

Moving beyond the hype

How teams can get started
and realize value

The Hemingway Effect in Gen AI

The sudden rise of Gen AI and the appearance of ChatGPT was born from research over 50 years in the making

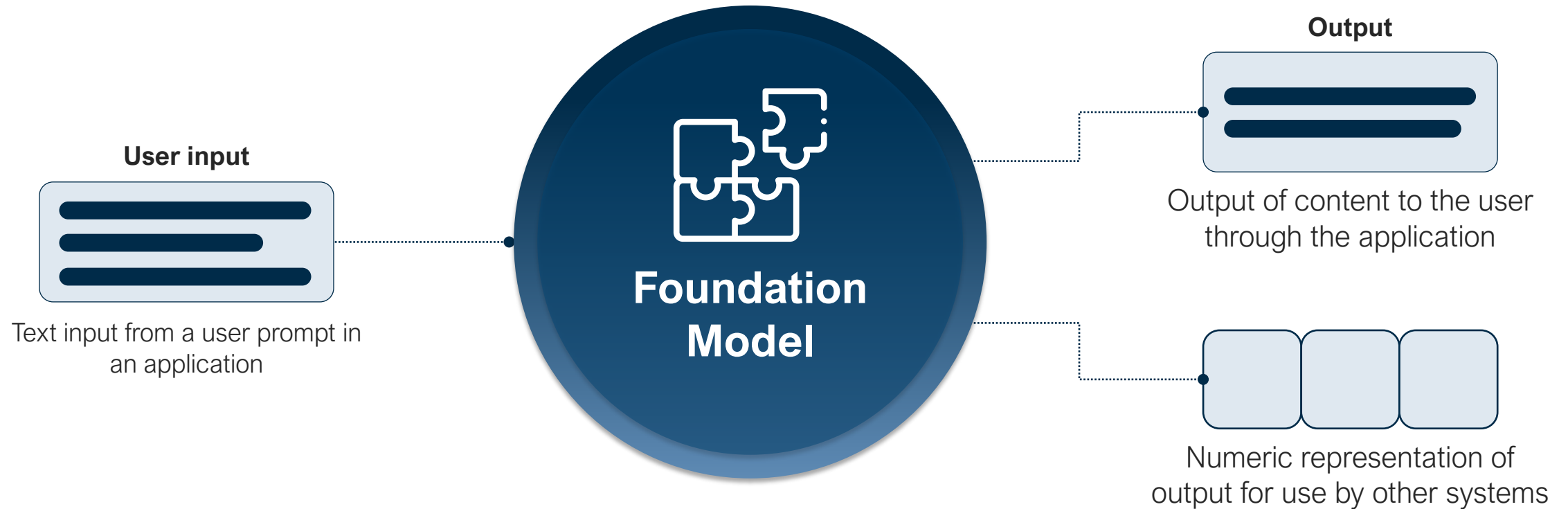


“ ‘How do you go bankrupt?’ Bill asked.
‘Two ways.’ Mike said. ‘Gradually, then suddenly’

Hemingway, *The Sun Also Rises*

A user provides a prompt; a model interprets that to generate content and send it to the user

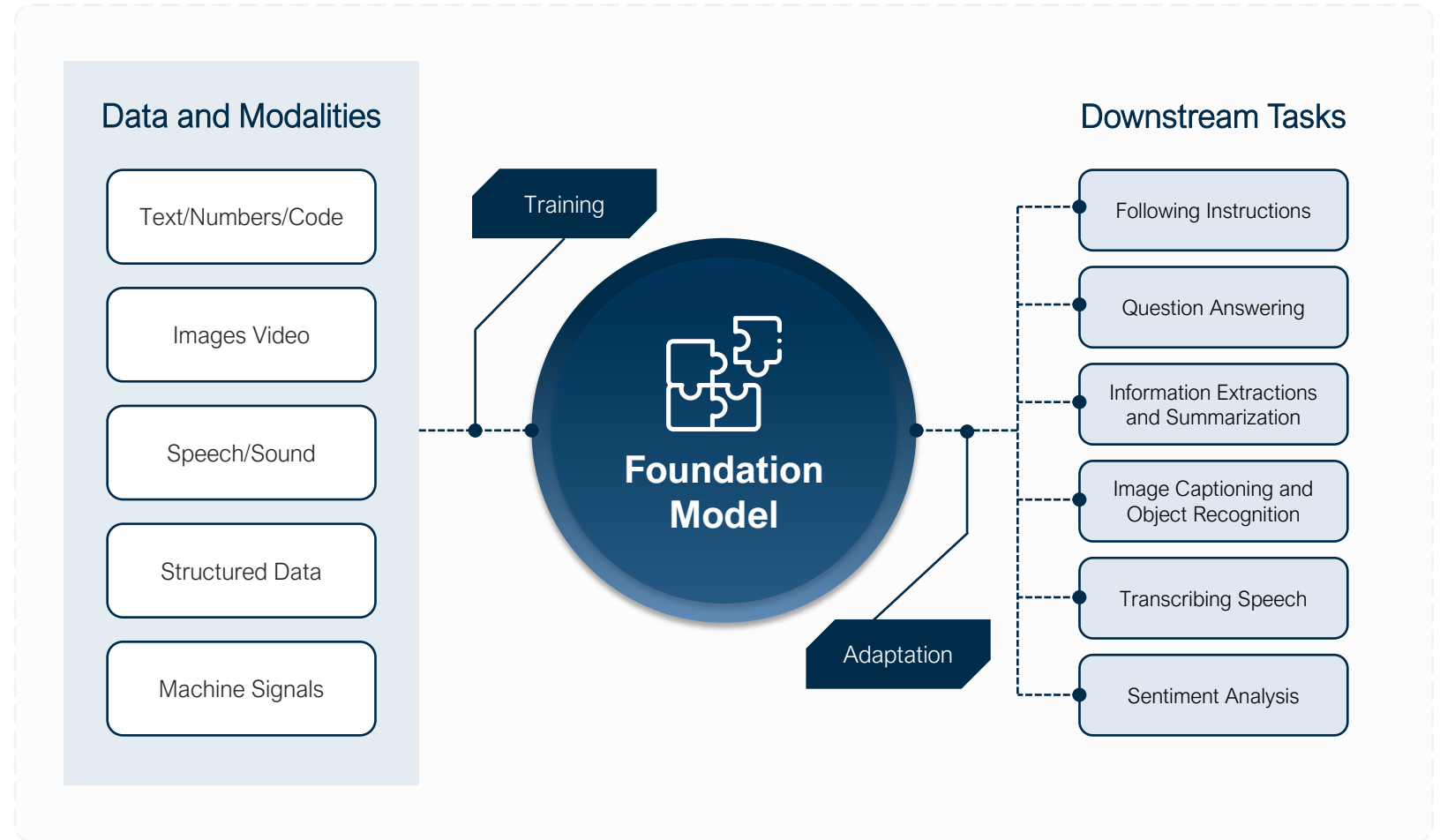
Illustrative concept depicting how a foundation model is at the center of generative AI



Foundation models are trained on massive amounts of unlabeled data through self-supervised learning



The train-and-learn methods of a foundation model results in generalized models capable of various tasks, such as image classification, natural language processing and question answering



Without getting too complex, there are many models and applications depending on the content

A small snippet of various applications and models powering Gen AI

Application layer	ChatGPT						
	Sales (email)						
	Marketing (content)						
	Support chat/email	Code Generation	Media / Advertising				Gaming
	General writing	Code Documentation	Consumer / Social				Music
	Note taking	Text to SQL	Design	Translation			Audio
	Other	Workshop Builders	Image Generation	Voice synthesis	Video editing / generation	3D models / scenes	Biology & chemistry
	TEXT	CODE	IMAGE	SPEECH	VIDEO	3D	OTHERS
Model layer	OpenAI GPT-3	OpenAI GPT-3	Stable Diffusion	OpenAI Whisper	Microsoft X-CUP	Dreamfusion	Galactica
	DeepMind Gopher	Tabine	OpenAI Dall-E 2	AudioLM	Meta Make-A-Video	NVIDIA GET3D	Minerva
	Facebook OPT	Stability.ai	Craiyon	Jukebox	Phenaki	MDM	Alphatensor
	Hugging Face Bloom	Codex	Imagen		Soundify	Magic 3D	MegaMolBART
	Cohere	Alphacode	Muse				Human Motion Diffusion Model
	Anthropic						BioNeMo
	BERT						GatorTron
	Google LaMDA						

LLMs have been increasing

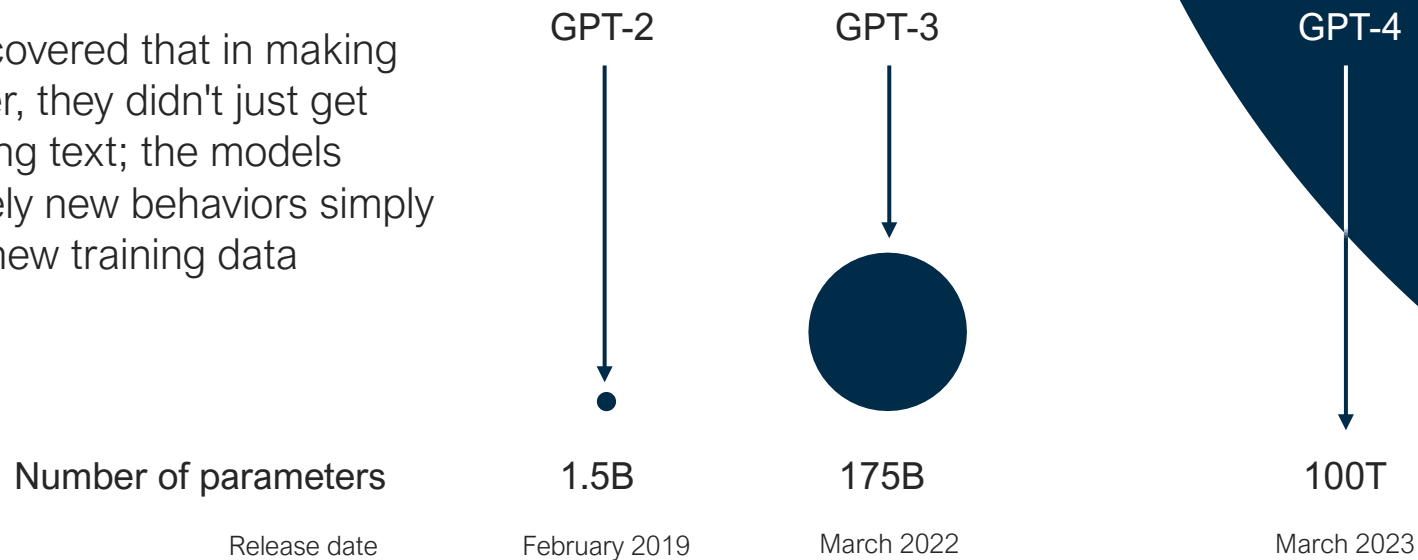
10x

As large language models (LLMs) improve, advances flow to downstream tasks and multi-modal models. These are models that can take multiple different input modalities (e.g., image, text, audio) and product output of different modalities

Why now? Better models, more data, more compute power



Researchers discovered that in making the models bigger, they didn't just get better at producing text; the models could learn entirely new behaviors simply by being shown new training data





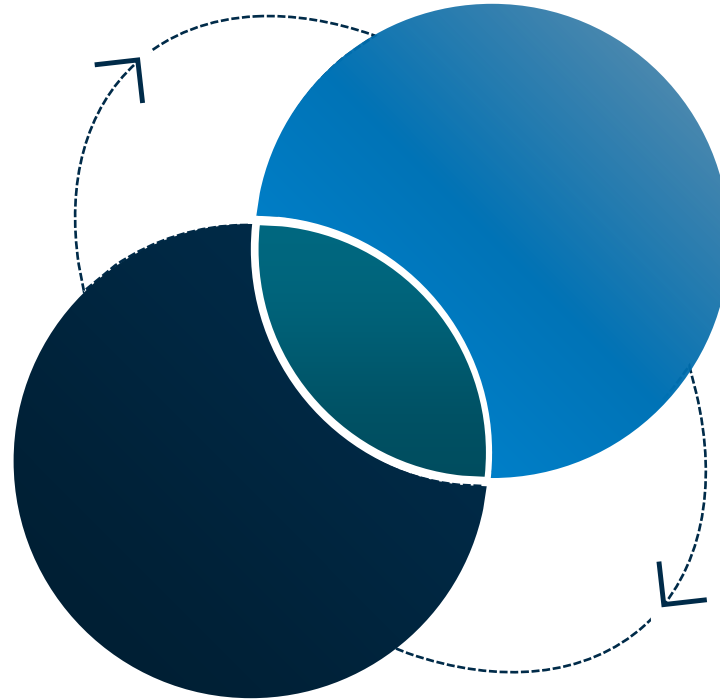
The potential

A review of the use cases for
life science companies

Generative AI will unlock better, faster and cheaper outcomes to vastly boost productivity

Virtuous Learning and Accessible Intelligence

Creating a system of AI-powered learning and intelligence that can be applied across a process or system, either across an enterprise or tasks in daily life that has the potential for improving people's quality of life



Amplifying Productivity

Drive efficiency, consistency, and improved quality through how you execute tasks—whether that's automation that reduces manual effort or AI that supports routine tasks like tagging and organizing ideas, summarization of discussions or documents or standardizing policy controls

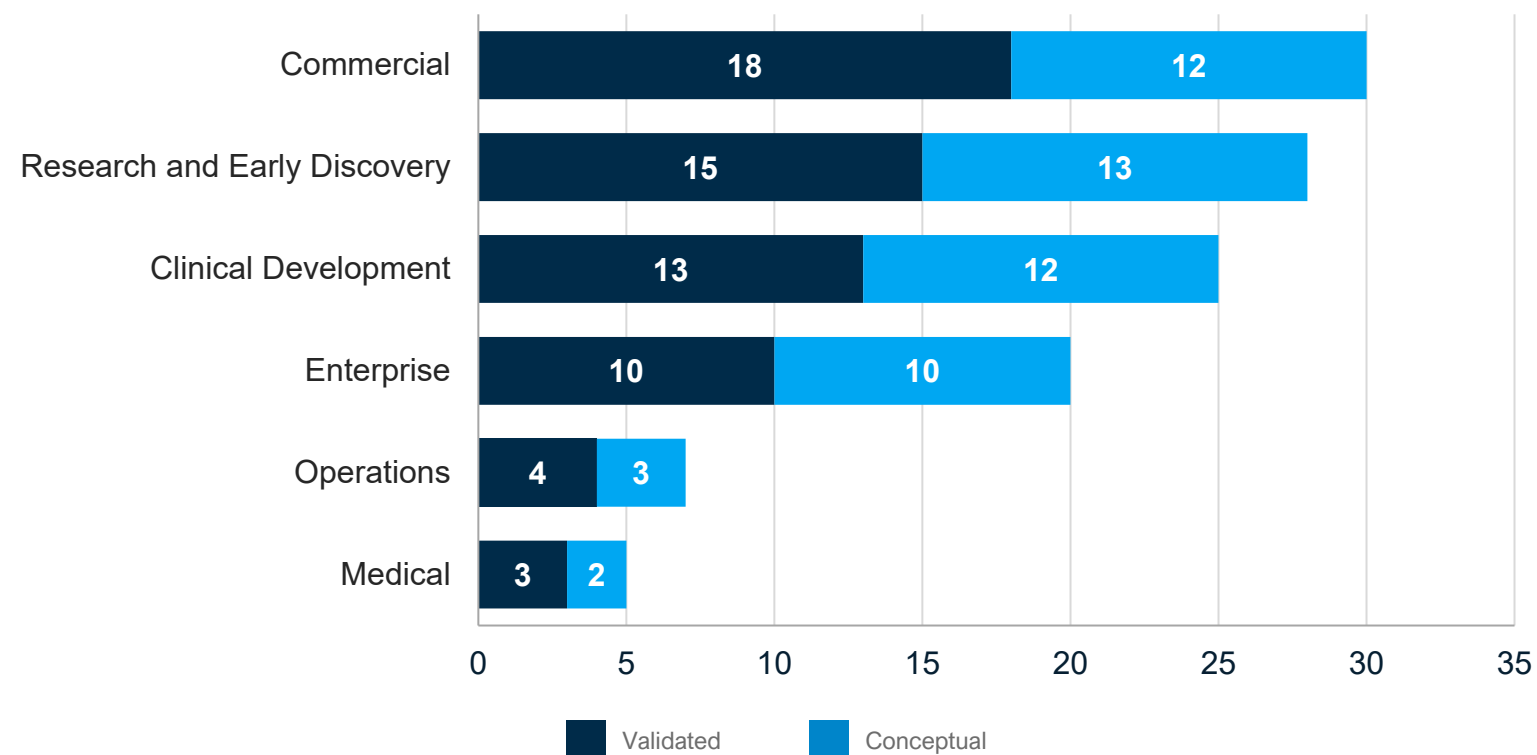
Unleashing Creativity

Go from zero to one, combine distant concepts, spark ideas, explore unexpected paths, instantly iterate and generate multiple variations, react, fine-tune, and adapt

Generative AI has the potential to deliver billions across all parts of the pharmaceutical value chain

Generative AI expected annual value across the pharmaceutical value chain

Expected Annual Value, \$B



Commercial offers the most potential

- 63 Generative AI use cases were modelled to get to the potential economic impact
- Most use cases fell into one of four domains
 - Knowledge extraction
 - Content and compound generation
 - Customer engagement
 - Coding and software generation
- Commercial represents the greatest potential to deliver sustained value to the organization

The potential use cases are limitless, but Pharma Commercial offers unique promise

MLR Automation

Track and review previously approved materials automatically, suggesting rephrasing options and keeping all involved parties informed to speed up the compliance and approval process

AI-Powered Segmentation

Create detailed patient profiles based on demographics, medical history and treatment needs to deliver highly targeted marketing messages

Targeted Engagement

Leverage AI to segment audiences and tailor communication messages to specific groups, increasing engagement and brand awareness

Rep CoPilot

Marketers, field reps, Hub services and other customer-facing team members can use Gen AI to provide on-demand retrieval, summarization, and synthesis of data

Monitor Brand Sentiment

Track online conversations and social media to understand public perception of the brand and products, allowing for proactive reputation management

Dynamic Pricing

Analyze market trends, competitor pricing and patient affordability to adjust prices in real-time, maximizing revenue while maintaining accessibility

Cost Effectiveness

Use AI to predict the cost-effectiveness of different pricing strategies, informing negotiations with payers and healthcare providers

Patient Education Material

Generate clear and concise educational materials about specific diseases and treatment options

Predictive Modeling

Forecast patient responses to marketing campaigns, optimize campaign budgets and maximize return on investment

Tailored Treatment Plans

Generate personalized treatment recommendations based on individual patient characteristics and genetic profiles

Drug Safety Monitoring

Analyze large datasets to identify potential drug side effects and safety risks in near time

Medication Adherence

Develop AI-powered tools that remind patients to take their medication and provide personalized advice

The dark side to Gen AI

With promise comes a lot of
risk to consider and manage



Foundation models present challenges that need to be addressed for Enterprise use

2024 is about adoption and scaling; quality access and data security are key as you scale

The obstacles

Cost

Foundation models require significant computational resources to develop, train and deploy, leading to an expected fivefold cost increase¹

Privacy and Security

Foundation models often require access to sensitive data, such as customer information or proprietary business data

Interoperability

The AI is not explainable. This can make it challenging for businesses to explain or justify their decisions to customers or regulators

Legal and Ethical

Businesses must ensure that their models are developed and deployed responsibly and ethically, which may require additional oversight, testing and validation

Accuracy

Out-of-the-box foundation models fall short of the required accuracy rate for a production application. A business may struggle to justify the time and cost required to do so

Environmental Impact

Energy consumption for machine learning is 10% for training and 90% for serving. Yet, training GPT-3 led to emissions equivalent to 550 roundtrips from NYC to SF.² Careful choices can reduce your carbon footprint

The enablers

Cost-effective Use

Foundation models are expensive to run. Instead of using large foundation models, companies may instead use them to help train smaller, more focused models that can achieve the same (or better) performance for a fraction of the price

Secure Deployment

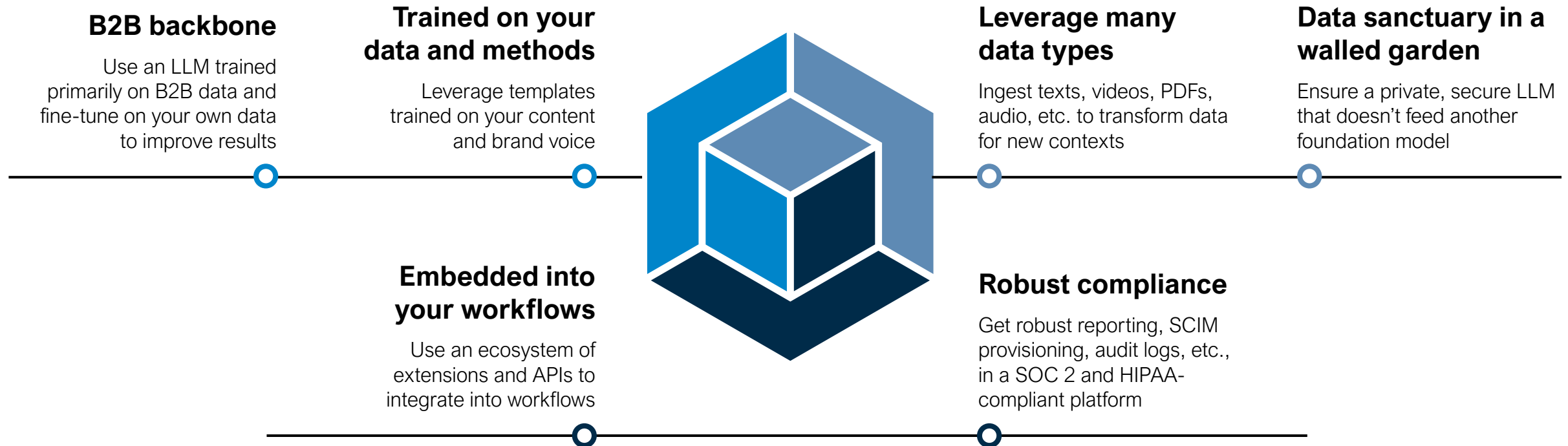
For most enterprise use cases, using a foundation model via API is not an option. Moreover, open-source models incorporate user data into their model training, prohibiting use where proprietary data is involved

Fine-tuning

Out-of-the-box foundation models trained on general knowledge will struggle with domain-specific tasks. To improve the model's performance, data scientists will have to gather and prepare data for fine-tuning

Generative AI should be enterprise ready

Look for six differentiators before jumping into a generative AI solution...



Companies looking to use Gen AI across the Enterprise have four things top of mind

Companies are looking to use data in ways that are...



1 Safe

Generative AI requires vast amounts of data, but enterprises prioritize using it securely, mitigating privacy risks and ensuring compliance with regulations



2 Trusted

Companies seek AI models trained on reliable, unbiased data to produce trustworthy outputs and foster user confidence in AI-generated insights



3 Not Exposed

With proprietary, sensitive and patient data being utilized, companies look for AI solutions that minimize the risk of sensitive information leaking during processing or within generated content



4 Maximize Relevancy

Hallucinations erode confidence and trust, so it is crucial to reduce hallucinations and prioritize the most relevant data points to ensure focused and actionable insights

Establish certain boundaries

Proper governance can mitigate the concerns facing Life Science companies

Keep It in House

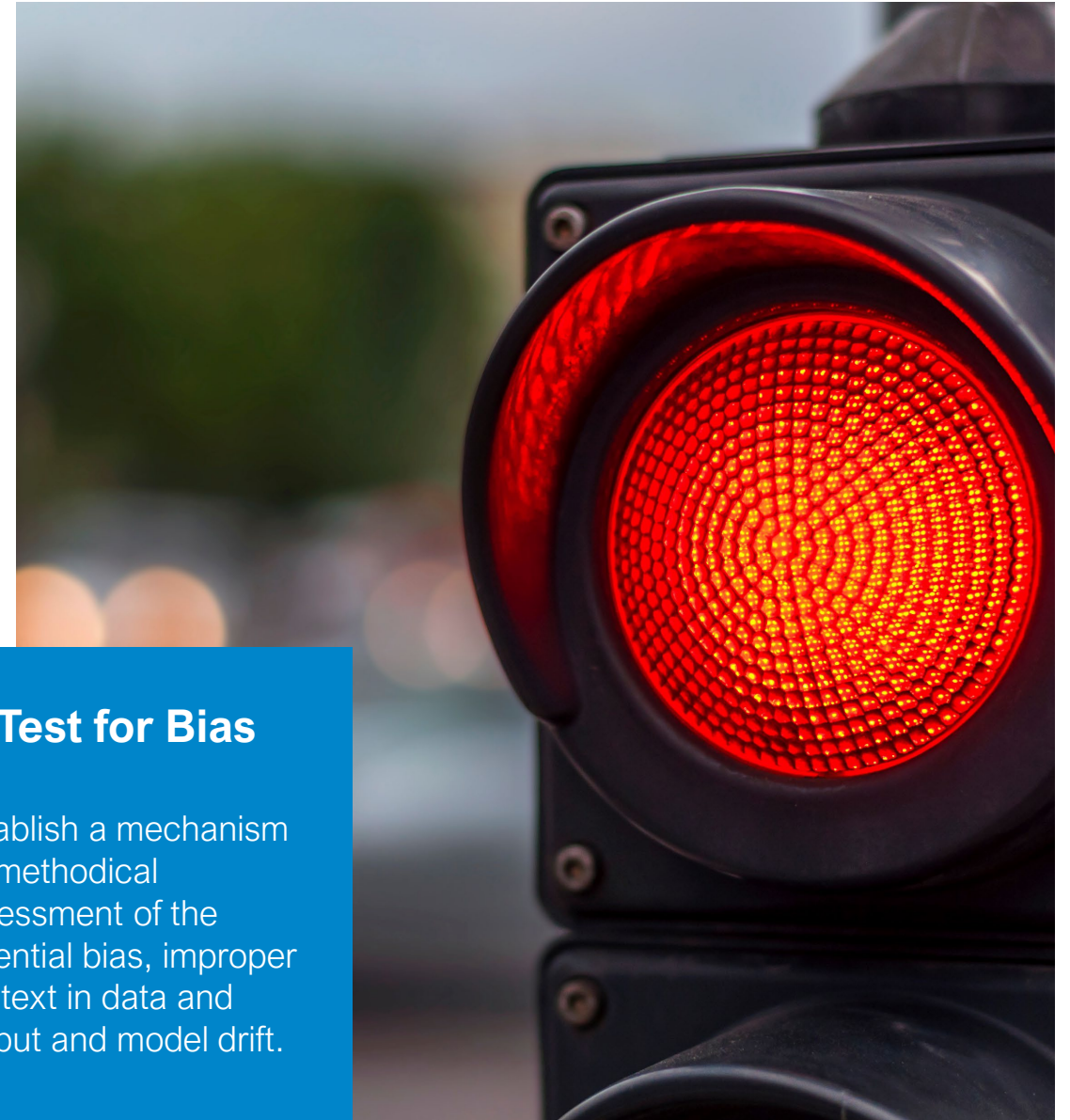
No real-time authoring of market-facing content. MRL/PRC/IRB approval is needed before distribution.

Keep It Private

No use of Patient Health Information (PHI) or proprietary data in open-sourced models.

Test for Bias

Establish a mechanism for methodical assessment of the potential bias, improper context in data and output and model drift.



A team of pit crew members in red suits and helmets are working on a Formula 1 car. They are focused and coordinated, with some members leaning over the car and others standing nearby. The car is white with black and red accents. The background is a clear blue sky.

How to start

A focused start is excellent, but the real challenge is turning that into meaningful enterprise capabilities

To get started, the keys are experimentation and focus on delivering a specific business outcome



BUILD YOUR KNOWLEDGE







Get your sea legs under you with experimentation. Move away from random acts of AI, build knowledge and be able to build an internal organizational point of view and reference framework



USE CASE DEFINED, OUTCOMES LED

Start with a business problem or workflow to improve and then identify the use cases to keep focused to deliver a business outcome

Companies can focus on these specific steps to unlock value

Step	Description
 Prioritize Use Cases	Prioritize 3-5 use cases and develop them to an enterprise level. This will ensure that they receive the necessary funding and attention. While experimentation is important, it's not advisable to spread use cases and POCs across multiple parts of the business. Instead, focus on a few high-impact use cases that solve a specific business problem and develop them through a standardized development cycle
 Establish Governance	To establish governance policies, create an AI ethics office or similar function to oversee responsible AI policies that focus on safety without limiting innovation
 Deploy Platforms	Create a secure environment that allows for use cases to be built on different foundational models. Models are not the same and should not be treated as such. Prompts and fine-tuning should be adapted to the specific model. In addition, models will continually change, so it's essential for your platform to have built-in flexibility. Concentrate on speed first, then define scale as you learn from implementation
 Seek Partnerships	When seeking partnerships, link them to value, identify what is required to deliver the use cases as quickly as possible and look to obtain the needed foundational models, tech, data, talent and assistance with implementation. AI-based drug discovery startups are already partnering with established biopharma companies to accelerate R&D
 Upskill People	Put your people on the right track by focusing from the start on building the necessary capabilities. As with existing AI efforts, the value will come from the ways in which people actually use the new solutions. Remember that Gen AI is not standalone but instead works in conjunction with traditional automation, predictive AI and human-based processes
 Rewire Processes	To manage the organization's evolution toward the right processes, start by reimagining core business processes end-to-end, concentrating on how people and technology can work together to integrate Gen AI and expand automation over time. Bring the C-suite along on the journey. It's essential to make this a corporate priority rather than just an IT task

Break away from the pack

How to go from hype to
reality and deliver value



Make it about people

Use good design to surface the right information at the right time

LLM has been around for years. It was only when OpenAI wrapped a digital experience around it and put it in the hands of people did it take off. Make it about people, not technology and transform experience to transform your business.





Make systems more accessible

The biggest change will likely come from how we interact with systems. We will layer a simpler natural language user interface over complicated technology



Measure outcomes by solving business problems



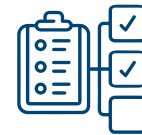
Increase user engagement

Focus on customer service. Take friction out of the process of finding answers and solving issues. Get data to humans in the process more quickly



Enrich the NBA feedback loop

Deepen the insights by making the feedback loops more robust and broadening the data sources; yielding greater relevancy



Create content on demand

Develop personalized interaction content from a library of pre-approved content that can be woven together in unique ways



Increase the utility of tech

Change interaction mode with systems from clicks and training to conversation mode; no more tutorials or training manuals!



Use an ecosystem partnership

Companies can achieve better controls through an ecosystem model

Unlock the power of the ecosystem

Stay current on ethics and governance changes by keeping frameworks updated in an open way through partnerships

Work with multinationals to collectively monitor compliance with evolving country requirements, industry regulatory requirements, etc.



Six principles to unlock value

Prioritize use cases

Focus on high-value, feasible and capability-building applications, integrating Gen AI with existing workflows and aligning with core business goals

Establish governance

Mitigate Gen AI risks (IP, privacy, bias, etc.) through responsible AI policies, data classification frameworks and regulatory compliance

Select & Deploy Platforms

Choose the right infrastructure, data platforms and models (public, managed or private) based on cost, speed and customization needs

Seek partnerships

Collaborate to access data, technology, talent and implementation support, balancing internal expertise with external efficiency

Upskill people

Train personnel at all levels on using AI and Gen AI for their roles, building expertise while leveraging ecosystem partners

Manage the change

Implement robust change management practices (potentially using test beds) to guide the organization and maximize value

Thank you

