

# The CxO Guide to Generative AI: Threats and Opportunities

June, 2023

# Yes, It's real!

Over the last few months, we've had conversations with leadership teams that start with a high-level question: "Will Generative AI impact our business, and how? The board wants us to develop a Generative AI strategy."

With a certain level of confidence the answer is YES, Generative AI will impact all industries, directly or indirectly.

According to [OpenAI Research](#), around 80% of the U.S. workforce could have at least 10% of their work tasks affected by the introduction of Large Language Models like ChatGPT, while approximately 19% of workers may see at least 50% of their tasks enhanced.

**If you are a shareholder, board member or CEO, it is imperative to develop a Generative AI strategy.**

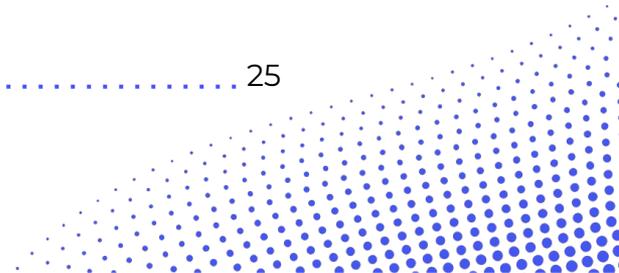
As of June 2023, the majority of CEOs and business owners have already experienced the impact of ChatGPT in their personal lives, noticed its effects on professional productivity, and discussed it in strategic business conversations.

This report is focused on practical opportunities, risks, and limitations of the state-of-the-art Generative AI applications for enterprises of all sizes. We'll review business patterns, as well as technical, legal, security, and governance aspects to consider when transforming the enterprise with Generative AI.

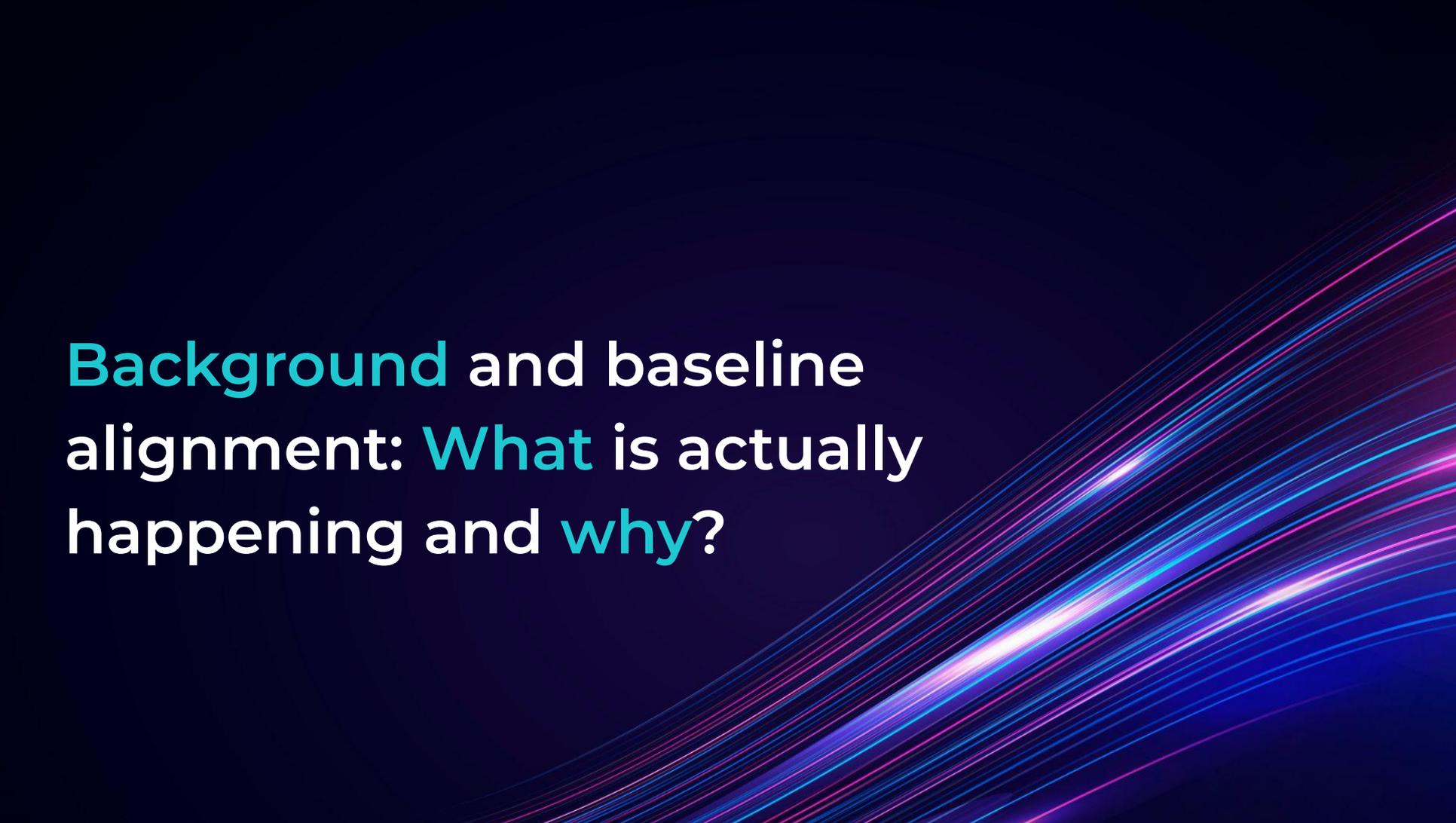


# Outline

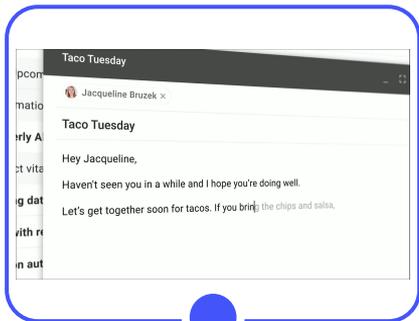
- 1** Background and baseline alignment:  
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**Background** and baseline  
alignment: **What** is actually  
happening and **why**?

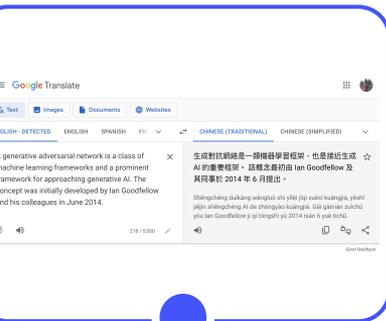
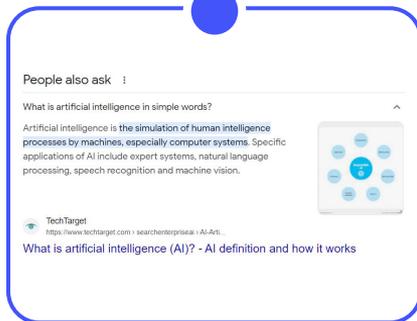
The background features a dark blue gradient with numerous thin, curved lines of light in shades of cyan, magenta, and purple, creating a sense of motion and depth.

# Intuition behind Generative AI: Existing applications in everyday life that you may never have noticed



LLMs help to overcome writer's block in Gmail or Outlook

Google Search uses LLM models to summarize answers that appear on the first page



Translation and speech recognition services are the first widely adopted applications of transformer models

While driving, the Tesla's autopilot is powered by the similar architecture of pre-trained transformers



# Eliminating **noise** and adding clarity

It is important to align on frequently asked questions and common distractors. Doing so will help businesses leaders eliminate noise and stay focused on achieving real business outcomes.

## The Distractor

“Stop AI for 6 months.”  
Elon Musk, Bill Gates, and 1000+ others signed a petition to halt AI experiments.

Are humans going to be replaced by AI in the future?

CEOs might not be aware of all technical details to innovate on business models with Generative AI.

Gen AI applications are not secure and not compliant, so major enterprises and even whole countries ban it.

## Our Perspective

- Open-source software can't be regulated or stopped at its core.
- There are a lot of harmful use cases like generation of new chemical weapons. Appropriate programs to address the issue are being developed by regulators in collaboration with major AI players.

**No.** Generative AI is a powerful yet practical technology that has its own inputs, outputs, and limitations. We suggest not to extrapolate it to general intelligence, and to completely eliminate this distractor from real-world business conversations.

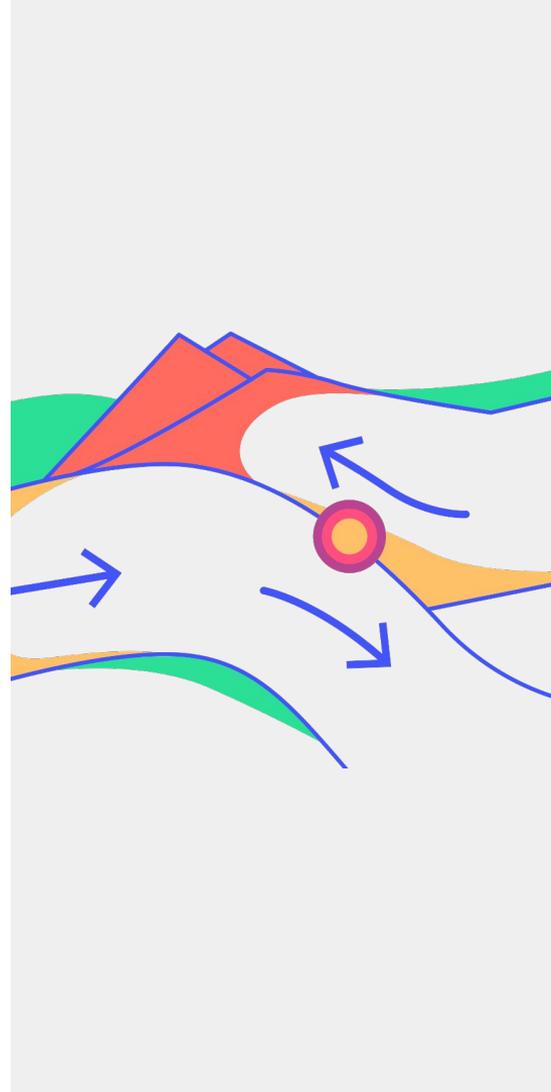
**Yes and No.** “We too” low-hanging-fruit use cases are to be commoditized soon. Innovative business models, however, require a much deeper understanding the first principles of Generative AI and a solid data infrastructure.

**No.** It is recommended not to confuse Generative AI technology with applications like ChatGPT that are not designed for enterprise requirements. But there are multiple vendors, including major cloud providers, who address or will address these issues soon.

# Background: Why the market shift is happening right now

**It didn't happen overnight. Two major forces have converged and pushed the technological breakthrough that we are all experiencing today:**

- 1** Advancements in deep learning, generative research, foundation models over the last 15 years paved the path for existing state-of-the-art model architectures. “Attention is all you need” – a breakthrough paper from 2017 is considered as a starting point of the most recent innovation cycle. It took the industry 5 years to build an actual user facing application (ChatGPT) and develop a commercial model for selling it to end users.
- 2** Data storage, Cloud and GPU compute became more accessible. Prior advantages of internet giants and their almost exclusive access to unlimited scale is no longer the case. Small startups like OpenAI and Stability AI can now develop new breakthrough applications on the same infrastructure as Google or Meta.



# Act now!

## Don't wait until your industry is disrupted by AI!

Business Insider

### Google management issues 'code red' over ChatGPT: report

Google's management has issued a "code red" amid the launch of ChatGPT – a buzzy conversational-artificial-intelligence chatbot created by...

Dec 21, 2022



Business Insider

### ChatGPT is about to write BuzzFeed content - and investors love it

Insider's Phil Rosen explains why shares of the media company popped Thursday and how artificial intelligence is involved.

Jan 27, 2023



Reuters

### [Edtech Chegg tumbles as ChatGPT threat prompts revenue warning](#)



The strategic question that must be raised on every board agenda:  
*“Will our industry and business model be relevant in 10 years?”*

*“If AI can drive a car, I’m sure it will disrupt my industry sooner or later.”*  
– Brij Patel, Founder and CEO of AFG

An example of an immediate protective legal action item for content-heavy businesses is to update their data terms of use.

Discover your competitive  
advantage: Emerging  
opportunities and use cases

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# Think big!

## Assess **two major** types of opportunities

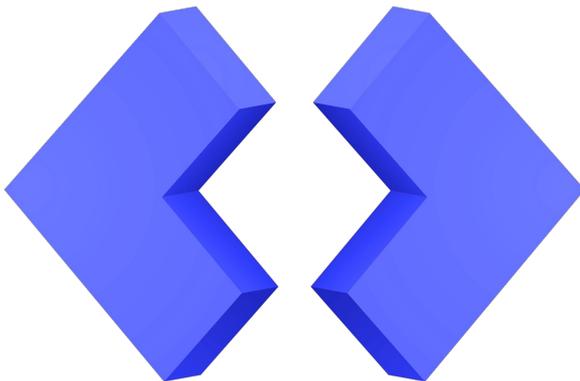
### Monetization of your assets through AI

Examples:

Tesla is monetizing its enhanced autopilot and self-driving add-ons for \$6k and \$15k each, respectively, which account for 50% of the total car price. In this sense, Tesla is becoming an AI business.

GitHub is charging \$19 per enterprise user for its AI Copilot add-on, representing a 100% price increase from the basic plan.

Bloomberg has announced BloombergGPT, creating an opportunity to begin monetizing its data assets through a new interface.



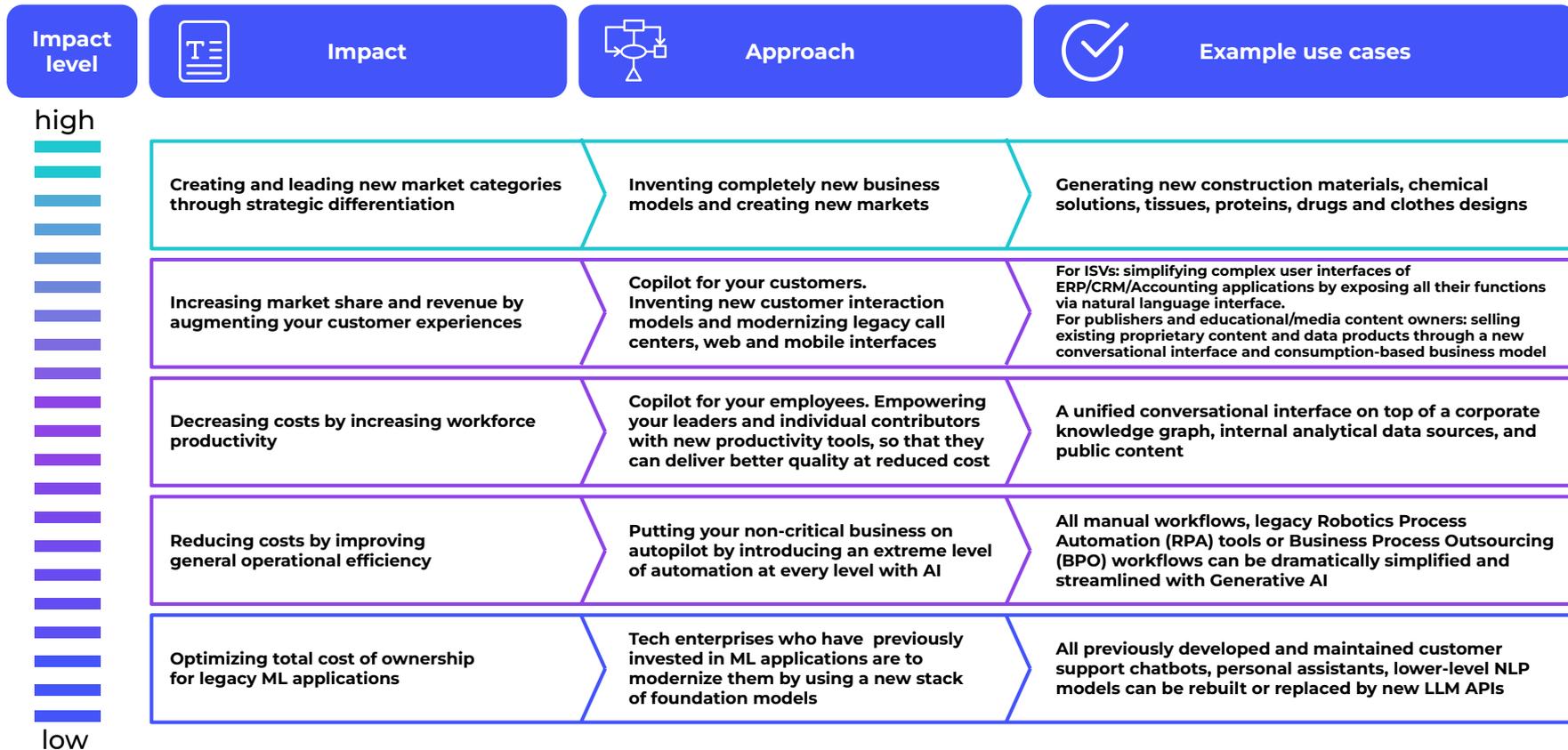
### Improving employee productivity with AI

Examples:

Generative AI boosts worker productivity by 14% in the first [real-world study](#).

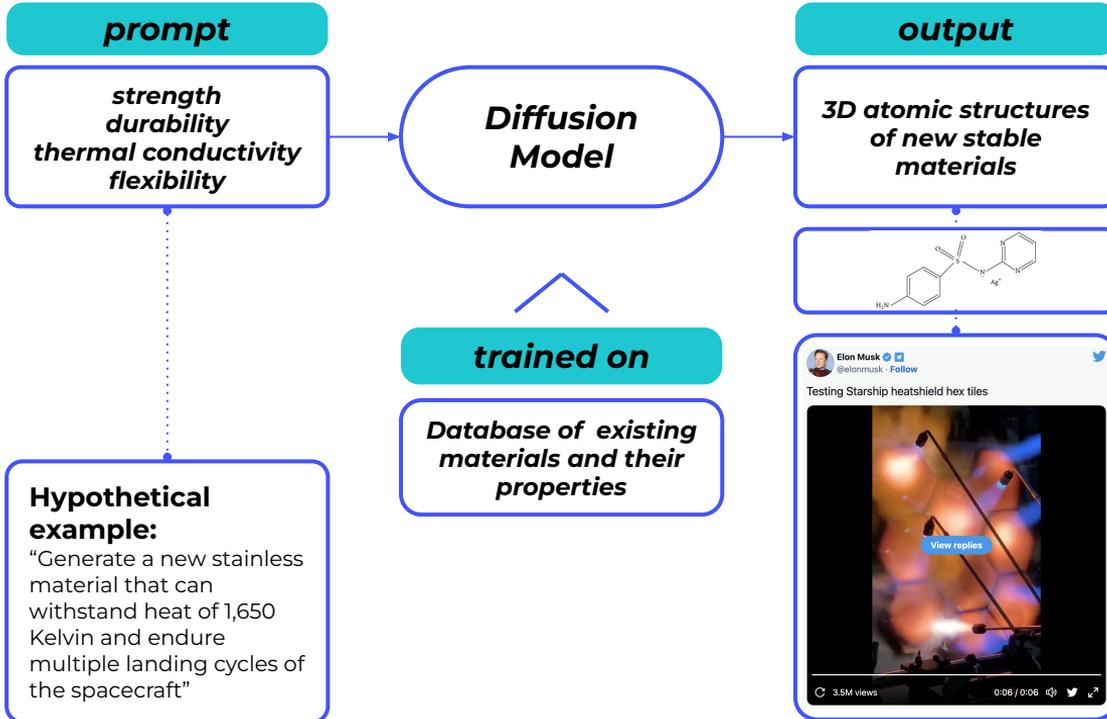
At Provectus, we see a productivity increase of 50-90% in tasks such as new domain research and business analysis. We've also seen a 40-80% productivity boost in the generation of synthetic datasets for ML model training and quality assurance. Engineering tasks – from requirement analysis and legacy code base research to bootstrapping new applications, testing, and debugging – have seen a performance improvement of 30-60%.

# Opportunities by level of impact



# Moonshot use case example: Novel materials generation

## GenAI tech blueprint



## Intuition:

In a similar fashion, Stable Diffusion models can generate new images. The same architecture can be used for generating new materials with desired physical properties.

## Risks:



# Opportunities by industry



## Media & Entertainment

- Content search and discovery
- Content generation (text, art, music)
- Content moderation
- Scenario development
- NPC generation in gaming
- Commentary generation for sports events



## Financial Services & Insurance

- Client reporting and compliance reporting
- Credit spreading
- Intelligent document processing and understanding
- Intelligent due diligence
- Augmented client interactions



## Consumer Internet

- Horizontal and vertical search transformation and market value redistribution
- Augmented customer experience.
- Specialized personal AI agents
- Content licensing for AI vendors



## Education

- Micro learning and AI-augmented experience
- Educational content monetization through conversational UX
- Educational and training content generation and new monetization models



## Professional Services

- Specialized productivity tools
- Internal knowledge graphs
- Conversational business intelligence
- Client reporting generation



## Healthcare & Life Sciences

- Medical charts and clinical notes generation and understanding
- Pricing and reimbursement modeling
- R&D knowledge graphs
- Protein folding simulation
- Creation of new drugs, proteins and materials, and their assessment

# Use case details: Client reporting in Financial Services

## Input prompt

Natural language prompt:

/ai Draft an annual client report for Top 500 index fund based on regulatory requirements and corporate guidelines |

## Generated output

### Portfolio Performance Report

#### Your Fund's Performance at a Glance

- For the 12 months ended December 31, 2022, returns for Top 500 Index Fund ranged from -18.23% for Investor Shares to -18.13% for Institutional Select Shares. It closely tracked its target index, the Standard & Poor's 500 Index. The fund provides exposure to the stocks of the largest U.S. companies.
- The period was a volatile, challenging one for financial markets. Overall, the economic backdrop deteriorated as inflation soared to multidecade highs, driven by government spending during the pandemic as well as higher energy and food prices in the wake of Russia's invasion of Ukraine. That prompted aggressive tightening by many central banks to bring inflation back in check, which increased fears of recession.
- The majority of the 11 sectors recorded negative returns for the 12 months. Information technology, consumer discretionary, communication services, and financial stocks hurt performance the most.

## Context drilldown

John Smith  
Jul 14, 2023 at 4:24 PM

Show me the raw dataset used for generation of the paragraph.

AI Assistant  
Jul 14, 2023 at 4:24 PM

For a Share Outstanding Throughout Each Period	Year Ended December 31			
	2022	2021	2020	2019
<b>Net Asset Value, Beginning of Period</b>	<b>\$233.06</b>	<b>\$183.64</b>	<b>\$157.98</b>	<b>\$122.64</b>
<b>Investment Operations</b>				
Net Investment Income	3,249	2,885	2,924	2,857
Net Realized and Unrealized Gain (Loss) on Investments	(45,458)	49,478	25,597	35,484
Total from Investment Operations	(42,209)	52,363	28,521	38,341

## Opportunity:

Client and Compliance Reporting for financial asset management firms is a resource-intensive task.

## Solution:

Use a Generative AI-powered report builder that simplifies and accelerates portfolio performance analysis, narrative generation, and the final report production.

## KPIs:

- Time to produce and deliver a report to the client, leading to increased customer satisfaction
- Cost of producing and maintaining client and compliance reporting, directly impacting the operating margin

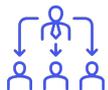
## Risks:

- Fiduciary duty for providing accurate and valid information

## Mitigation:

- Data lineage and cross validation of every metric and data point in the report

# Opportunities by business function



## Executive team (CxO)

- Generative business intelligence and solutions for tapping into company's data and insights and summarizing it for the C-level format
- Augmented communication strategy:
  - a. Board reporting
  - b. All-hands updates
  - c. Company values



## Sales & Marketing

- Sales call assistant
- Market research and reporting
- Proposal generation
- Prospect research and due diligence



## People & Operations

- Improving employee experience through internal knowledge graph and AI search
- Augmented onboarding
- Augmented screening interview



## Research & Development

- Industry specific R&D knowledge graphs and AI-curated industry insights
- Simulation and experiments tracking
- New materials, chemicals, protein designs



## Security & Compliance

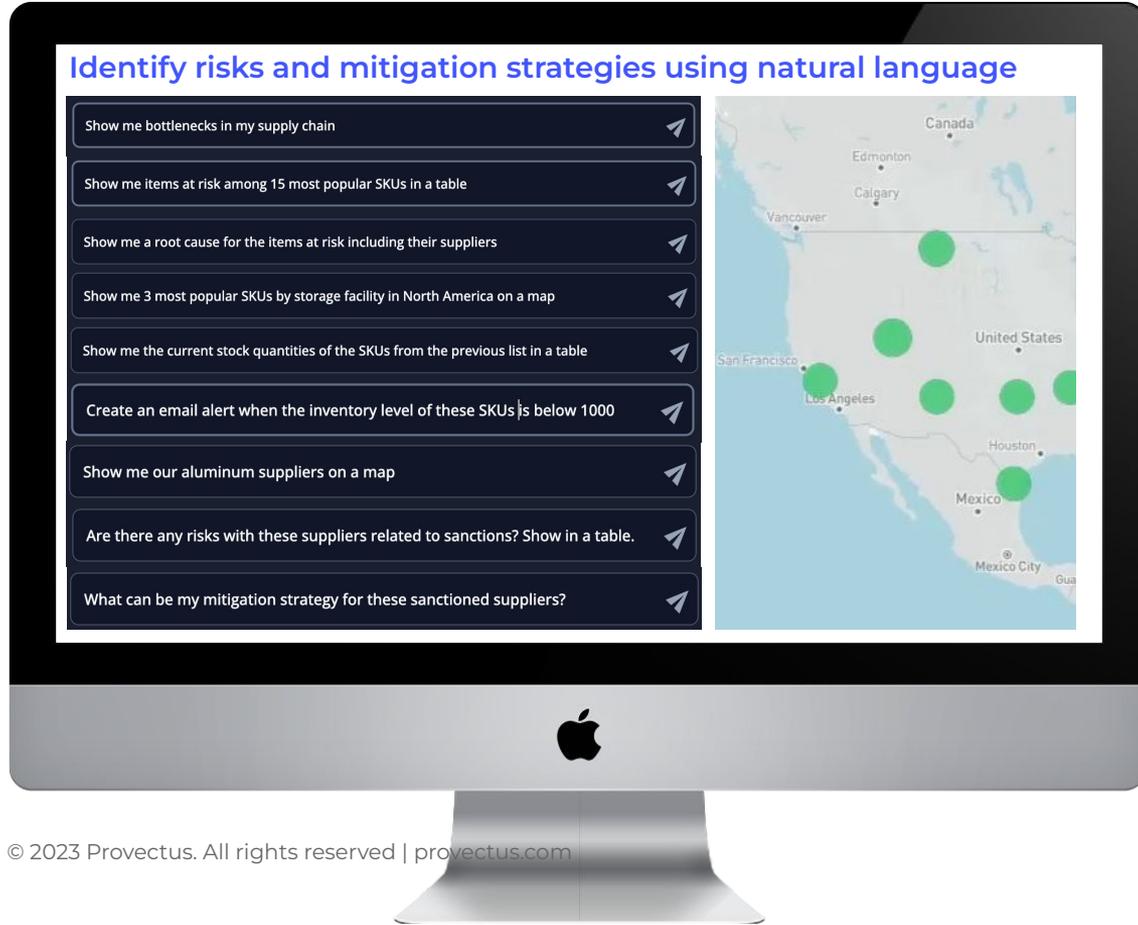
- Compliance reporting
- Security risk assessment
- Augmented security training
- Background check



## Finance & Legal

- Augmented contract review and redlining
- Vendor assessment and due diligence
- Reporting
- Scenario simulation and stress testing

# Use case details: Sales and Operations Planning



## Opportunity:

Sales & Operations Planning process requires a comprehensive visibility and intelligence to accelerate decision making process by command center leaders, as well as CRO, CSCO — all up to CEO.

## Solution:

Deploy a Generative AI-powered S&OP visibility solution to provide conversational decision intelligence on top of internal (ERP, MES, CRM) and external (risks, news, sanctions) knowledge graphs.

## KPIs:

- Revenue through proactive mitigation of supply chain disruptions
- Operational efficiency of the command center

## Risks:

- Overall maturity of internal IT systems
- Adoption and change management of legacy business processes

# A Generative AI adoption framework.



# Generative AI Adoption Journey at Enterprise

## Off-the-Shelf LLM Enablement

Achieve productivity gains by equipping your knowledge workers with out-of-the-box LLM applications, and establish a solid foundation for secure, compliant, fair, and responsible AI adoption from day one.

## Enterprise AI Search

Extend out-of-the-box LLM capabilities with an enterprise knowledge base that includes, but is not limited to, FAQs, internal policies, training materials, and information from IT, HR, Product, Sales, and Marketing departments. Empower knowledge workers to be more productive in their day-to-day tasks.

## Generative Documents Intelligence

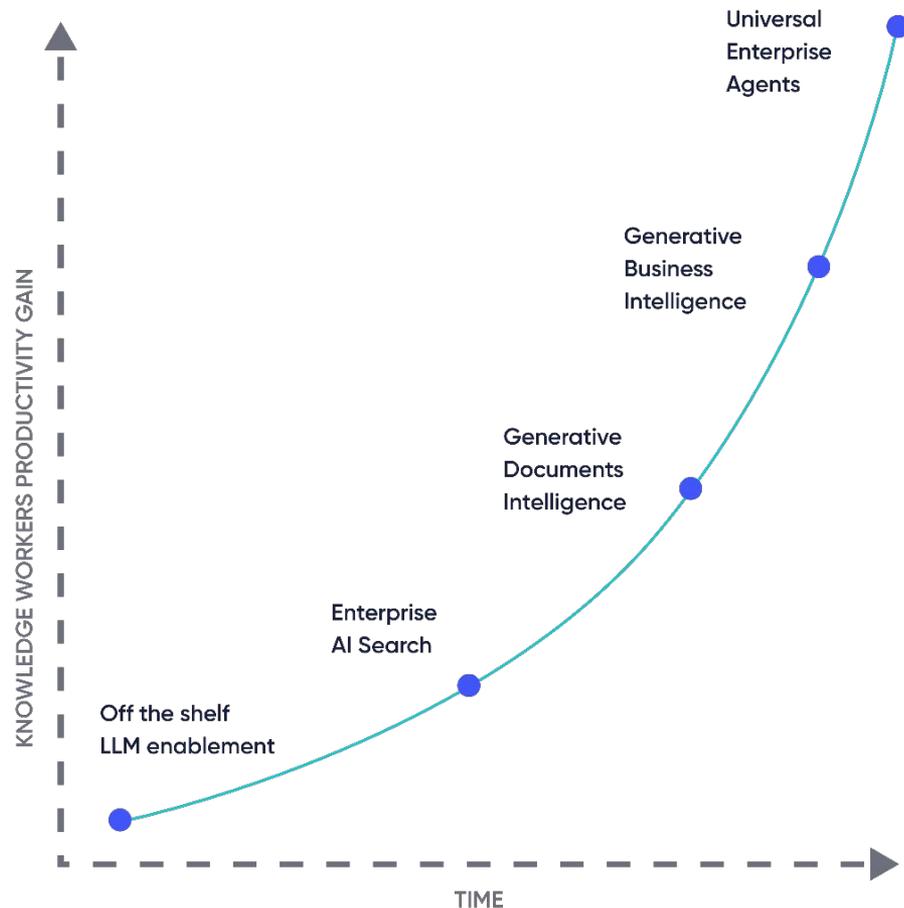
Boost productivity for corporate roles dealing with large, unstructured documents in underwriting, auditing, asset management, and legal affairs by reducing the time required for quality document processing and understanding from days to minutes.

## Generative Business Intelligence

Increase the productivity of knowledge workers by exposing them to corporate business intelligence capabilities and KPIs through a natural language interface, to accelerate critical business decisions.

## Universal Enterprise Agents

All of the aforementioned features and components can be combined into a comprehensive, easy-to-use product that serves as a universal Gen AI companion for enterprise users.



How to start  
a Generative AI journey?

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# Step 1: Prioritize use cases

OPPORTUNITY			IMPACT		EFFORT					
Category	Use Case	Users	KPI		Expected Impact	Data	ML Problem	Integration	UX/UI	Costs
			Proxy KPIs	Business	How strong is the expected impact on business KPI?					

## Tip:

You need to have a hands-on AI Expert and AI Product Owner in the room for a quick feasibility assessment, and to create a high-level ROI model

## Tip:

No matter how excited you are about technology, try to find a solution for your business problem, and not vice versa

## Tip:

Challenge your use cases for compliance and fairness requirements early on in the process

# Use cases prioritization: Opportunity-Risk-Strategy Tool

## Use Case 1:

### Customer support (business function)

High impact on customer satisfaction  
Low risk perceived – routine script-based jobs are already commoditized and outsourced

### Executive consideration

Introduce a Generative AI-powered chatbot for frequent routine and FAQ-type support cases as an entry point for customer inquiries to make human agents assist only with complex cases

### Where to start

Focus on business outcomes – test drive a solution pilot with a small subset of the audience, fine-tune, and scale.

## Use case 2:

### Content creation (individual contributors)

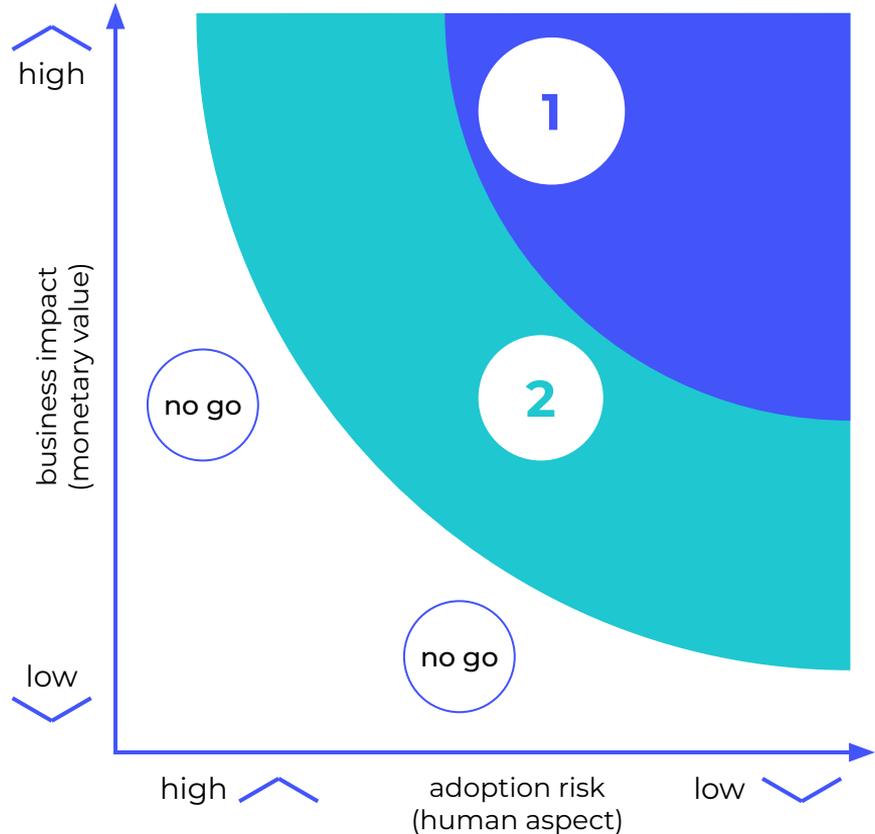
High impact on productivity  
High risk perceived – a perceived threat of workforce elimination

### Executive consideration

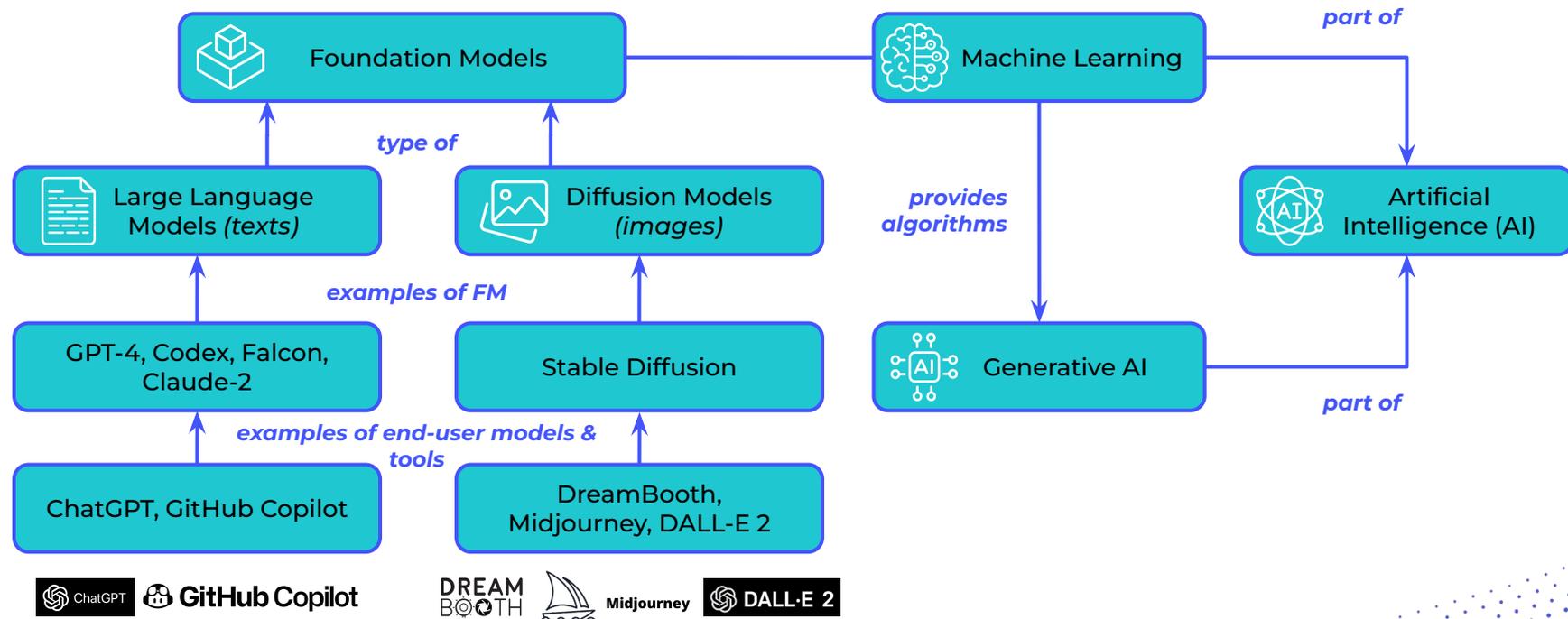
Redefine the role of content creators to shift their focus on providing inputs and supervising the AI-generated content vs. creating the first drafts

### Where to start

Focus on change management – cultivate an AI-first culture and build from success with early adopters within the team.



# Step 2.1: Understand Gen AI Terminology: AI, Generative AI, Large Language Models, and Foundation Models



# Step 2.2: Understand available tools and services

## Fully Managed Services

 OpenAI  
(ChatGPT plugins)

 Azure  
(OpenAI Service)

 aws  
(Amazon Bedrock)

 Google Cloud  
(GenAI App Builder)

## Application Components

### Proprietary LLMs

 OpenAI  
(GPT models API)

 (PaLM API)

 (Amazon Titan)

 cohere

 AI  
(Claude API)

 AI21labs  
(Jurassic-2 API)

and many others...

### Open-source LLMs (commercial use allowed)

 TS, UL2

 Bloom

 StableLM

 Pythia, GPT-NeoX

 Open Assistant

 Dolly

and many others...

### Prompt Engineering

 LangChain

 LlamaIndex

### Model Hubs

 Hugging Face

 Amazon SageMaker JumpStart

### Vector DBs

 Chroma  
 redis

 Pinecone  


## Infrastructure & Compute Frameworks

 Amazon SageMaker

 Azure ML

 RAY

 GCP Vertex AI

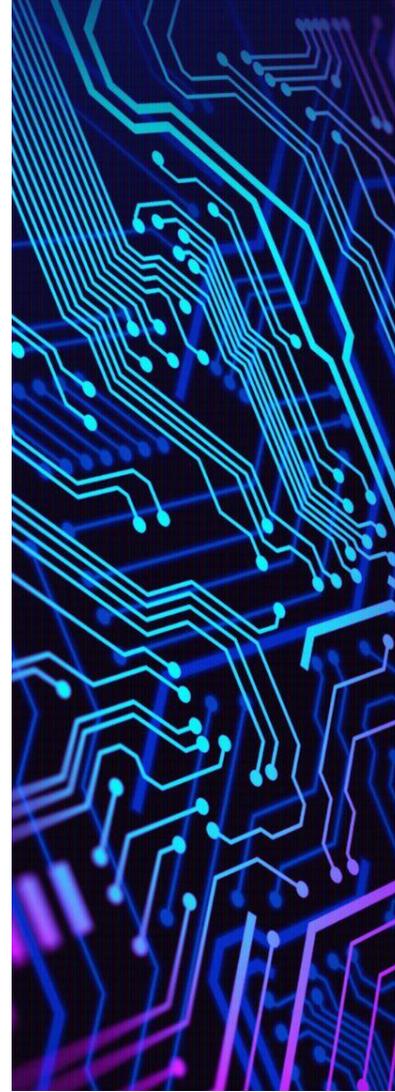
 Lambda

# Step 3: Understand risks and risk mitigation strategies

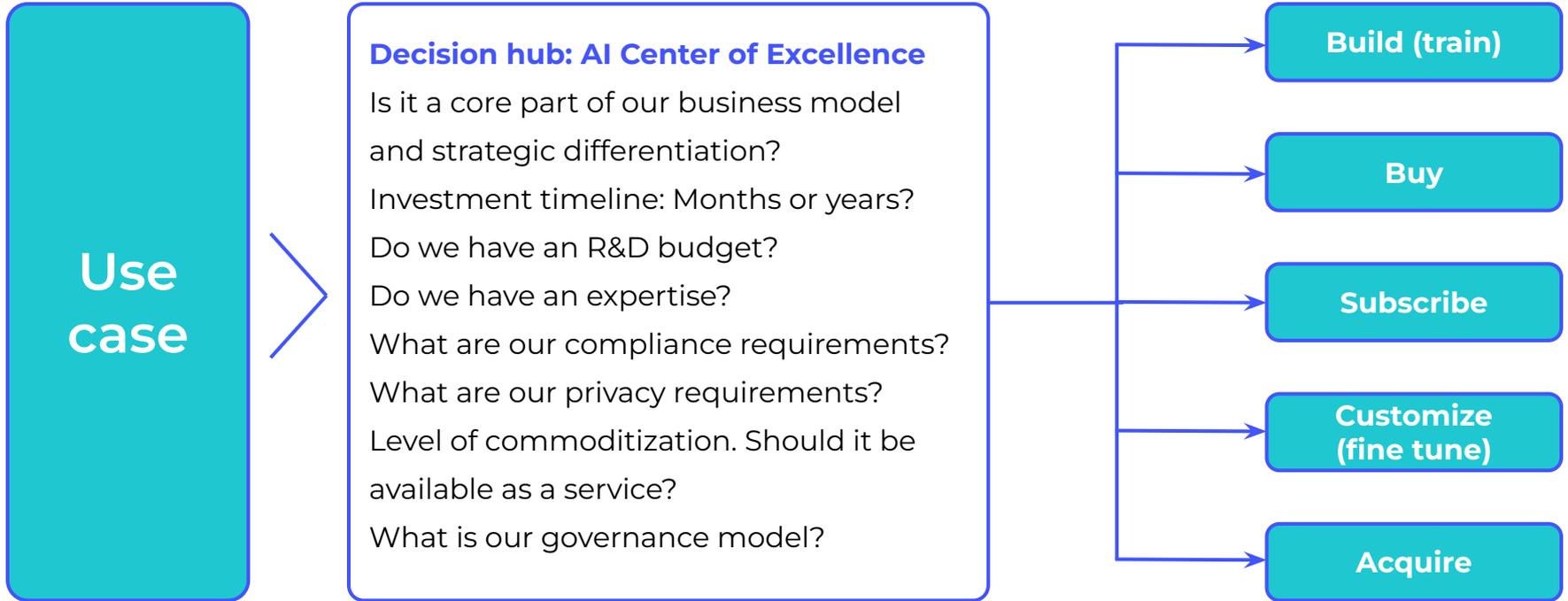
## GenAI Risks & Limitations

## Mitigation Strategy

<b>Harmful responses, hallucinations, and inherited biases from the data that AI has been trained on</b>	<ul style="list-style-type: none"><li>• Design human-in-the-loop experience for continuous evaluation and data collection. Don't use LLM as part of a fully automated pipeline without human in the loop</li><li>• User training and clear communication about possible AI behavior</li><li>• Apply LLM alignment methods like Reinforcement Learning from Human Feedback (RLHF). Note: it is an advanced technique mastered by a handful of LM vendors so far.</li><li>• Turn hallucinations into a positive benefit for creative use cases like music and art generation.</li></ul>
<b>Environment impact from a very intensive process of carbon emissions during LLM training and inference</b>	<ul style="list-style-type: none"><li>• Budget carbon impact in advance when selecting an LLM vendor and include it into the total cost of the model</li><li>• Stanford AI Index report is one of the latest data sources for estimating an environmental impact of LLMs</li></ul>
<b>LLMs can't be used for precise calculations, structured finance, and mathematical problems</b>	<ul style="list-style-type: none"><li>• Multiple deterministic systems (databases &amp; APIs) can be integrated together and be exposed through an AI interface</li></ul>
<b>Compliance risks of data leakage when sending it to third-party providers of foundation models</b>	<ul style="list-style-type: none"><li>• Private VPC deployment of your own model, as well as 3rd-party models, is available for private deployment</li><li>• Implement logging and audit trail for capturing, filtering, and blocking of any sensitive requests to AI models</li></ul>
<b>Knowledge cut-off</b>	<ul style="list-style-type: none"><li>• Integration with real-time data sources and APIs, and with internal knowledge graphs</li></ul>
<b>Data copyright and data licensing</b>	<ul style="list-style-type: none"><li>• Implementing data lineage, data cleansing, and data testing best practices</li><li>• New legal frameworks and processes to be implemented</li></ul>
<b>Cost of LLM hosting</b>	<ul style="list-style-type: none"><li>• Mix large &amp; expensive models for creative tasks and your own "smaller" models for specialized tasks</li><li>• Right now it's a dawn for open-source LLMs, datasets, and optimization techniques</li></ul>



## Step 4: Define your implementation strategy



# Connect with our leadership team



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Questions?

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