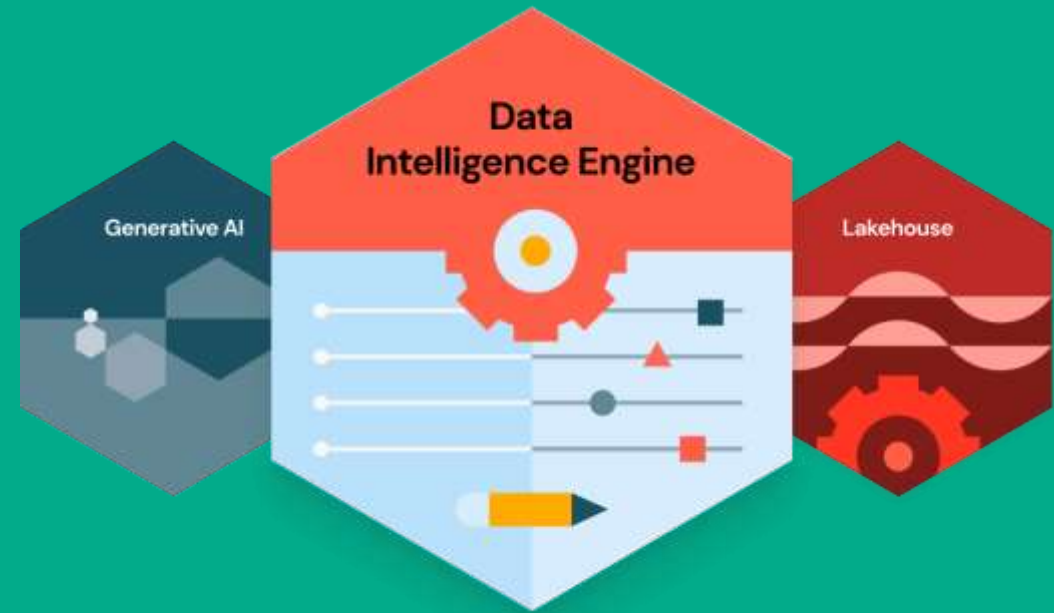


From Data to Decisions: Generative AI for Intelligent Supply Chains



David Rogers

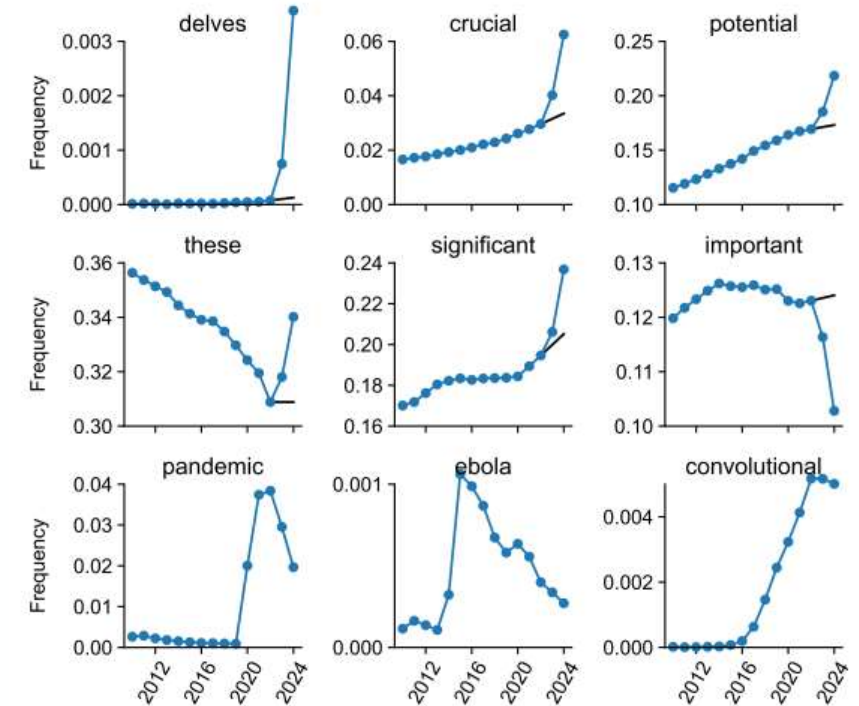
ASCM CONNECT 2024:
NORTH AMERICA

What's the give away?

The intelligent enterprise hinges on strategically utilizing data within supply chain management. This presentation delves into the transformative impact of generative artificial intelligence (AI) on supply chain operations, spotlighting its role in augmenting visibility, deepening sustainability, optimizing inventory and elevating customer service. We will navigate the complexities of AI implementation, addressing the inherent challenges and proposing actionable strategies to overcome these hurdles. The session aims to equip participants with the knowledge to effectively integrate AI solutions within their supply chain operations, ensuring accuracy, safety and compliance in AI applications.

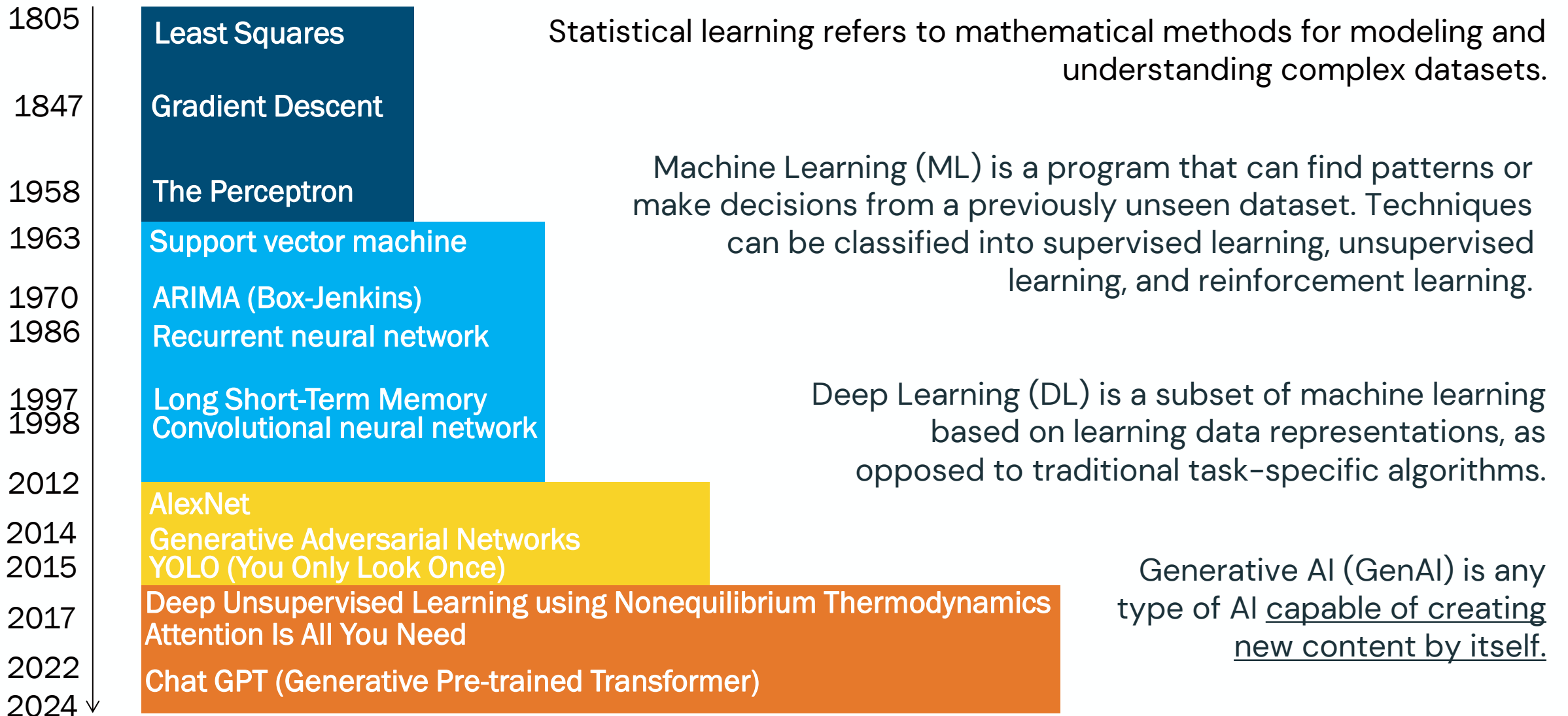
Delving In

The intelligent enterprise hinges on strategically utilizing data within supply chain management. This presentation **delves** into the transformative impact of generative artificial intelligence (AI) on supply chain operations, spotlighting its role in augmenting visibility, deepening sustainability, optimizing inventory and elevating customer service. We will navigate the complexities of AI implementation, addressing the inherent challenges and proposing actionable strategies to overcome these hurdles. The session aims to equip participants with the knowledge to effectively integrate AI solutions within their supply chain operations, ensuring accuracy, safety and compliance in AI applications.



"Delving into ChatGPT usage in academic writing" Kobak et al.

How Did We Get Here?



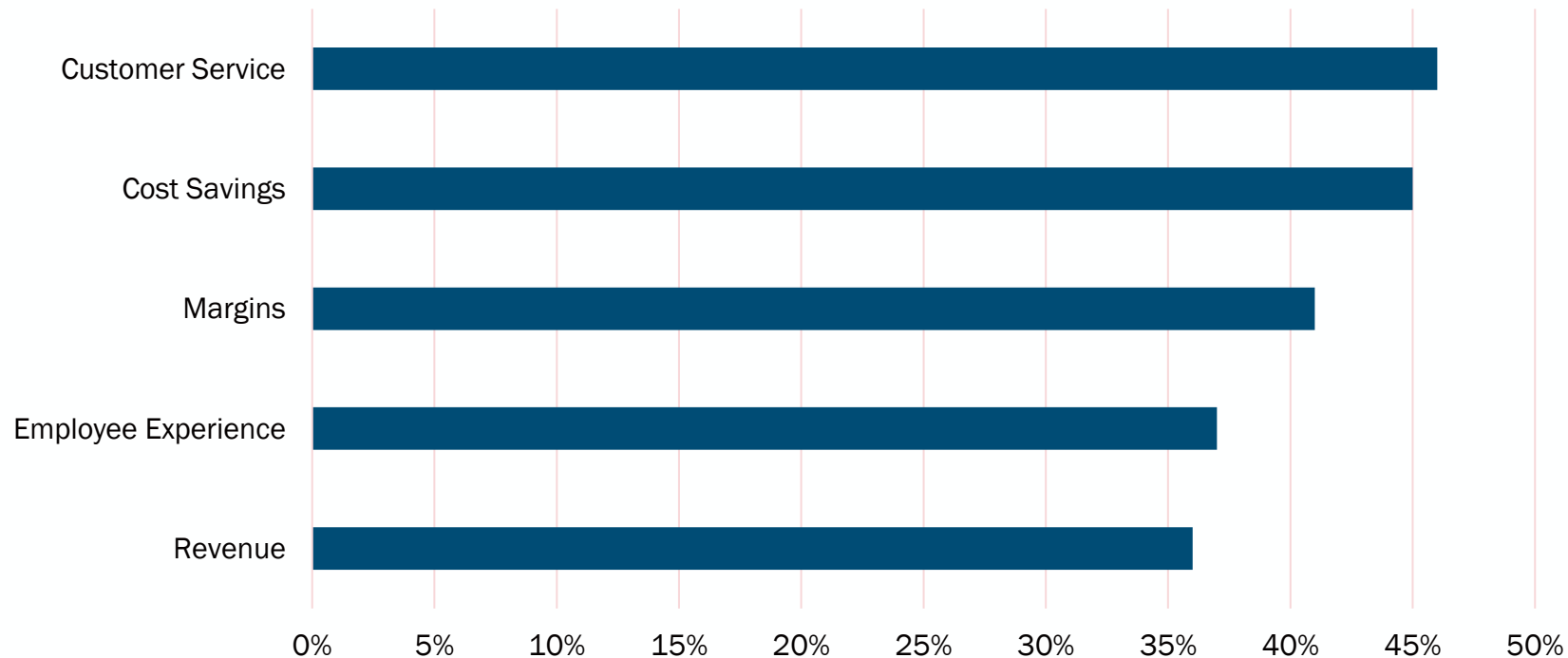
**How many of you use
Generative AI in your work
today?**

**How many of you using
Generative AI believe it is
already effective at Supply
Chain Management tasks?**

Why Now?

91% of global organizations using generative AI say it is effective in optimizing supply chain processes and decision-making.

Generative AI improved KPIs



“2024 Supply Chain Executive Survey” *Blue Yonder* March, 2024

Let the Machine Do the Job

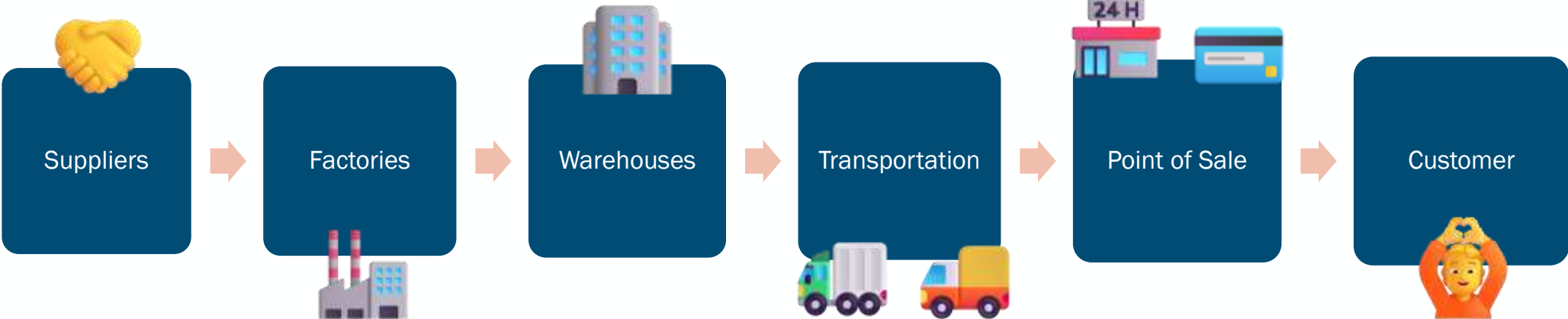
“Slow, manual supply chain planning processes can be a thing of the past, with machines taking on repetitive tasks that aren’t a good use of human capacity.”

“The route to no-touch planning: Taking the human error out of supply chain planning” *McKinsey* 2018

How GenAI is Impacting Supply Chain Management

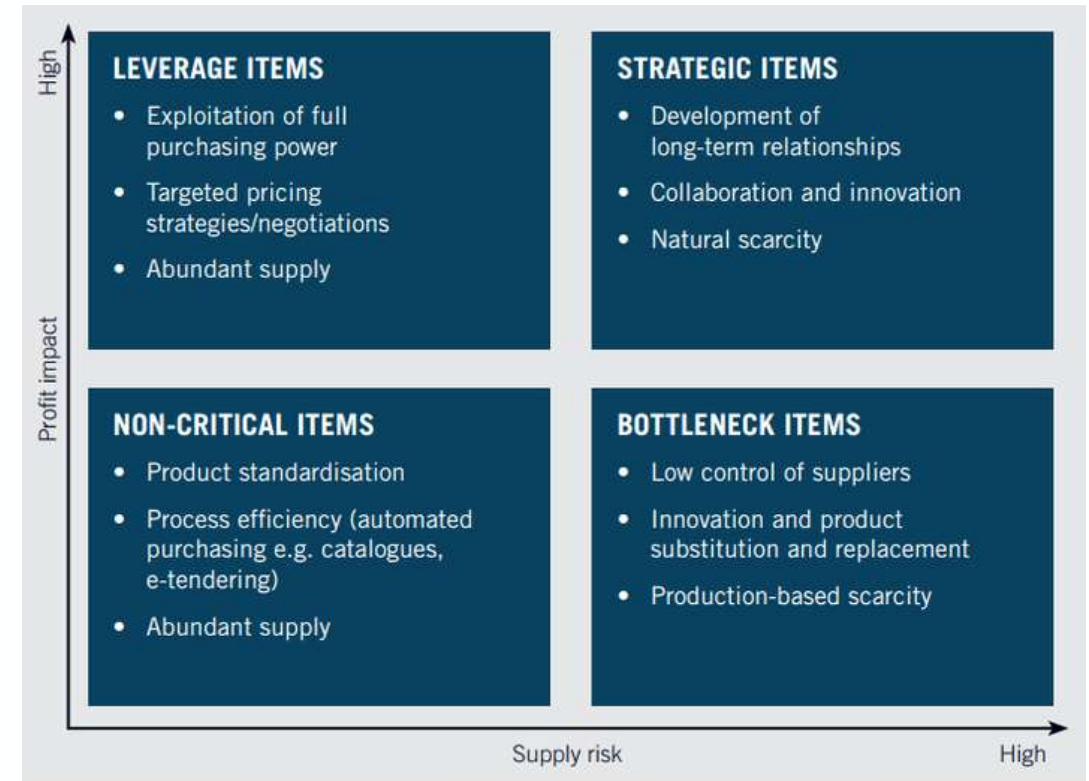
Supply Chain Management Stages

At the heart of every supply chain is the end customer



Suppliers

Case	Data	GenAI Technique	KPIs
Strategic Sourcing	ERP, Email	Fine-tuning	Revenue
Supplier Management	ERP, Email	RAG	Margins
RF(X) Creation	ERP, PDFs	RAG	Cost Savings
Automated Negotiations	ERP, Email	RAG, Fine-tuning	Cost Savings, Margins
Entity Resolution & Compliance	ERP, Internet, Third-Party	Fine-tuning, GraphRAG	Cost Savings, Customer Service
What If Simulation	Weather, TMS, MES, ERP	Fine-tuning, GraphRAG	Cost Savings, Revenue



Supplier What If Simulation

The screenshot displays a simulation interface with a chat window on the left and a dashboard on the right.

Chat Window:

- User:** Yes, I would like an update. I just learned that we are experiencing a disruption on the transport line "Supplier_Mexico_Container_Produce_to_Factory_Seattle_Container_Supply" for the next two months. How will that impact the predicted profit and service level?
- AI Assistant:** I am now running a Cosmo Tech simulation. This may take a few minutes.
- AI Assistant:** The disruption on the transport line "Supplier_Mexico_Container_Produce_to_Factory_Seattle_Container_Supply" for the next two months is expected to have the following impact on the predicted profit and service level:
 - Profit: The predicted profit is estimated to be around \$12.26 million.
 - Service Level: The predicted service level is estimated to be around 97.86%.
- AI Assistant:** Please note that these are just predictions and the actual impact may vary.
- User:** What do you recommend in order to mitigate the impact of thi

Dashboard:

- Scenario:** AI_Assistant_Whatif_TransportDisr...
- Simulation Control:** Start date: 1/1/2025, End date: 12/30/2025, Simulation granularity: Day.
- Key Metrics:** 97.9% (Service level), 139K (Quantity), 3M (Cost).
- Most substituted production resources:** A table listing resources and their quantities.
- Service of demand and stock over time:** A line graph showing demand and stock levels over time.
- Observed quantities and demand:** A table showing observed quantities and demand for various parts.
- CO2E split per cost type:** A pie chart showing the distribution of CO2E across different cost types.

“2024 Cosmo Tech GenAI & Simulation Product Demonstration” YouTube March, 2024

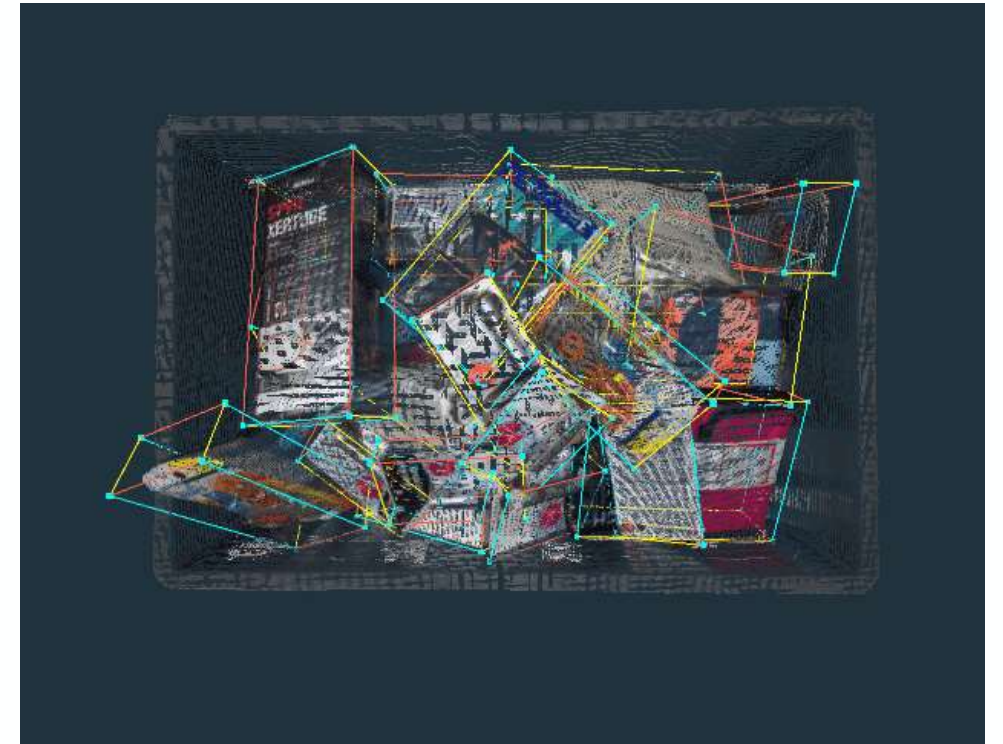
Factories



Case	Data	GenAI Technique	KPIs
Product Design	LIMS, Patents, File Share, CAD	cGAN, Pre-training	Revenue, Margins
Autonomous Production	ERP, MES, QMS, Historian, IoT	GraphRAG, LSTM	Margins
Field Assistant	ERP, CMMS, Historian, Equip Manuals, IoT	RAG	Cost Savings, Employee Experience
Workforce Training	ERP, IoT, Digital Work Instruct	RAG	Revenue, Employee Experience

Warehouses

Case	Data	GenAI Technique	KPIs
Robotic Automation	ERP, WMS, WES, IoT, Images	VAEs, Diffusion, Pre-training	Revenue, Margins
Inventory Optimization	ERP, WMS, EDI	RAG	Cost Savings, Customer Service



**How many of you flew
United Airlines to get here?**

How many were delayed?

How many received a text?

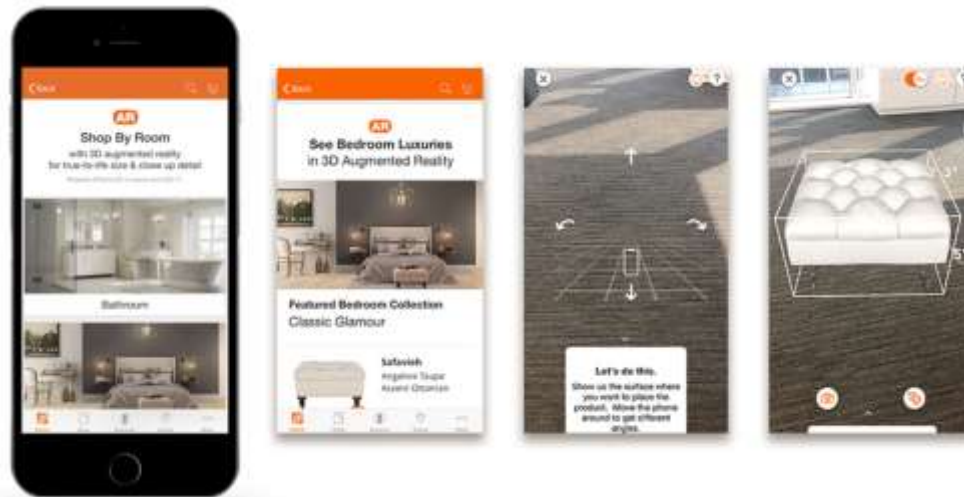
Transportation



Case	Data	GenAI Technique	KPIs
Shipment Status	TMS, IoT, Weather	Prompt Eng, RAG	Customer Service
Automated Quoting	ERP, TMS, Email, EDI	RAG	Cost Savings, Margins
Autonomous Transport	Video, Maps, IoT	Pre-training, Diffusion	Cost Savings

Point of Sale

Case	Data	GenAI Technique	KPIs
In Store Assistant	ERP, BIM, CRM, IoT	RAG	Customer Service
Virtual Room	Product Catalog, CRM	RAG, GAN	Customer Service
Personal Offer	CRM, Product Catalog, eCommerce	Fine-tuning	Revenue



Customer Experience

Case	Data	GenAI Technique	KPIs
Automated Reviews	CRM, eCommerce	Prompt Eng, RAG	Customer Service
Scheduling and Delivery	CRM, TMS	Prompt Eng, RAG	Customer Service
Personalized Marketing	CRM, Product Catalog	Fine-Tuning, Diffusion	Revenue, Customer Service
CSR Virtual Agent	ERP, CRM	Prompt Eng, RAG	Customer Service, Cost Savings, Employee Exp.
Warranty	ERP, CRM, IoT	Prompt Eng, RAG	Margins, Cost Savings

Live chat

- Available during business hours.
- One agent can handle two-three concurrent chats.
- Easy to implement, but you need to train your team to offer support via chat.
- The customer needs to wait for the human agent to get a response.
- Expensive to scale.
- Lets you deliver fully personalized experience.
- The agent can handle complex issues right away.

Chatbot

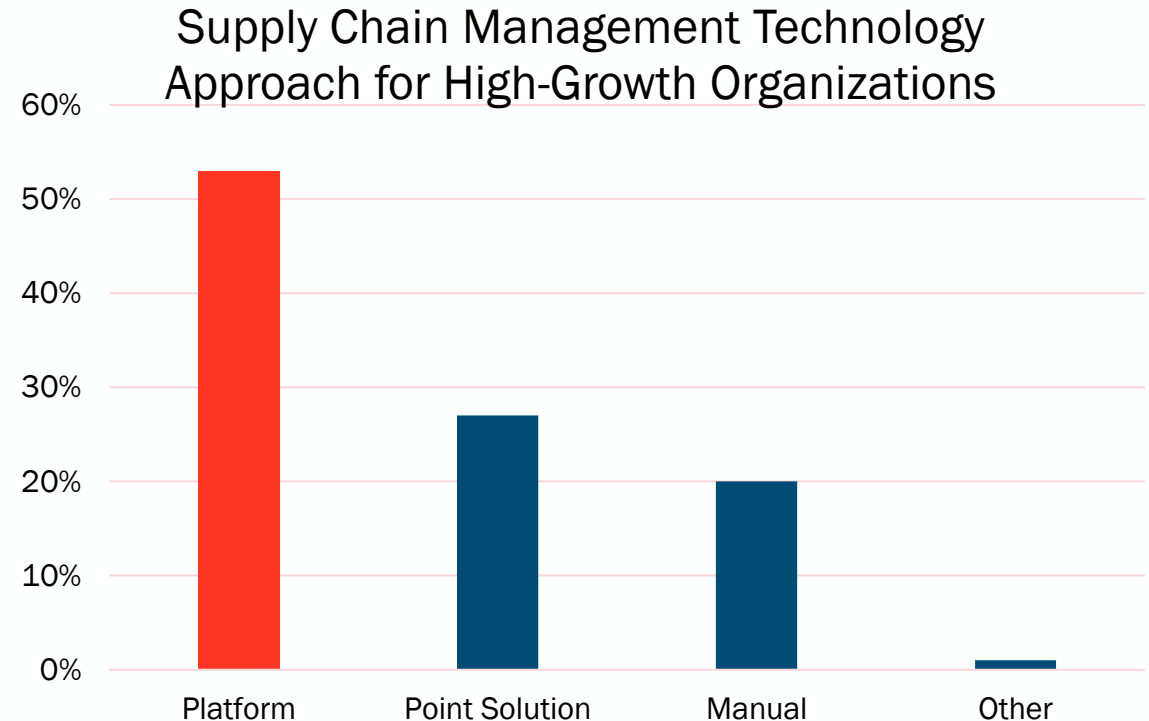
- Available 24/7.
- One bot can chat with multiple customers simultaneously.
- It takes time to create an effective chatbot scenario, but once finished, it doesn't require human help.
- The customer gets instant answers.
- Cheaper to scale.
- Lets you deliver moderate personalization at scale.
- The bot needs to transfer complex queries to a human representative.

What to consider when procuring GenAI capabilities

Platform Approach vs Point Solution

“When prioritizing a platform approach, data flows seamlessly from an ERP solution to supply chain planning, transportation management, and warehouse management systems—affording organizations the comprehensive visibility essential for diving into digital operations...

Over one-third of surveyed organizations leverage **a unified system that merges ERP and SCM capabilities**. By using a unified system that merges ERP and SCM capabilities, businesses can achieve a bigger picture view, **enabling more rapid, data-driven choices.**”



Source: Nucleus Research “Y88 June 2024”

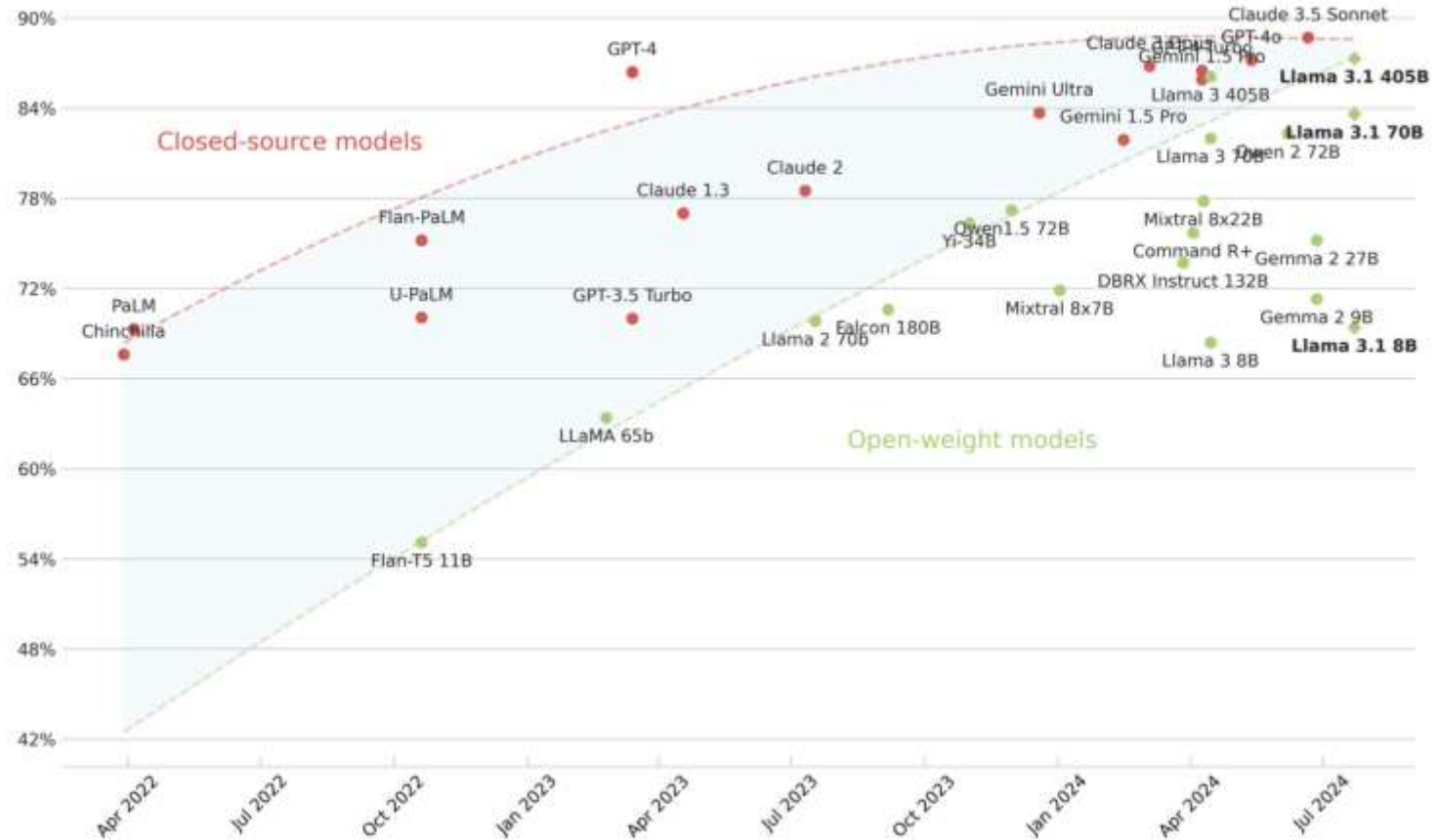
Foundation Models: Open vs Closed

Closed-source vs. open-weight models

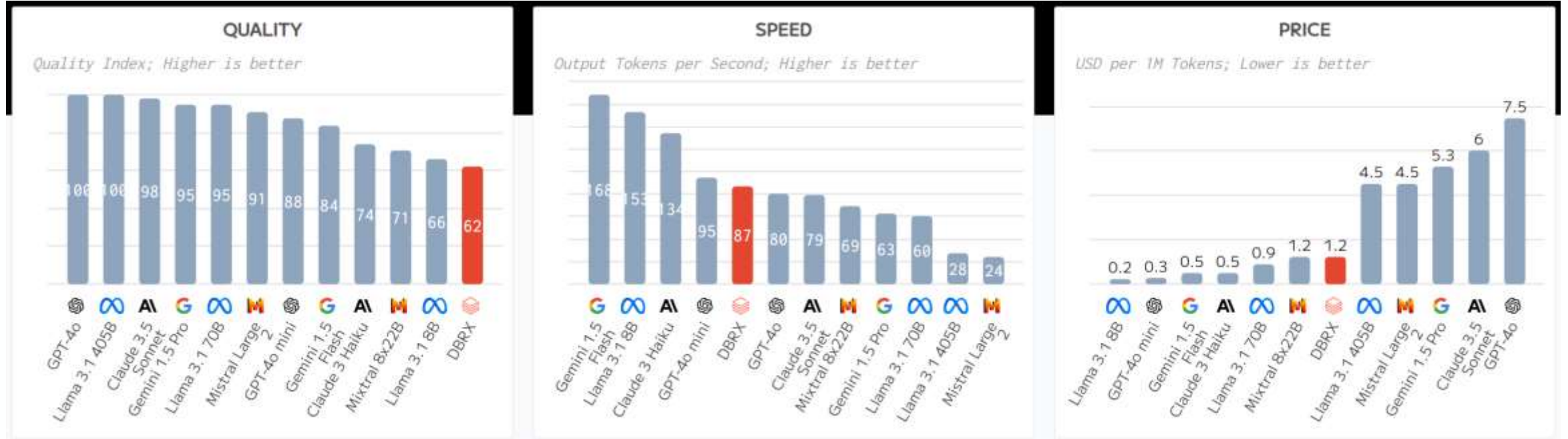
@maximelabonne

Llama 3.1 405B closes the gap with closed-source models for the first time in history.

MMLU (5-shot)



Model Capability: Quality x Speed x Price



Technique



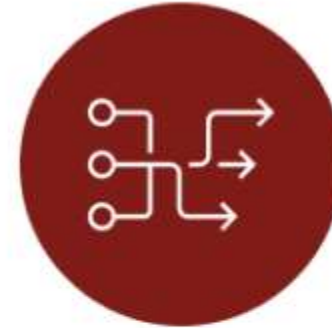
Prompt engineering



Retrieval augmented generation (RAG)



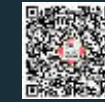
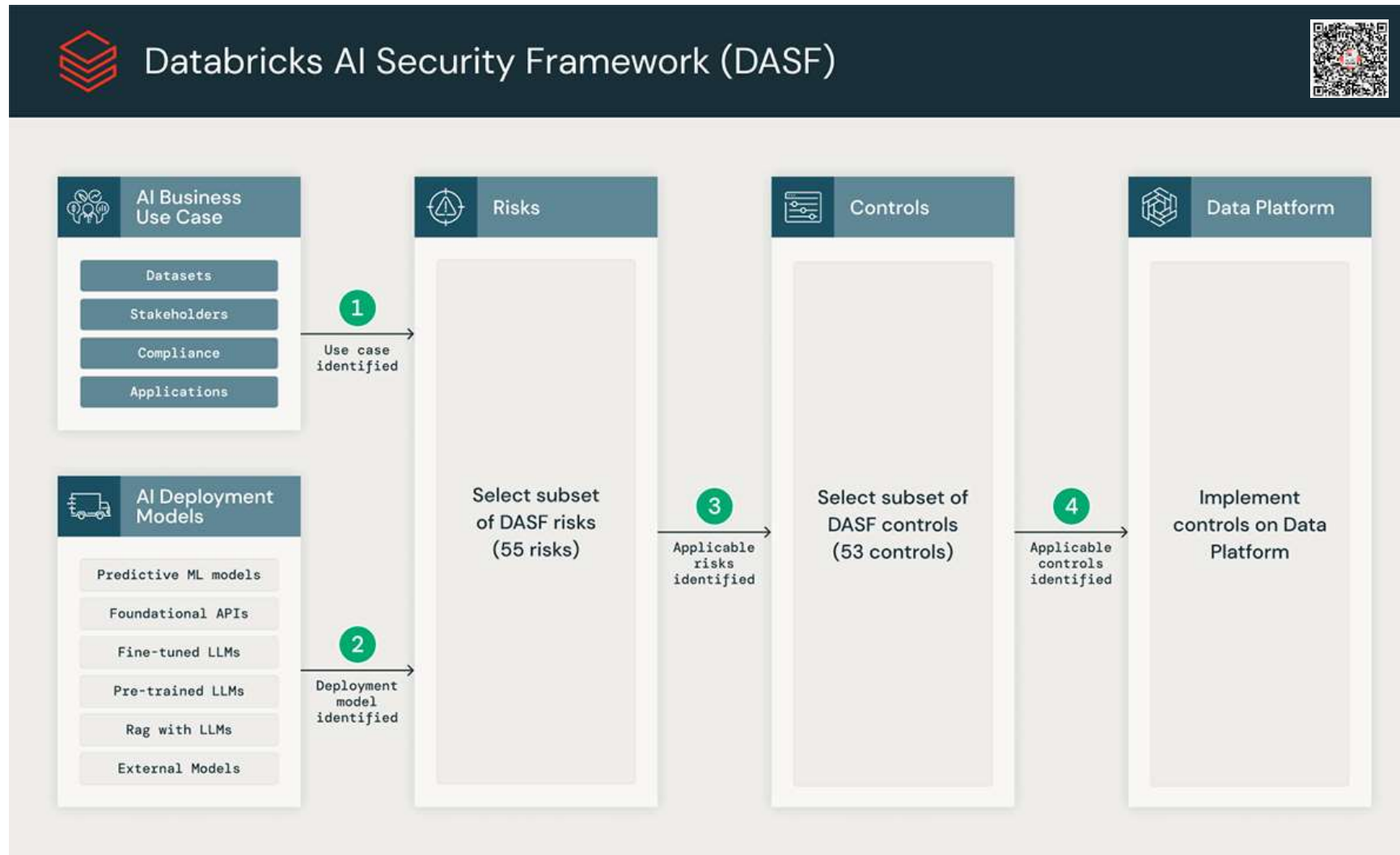
Fine-tuning



Pretrain from scratch

Complexity/compute intensiveness

Repeatability, Governance, and Security



Step 1 - Identify the AI business use case: Work with your stakeholders on your organization's AI use cases.

Step 2 - Determine AI deployment model: Choose an appropriate deployment model such as predictive ML models, RAG-LLMs, fine-tuned LLMs, pre trained LLMs, foundation models, and external models.

Step 3 - Select the most pertinent risks: Pinpoint the risks most relevant to your organization based on the use case and deployment model your organization is implementing.

Step 4 - Choose and implement controls: Select controls that align with your organization's risk appetite.

**Where is GenAI headed
next in Supply Chain
Management?**

Let the AI Agent Do the Job

Slow, manual supply chain planning processes can be a thing of the past, with **AI Agents** taking on repetitive tasks that aren't a good use of human capacity.

GenAI Agents Lifecycle

