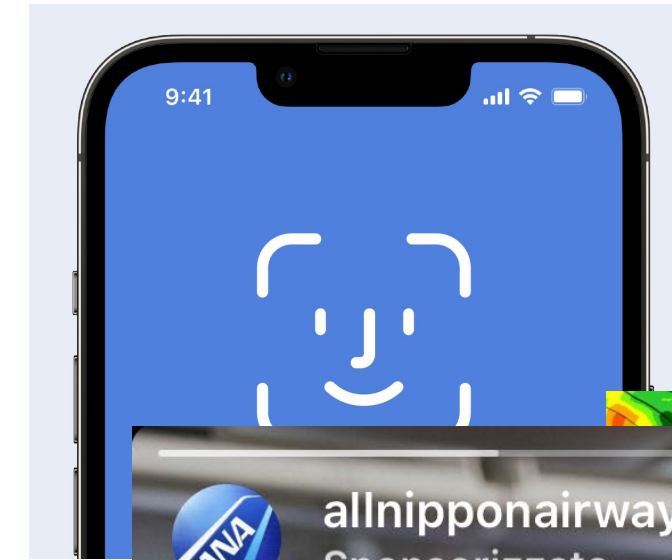




Conventional AI  
vs.  
Generative AI

# Conventional AI

Classification



Regression

Clustering

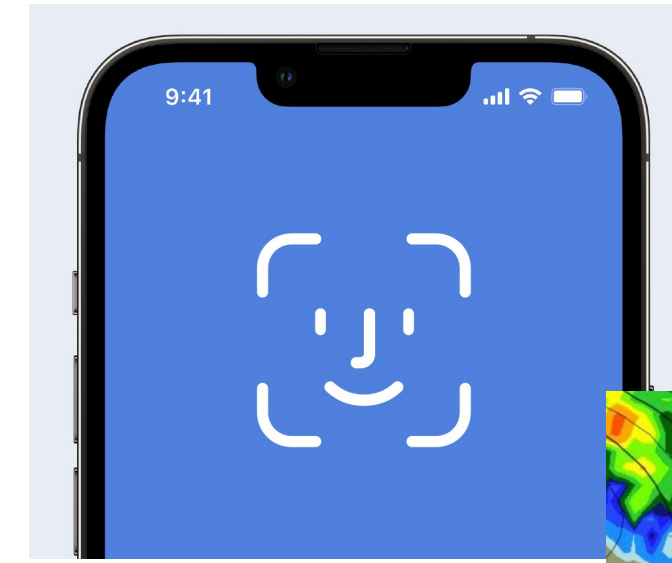
Dimensionality Reduction

Reinforcement Learning

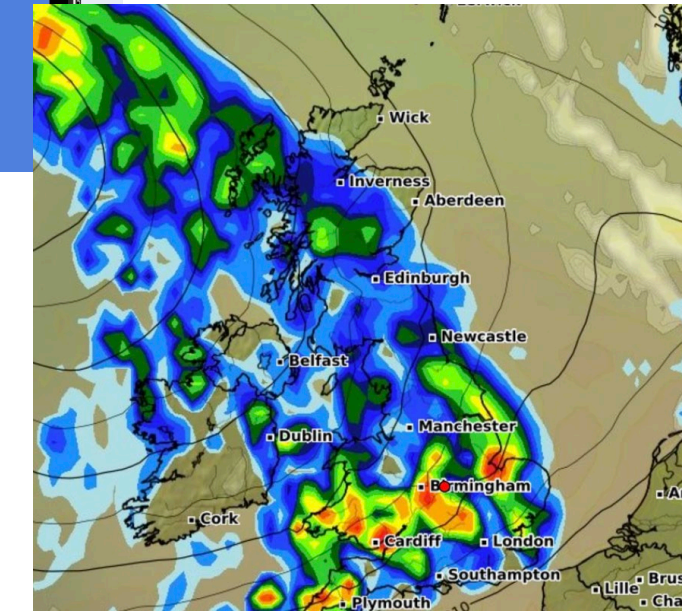


# Conventional AI

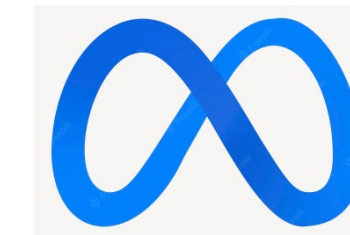
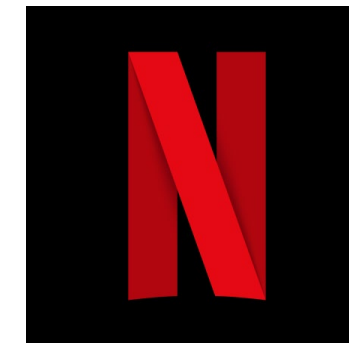
Classification



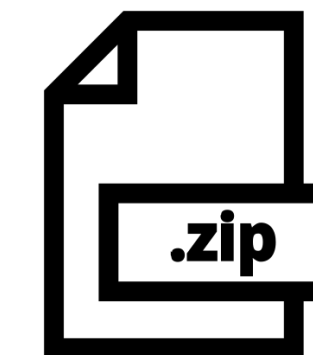
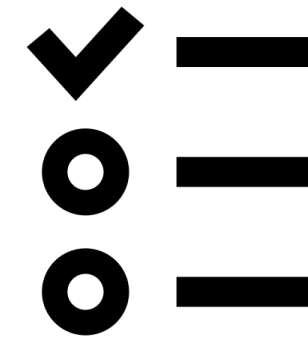
Regression



Clustering



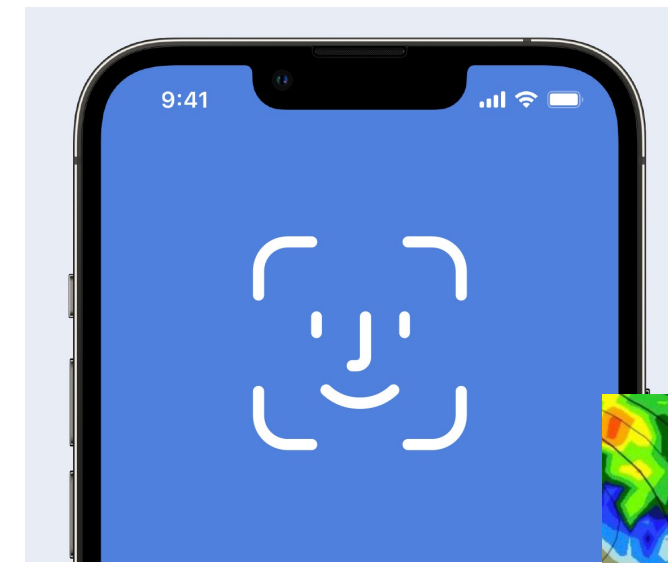
Dimensionality Reduction



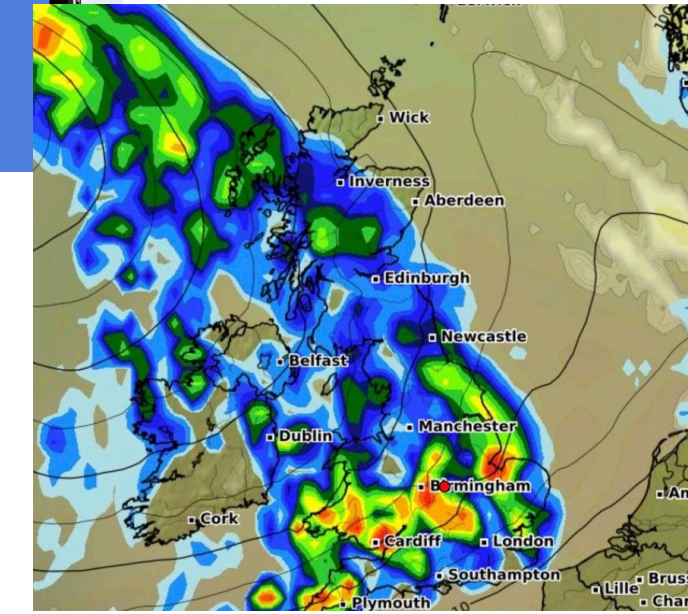
Reinforcement Learning

# Conventional AI

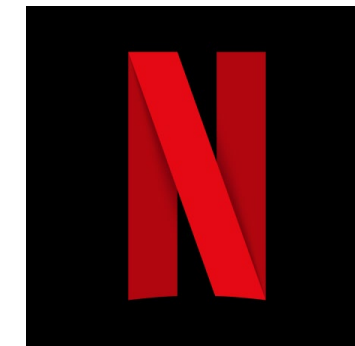
Classification



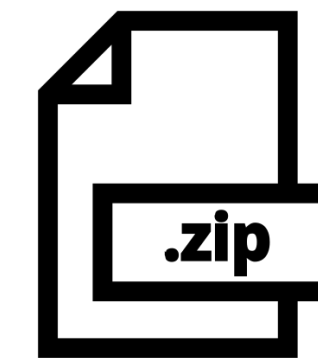
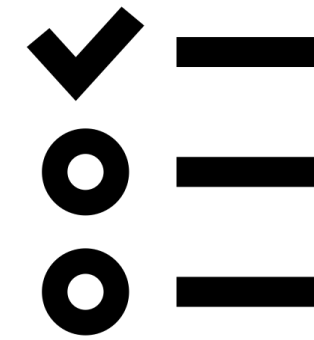
Regression



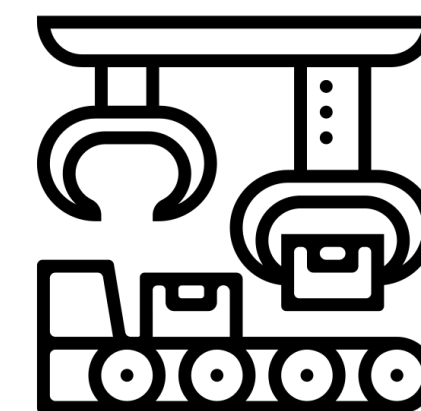
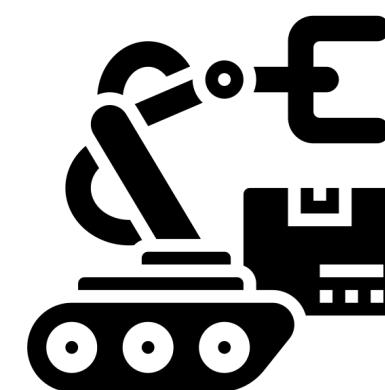
Clustering



Dimensionality Reduction



Reinforcement Learning





# Generative AI

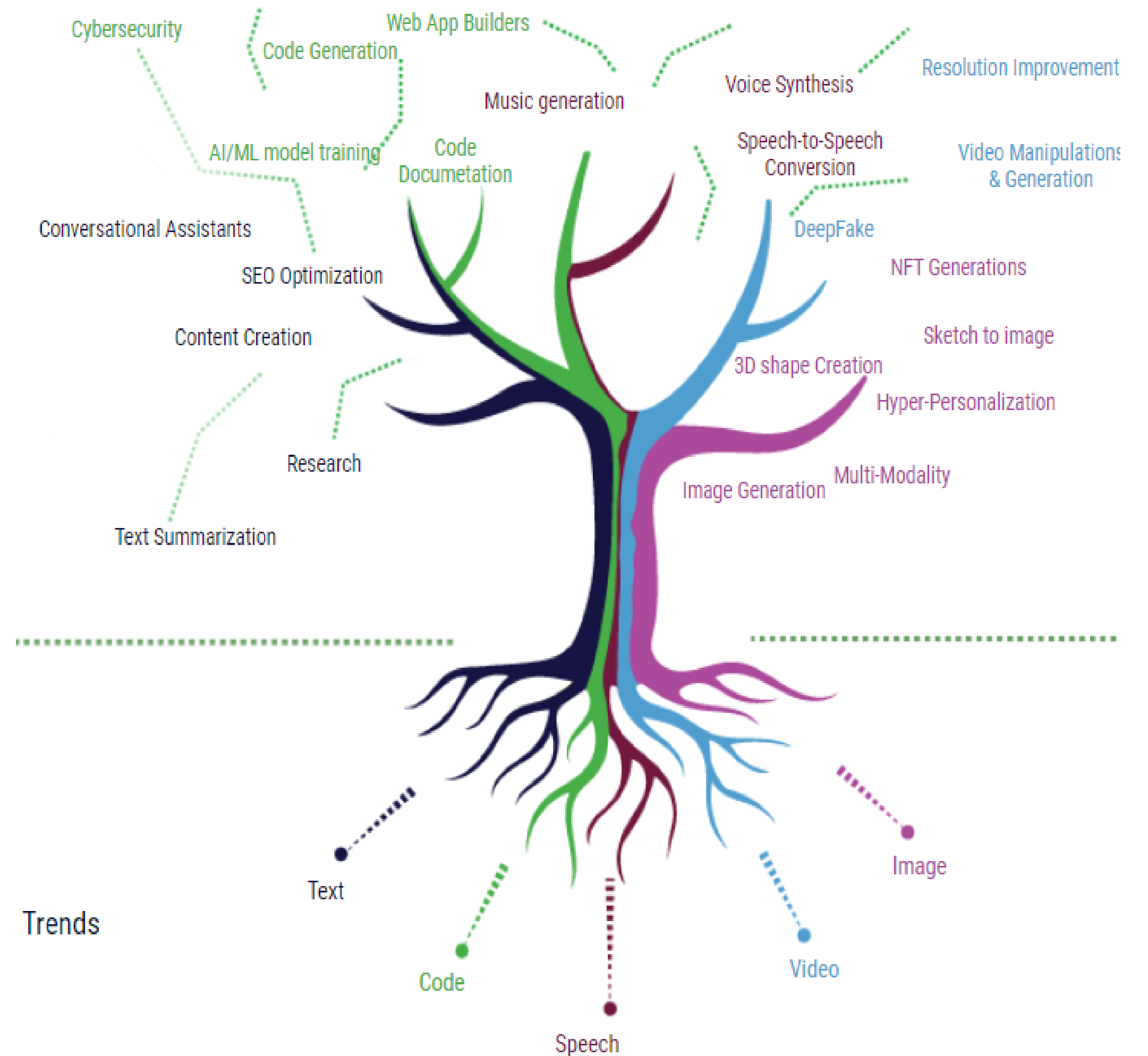
**Generate** all kinds of data, e.g.

- Audio: Speech, Music, etc.
- Images
- Video
- 3D-objects
- Text

**Perform** all kinds of data **transformations**, e.g.

- Domain-transfer
- Style-transfer

**Enrich** datasets and **improve** machine learning



# Generative AI

**Generate** all kinds of data, e.g.

- Audio: Speech, Music, etc.
- Images
- Video
- 3D-objects
- Text

**Perform** all kinds of data **transformations**, e.g.

- Domain-transfer
- Style-transfer

**Enrich** datasets and **improve** machine learning

Example for Domain-transfer:

Input winter image



AI-generated summer image



Input sunny image



AI-generated rainy image



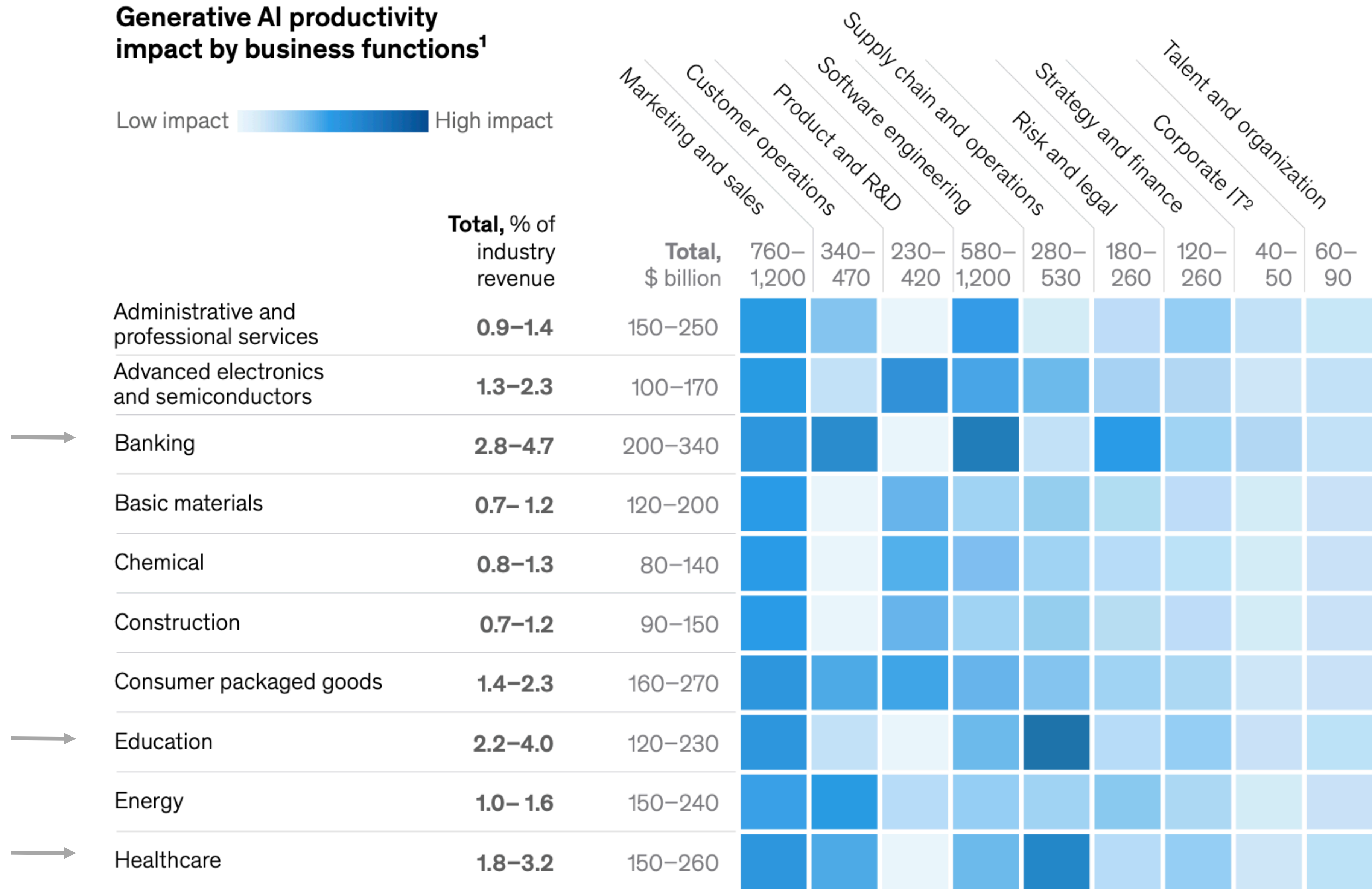


How can the industry capitalize  
on new AI advancements?



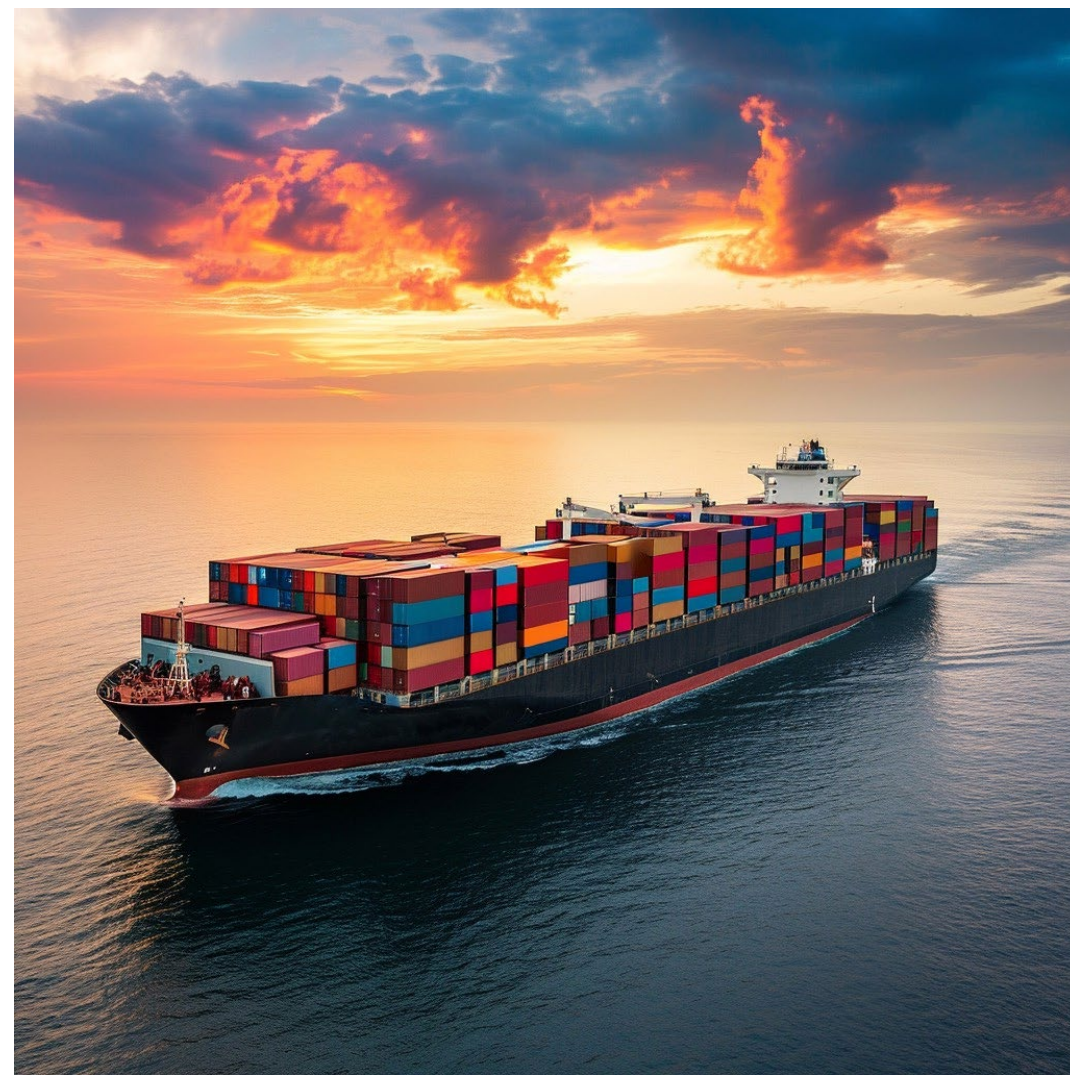
## Generative AI productivity impact by business functions<sup>1</sup>

Low impact  High impact





# Reducing manual labor by 80%

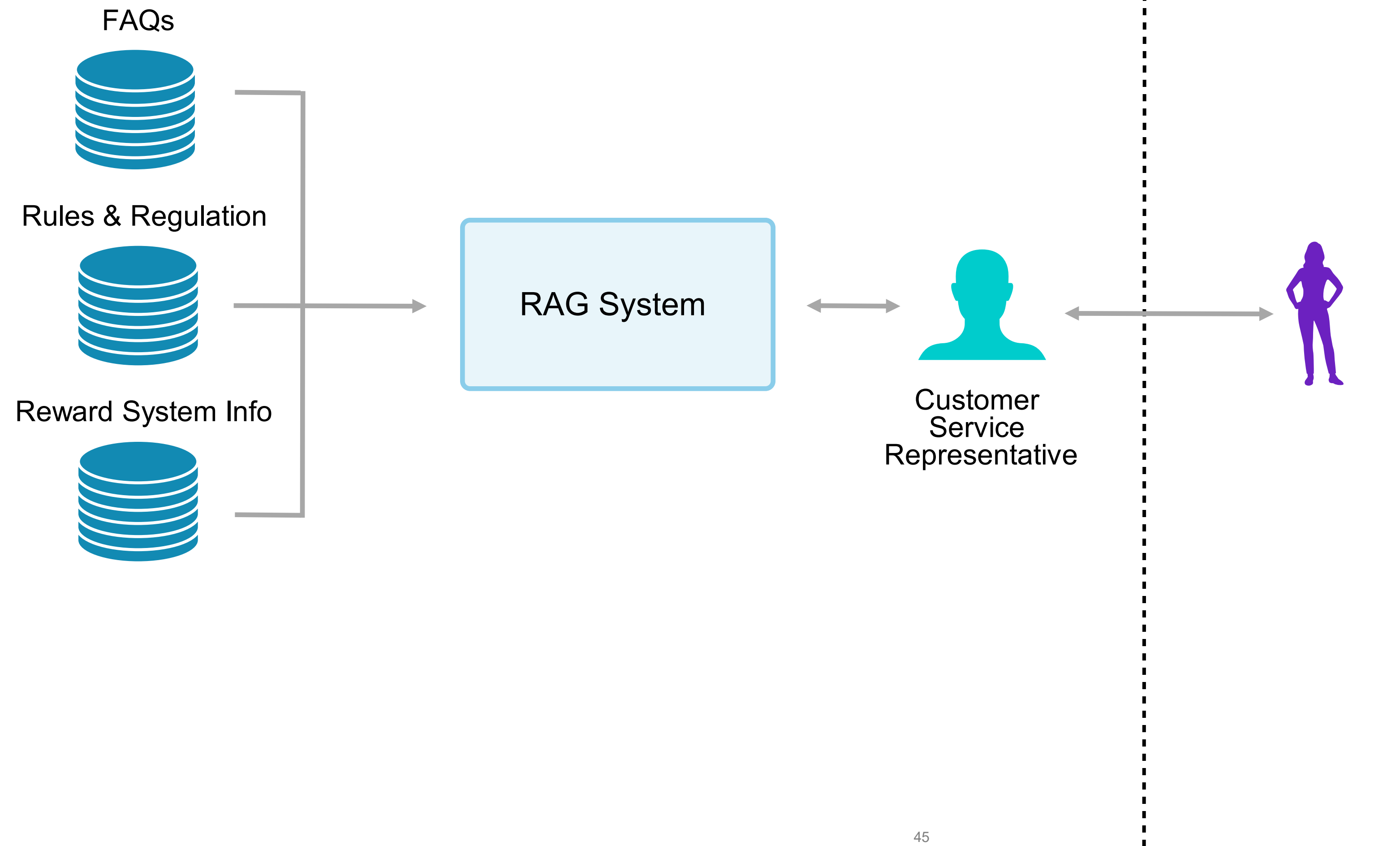


**International Container  
Shipping Company**

# Reducing manual labor by 80%



**International Container  
Shipping Company**





# How to *strive* in the new AI era







# The Secret Sauce - Prompt Engineering



# Prompt Engineering - 5 golden rules

Rule	Description	Example
------	-------------	---------

# Prompt Engineering - 5 golden rules

Rule	Description	Example
<b>Expert Persona</b>	Define skill profile that the model should emulate.	“You are a business analyst at a marketing firm.”

# Prompt Engineering - 5 golden rules

Rule	Description	Example
<b>Expert Persona</b>	Define skill profile that the model should emulate.	“You are a business analyst at a marketing firm.”
<b>Context</b>	Provide external or user-specific details.	“Three marketing campaigns were launched last quarter.”

# Prompt Engineering - 5 golden rules

Rule	Description	Example
<b>Expert Persona</b>	Define skill profile that the model should emulate.	“You are a business analyst at a marketing firm.”
<b>Context</b>	Provide external or user-specific details.	“Three marketing campaigns were launched last quarter.”
<b>Task Specification</b>	Instruct the model on required actions. <ul style="list-style-type: none"><li>- A single instruction.</li><li>- An instruction sequence.</li><li>- Pseudo-Code Instructions: Detailed, structured guidelines for complex tasks.</li></ul>	“Perform a Cause-effect Analysis. Develop a hypothesis to understand the reasons behind the customer’s inquiry based on the content and context of the email.”

# Prompt Engineering - 5 golden rules

Rule	Description	Example
<b>Expert Persona</b>	Define skill profile that the model should emulate.	“You are a business analyst at a marketing firm.”
<b>Context</b>	Provide external or user-specific details.	“Three marketing campaigns were launched last quarter.”
<b>Task Specification</b>	Instruct the model on required actions. <ul style="list-style-type: none"><li>- A single instruction.</li><li>- An instruction sequence.</li><li>- Pseudo-Code Instructions: Detailed, structured guidelines for complex tasks.</li></ul>	“Perform a Cause-effect Analysis. Develop a hypothesis to understand the reasons behind the customer’s inquiry based on the content and context of the email.”
<b>Execution Rules</b>	Directives that shape the model’s decision-making during task execution, including: <ul style="list-style-type: none"><li>- Problem-solving methods.</li><li>- Ethical standards, etc.</li></ul>	“Consider all potential solutions for replying to the email.” “Consider only the FAQs when formulating replies.”

# Prompt Engineering - 5 golden rules

Rule	Description	Example
<b>Expert Persona</b>	Define skill profile that the model should emulate.	“You are a business analyst at a marketing firm.”
<b>Context</b>	Provide external or user-specific details.	“Three marketing campaigns were launched last quarter.”
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<b>Execution Rules</b>	Directives that shape the model’s decision-making during task execution, including: <ul style="list-style-type: none"><li>- Problem-solving methods.</li><li>- Ethical standards, etc.</li></ul>	“Consider all potential solutions for replying to the email.” “Consider only the FAQs when formulating replies.”
<b>Output Constraints</b>	Specify conditions for the output in terms of structure, content, length, etc.	“The output should be a structured analysis with sections for classification, summarization, and the cause-effect analysis. Keep it under 500 tokens.”

The slide features two white diagrammatic elements. The first is a vertical line extending from the top edge, meeting a horizontal line at its base. The second is a horizontal line extending from the left edge, meeting a vertical line at its right end. The word "Tools" is centered between these two elements.

# Tools



# ChatGPT/ Bard/ Mistral/ Claude

Rule	Description
<b>Expert Persona</b>	Define skill profile that the model should emulate.
<b>Context</b>	Provide external or user-specific details.
<b>Task Specification</b>	Instruct the model on required actions. <ul style="list-style-type: none"><li>- A single instruction.</li><li>- An instruction sequence.</li><li>- Pseudo-Code Instructions: Detailed, structured guidelines for complex tasks.</li></ul>
<b>Execution Rules</b>	Directives that shape the model's decision-making during task execution, including: <ul style="list-style-type: none"><li>- Problem-solving methods.</li><li>- Ethical standards, etc.</li></ul>
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# ChatGPT/ Bard/ Mistral/ Claude

Rule	Description
<b>Expert Persona</b>	Define skill profile that the model should emulate.
<b>Context</b>	Provide external or user-specific details.
<b>Task Specification</b>	Instruct the model on required actions. <ul style="list-style-type: none"> <li>- A single instruction.</li> <li>- An instruction sequence.</li> <li>- Pseudo-Code Instructions: Detailed, structured guidelines for complex tasks.</li> </ul>
<b>Execution Rules</b>	Directives that shape the model's decision-making during task execution, including: <ul style="list-style-type: none"> <li>- Problem-solving methods.</li> <li>- Ethical standards, etc.</li> </ul>
<b>Output Constraints</b>	Specify conditions for the output in terms of structure, content, length, etc.

Campaign Type	Reach	Impressions	CTR (%)	Conversion Rate (%)	CPC (€)	CPA (€)	ROAS (%)	Key Insight
Social Media	500k	1.2M	2	0.5	0.30	60	120	High reach but low conversion; needs better targeting.
Search Engine	300k	800k	5	1	0.50	50	150	High CTR indicates strong user intent; refine keywords.
Email	200k	200k	10	2	0.10	5	400	Highest conversion and ROAS; expand and personalize.

## Strategy Formulation:

Objective	Strategy
Social Media	Focus on segments with highest engagement; optimize creatives.
Search Engine	Increase budget for effective keywords; improve ad copy.
Email	Grow email list; implement further segmentation for targeted content.

# ChatGPT/ Bard/ Cloud



ChatGPT 4 >



Explain to me what this medication does, and if I inhale it multiple times a day, is that bad?



ChatGPT

The medication in the image is an inhaler containing the drug beclometasone dipropionate, which is a corticosteroid. It's typically used to prevent the symptoms of asthma, such as wheezing and shortness of breath, by reducing inflammation in the lungs. It's not designed for immediate relief of asthma attacks but for regular, long-term control.

Inhaling it multiple times a day should be done only according to a doctor's

# Perplexity AI

The screenshot displays the Perplexity AI search interface. At the top left is the Perplexity logo. The search bar contains the query "Nvidia posts record revenue". The results are generated by "Copilot" and show 3 steps completed. A "Sources" section lists three sources: CNBC (1), Fast Company (2), and NVIDIA (3). The "Answer" section provides a detailed summary of Nvidia's financial performance for Q4 2023, highlighting a record revenue of \$22.1 billion and a net income of \$12.29 billion. To the right of the text is a vertical stack of images: a server room, a financial dashboard for NVDA, and an NVIDIA logo.

perplexity | Perplexity Bot | 11,275 | 1,004 | 1d ago | Share

New Thread... [K]

Home | Discover | Library

Weight Loss Myths | I want you to execute... | In Marketing what are... | Is soras OpenAI an AGI? | owner of openAI fund | why does altman want ... | What is Retrieval... | Cohere For AI Launche...

## Nvidia posts record revenue

Copilot | 3 steps completed




### Sources

- Nvidia posts record revenue up 265% on... | cnbc • 1
- Nvidia's record 265% revenue growth is... | FC fastcompany • 2
- NVIDIA Announces Financial Results for... | nvidia • 3
- View 4 more

### Answer

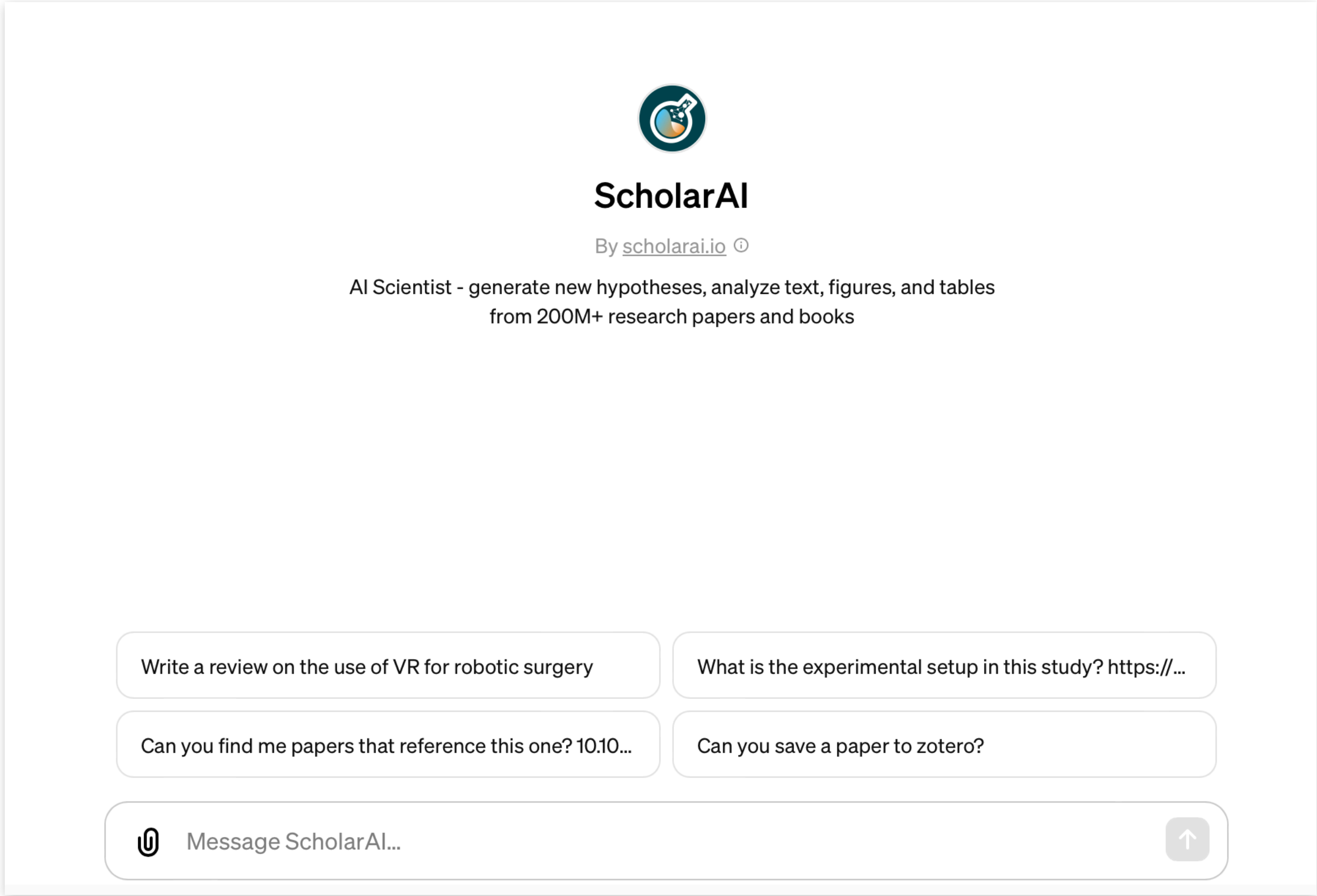
Nvidia has reported a record-breaking revenue, showcasing a significant surge in its financial performance, particularly driven by its booming AI business. For the fourth quarter ended January 28, 2024, Nvidia announced a quarterly revenue of \$22.1 billion, which is a 22% increase from the previous quarter and a staggering 265% increase from the same period a year ago. The company's net income for the quarter was an impressive \$12.29 billion, or \$4.93 per share, which is up 769% compared to last year's \$1.41 billion, or 57 cents per share <sup>1</sup> <sup>3</sup> <sup>5</sup>.


The substantial growth in revenue and net income is attributed to strong sales of AI chips for servers, particularly Nvidia's "Hopper" chips such as the H100. The Data Center business, which now forms the majority of Nvidia's revenue, saw a 409% increase to



View more

# Scholar AI: 10X Research



  
**ScholarAI**  
By [scholarai.io](https://scholarai.io) ©



AI Scientist - generate new hypotheses, analyze text, figures, and tables from 200M+ research papers and books

Write a review on the use of VR for robotic surgery

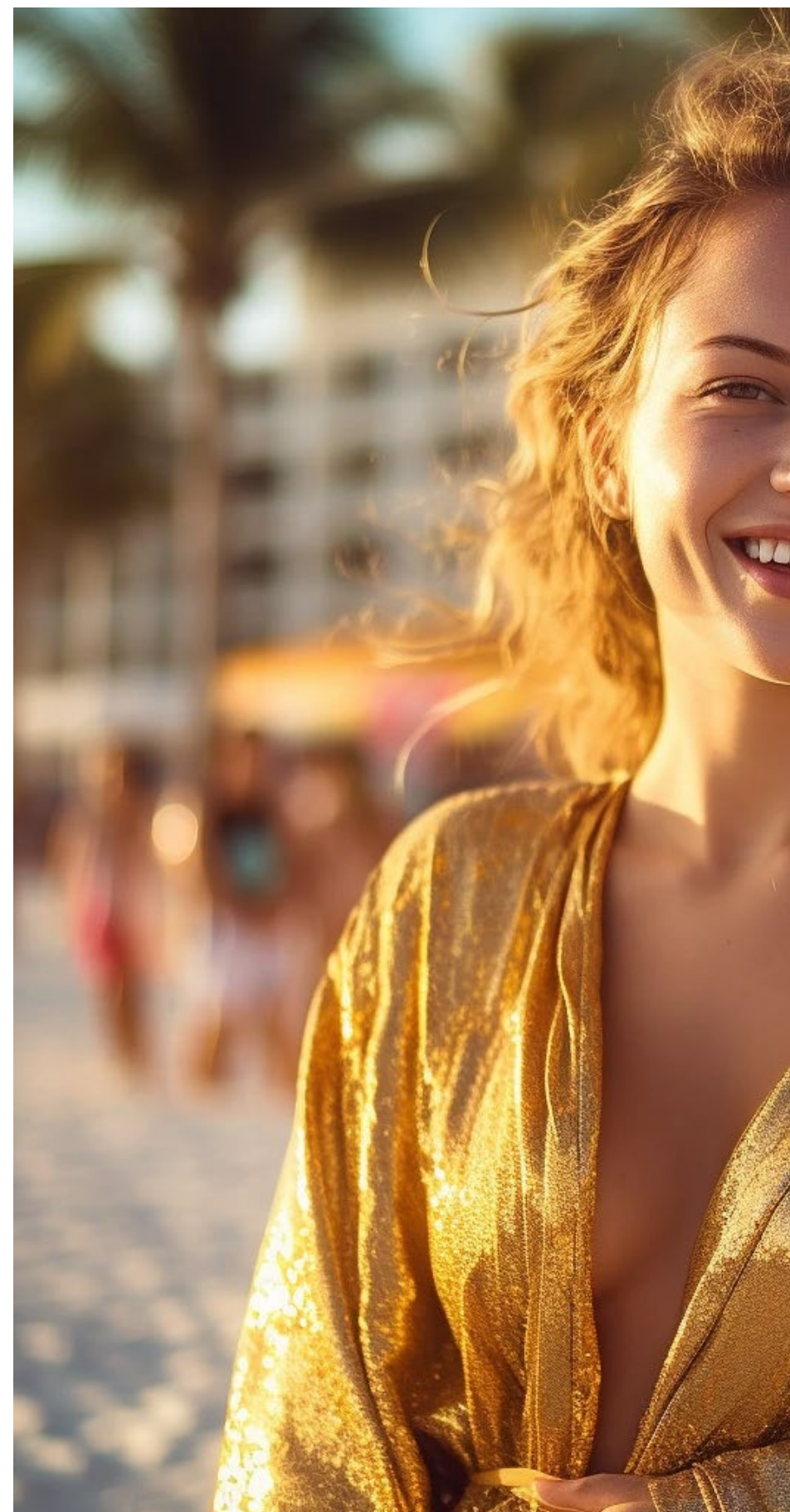
What is the experimental setup in this study? https://...

Can you find me papers that reference this one? 10.10...

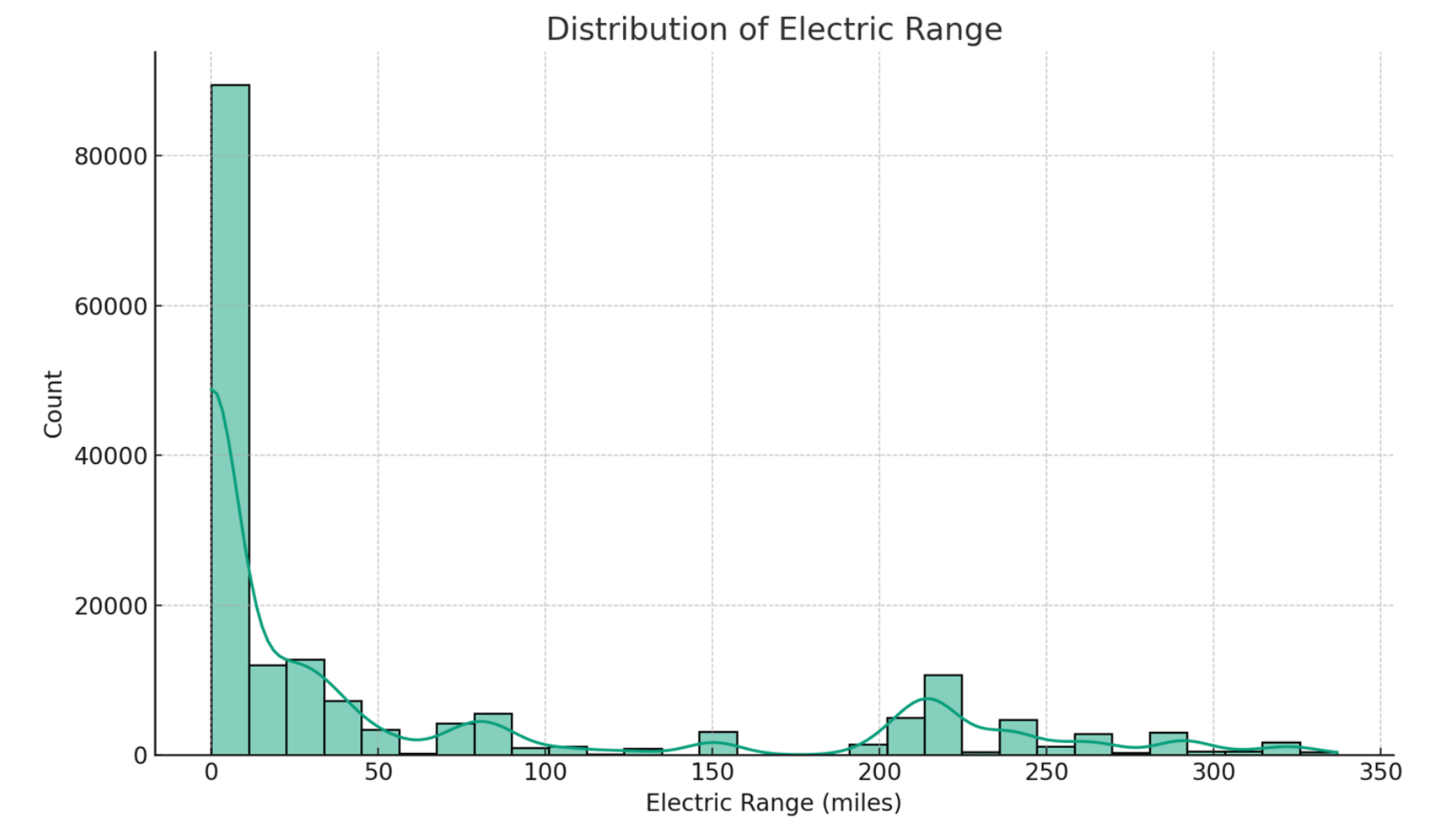
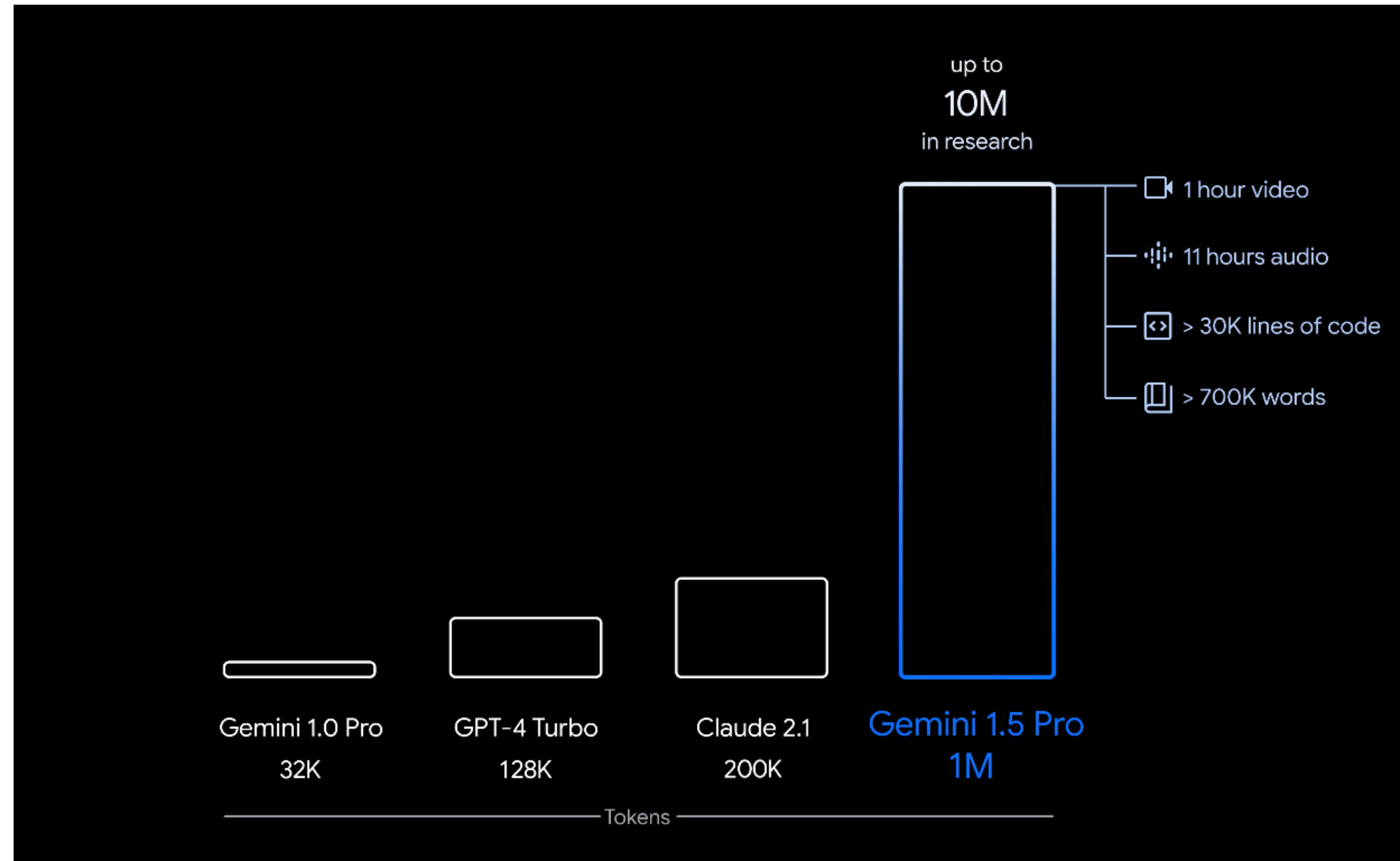
Can you save a paper to zotero?

 Message ScholarAI... 

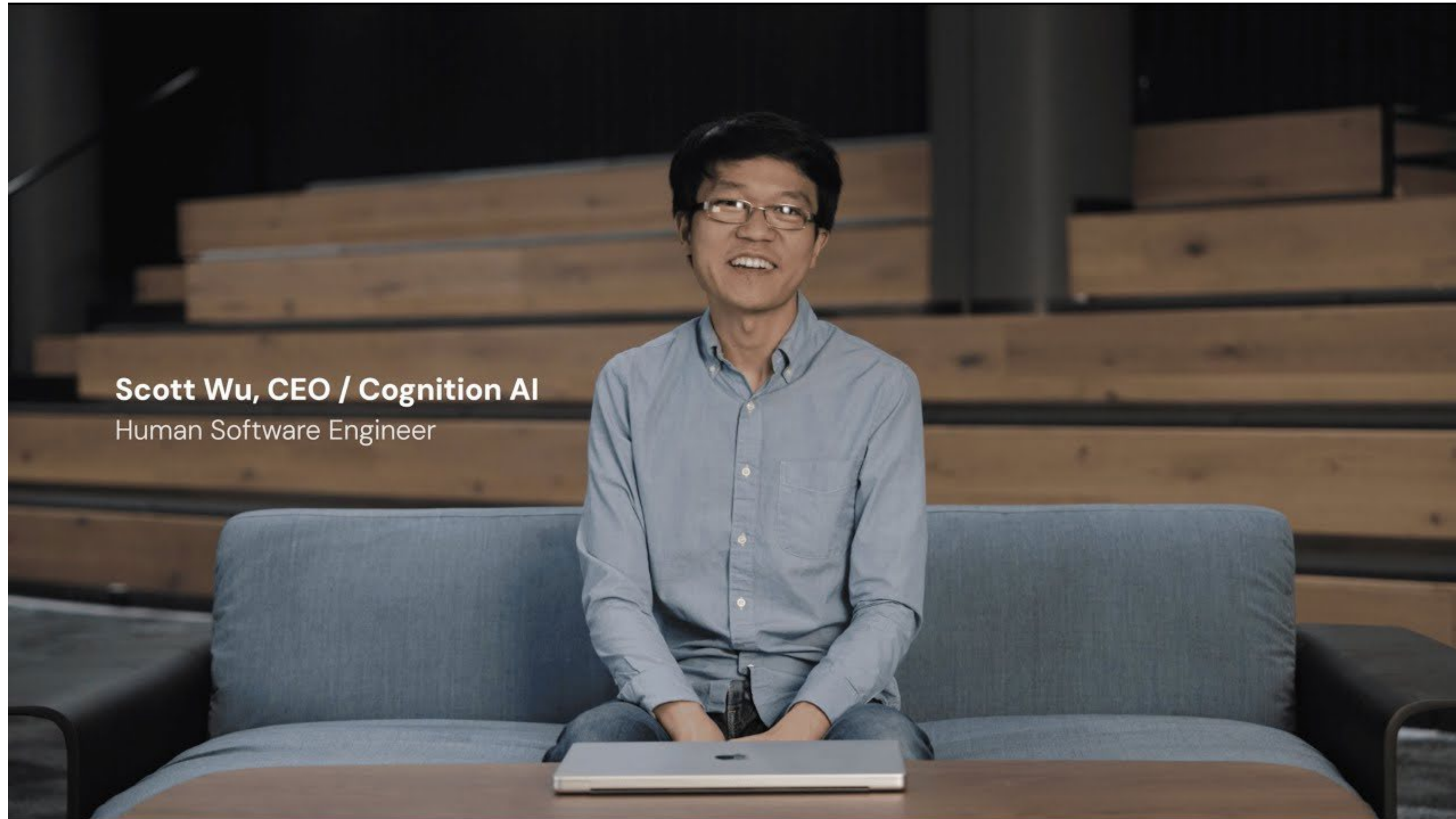
# Midjourney



# Data Analytics


















# Devin AI - The best AI Software Engineer (but closed-source)



<https://www.cognition-labs.com/introducing-devin>



# Find your GenAI Marketing Tool

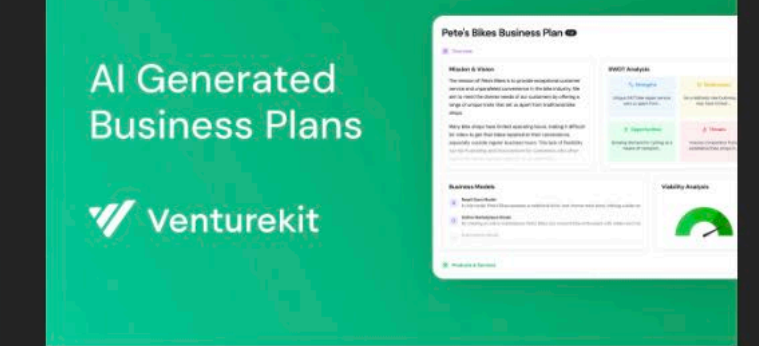
-  Ulzard
-  Aitister
-  Aicc
-  Skippr
-  Smoot
-  Cognifyer
-  Vizcom
-  Botika
-  Laneform
-  Model Vant...
-  ZWEISPACE...
-  Diagram
-  TailorBird
-  yoona.ai
-  AdsGency AI



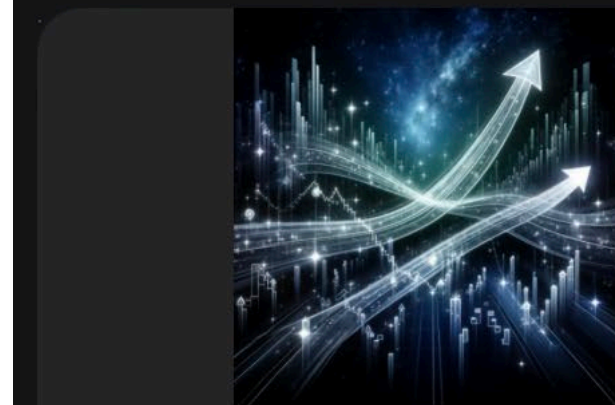
**Photoshift**  
Commercial AI Product Photography  
Marketing Image Generator



**Osum**  
AI Market Research Tools for Growth  
Marketing Business



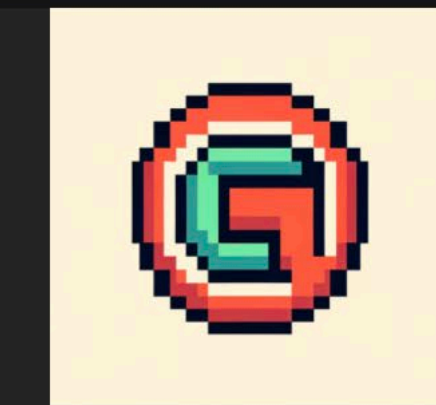
**Venturekit**  
AI Generated Business Plans  
Marketing Business  
Free



**GSC Keyword Ranking Changes Scatter Plot**  
Get a scatter plot of keyword rankings  
Marketing SEO GPT



**Website Roaster GPT**  
Critique any type of website with light-hearted roasts and feedback.  
Marketing Design GPT



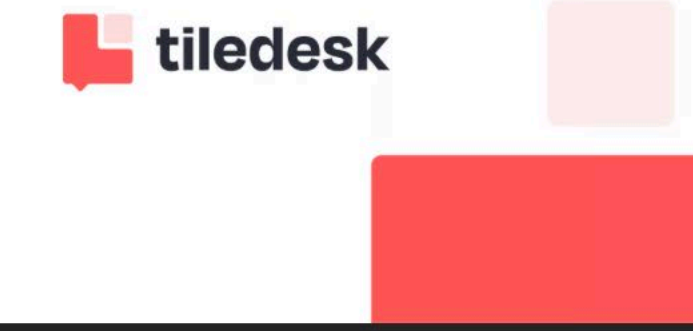
**UX Copywriter**  
Master the art of UX copywriting  
Marketing Design GPT



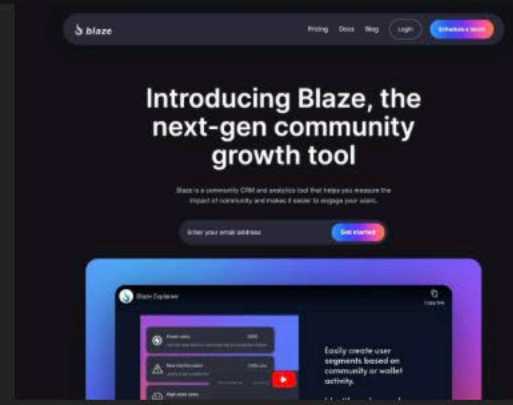
**BrandCraft**  
A creative aide for generating unique brand names for companies & products.  
Marketing Business GPT



**Copywriter GPT**  
Your innovative partner for viral ad copywriting!  
Writing Marketing GPT



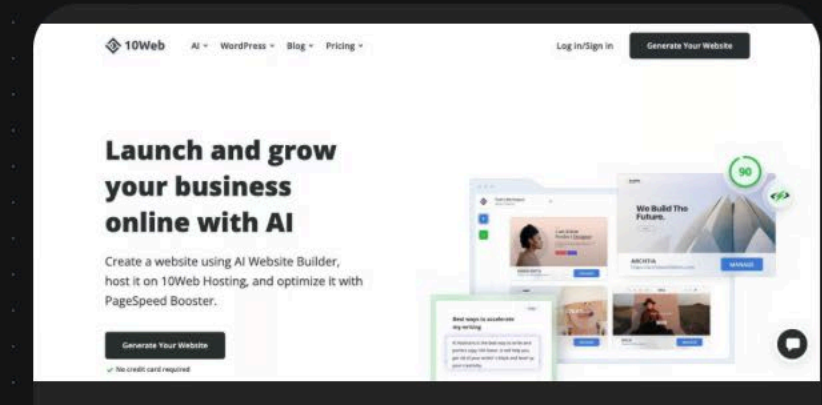
**Tiledesk**  
Conversational Automation for Customer Engagement  
Marketing  
Free



**Blaze**  
Web3 CRM, Marketing Automation & Growth



**Mango SEO**  
Programmatic AI Powered SEO  
Marketing SEO



**10web**  
Build or recreate any website in minutes with the power of AI



# Exercise Time!

**3 - 4 person per group**

**Time: 10 min**

**Introduce yourselves and discuss the following questions:**

- What are the low hanging fruits using GenAI in Marketing and beyond?
- How will AI impact marketing in the long term? In 5 years.


**Share your valuable Expertise!**






Looking ahead

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AI keeps evolving  
- with higher pace.



# AI Agents





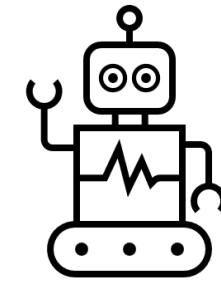
How do they work?



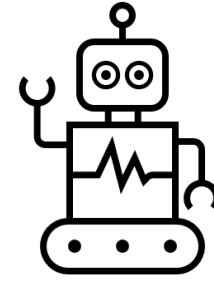
**Example:** Build a tech news webpage, displaying what's hot on Twitter



**Example:** Build a tech news webpage, displaying what's hot on Twitter



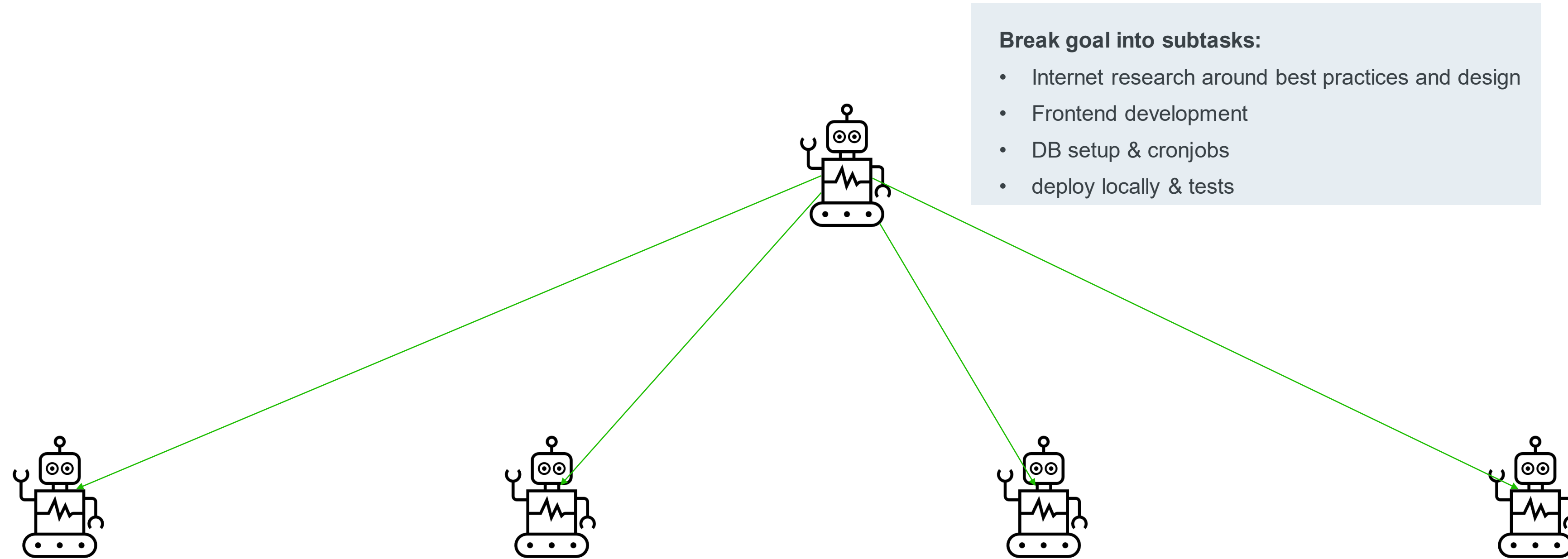
# Example: Build a tech news webpage, displaying what's hot on Twitter



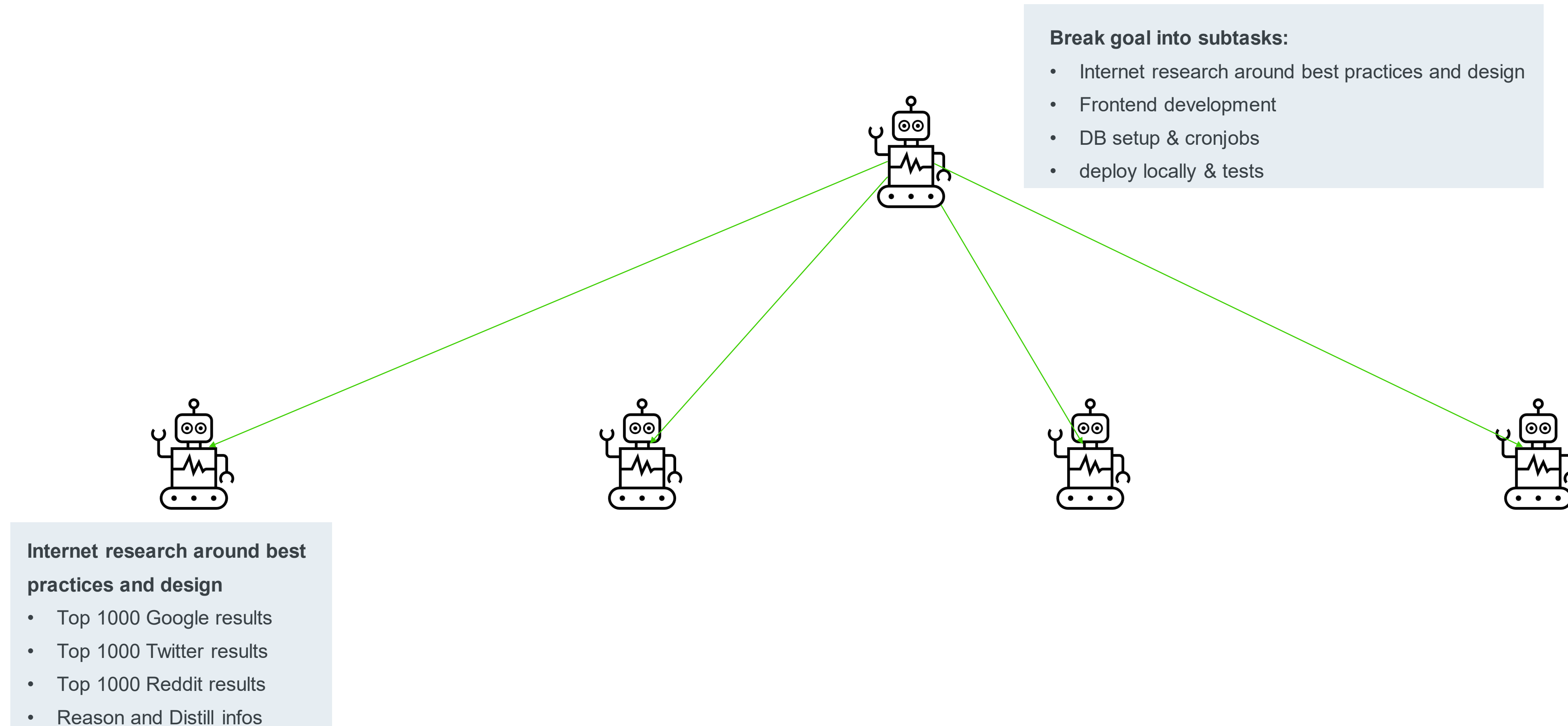
## Break goal into subtasks:

- Internet research around best practices and design
- Frontend development
- DB setup & cronjobs
- deploy locally & tests

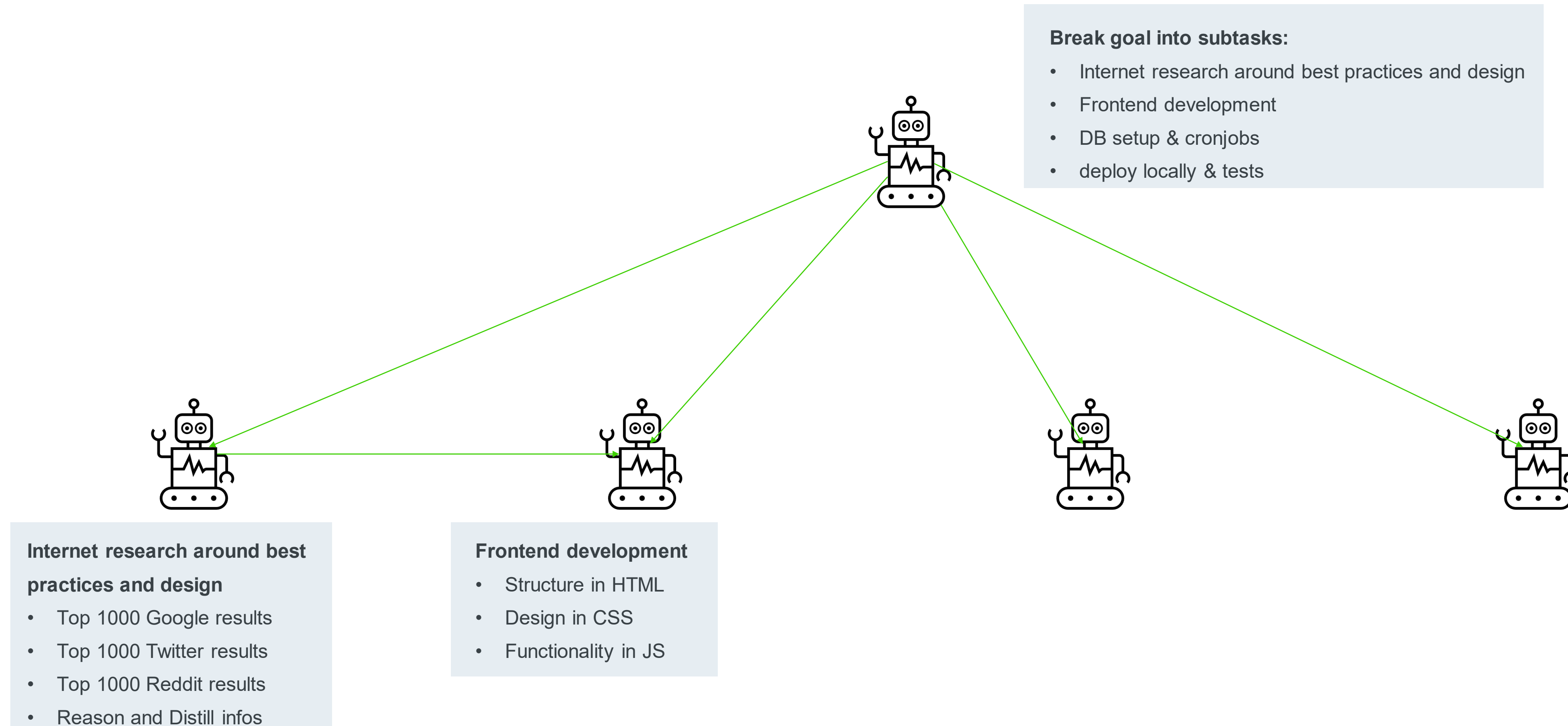
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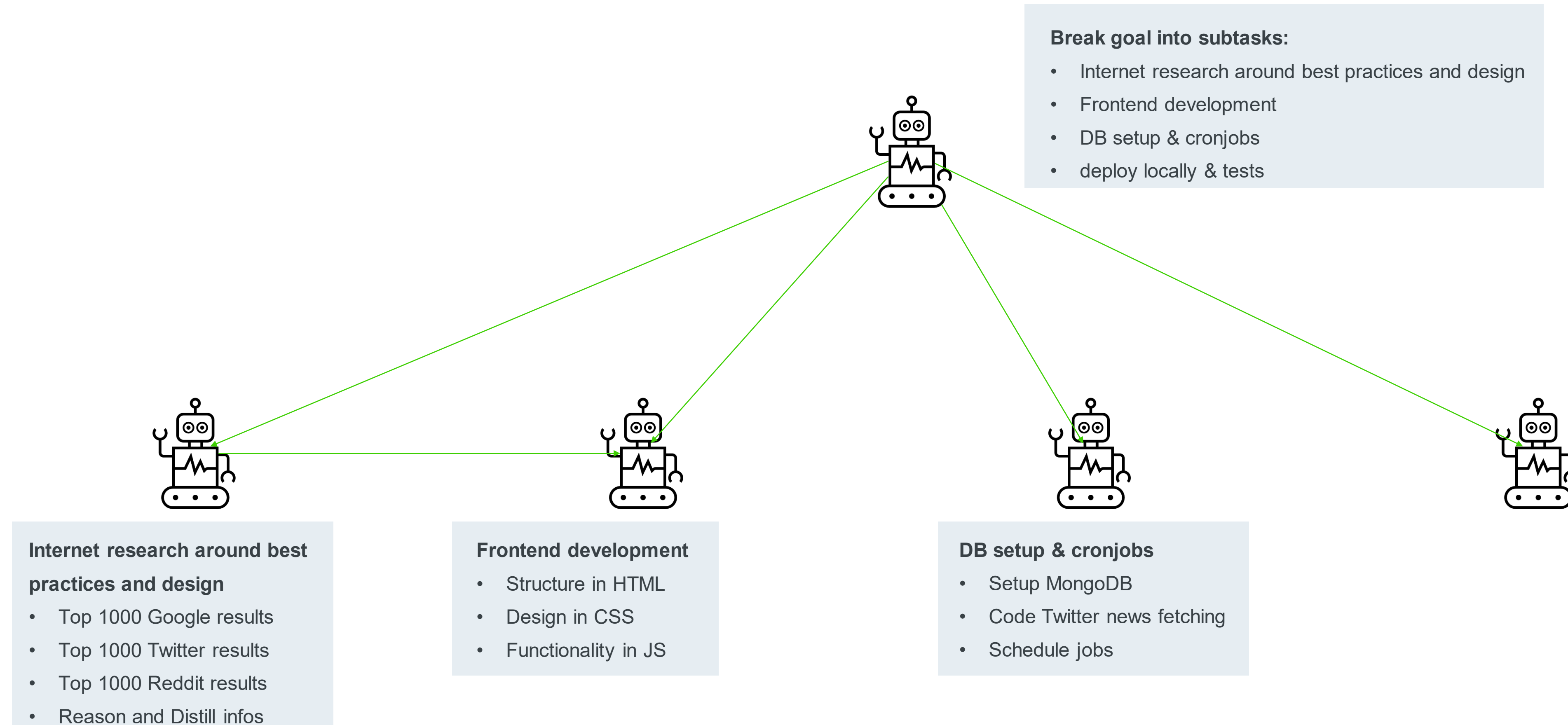
# Example: Build a tech news webpage, displaying what's hot on Twitter



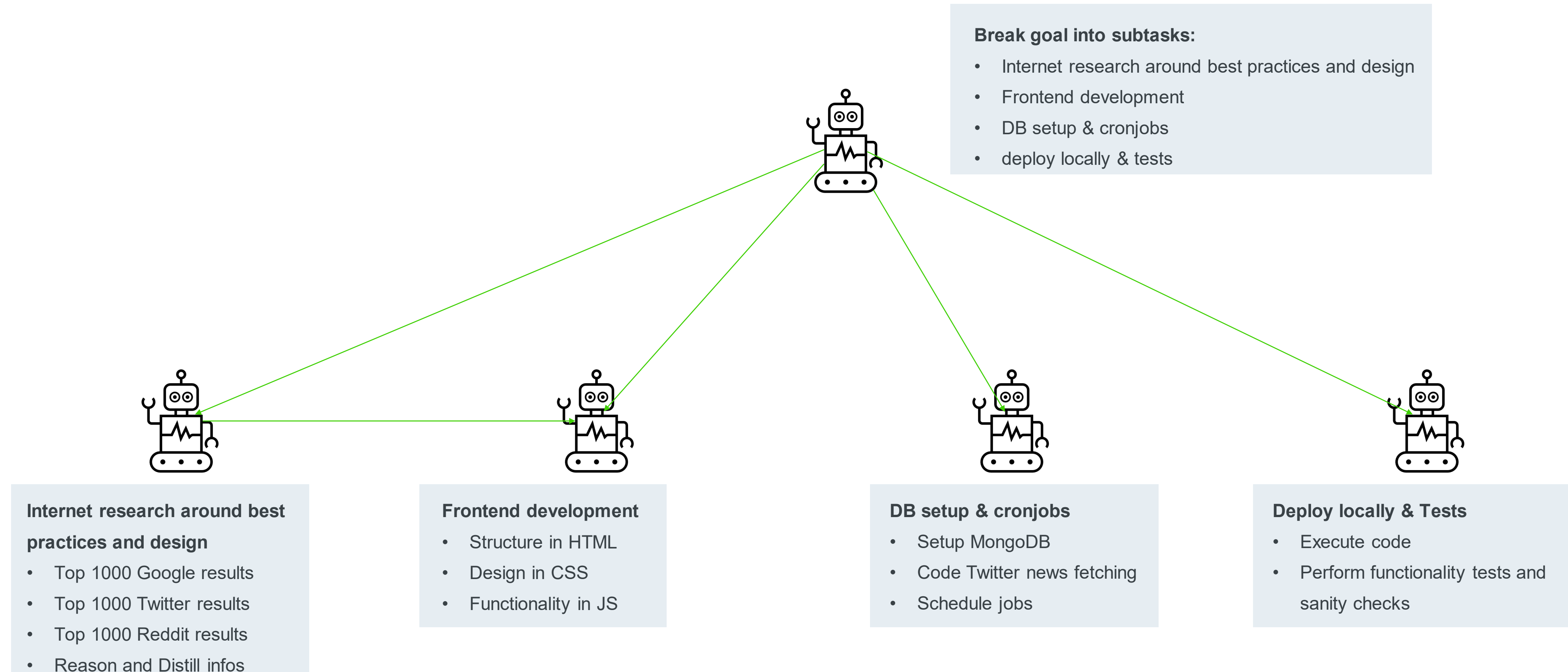
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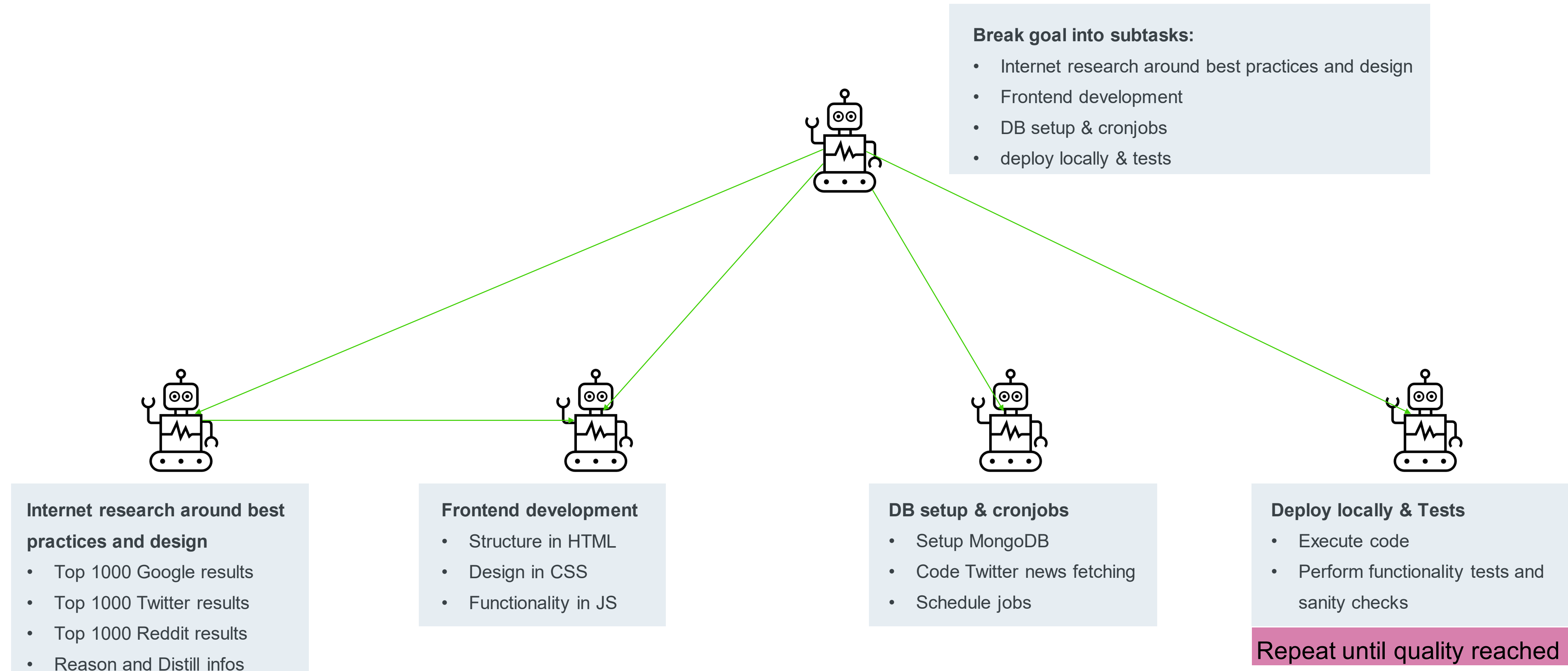
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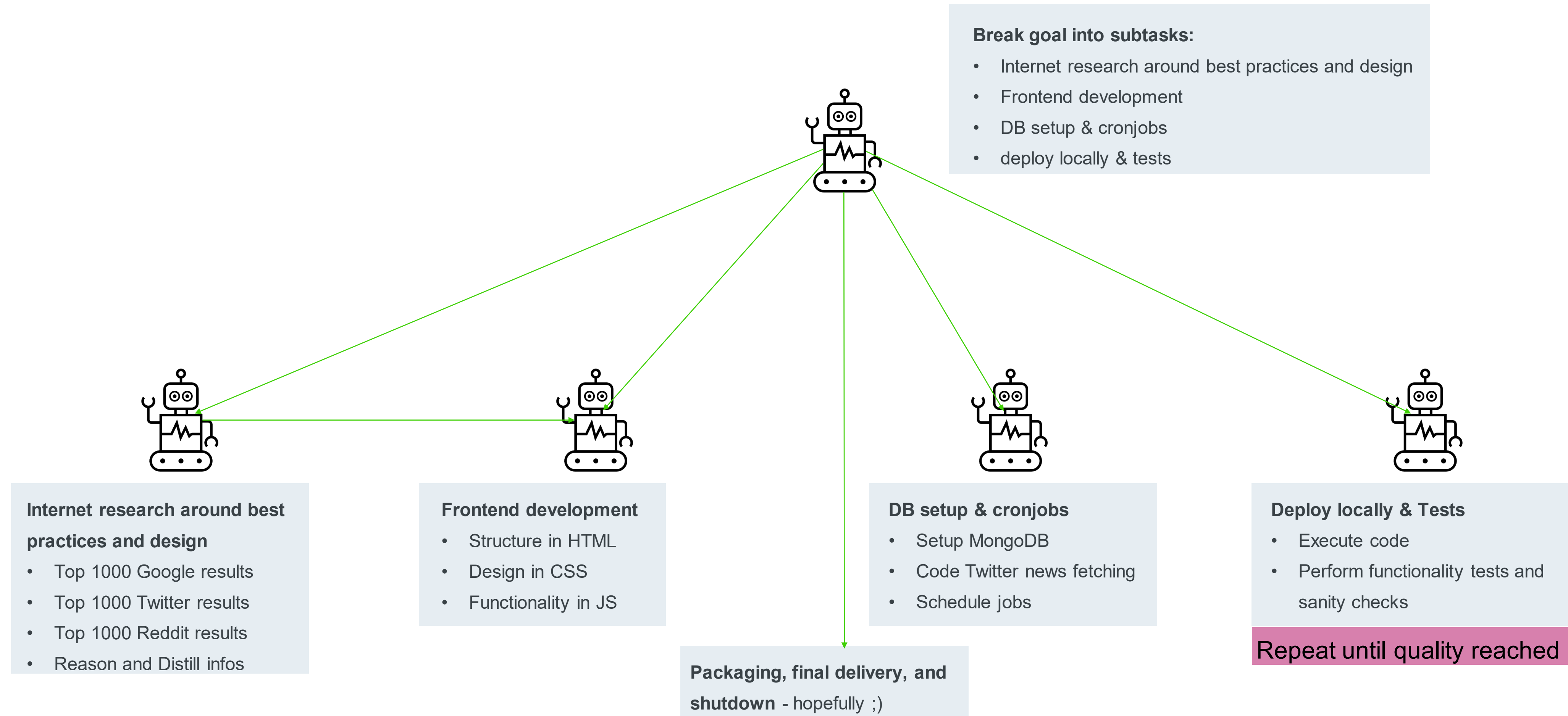


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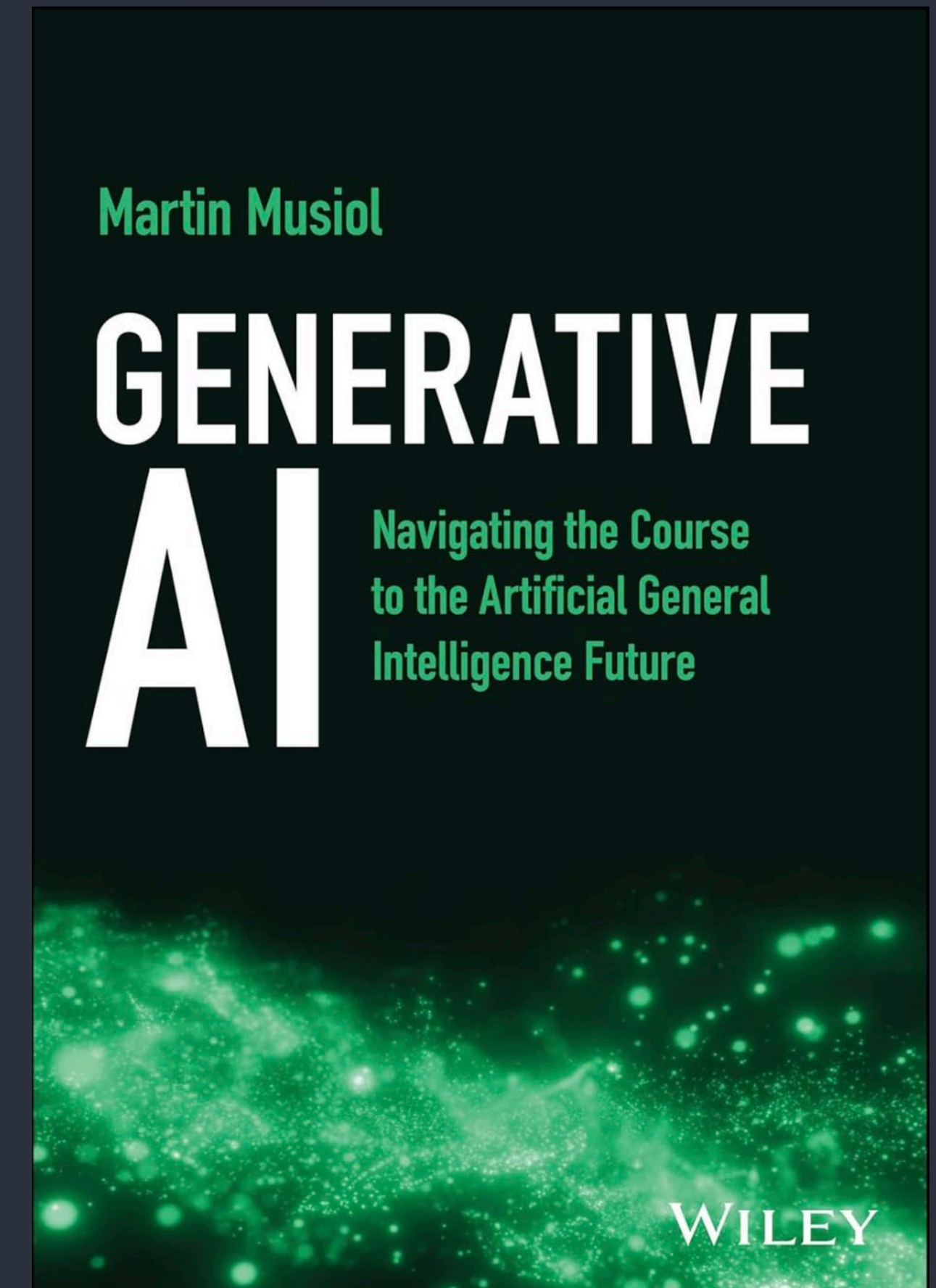




Questions?



Questions?



Thank you!



 Martin Musiol