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PENDOMONIUM 2023

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**Supercharging product
innovation with
generative AI:**

Building better products, faster



Agenda

- Intro to GenAI
- GenAI realization for product teams
- Making GenAI enterprise ready

AI is fundamentally changing business processes

Predictive AI

Data

Labelled Data
Specific Data Sets

Models

Specific Model for a Specific task

Predictive Analytics

Demand Forecasting
Stocking/inventory planning
Dynamic pricing

Anomaly detection

Fraud detection / AML
Cybersecurity (e.g., Email monitoring)

Classification

Vision &
NLP Data Labeling

Regression

Customer Lifetime Value
Churn Prediction

Recommendation Systems

Search/Rec for Retail
Video recommendations
Game experience recomm.

Image Recognition

Medical Diagnostics
Image-based search
Physical security

Generative AI

Data

Unlabelled Data
generic Data Sets

Models

General Models

Content Generation

Text, Images, Video, Code
etc.

Semantic Search

Talk to docs

Conversational AI

Human-like coherence of
conversation and
responsiveness

Enterprise Search

Your Data , securely
searched

Embeddings

Make unstructured data
computationally accessible

Code Generation

Increase developer
productivity n-fold

Proprietary + Confidential



Go read this huuuuuge pile of books.

So, you've learned about cats and millions of other concepts ... what's a cat?

A cat is a small, domesticated carnivorous mammal.

Generative language models

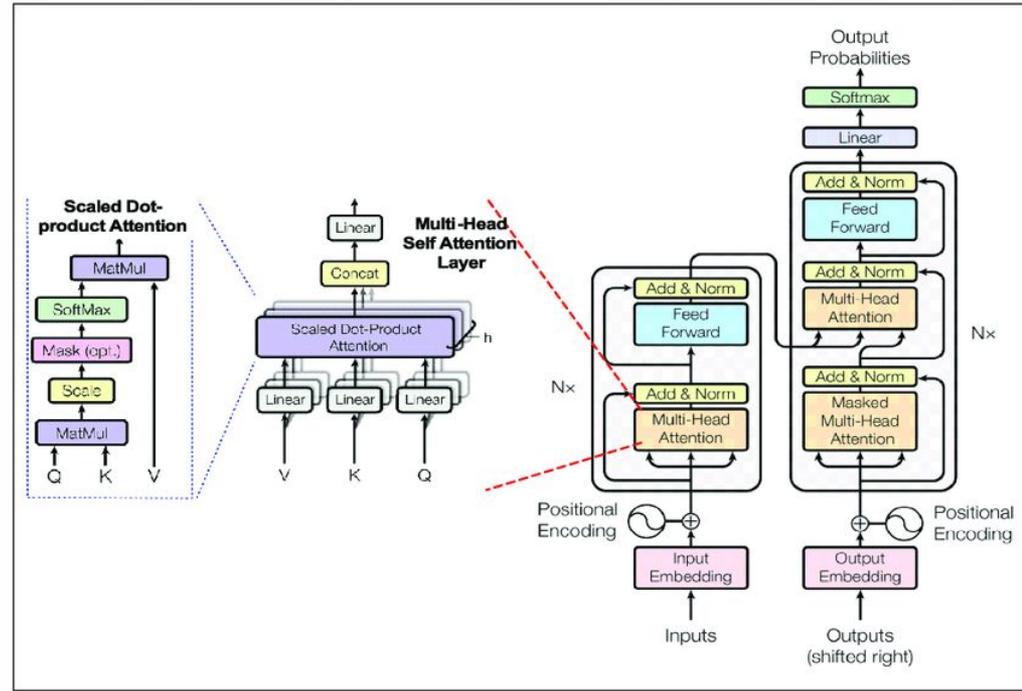
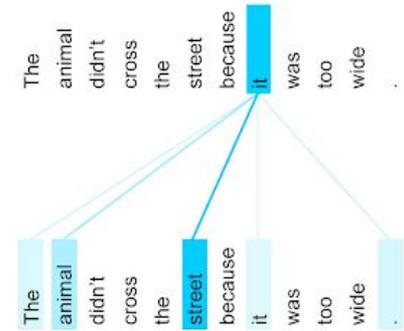
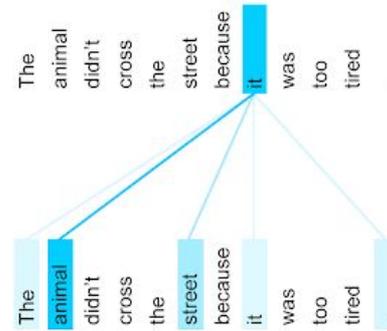
LaMDA, PaLM, GPT-3, etc.

Google Cloud

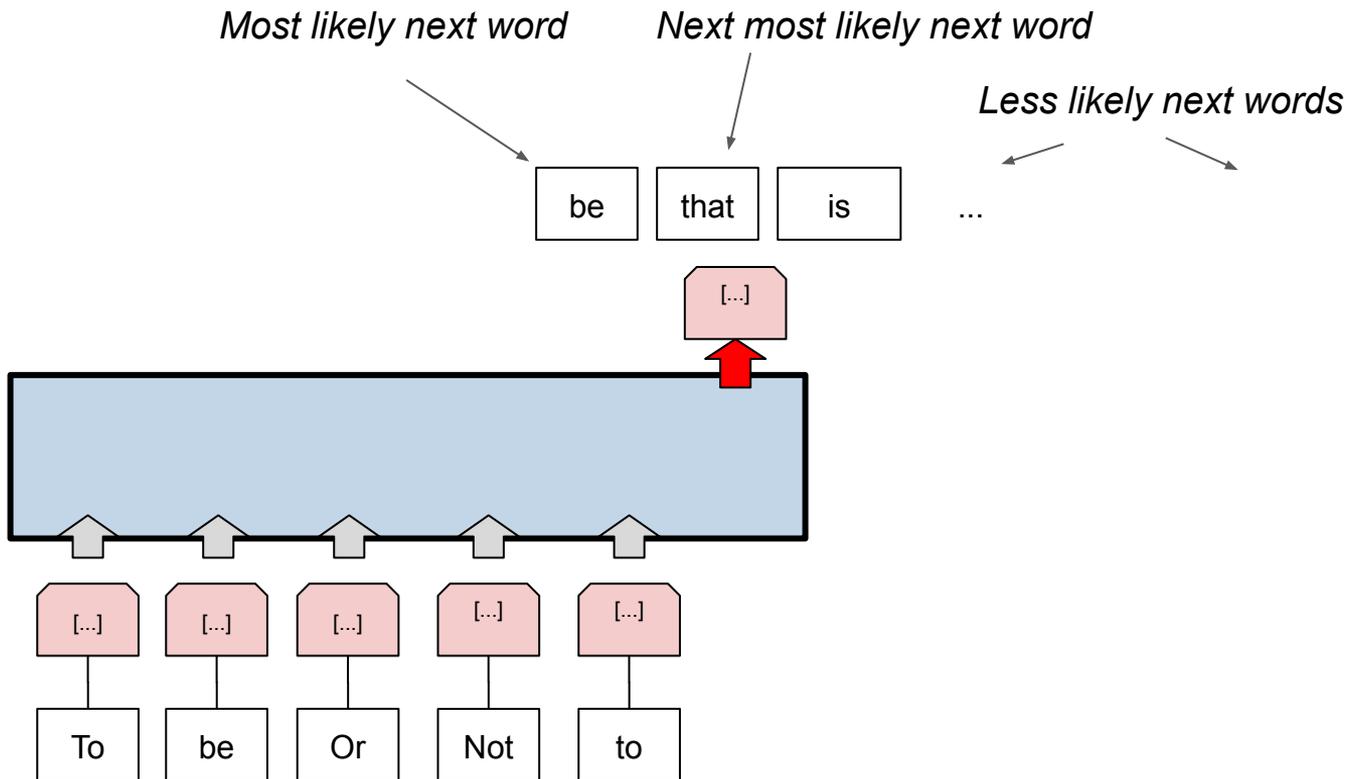
Transformers : "Attention is All you Need"

Published in 2017 by Google Brain and the University of Toronto.

Task : Language Translation



Language Models will try to predict the most likely next word based on their pre-training



Consumers & enterprises have different needs....



Consumers and enthusiasts

Help me plan a neighborhood block party

Outline my blog post about summer mocktail recipes

I want to write a novel. How do I get started?

Draft a packing list for my weekend fishing and camping trip

Give me a list of idioms for "let's circle back" that aren't cringe

Help me name my first EP

Bard, MakerSuite



Enterprises

Allow data analysts to search and summarize market reports while **controlling our data**

Handle a customer service interaction with **accurate info**

Help my customers understand my financial products while being **safe, explainable, and regulatory compliant**

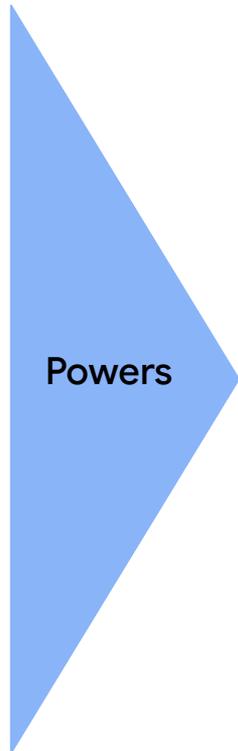
Can you guarantee we have **access to state-of-the-art models?**

Is it easy to **integrate into our existing apps and platform?**

Can we generate content while **controlling costs?**

Vertex AI

Google's research drives a family of models which power experiences for all users



Consumer / Hobbyist Experiences



Bard



MakerSuite

Enterprise Experiences

Duet AI for

Google Workspace



Google Cloud

In-console Code & Chat Assistance
Security AI Workbench

AI Builder Experiences



Vertex AI

Generative AI App Builder

Med-PaLM 2

Sec-PaLM

Models for AI Builders

Example:
PALM API's Model:
text-bison-001

Animal indicates size

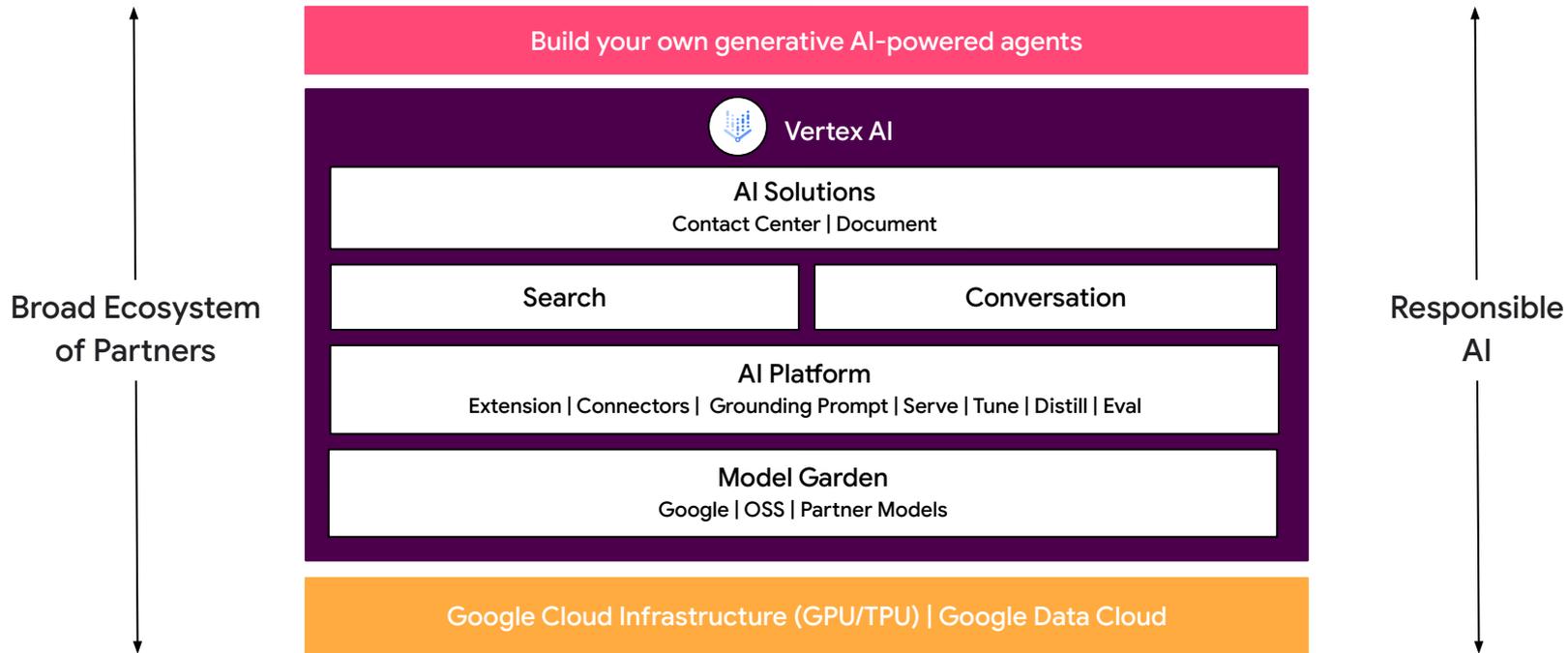
- Unicorn
- Bison
- Otter
- Gecko

Numbers indicate version

001 -> 002
Signifies refresh

Google Cloud's Generative AI Portfolio

To support the needs of **Generative AI** centric enterprise development



Supercharging Product Innovation with Generative AI

Rapid Ideation & ProtoTyping

- Variation Generation: Produce numerous design variations in minutes.
- Swift Feedback Loop: Quicker iteration based on real-time AI evaluations.
- Refined Outcomes: Filter through generated ideas to choose top contenders.

ROI & Cost Efficiency

- Virtual Prototyping: Reduces physical resources and time.
- Material Savings: Minimize wastage with optimized designs.
- Reduced R&D Time: Faster time-to-market with efficient prototyping.

Optimization

- Multifaceted Analysis: Considers various objectives and constraints.
- Superior Solutions: Offers designs beyond human intuition.
- Performance Driven: Balances aesthetics with functionality.

generative AI can powerfully reshape product innovation Confidential

Consumer-driven Designs

- **Consumer Data Integration:** Align designs with market demand.
- **Predictive Analysis:** Anticipate and cater to emerging trends.
- **Enhanced Market Fit:** Improved product acceptance and lower shelf time.

Sustainability

- **Eco-Friendly Designs:** Prioritizes minimal environmental impact.
- **Resource Optimization:** Efficient use of materials and energy.
- **Life-cycle Analysis:** Considers environmental footprint across product lifespan.

Personalization

- **Tailored Experiences:** Unique designs for individual preferences.
- **Scalable Customization:** Mass personalization without significant overheads.
- **Consumer Loyalty:** Enhanced brand experience and retention.

Supercharging Product Innovation with Generative AI

Proprietary + Confidential

Enhanced Creativity

- Expanded Design Palette: Offers diverse and unexpected suggestions.
- Human-AI Collaboration: Combines machine efficiency with human intuition.
- Breakthrough Innovations: Paves the way for pioneering designs.

Cross-industry Applications

- Versatile Implementation: Applicable from fashion to automotive industries.
- Industry-Specific Solutions: Tailored AI models for niche demands.
- Collaborative Learning: Transfer knowledge across sectors.

Continuous Learning & Adaptation

- Dynamic Update: Adapts to changing market and tech scenarios.
- Data-Driven Refinements: Continual improvement based on feedback.
- Future-Proof Designs: Ensures relevance in evolving landscapes.

genAI is poised to revolutionize how businesses approach product innovation, offering a blend of speed, efficiency, and adaptability that's unparalleled by traditional methods.

Risk Mitigation

By simulating various scenarios, generative AI can predict potential failures or weaknesses in a design. This early detection can save companies from costly recalls or redesigns in later stages, ensuring a more robust final product.

- Predictive Failure Analysis: Early identification of design flaws.
- Cost Avoidance: Prevents expensive recalls and redesigns.
- Robust Outputs: Ensures high-quality, durable products.



Role of Product Managers in Driving GenAI Realization

The introduction of **GenAI** into **product development** brings with it a paradigm shift in how products are conceived, built, and improved. This is where the role of PMs becomes paramount.

- **Vision Casting:** clear vision of how GenAI can enhance their product. Adept at forecasting technological trends and aligning them with business goals.
- **Collaborative Leadership:** The interdisciplinary nature of GenAI means fostering collaboration between data scientists, developers, UX designers, and other stakeholders.
- **Risk Management:** Like all AI, GenAI has ethical considerations. Ensure that their product respects user privacy, avoids biases, and meets all regulatory standards.
- **Continuous Learning:** The field of GenAI is evolving rapidly. Commitment to continuous learning to stay abreast of the latest developments, methodologies, and best practices.
- **Stakeholder Communication:** Ensure internal stakeholders (like executives or board members) and external ones (like users or investors) understand the value and implications of GenAI in the product.

Tracking product analytics (UX journey) is key to building a better product.

- Product analytics data can help you **understand how users are interacting** with your product:
 - Where they are getting stuck, and
 - What features they are using the most.
 - This information can be used to improve the user experience,
 - Prioritize new features, and make better business decisions.
- ***Google Analytics and Pendo data complement each other***
 - Enable product and business teams to track in-app user behavior.
- Google Analytics is a powerful tool for ***tracking overall website traffic and behavior***.
 - More ***detail about in-app user behavior*** as a product analytics platform like Pendo.
- ***Pendo provides detailed insights into how users are interacting*** with your product,
 - Which ***features*** they are using,
 - Where they are ***dropping off***, and
 - What ***errors are encountered***.
 - Used to ***improve the user experience and fix any usability issues***.

Tracking product analytics (UX journey) is key to building a better product.

- *Interpreting user feedback at scale is time consuming and inefficient.*
- **Manage and interpret user feedback** at scale as your product grows
 - Leveraging genAI to **improve signal to noise ratio** (from user feedback)
 - Allowing product teams to **focus more on the big picture** (common themes and pain points) ... **leading to better product.**
- GenAI used to analyze user feedback data at scale and **identify common themes and pain points.**
 - product teams can **focus on the most important issues** and
 - make **better product decisions.**
- Bringing together **Pendo's product analytics with Google genAI** also helps for more conversational analysis of the data - **allowing non-technical teams to dig into user feedback.**

In App Analytics and Gen AI

- In-app product analytics is the ***process of collecting and analyzing data about how users interact with a product*** (e.g., mobile app).
 - a. This data can be used to ***improve the user experience, prioritize new features, and make better business decisions.***
- GenAI models are ***trained on large datasets of existing content, and they can learn to generate new content*** that is similar to the training data.
- ***Intersections***
 - a. Gen AI can be used to ***analyze*** in-app product ***analytics data at scale and identify common themes and pain points.***
 - b. ***Help product teams to focus on the most important issues*** and make better product decisions.

Generative AI will transform the product development lifecycle

- ***Improve the user experience***
 - By analyzing in-app product analytics data, Gen AI can identify areas where the user experience can be improved.
 - identify features that are difficult to use or to identify errors that are causing users to abandon the app.
- ***Prioritize new features***
 - Gen AI can be used to analyze in-app product analytics data to identify the features that are most important to users.
 - This information can be used to prioritize new feature development.
- ***Make better product decisions***
 - Generative AI can be used to simulate the impact of different product decisions on user behavior. This information can be used to make better product decisions.

To Realize these Benefits you need the right Generative AI: Business Value Checklist

What is the checklist to be aware of in this roadmap to gain and maintain business value from GenAI?

- **Derive** Business Value
 - How can we generate business value from Generative AI?
- **De-risk** the Decision Path
 - What are the risks, pitfalls and key considerations? Security, Privacy, Grounding.
- **Deal with the ramifications**
 - Of your decision path in Generative AI
- **Decide:** Maintain the Ability to **Pivot**
 - Business
 - Technical – Architecture

Key Enterprise Considerations for GenAI

New Business Models

Business Aspects

Optimize Business Models

Governance & Responsible AI

Privacy & Security

Cost & ROI

Domain-specificity

Org, Culture & Skills

Technical Aspects

Vertical Tooling Support

Horizontal ML Lifecycle Support

Generative AI Enterprise Integration

Infrastructure

Prototype to Production

Key Enterprise Considerations for GenAI

New Business Models

Business Aspects

Optimize Business Models

Governance & Responsible AI

Privacy & Security

Cost & ROI

Domain-specificity

Org, Culture & Skills

Are you training with bias?
When should you retrain?
Are your models/apps domain-specific enough?

Technical Aspects

Vertical Tooling Support

Horizontal ML Lifecycle Support

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Responsible AI Tooling, Enablement, and Support



Safety
Attributes



Content
Moderation
API



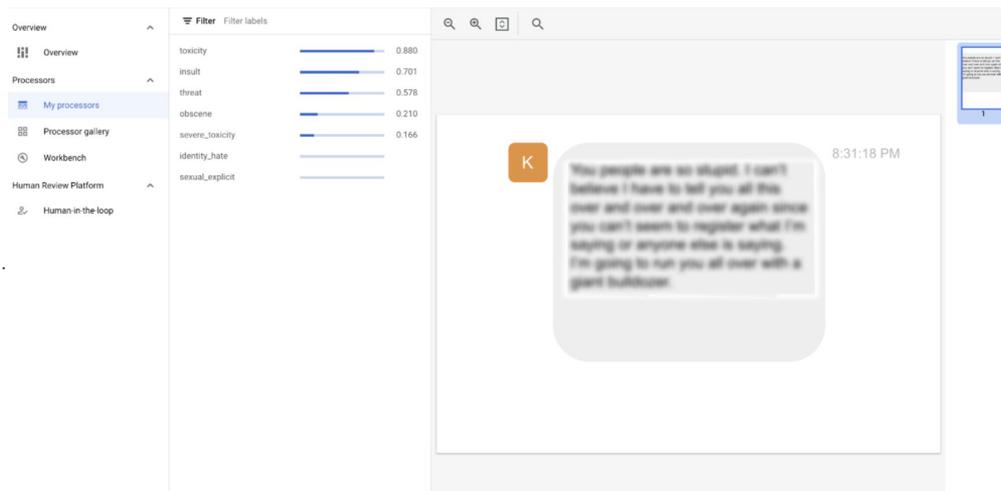
Recitation &
Factuality



Bias
Evaluation
Tooling

Content Moderation API

Our Content Moderation API will enable customers to detect and scan potentially offensive and harmful content.



Toxicity

Insult

Sexual

Violence

Obscenity

+ more

Bias Evaluation Tooling

Our Bias Evaluation Tooling will enable customers to assess potential bias in safety attribute performance within their prompt-tuned and/or fine-tuned models.

Assess how robust and resilient the safety attributes are to adversarial inputs and outputs across identity factors, industry, and use case.

Identity Group	Subgroup AUC 	BPSN AUC 	BNSP AUC 
African	1.0	1.0	1.0
African American	1.0	1.0	1.0
American	1.0	1.0	0.99
Asian	1.0	1.0	1.0
Bisexual	1.0	0.9%	1.0
Black	1.0	1.0	1.0



Model Card

Generative AI in the Enterprise

Additional considerations:

- The **ethical implications** of generative AI
- The **regulatory landscape** for generative AI
- The **impact** of generative AI on the **workforce**

Questions for discussion:

- What are the biggest **challenges** you see in making generative AI enterprise-ready?
- What are the most **important steps** that enterprises can take to prepare for generative AI?
- What are your thoughts on the **future** of generative AI in the enterprise?

Key Enterprise Considerations for GenAI

New Business Models

Business Aspects

Optimize Business Models

Governance & Responsible AI

Privacy & Security

Cost & ROI

Domain-specificity

Org, Culture & Skills

Is your private data secure?
Are you exposing our IP?
Are your models secure?
Is your code secure?

New Products & Services

Technical Aspects

Optimize Products & Services

Vertical Tooling Support

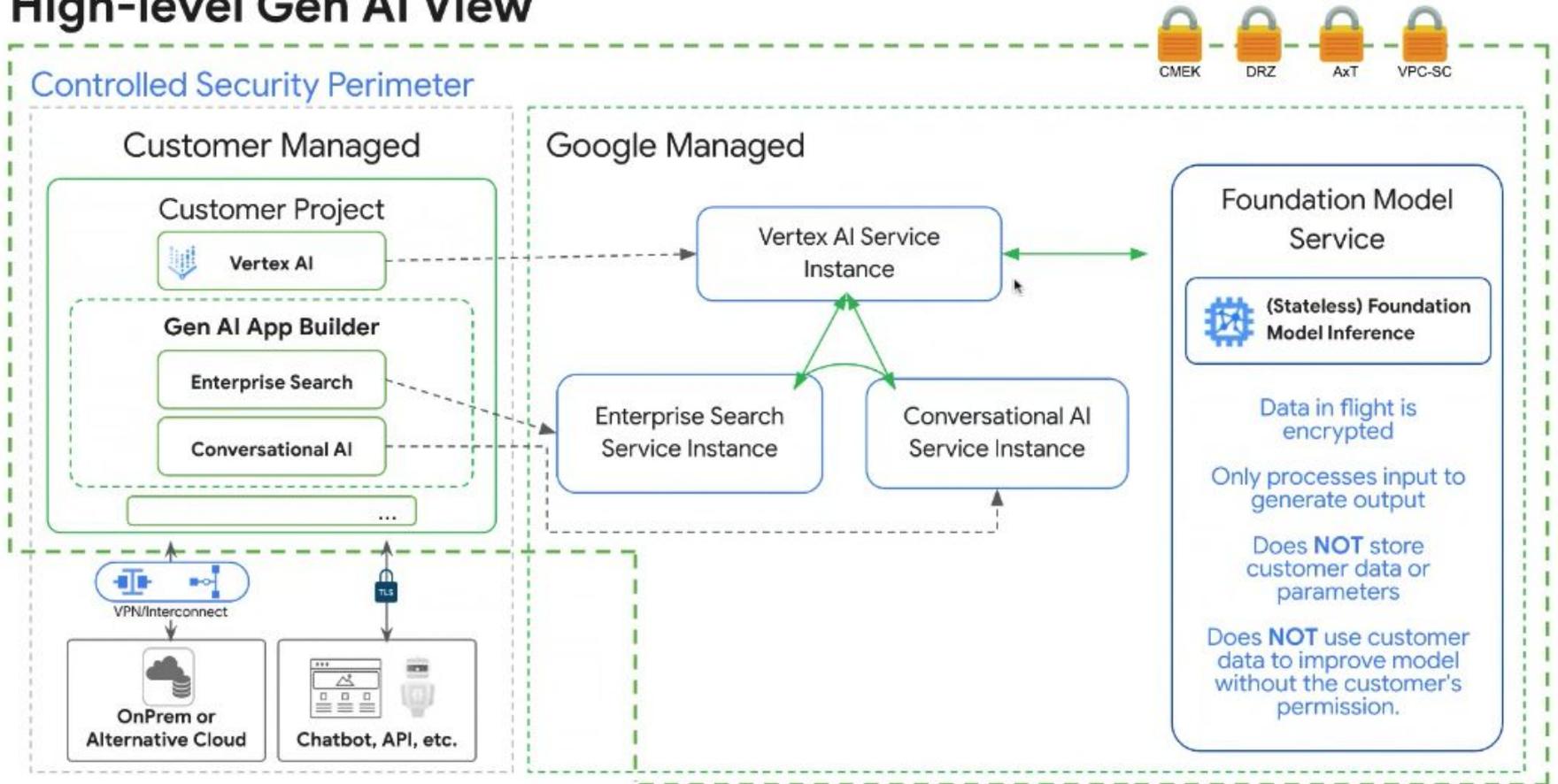
Horizontal ML Lifecycle Support

Generative AI Enterprise Integration

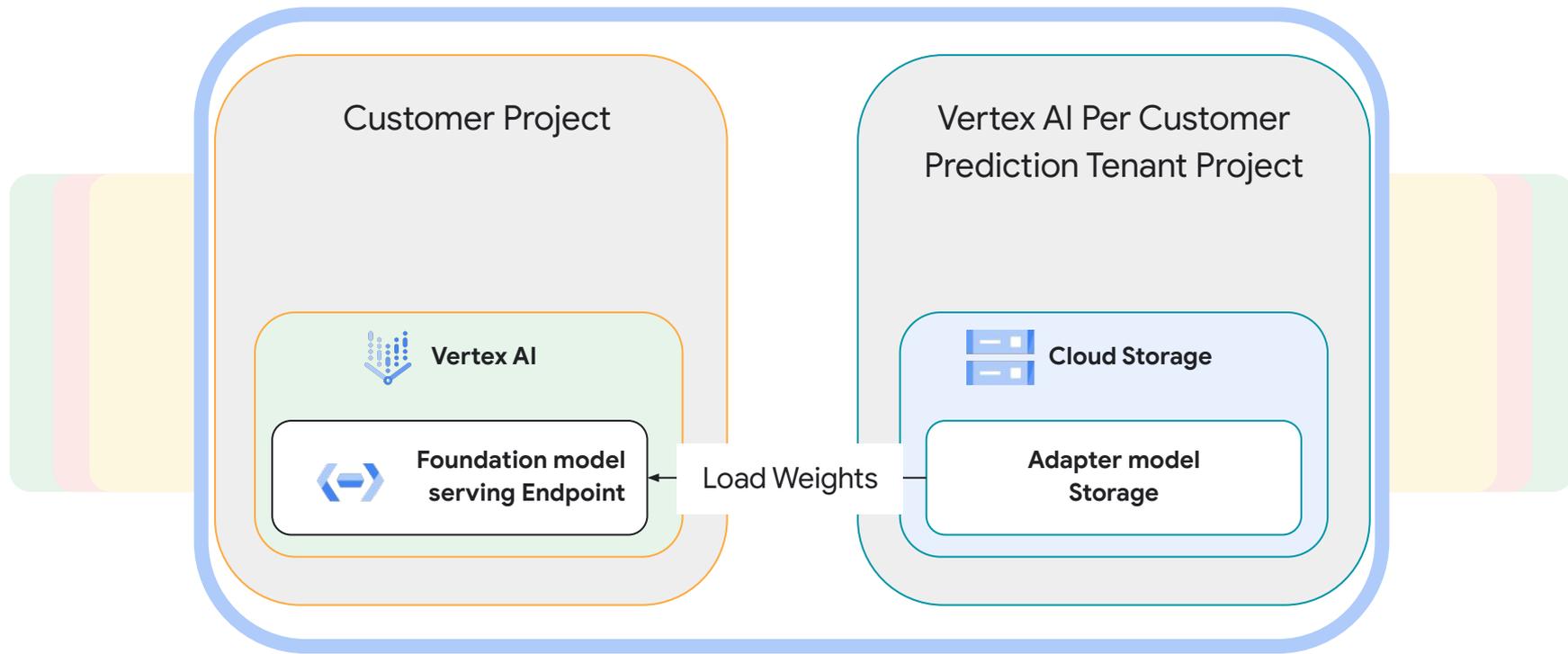
Infrastructure

Prototype to Production

High-level Gen AI View



Serving of Adapted Foundational Models



Key Enterprise Considerations for GenAI

New Business Models

Business Aspects

Optimize Business Models

Governance & Responsible AI

Privacy & Security

Cost & ROI

Domain-specificity

Org, Culture & Skills

How much cost is acceptable?
Cost per lifecycle stage.
What is the ROI at ea stage of GenAI?
How deep should we invest in customization, even pre-training?

Technical Aspects

Vertical Tooling Support

Horizontal ML Lifecycle Support

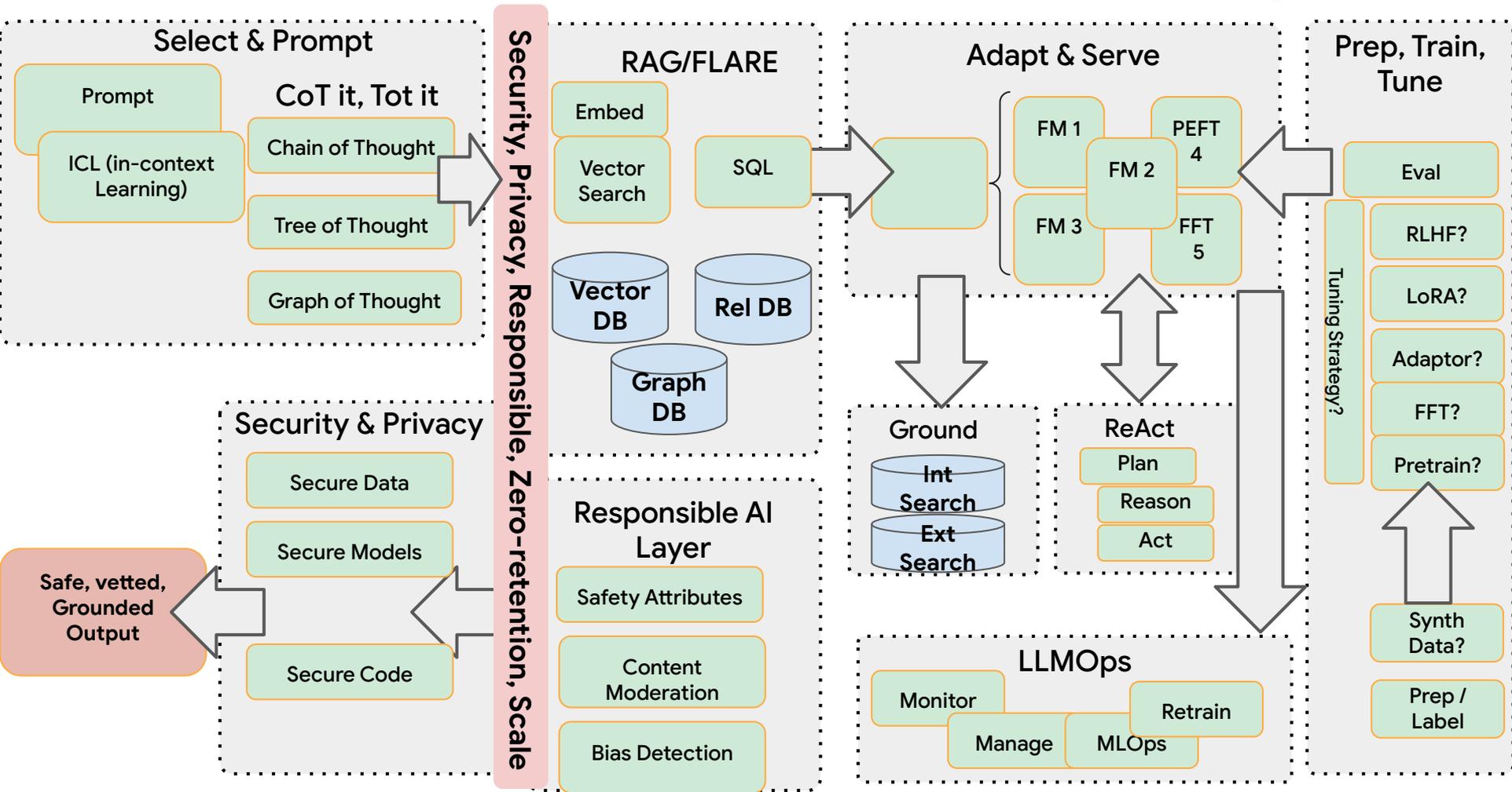
Generative AI Enterprise Integration

Infrastructure

Prototype to Production

A Comparison of DOL of Customization Techniques

Technique	Description	When to use	Cost	Data needed
Prompt-tuning	Modifying a pre-trained model to be more specific to a particular task by providing a prompt or specific input format	Improving performance on a specific task without fine-tuning	Low	Labeled dataset for specific task
PEFT (Adaptors/LoRA)	Optimizing the performance of a language model for specific hardware or software architectures	Improving efficiency on specific devices or platforms	Moderate	Performance data on target architecture
Fine-tuning	Adapting a pre-trained model to a specific task by training it on a smaller labeled dataset	Specific task performance	High	Smaller labeled dataset
Up-training	Training a pre-trained model on a larger dataset with the same task objective	Further improving task performance and adapting to a more specific use case	High	Large labeled dataset
Pre-training	Training a model on a large corpus of unlabeled text data	Initial training phase	High	Large unlabeled corpus

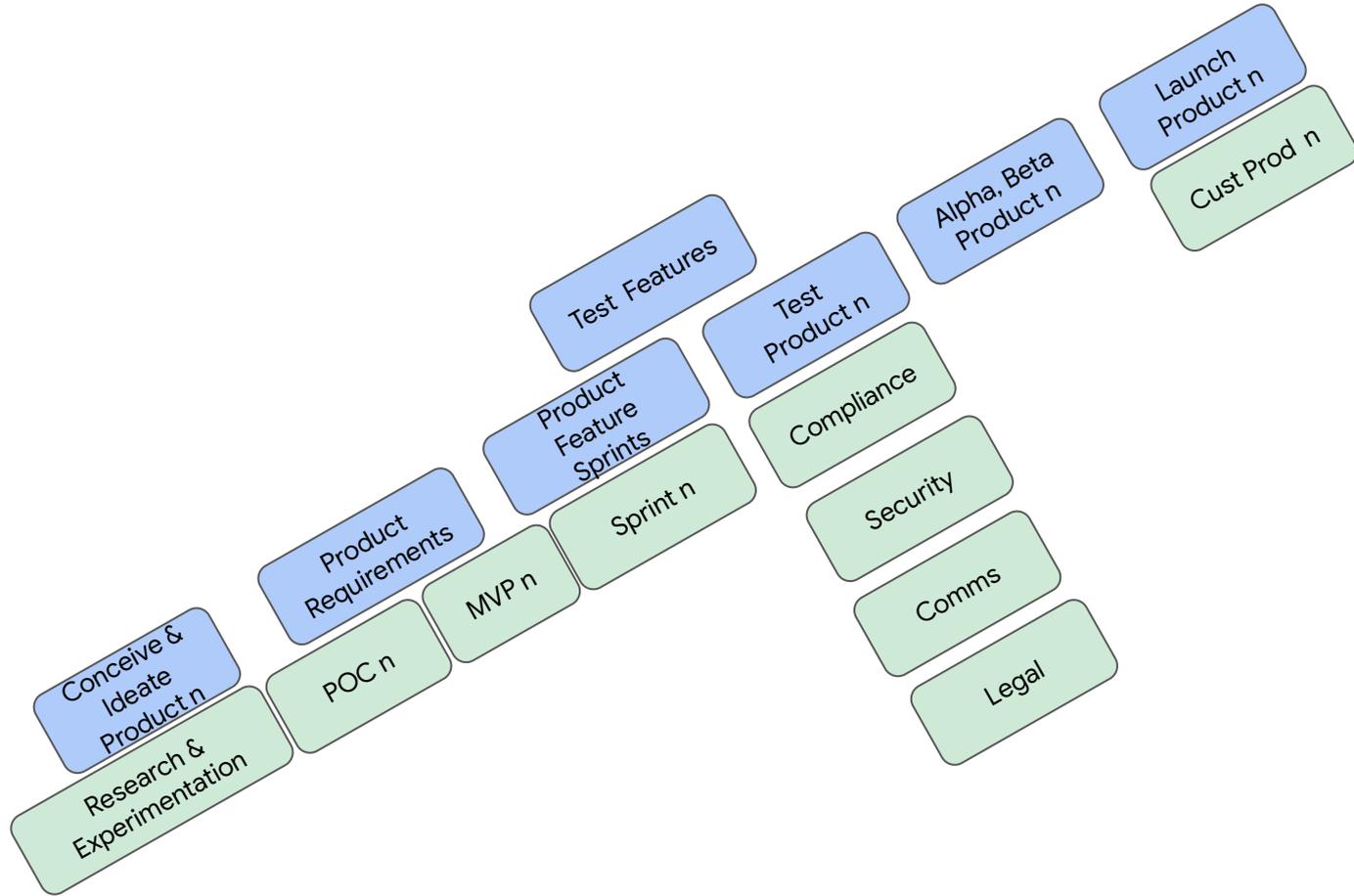


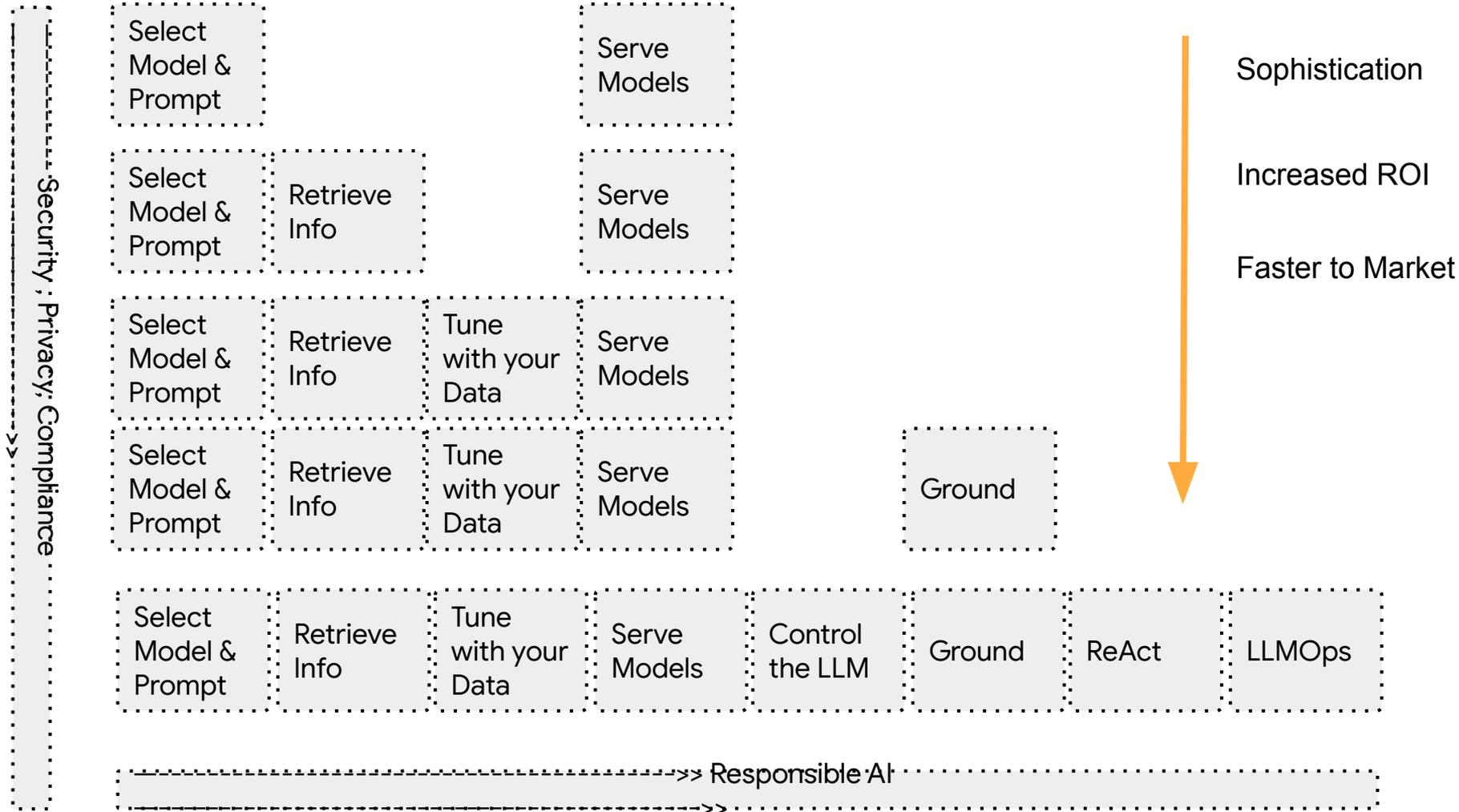
The Generative AI Lifecycle Patterns

Read the details in this blog



The gen AI PoC to Production Hill







Thank you.

Read the details in this blog

