



# 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.

# 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

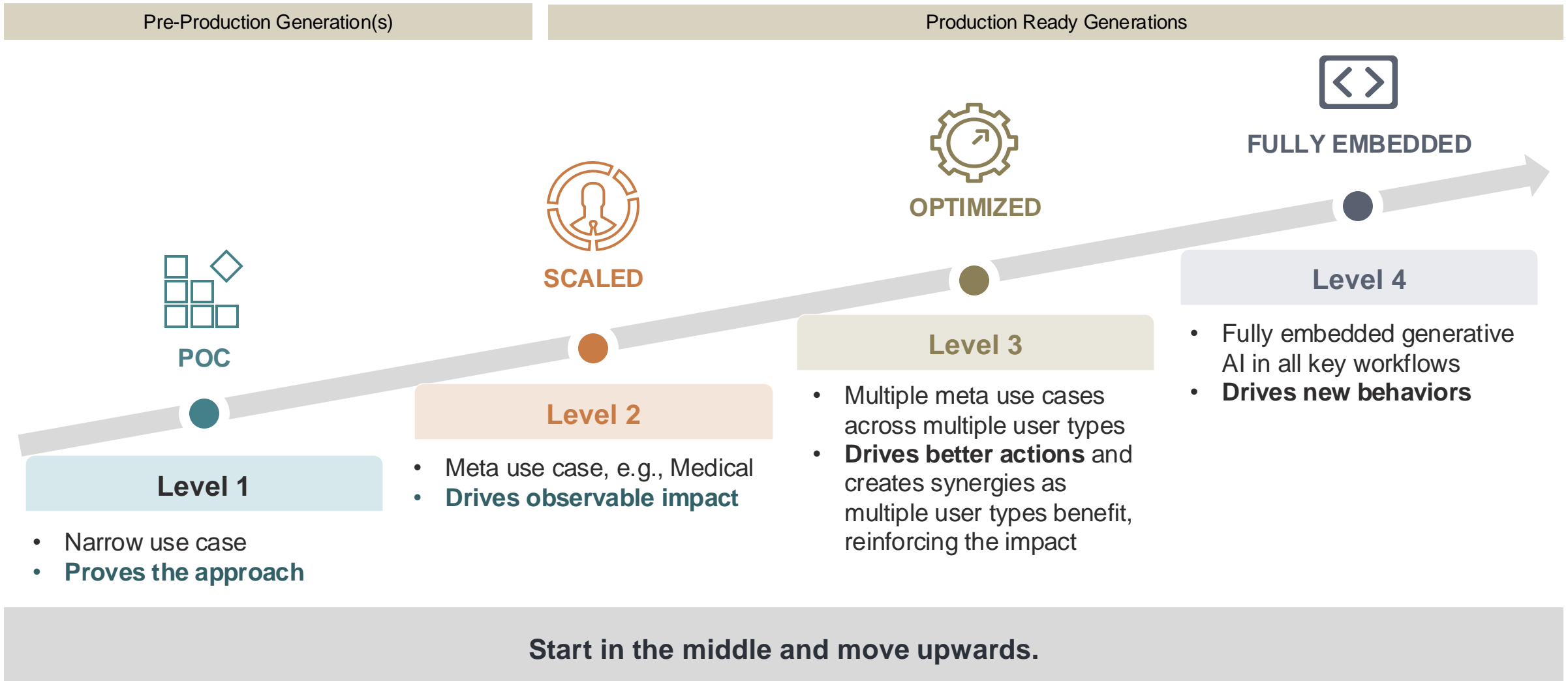
- **Building org momentum:** Going beyond a rallying cry.
- **Adoption:** Don’t assume that if you build it, they will come.



# Building the foundation



# The foundation: Design upward compatible Gen-AI Roadmap



# 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

- ✓ 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

- Question/answer
- Suggestions
- Content generation

- LLM+
- Classification/Tagging
- Summarization

- Sentiment analysis
- Data Identification and Retrieval
- Code generation

**Key Focus for Production**

Pro /Con

Use Cases

# Case Example: Upward Compatibility Tech Stack

Summarization only  
(know problem; known answer)



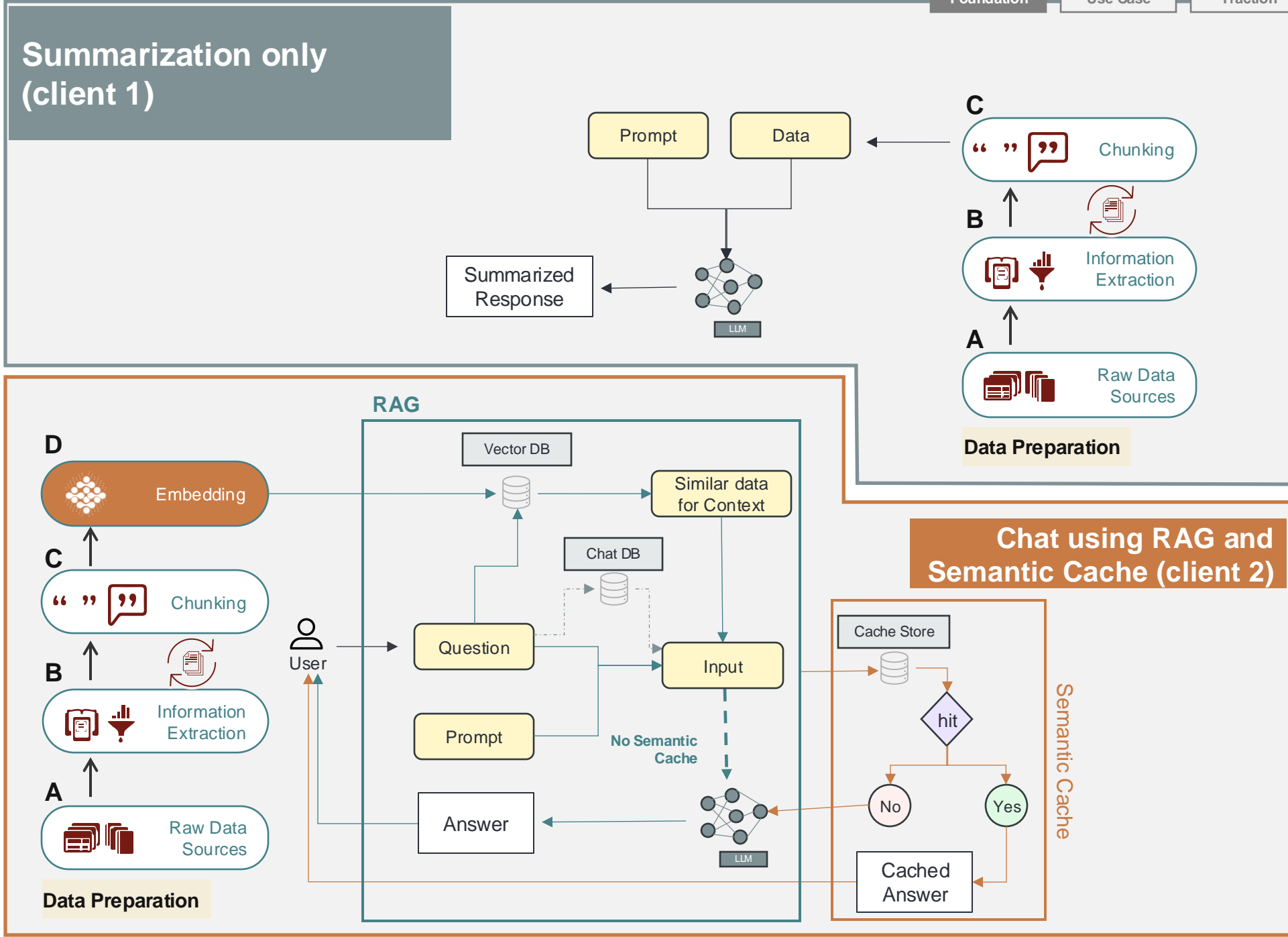
+ Rag Approach  
(context and domain awareness)



+ 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

# Case examples: Q&A bot for unstructured data

## Problem

Proprietary "nouns" in free text notes

Version confusion and duplication

Unstructured data existing in different forms (insight text, graphs, PDFs, etc.)

Differential data access is required

Different sources may require different context

## Solution

Consider LLM choice; Replace with generic when submitting to LLM; Rename back when showing output internally

Governance process to ensure only latest version is used

Content-specific ingestion and chunking strategy; usage of vision models

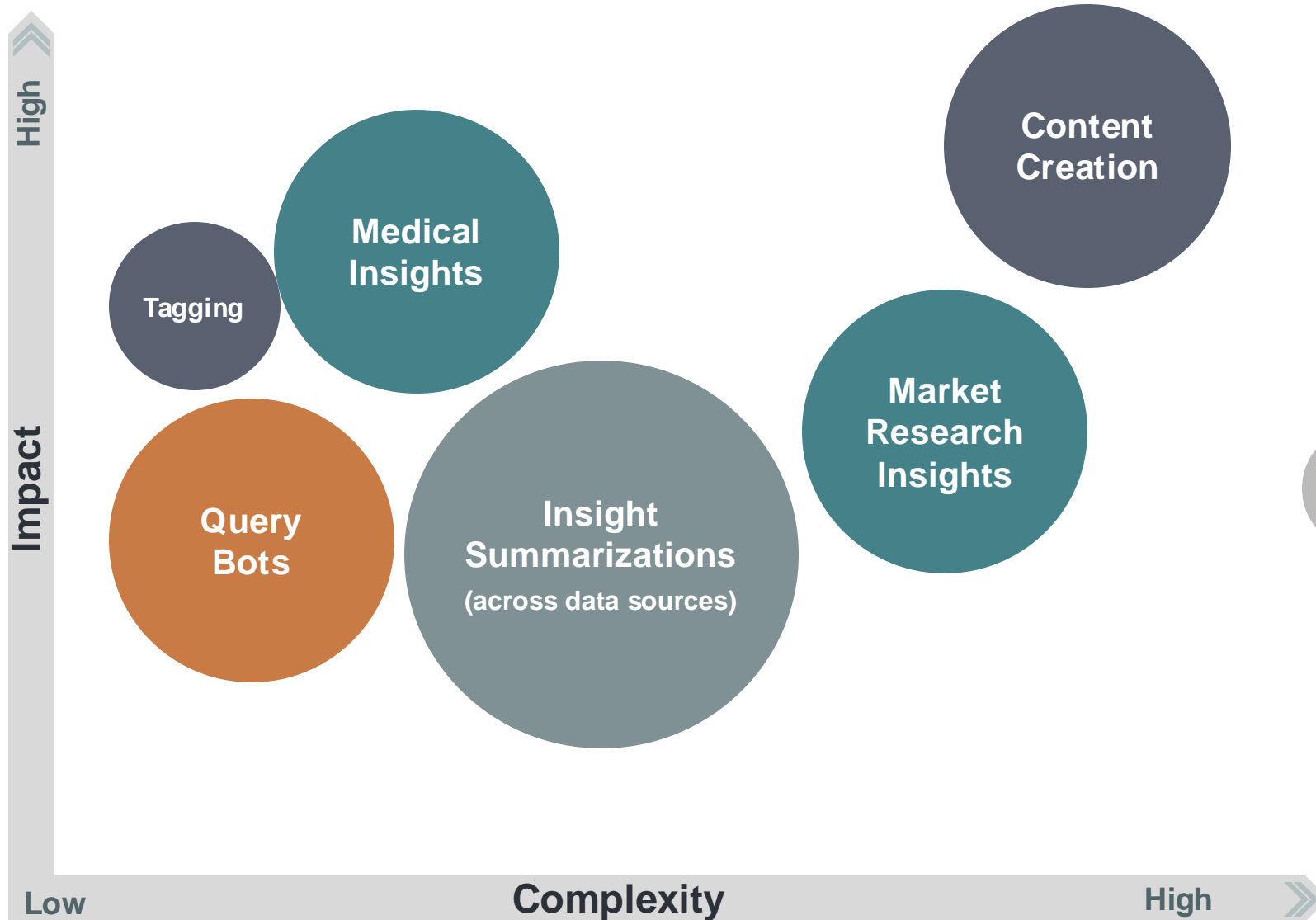
User / persona-based permissions built into the process pipeline

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)

## MEDICAL AFFAIRS CASE STUDY:

# Turning insights to action with greater efficiency

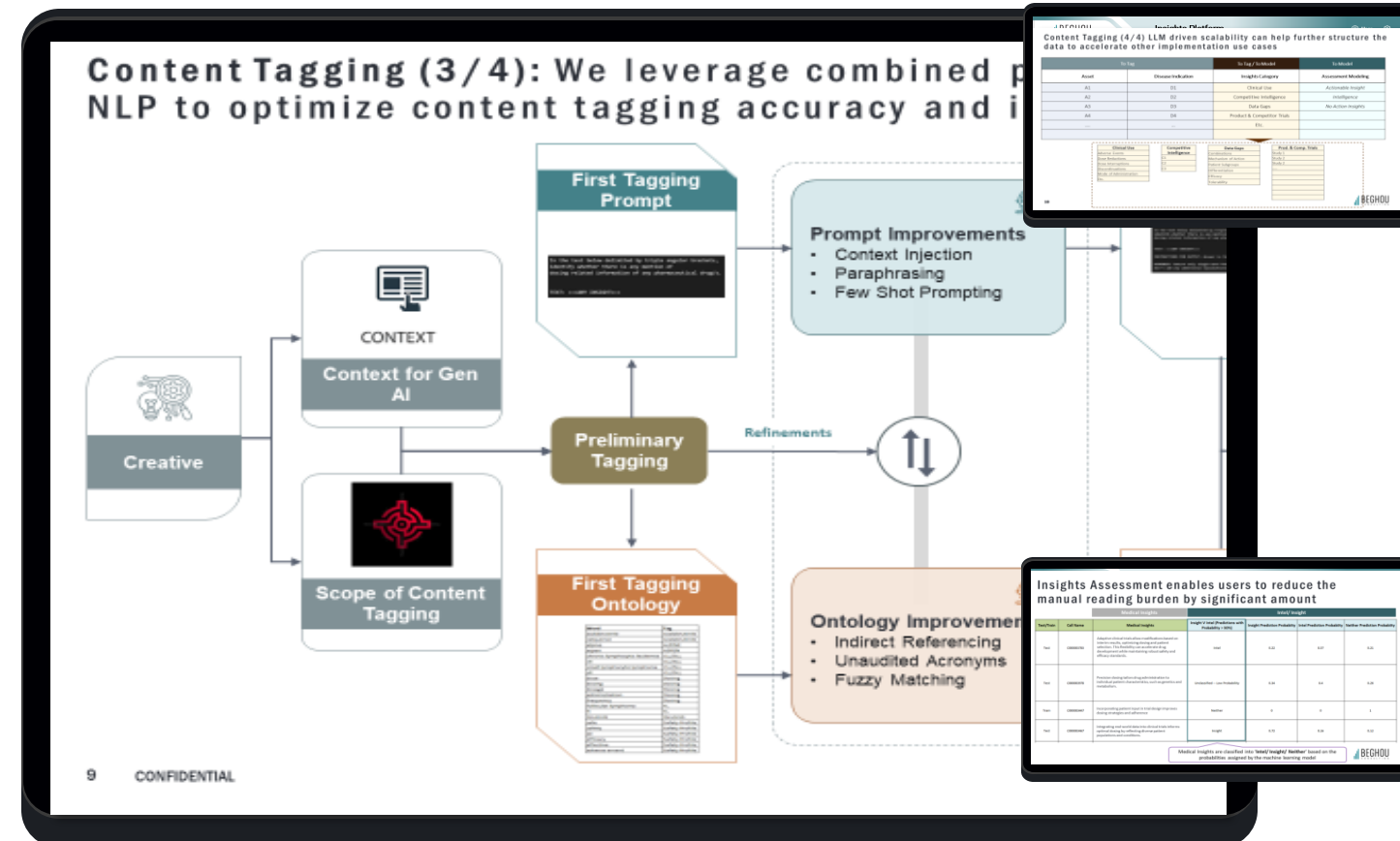
**CHALLENGE:** Medical affairs insights analysis is time consuming and prone to human error and bias

## 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





# MEDICAL AFFAIRS CASE STUDY: Democratizing insights

Foundation

Use Case

Traction

### Topic Identification & Insight Generation using Gen AI

#### Safety Profile

- KOLs highlighted Brand A's superior safety profile and tolerability, with lower CV toxicity, though they wish to monitor long-term.

#### Dosing

- There was interest (especially from community HCPs) in once-daily dosing from a convenience and adherence point of view, though an academic KOL suggested weight-based dosing and more options.
- KOLs (especially academic KOLs) expressed interest in fixed-duration regimens.

#### Competitive Landscape

- Most KOLs were excited by data showing Brand A's superiority vs. competitor Brand B, and think once-daily dosing may drive preference vs. competitor Brand C.

#### Specific Indications

- Largely positive sentiment regarding Pharma company Z's clinical trials.
- HCPs, especially academic KOLs, are still interested in studying other therapy options, as well as considering Brand A for other indications.

#### Concerns

- Some HCPs desire more efficacy data regarding once-daily dosing.
- Some HCPs (especially academic KOLs) desire head-to-head studies vs. competitor Brand B.
- Some HCPs desire longer term studies regarding toxicity.
- Some HCPs are concerned about the competitive landscape and perception.

We built a pipeline from raw MSL notes to client interface backed by GPT model to automatically outline key topics and generate key insights from data

## MSL Executive Summaries

Gen AI driven summary creation for executive leadership

## MSL Insights Dashboard

Gen AI driven dashboard to generate on-demand insights

### Insights Platform

Medical Notes Summary | Clinical Trials Summary | Publications Summary | Interactions Summary

Segment: [v] Targets: [v] Topic: [v] Time Period: [v] KOL type: [v]

#### Summary of Filtered Notes

Key Topics	Favorability Score	Leading Summaries
MCA	90% Highly Favorable	<ul style="list-style-type: none"> <li>The mechanism of action of Drug X involves the selective inhibition of Enzyme Y, which plays a crucial role in Pathway Z. By binding to the active site of Enzyme Y, Drug X disrupts the normal physiological process, leading to the suppression of Disease A symptoms.</li> </ul>
Data Gaps	7% Unfavorable	<ul style="list-style-type: none"> <li>Despite extensive research, significant data gaps remain in our understanding of Disease B progression. These gaps hinder the development of effective treatments and the identification of early biomarkers.</li> </ul>
Trial Outcome	50% Mildly Favorable	<ul style="list-style-type: none"> <li>Clinical trial outcomes for Treatment C have shown promising results, with significant improvements in Patient Group D compared to the placebo. These outcomes underscore the potential of Treatment C to become a standard therapy.</li> </ul>

#### Counts

#### Network Graph

### Conversational AI

Placeholder | Placeholder | Placeholder | Placeholder

Data Source: [v] Time Period: [v] Edit Selection: [v]

Hello, Dan. How can I help you today?

Define NSCLC treatment options [DS]

NSCLC treatment involves chemotherapy (e.g., platinum agents, taxanes), targeted therapies (e.g., EGFR, ALK inhibitors), immunotherapies (e.g., PD-1/PD-L1 inhibitors), anti-angiogenesis agents (e.g., VEGF inhibitors), and mutation-specific drugs (e.g., KRAS, MET, RET inhibitors). These therapies inhibit cancer growth by targeting specific pathways, enhancing immune response, or blocking tumor blood supply.

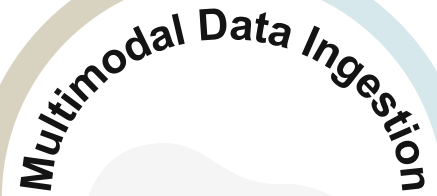
Describe more about RET [DS]

Typing the response ...

Enter your question here

## 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

### YTD -HCP Insights Details

Search [v] Call Date Range [v] Export [v]

Date	Insight ID	Product	Indication	Trial	KOL Type	Insight
1/1/2023	INS0001	A	I1	T1	Investigator	Continuous safety monitoring during clinical trials identifies adverse effects early, ensuring patient well-being throughout the study.
1/8/2023	INS0002	B	I2	T2	National	Understanding a drug's mechanism of action helps predict side effects, guiding clinicians in mitigating risks.
1/15/2023	INS0003	C	I3	T1	Local	Efficacy can vary among patient populations. Tailored trials ensure effectiveness across diverse groups.
1/22/2023	INS0004	C	I1	T2	Local	Optimal dosing strategies balance efficacy and safety, adjusting doses to achieve therapeutic levels without causing toxicity.
1/29/2023	INS0005	B	I3	T3	Local	Clear understanding of a drug's mechanism of action aids in predicting therapeutic outcomes and improving treatment success.
2/5/2023	INS0006	A	I2	T4	Local	Exploring the dose-responder relationship is key to determining the maximum effective dose and reducing adverse effects.
2/12/2023	INS0007	B	I1	T2	Investigator	Clinical trial efficacy doesn't always translate to real-world settings. Post-marketing studies assess real-world effectiveness.
2/19/2023	INS0008	B	I2	T1	Investigator	Safety is paramount, especially in elderly patients. Understanding drug interactions helps prevent adverse reactions.
2/26/2023	INS0009	C	I3	T3	Investigator	Mechanism-based drug design targets specific pathways, enhancing efficacy while minimizing off-target effects.
3/5/2023	INS0010	C	I1	T4	Investigator	Personalized dosing, informed by genetics and pharmacokinetics, ensures optimal efficacy with minimal side effects.
3/12/2023	INS0011	A	I2	T3	National	Selecting appropriate efficacy endpoints in trials is crucial for demonstrating therapeutic benefit and gaining approval.
3/19/2023	INS0012	A	I2	T4	National	Ensuring safety in vulnerable populations requires tailored trials and careful monitoring of adverse events.
3/26/2023	INS0013	A	I2	T3	National	Combining drugs with complementary mechanisms of action can enhance efficacy while maintaining safety.
4/2/2023	INS0014	B	I3	T2	National	Dose titration, gradually increasing a drug dose, helps achieve desired therapeutic effects while minimizing side effects.

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

# MARKET RESEARCH CASE STUDY: Cataloging to disconnect analysis

Foundation

Use Case

Traction

User types a question.

## 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

User selects number of relevant references they want to retrieve.

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

### Answer

#### Market growth projections

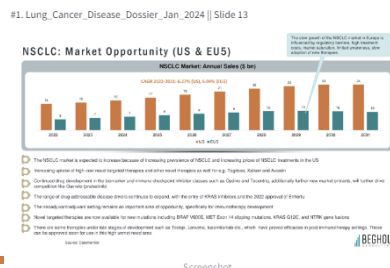
The non-small cell cancer (NSCLC) market is anticipated to experience significant growth in both the US and EU5 (Germany, France, the UK, Italy, and Spain) from 2022 to 2031. The US market is expected to grow from 14 billion in 2022 to 24 billion by 2031, while the EU5 market is projected to expand from 6 billion in 2022 to 10 billion by 2031. The compound annual growth rates (CAGR) are estimated at 6.27% for the US and 6.04% for the EU5.

#### 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 with disease driven with the entry of KRAS inhibitors highlight the market's adaptability and growth potential.

#### Opportunities and challenges

The NSCLC market's expansion 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 efficacy, such as Tedopi, Lenvima and tucusatamab, 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 therapies, contributing to the slower growth rate compared to the US.



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

**WHY?**  
Market Research insights is a good use case

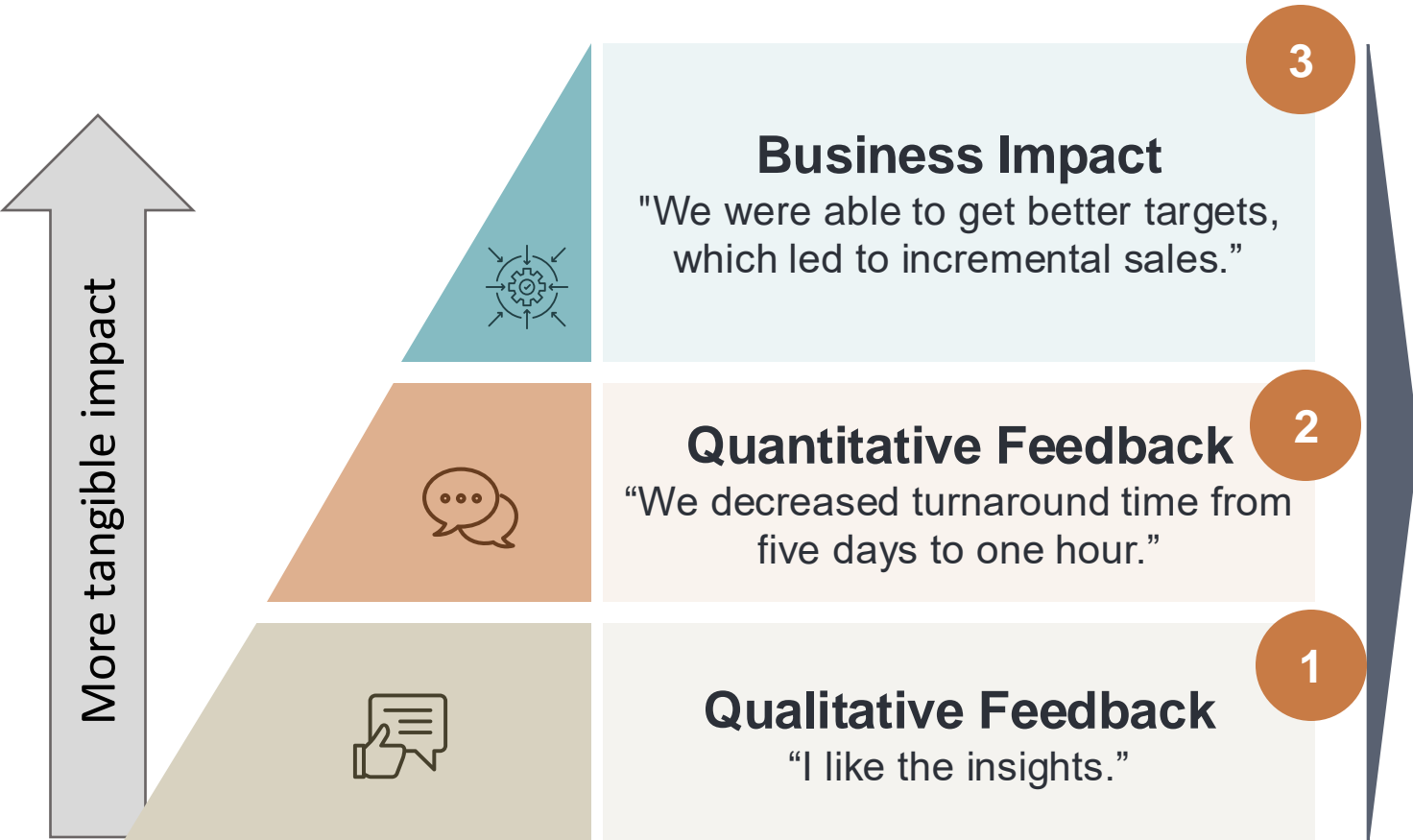
1. More unstructured data
2. High Context, interconnected but predominantly siloed project



**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



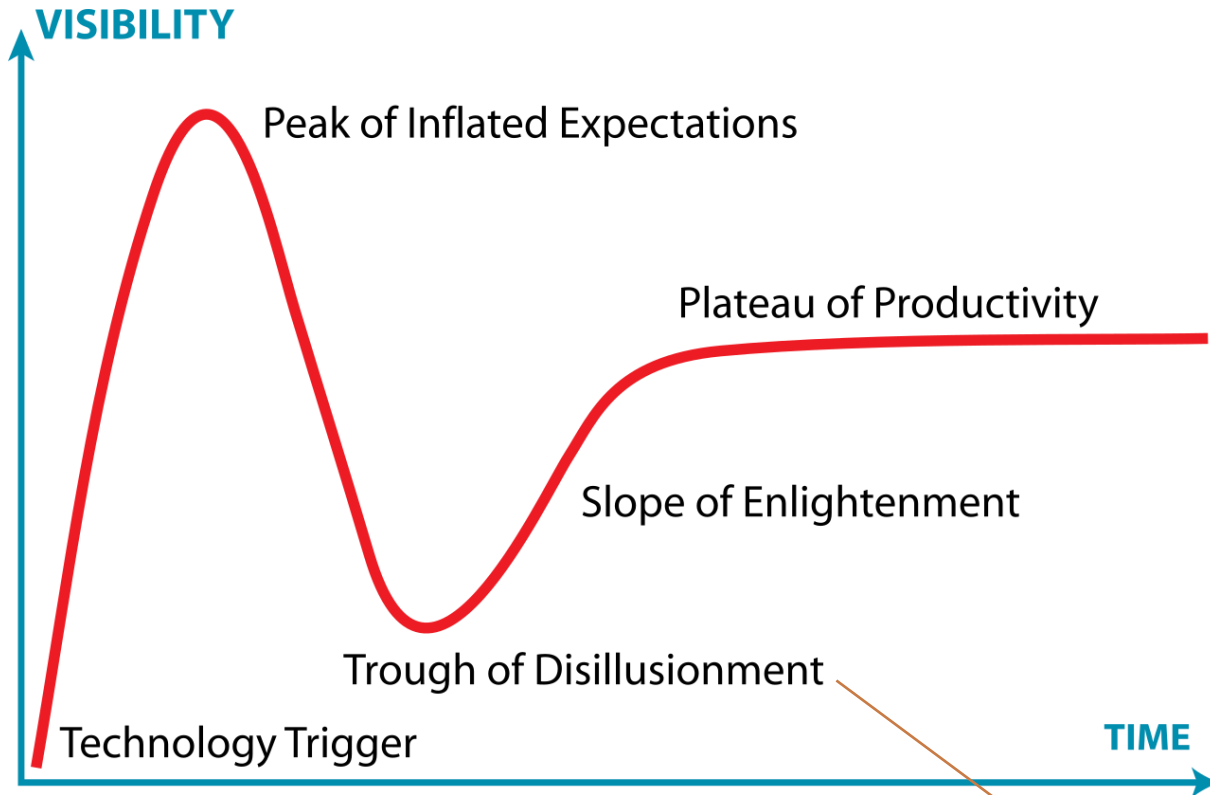
- Use cases should meet all three types of impact.
- However, you don't have to produce the top tier immediately.
- Based on organizational maturity, in the short run you can focus on articulating the lower levels of impact and progress to the top.

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.

# 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

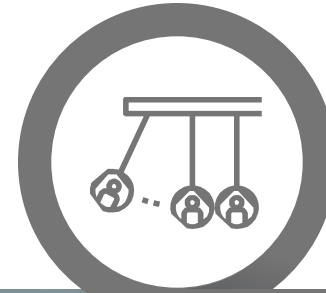
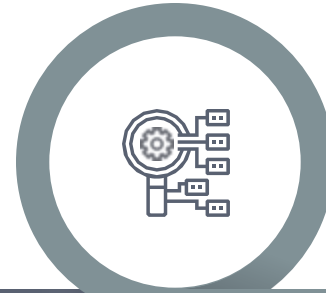
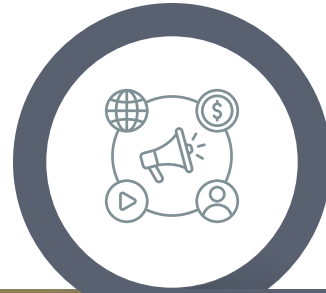


## A trough does exist

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



# Key adoption and change management accelerators



## Establish User Buy-In

Steering Committee of end users and stakeholders

## Develop a Brand

“Branding” your platform, reports and tools (e.g., logo)

## Identify Ambassadors

Power-users as ambassadors (e.g., help training, IT for jump-start)

## Choose Impactful Meta Use Case

Addresses business priority with unmet needs

## Check the Blind Spots

“Soft launch” and create internal buzz

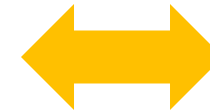
## Make a Splash

Launch in-person if possible

Industry Status



Typically a Broken Link



Hit or a miss



# North Star: Moving from GenAI POC to Production

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



# Thank you!

## Any questions for our speakers?

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