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FROM POC TO PRODUCTION

Navigating GenAI Implementation in Life Sciences

MEET OUR SPEAKERS

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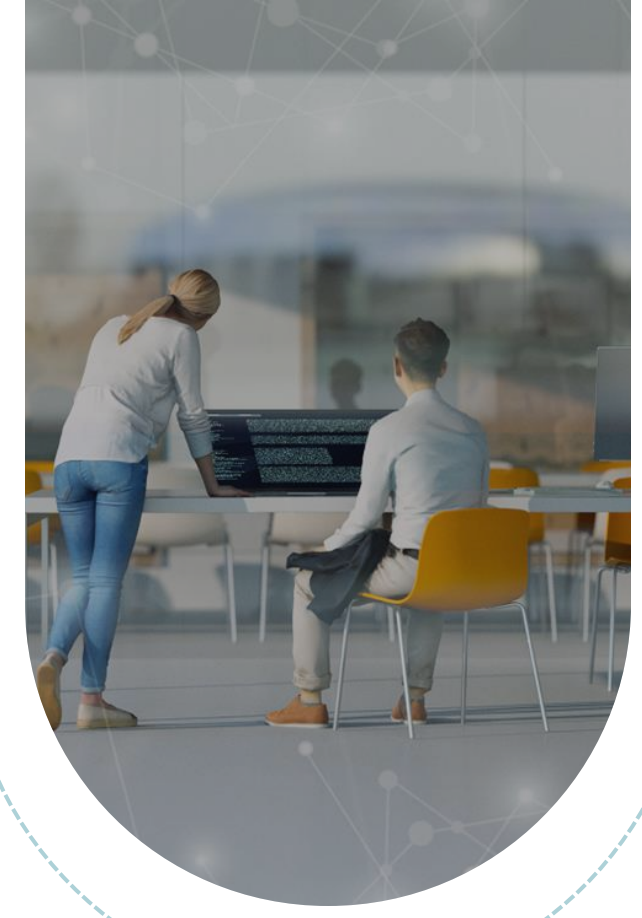
GenAI in life sciences today

…there is a lot of skepticism especially from

- Goldman Sachs
- Sequoia Capital
- Pharma Industry
- Tech investors



However,…

- **We believe** there is significant potential for GenAI to make a meaningful impact.
- This isn’t just a bubble waiting to burst – **there’s a pathway** for GenAI to fulfill its promise.

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North Star: Moving from GenAI POC to Production

1

Building the foundation

- **Tech stack**: “Don’t boil the ocean”; design for upward compatibility.
- **Data**: Still the new oil; Garbage-in and garbage-out is still true.

2

Prioritizing the right use cases

- **Meta use cases:** Right-fit meta use cases over narrow ones.
- **Impact story:** Initial wins vs. only long-term focus.

3

Planning for and gaining traction

- **Building org momentum:** Going beyond a rallying cry.
- **Adoption:** Don’t assume that if you build it, they will come.

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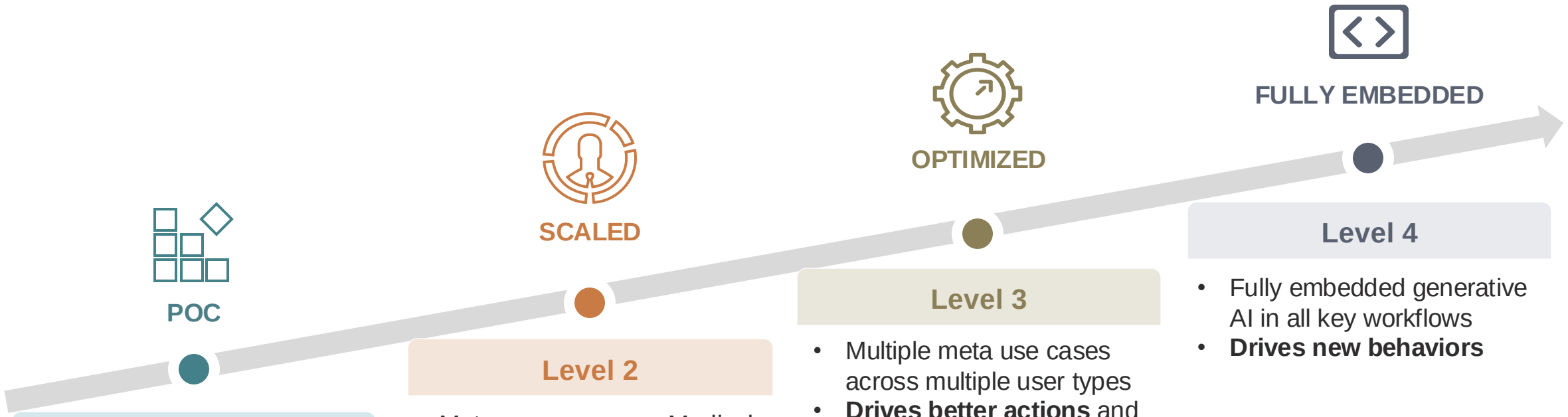
Building the foundation

The foundation:
Design upward compatible Gen-AI Roadmap

Pre-Production Generation(s)	Production Ready Generations



Level 1

- Narrow use case
- **Proves the approach**

Level 2

- Meta use case, e.g., Medical
- **Drives observable impact**

Level 3

- Multiple meta use cases across multiple user types
- **Drives better actions** and creates synergies as multiple user types benefit, reinforcing the impact

Level 4

- Fully embedded generative AI in all key workflows
- **Drives new behaviors**

Start in the middle and move upwards.

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The foundation:
Design upward compatible tech-stack

Approach: Increasing Complexity and Resource Intensiveness

	LLM *Pre-trained, out-of-the-box*	Prompt Engineering *Customize instructions*	Retrieval-Augmented Generation *Combine LLM with custom data*	Fine tuning *Refine an existing model*	Pretraining *Train a model from scratch*
	LLM only aware of data it was trained on		LLM may be made context and domain aware		
Pro /Con	✓Lowest effort to use • Variable response quality	✓Improves LLM responses • Instructions must be carefully crafted to get desired results	✓Efficient method to provide context ✓Highly adaptable • Requires additional technology and engineering	✓Additional control and customization ✓Reduce unknown bias • Requires additional resources and expertise	✓Maximum control ✓Avoid unknown bias • Most resource and expertise intensive
Use Cases	• Question/answer • Suggestions • Content generation	• LLM+ • Classification/Tagging • Summarization	• Sentiment analysis • Data Identification and Retrieval • Code generation		

Key Focus for Production

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Case Example: Upward Compatibility Tech Stack

Summarization only
(know problem; known answer)

↓

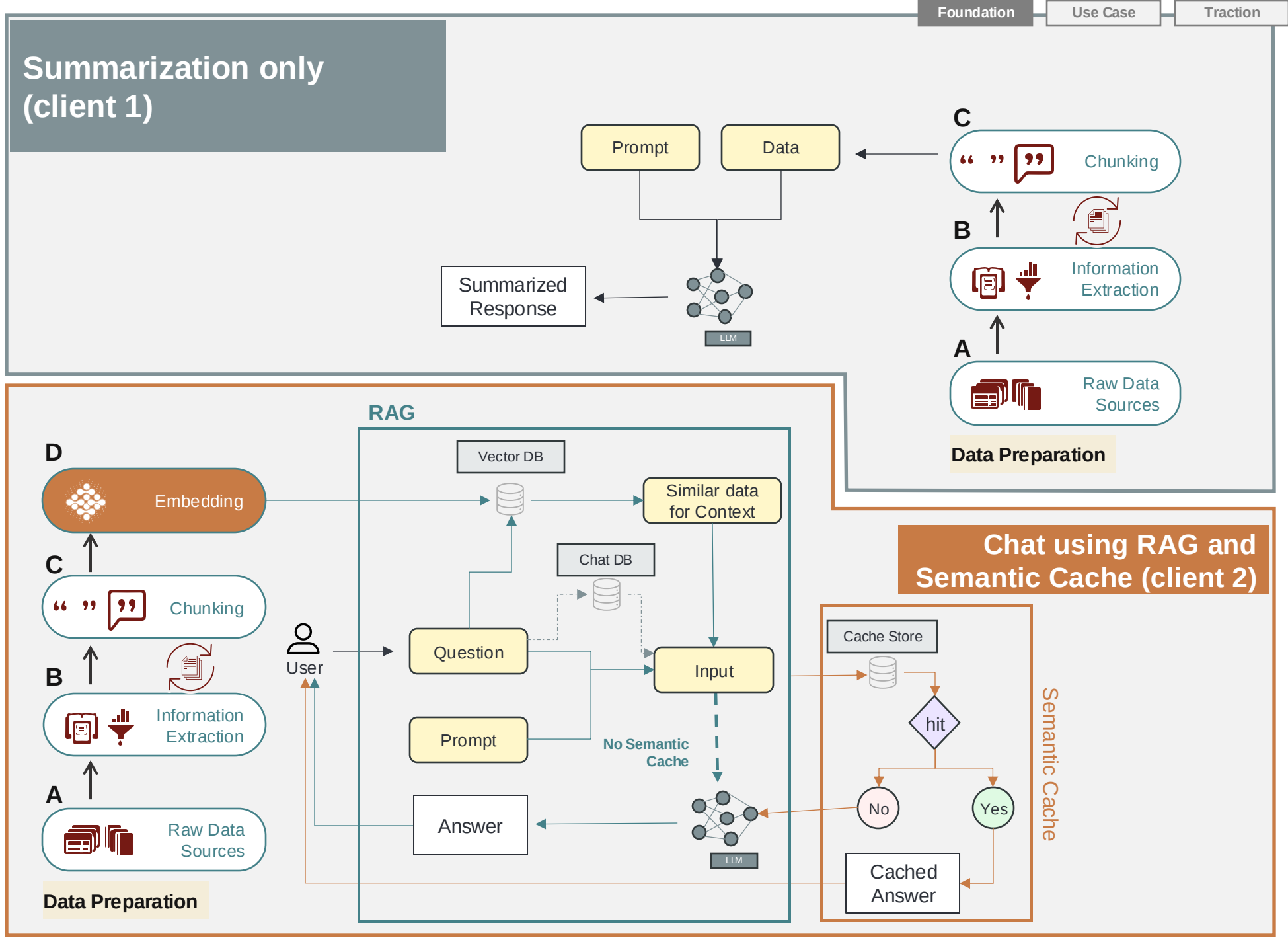
+ Rag Approach
(context and domain awareness)

↓

+ Dynamic query bot
(increase interactives; response history)

↓

+ Optimized semantic caching
(improve response time)

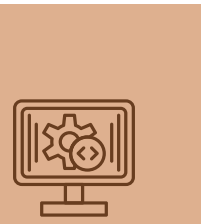


Effectively and safely leveraging your data with LLMs requires thoughtful strategies across the ecosystem

1. Data security
2. New and updated content
3. Testing pipeline
4. Garbage in/garbage out

Data Management Foundation

1. Data prep and InfoSec best practices for handling, validating, integrating, and managing ALL data
2. Targeted data ingestion using domain-appropriate techniques
3. Appropriately “chunking” data
4. Keep vector stores current through periodic refreshes



1. Accuracy and performance
2. Make data more relevant for LLMs

Tailoring Data Processing

1. Chose an LLM model for cost, latency, and relevance
2. Prompt engineering to optimize LLM outputs
3. Contextualization to provide the right LLM input
4. Test and iterate over sample data

1. Useability
2. Sensitive data
3. Unauthorized data access

Application Design

1. Understand where GenAI fits in the tech stack
2. Employ standard interface approaches (e.g. encryption, user-roles) to ensure end-to-end security

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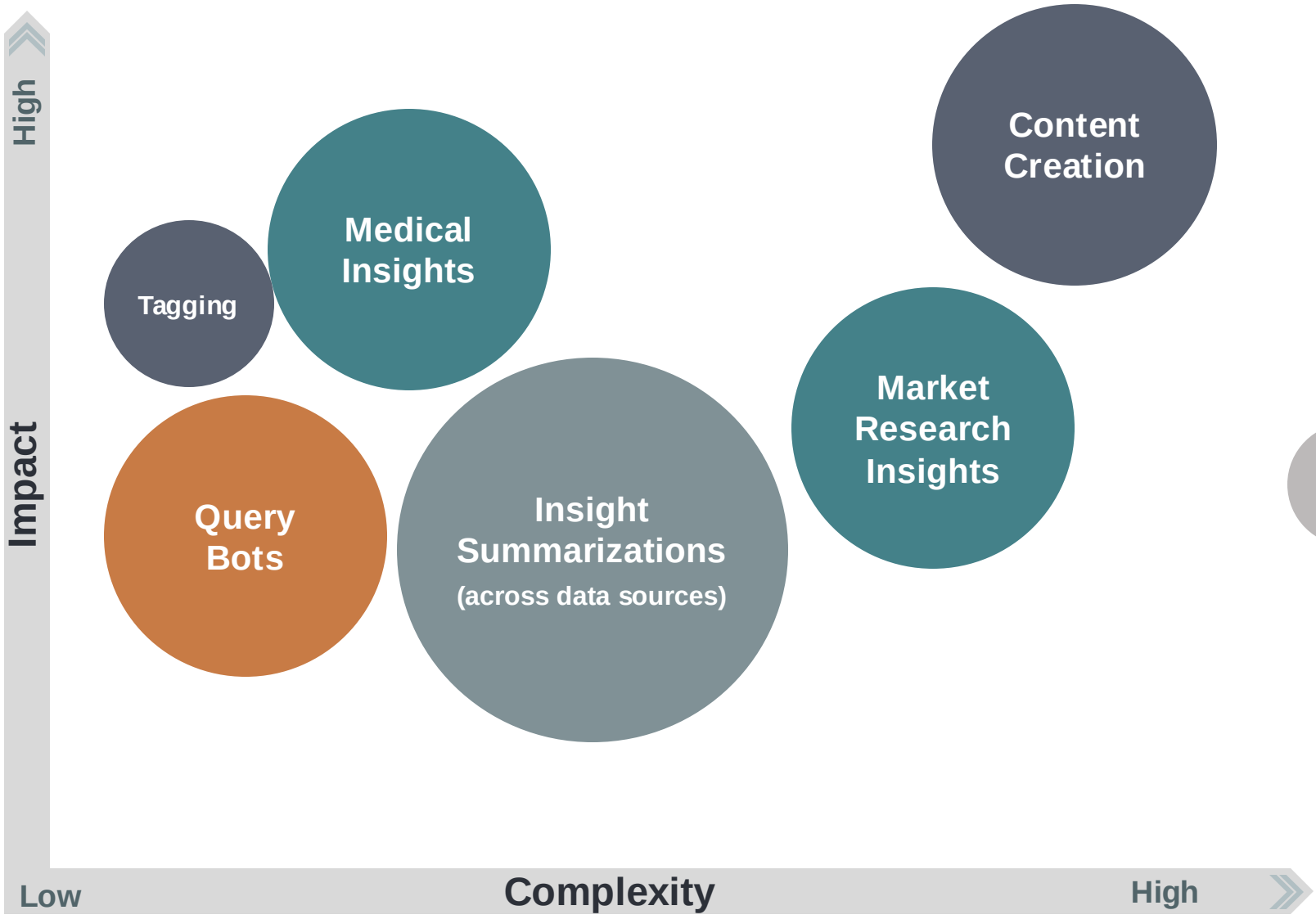
Case examples: Q&A bot for unstructured data

Problem	Solution
Proprietary "nouns" in free text notes	Consider LLM choice; Replace with generic when submitting to LLM; Rename back when showing output internally
Version confusion and duplication	Governance process to ensure only latest version is used
Unstructured data existing in different forms (insight text, graphs, PDFs, etc.)	Content-specific ingestion and chunking strategy; usage of vision models
Differential data access is required	User / persona-based permissions built into the process pipeline
Different sources may require different context	Appropriate contextualization techniques and few shot examples built into prompts to increase LLM awareness

Prioritizing the right use cases

Choose a “meta use case” (big/family of use cases)



For "**Impact**“, consider factors like:

- Long term value
- Business urgency
- Broader business goals
- Efficiency gains
- Enabling new capabilities

For “**Complexity**“, consider factors like:

- Data / integrability
- Feasibility ($, resources)
- Familiarity (tech needs, workflow)

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MEDICAL AFFAIRS CASE STUDY:

Turning insights to action with greater efficiency

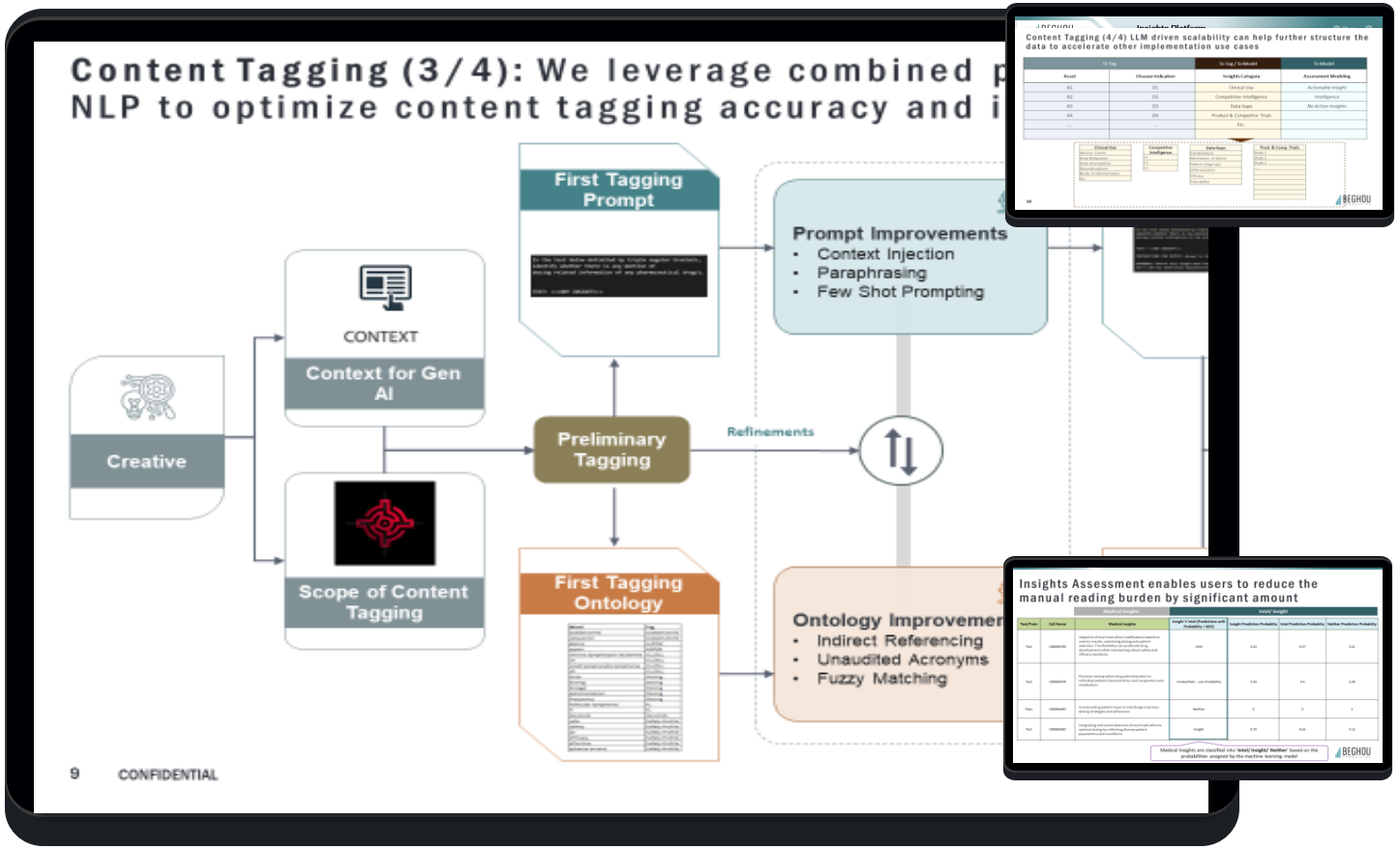
CHALLENGE: Medical affairs insights analysis is time consuming and prone to human error and bias

GENAI APPROACH:

- Prompt engineering to perform the tagging process and labeling notes
- TA contextualization and few shot promoting to improve accuracy and inference capabilities
- Pre-aligned accuracy metrics for success

IMPACT:

- More time to focus on actioning insights
- Increased accuracy and comprehensiveness
- Reduced lead time
- Daily automated processing



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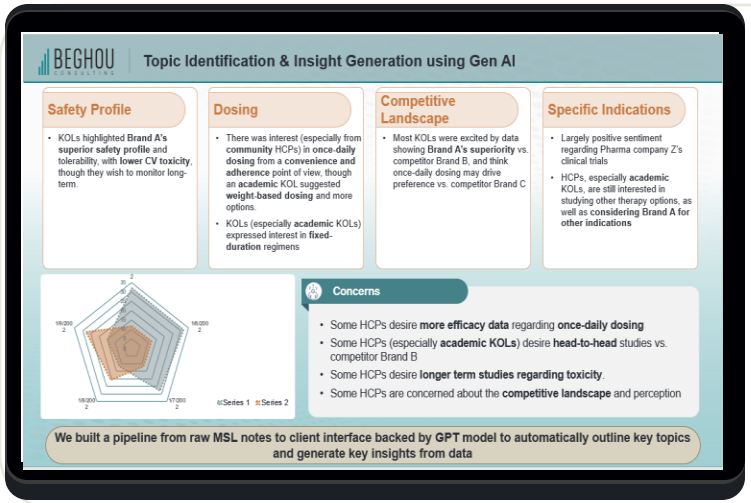
MEDICAL AFFAIRS CASE STUDY:
Democratizing insights

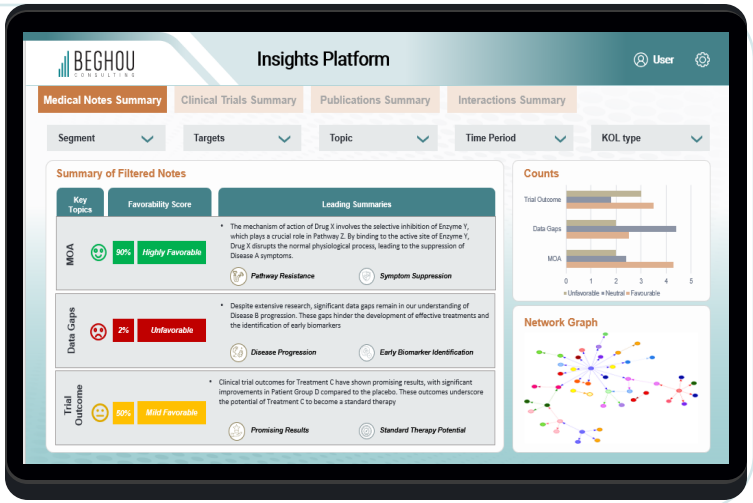


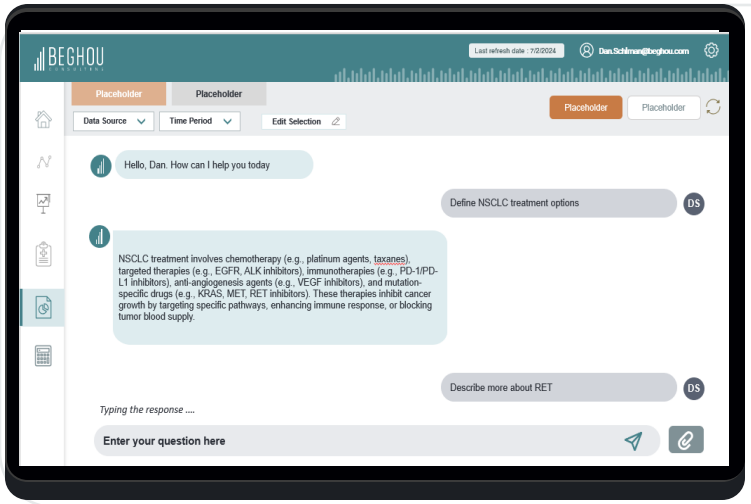
MSL Executive Summaries

Gen AI driven summary creation for executive leadership

MSL Insights Dashboard

Gen AI driven dashboard to generate on-demand insights



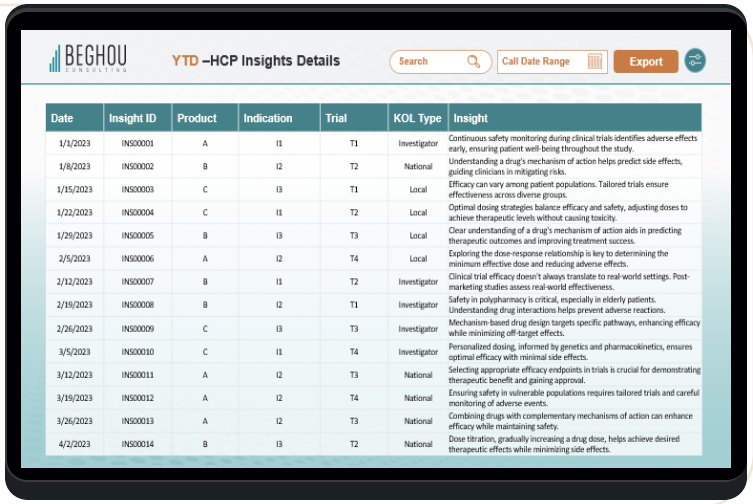


Conversational AI

GPT 4o enabled, agentic conversational AI enriched with knowledge graphs and customized ontologies

Semantic Search Enablement

GenAI-based automated semantic tagging to enable semantic search amongst knowledge pool



IMPACT From manual quarterly analysis to near real-time insights across the organization

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MARKET RESEARCH CASE STUDY:
Cataloging to disconnect analysis

User types a question.

User selects number of relevant references they want to retrieve.

Beghou Q&A Engine

Enter Query

Provide some Insights on the future market landscape in the non-small cell lung cancer (NSCLC) market.

1

Search

Answer

Market growth projections

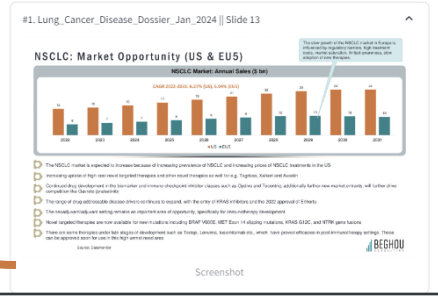
The non-small cell cancer (NSCLC) market is anticipated to experience significant growth in both the US and EU5 (Germany, France, the UK, Italy, and Spain) from 2022 to 2031. The US market is expected t0 growth from 14billionin2022to24 billion by 2031, while the EUS market is projected to expand from 6billionin2022to10 billion by 2031. The compound annual growth rates (CAGR) are estimated at 6.27% for the US and 6.04% for the EUS.

Key Drivers of Growth

The growth in the NSCLC market is driven by several factors, including the rising prevalence of NSCLC, increasing treatment costs, and the uptake of high-cost, novel targeted therapies such as Tagrisso, Xalkori, and Avastin. Continuous drug development in biomarker and immune checkpoint inhibitor classes, notably OPDIVO and Tecentriq, along disease driven with the entry of KRAS inhibitors highlight the market's adaptability and growth potential.

Opportunities and challenges

The NSCLC market's expension is further facilitated by the availability of targeted therapies for new mutations, including BRAF V600E, MET Exon 14 skipping mutations, KRAS G12C, and NTRK gene fusion. Late-stage therapies showing post-immunotherapy efficiacy, such as Tedopi, Lenvima and, tusamitamab, are nearing approval, addressing high unmet need. However. The market's growth in the Eu is hindered by regulatory barriers, high treatment costs, market saturation, limited awareness, and slow adoption of new trophies, contributing to the slower growth rate compared to the US.



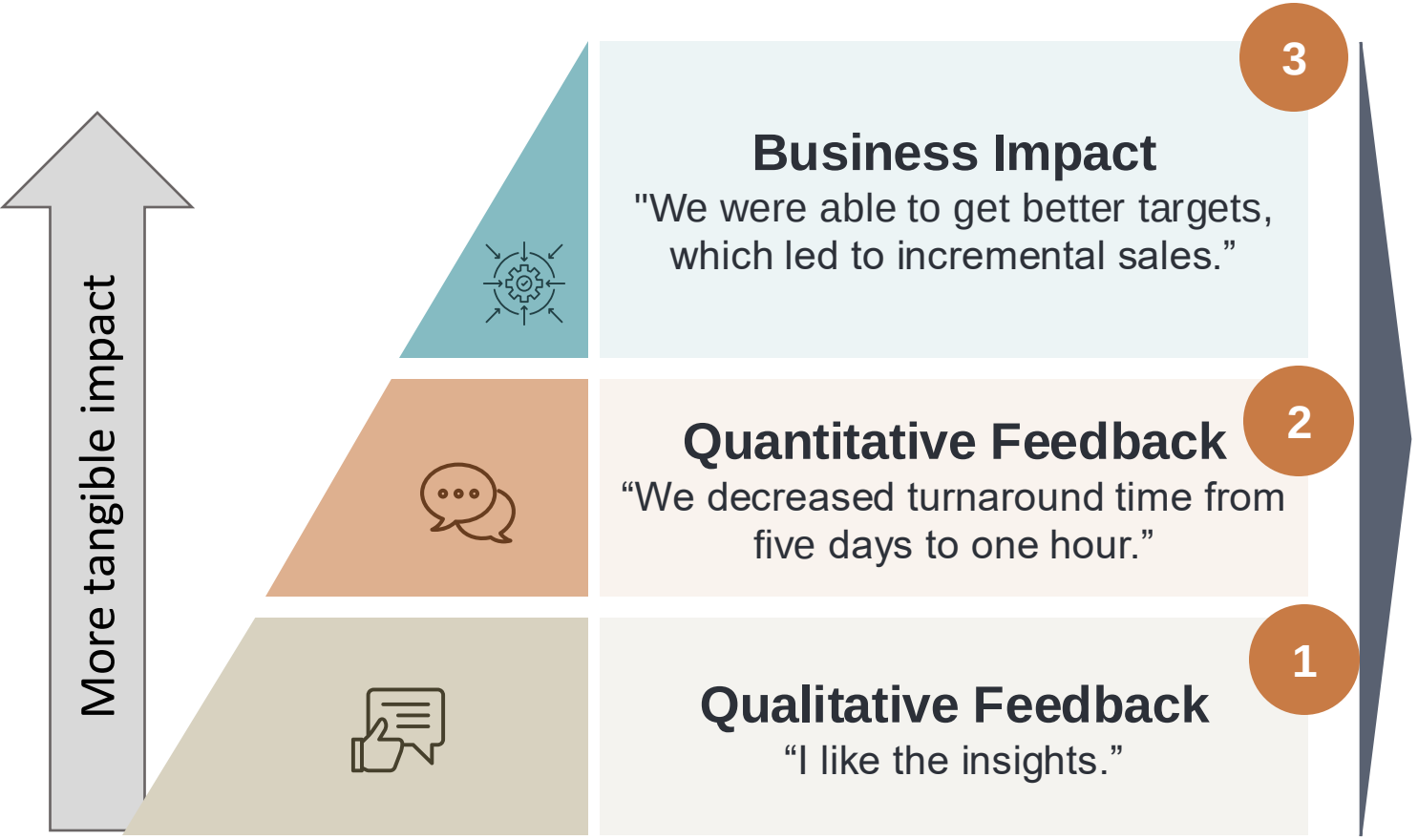
Q&A Engine provides answer powered by LLMs based on the Market Research repository.

Q&A Engine also provides the document name, location, and a snippet of the reference.

WHY?
Market Research insights is a good use case
1. More unstructured data
2. High Context, interconnected but predominantly siloed project

Two Key Business Drivers:
1. EFFECTIVENESS: Untapped Insights
2. DISCONNECT: Disconnect between quant and qual, Disconnect between market research and secondary data

Three types of organizational impact stories



- Use cases should meet all three types of impact.
- However, you don't have to produce the top tier immediately.
- Based on organizational maturity, in the short run you can focus on articulating the lower levels of impact and progress to the top.

No one is specifically fixated on highest level of impact (Business Impact) from the get-go. However, some clients can now claim this achievement after progressing from the foundational levels.

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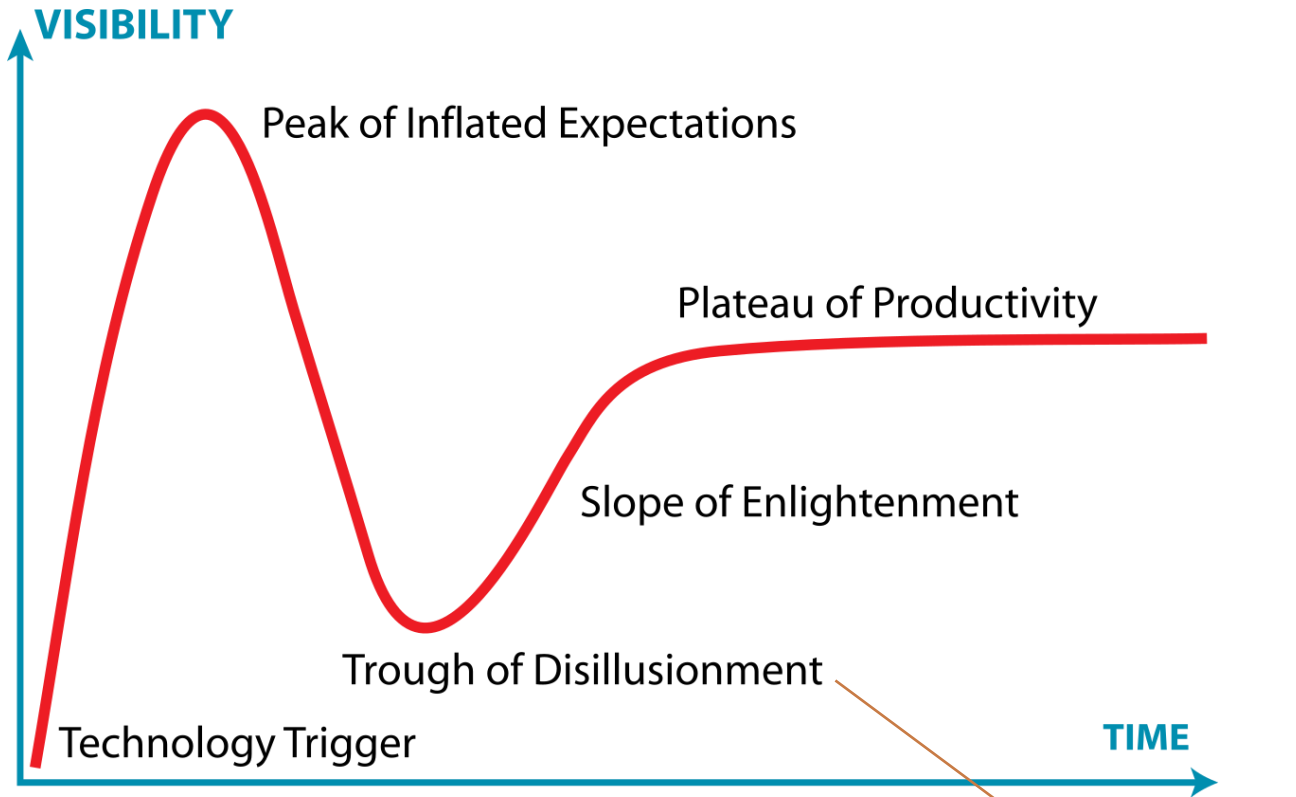
Planning for and gaining traction

You cannot assume "if you build it, they will come"



We should pre-empt this and plan to solve for this by building not just momentum but also an adequate change management plan

A trough does exist

- In pharma, teams can complain of tool overload
- There is often distrust of "black boxes"

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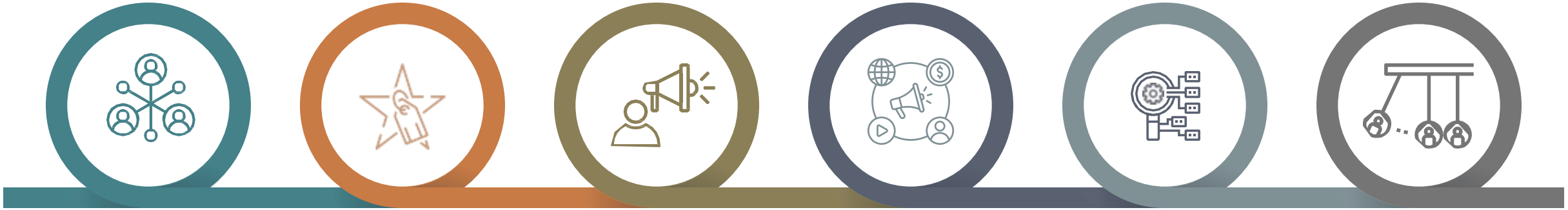
Key adoption and change management accelerators



Establish User Buy-In	Develop a Brand	Identify Ambassadors	Choose Impactful Meta Use Case	Check the Blind Spots	Make a Splash
Steering Committee of end users and stakeholders	“Branding” your platform, reports and tools (e.g., logo)	Power-users as ambassadors (e.g., help training, IT for jump-start)	Addresses business priority with unmet needs	“Soft launch" and create internal buzz	Launch in-person if possible

Industry Status

Typically a Broken Link

Hit or a miss

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Thank you!

Any questions for our speakers?

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