

BI Presentation

Generative AI - Market Analysis

Bloomberg Intelligence

475+
professionals

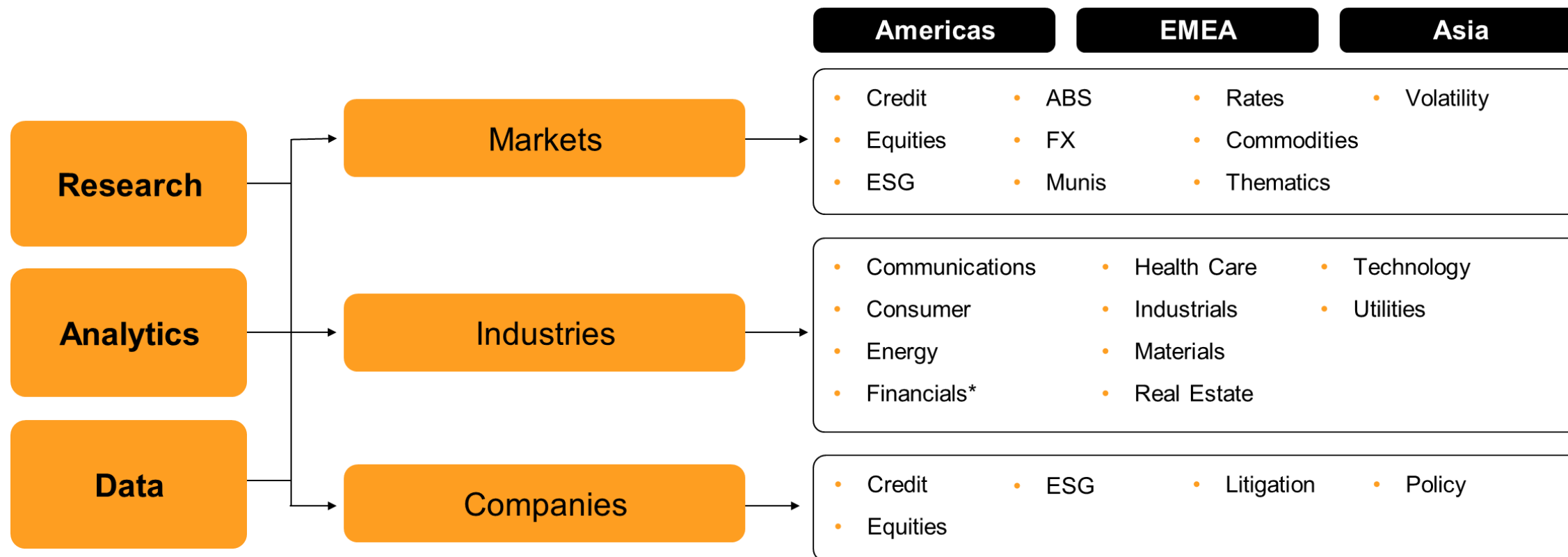
15+
average
experience

600+
data providers

2,000+
companies

Global
12 offices, 8 countries

Research, analytics and data tools to help you make informed investment decisions



**Includes Market Structure Research*

Generative AI Features

Software Copilots

Conversational Chatbots

Inbuilt Translation

Summarizing Text

Image/Video Generation

Potential to Drive Big Changes



Conversational User Interfaces



AI Based Content Creation



Deeper Personalization



Change in Knowledge Workers Jobs



Contact Center Transformation

Generative AI Products

Microsoft

- Azure AI Service
- Github + Office Copilots
- Bing-ChatGPT Search

Alphabet

- Search Generative Experience
- Duet G-Suite copilot
- Bard Chatbot

Amazon

- Bedrock LLM as a service
- Amazon Code Whisperer
- Alexa based on LLM

Meta

- Recommendation Systems
- Content Creation Tools
- Open Source Llama Model

Copilot Adoption

The image displays the Copilot AI interface on both a desktop and a mobile device. The desktop view shows a PDF document titled "Technical Report-58192749.pdf" with "Rev 1 (02/14/2023) Approved" status. The document content includes "4.0 Supplemental Geotechnical Recommendations" and "4.1 Supplemental Foundation Analysis". A "Trapezoidal Distribution of Pressure" diagram is visible, showing a trapezoid with a total height of H and a top width of 0.2H. The AI-generated response on the desktop states: "Here's what I found on page 131 of Burnham Park Medical Center Geotechnical Report. In Section 4.0 - Supplemental Geotechnical Recommendations 'Silty sand was encountered in previous and supplemental explorations from near the ground surface to a depth of approximately 18 feet below grade. The long term groundwater table at this site is estimated to be at 8.5 feet below grade. To prevent the surface granular soils from sloughing into the caisson shaft and water inflow from the shallow water table, we recommend that a temporary steel casing be employed at the surface during construction.'" Suggested actions include "Overlay water table with Drawings", "Find water table related items", and "Respond to Water Table RFI".

The mobile device view shows the same Copilot interface. The AI-generated response on the mobile device states: "Here's what I found on page 131 of Burnham Park Medical Center Geotechnical Report. In Section 4.0 - Supplemental Geotechnical Recommendations 'Silty sand was encountered in previous and supplemental explorations from near the ground surface to a depth of approximately 18 feet below grade. The long term groundwater table at this site is estimated to be at 8.5 feet below grade. To prevent the surface granular soils from sloughing into the caisson shaft and water inflow from the shallow water table, we recommend that a temporary steel casing be employed at the surface during construction.'" Suggested actions include "Respond to Water Table RFI" and "Ask a question".

Assistants, Chatbots with Personalities

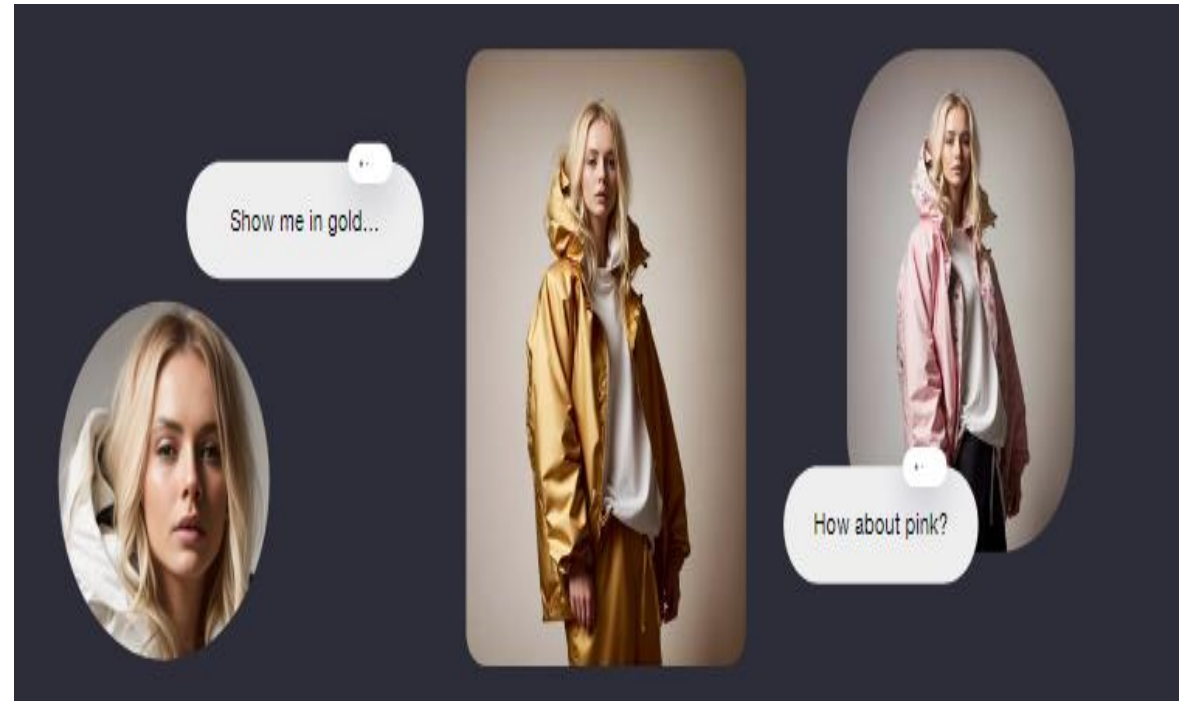
The collage features five panels illustrating AI marketing applications:

- Website copy tool:** Shows a laptop and smartphone displaying a website with an "AI Suggestion" button.
- Product descriptions:** Shows a "Circle Vase" with a "Suggest Description" button and a generated text box.
- Social ads:** Shows a Facebook-style ad for the "Circle Vase" with a generated description.
- Customer conversations:** Shows a chat interface with a "Help Me Respond" button and a generated response to a customer query.
- Social calendar:** Shows a calendar with "National Sunglasses Day", "National Camera Day", and "Social Media Day" highlighted, with a "See Post Ideas" button.

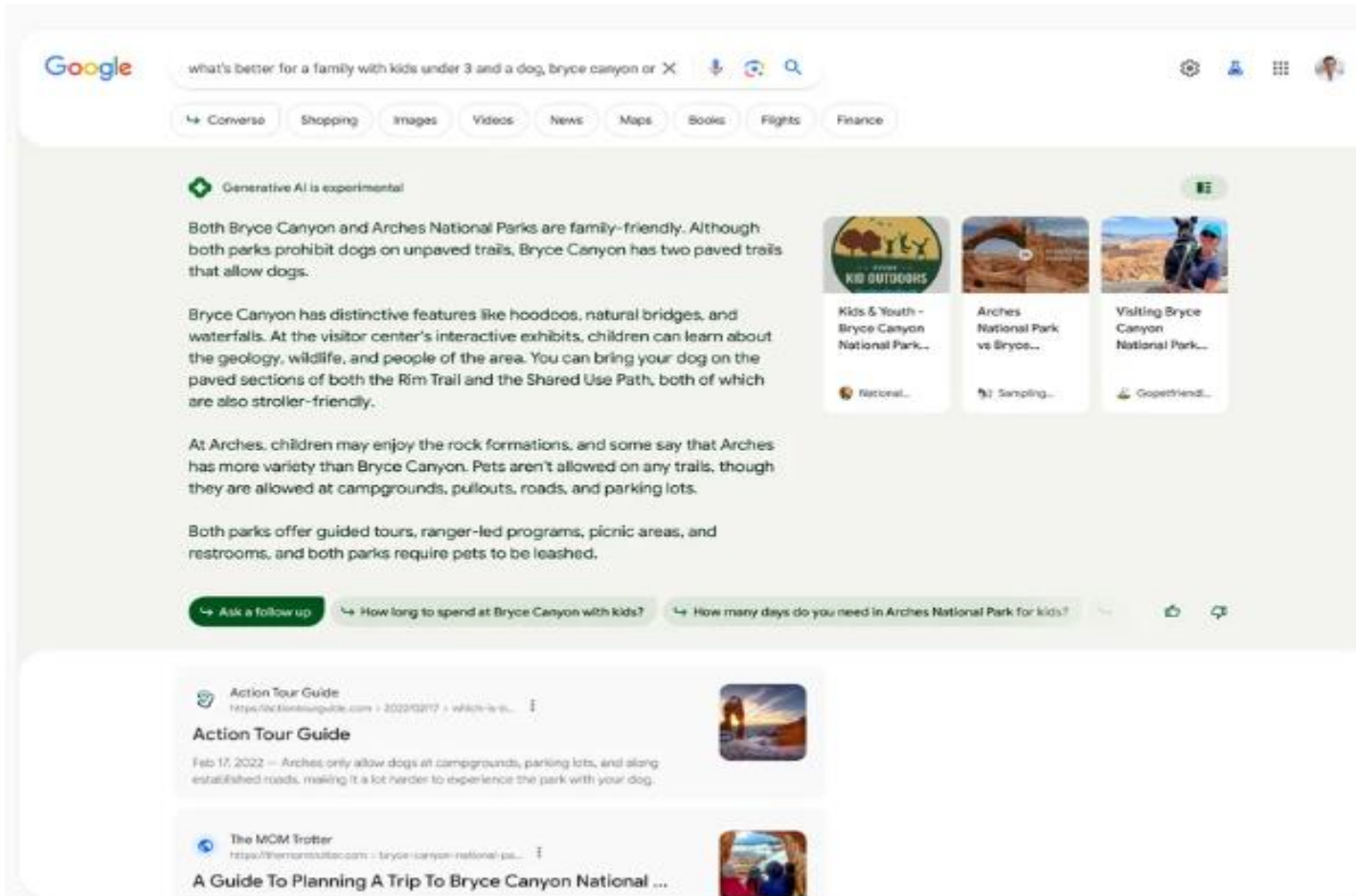


Source: Company Filings, Bloomberg Intelligence

Conversational Interfaces



Search Generative Experience



Challenges

But LLMs are *not* enterprise-fit **out of the box**



Biased

LLMs can exhibit bias which can lead to toxic, hurtful or polarizing language that negatively affects the end user and could lead to legal or reputational risk for the brand.



Inaccurate

LLMs can hallucinate or provide information that is generic, out of context, out of date or in the wrong voice, or even belong to a competitor.



Limited

LLMs cannot follow enterprise workflows such as form filling and submission. They also don't independently surface analytics or insights to drive business outcomes.

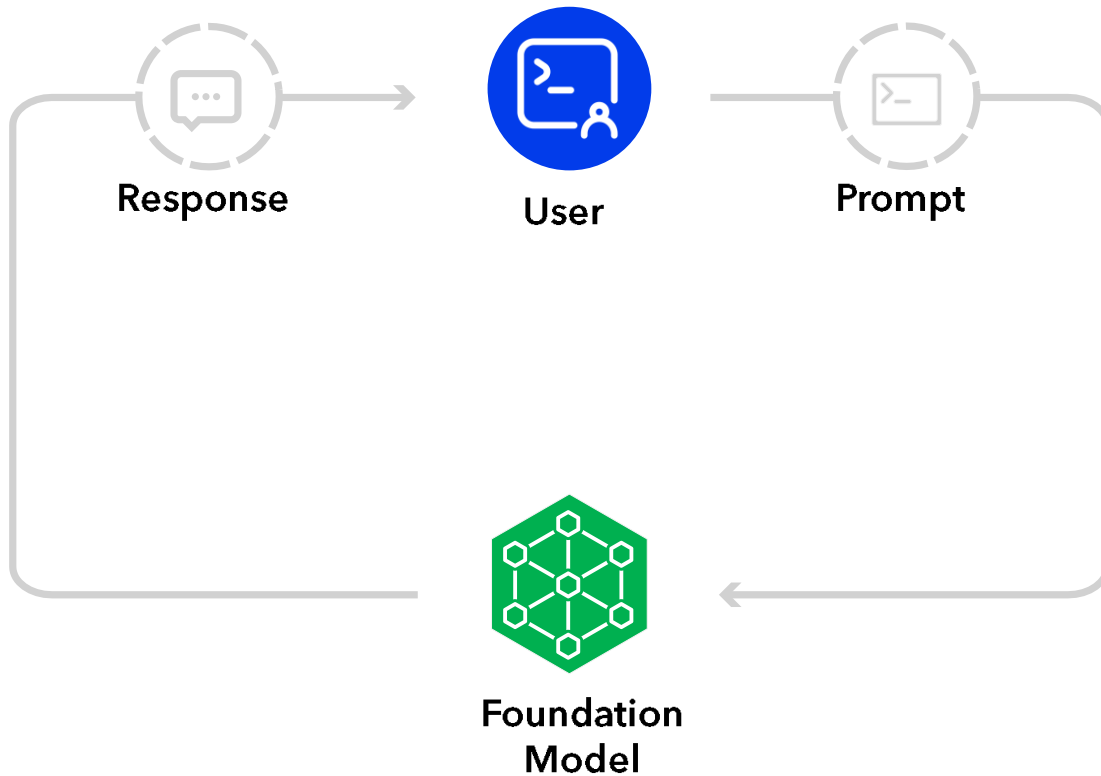


Isolated

LLMs are not connected to other enterprise software or systems and cannot access inventory, place orders, or escalate situations to live agents.

LLMs are Powerful Tools but Not Accurate Enough for Enterprise

Without a connection to enterprise data sources, LLMs cannot provide accurate information



Lacking proprietary knowledge

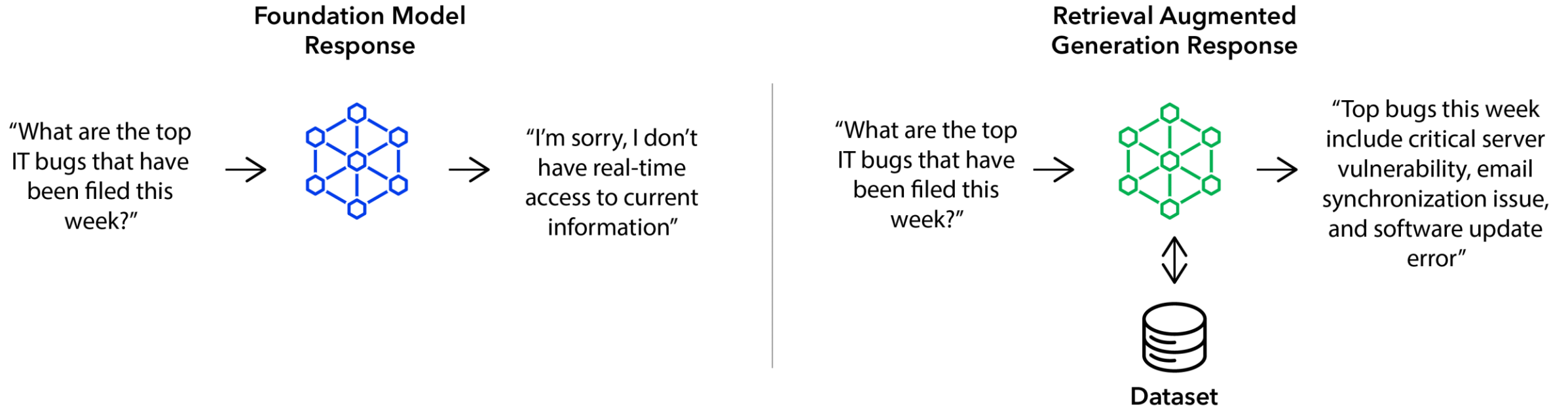


Risk of outdated information



Hallucinations

Connecting Generative AI Models to Enterprise Data



70%

Of Enterprise Data is Untapped

Unlock many new opportunities for greater intelligence

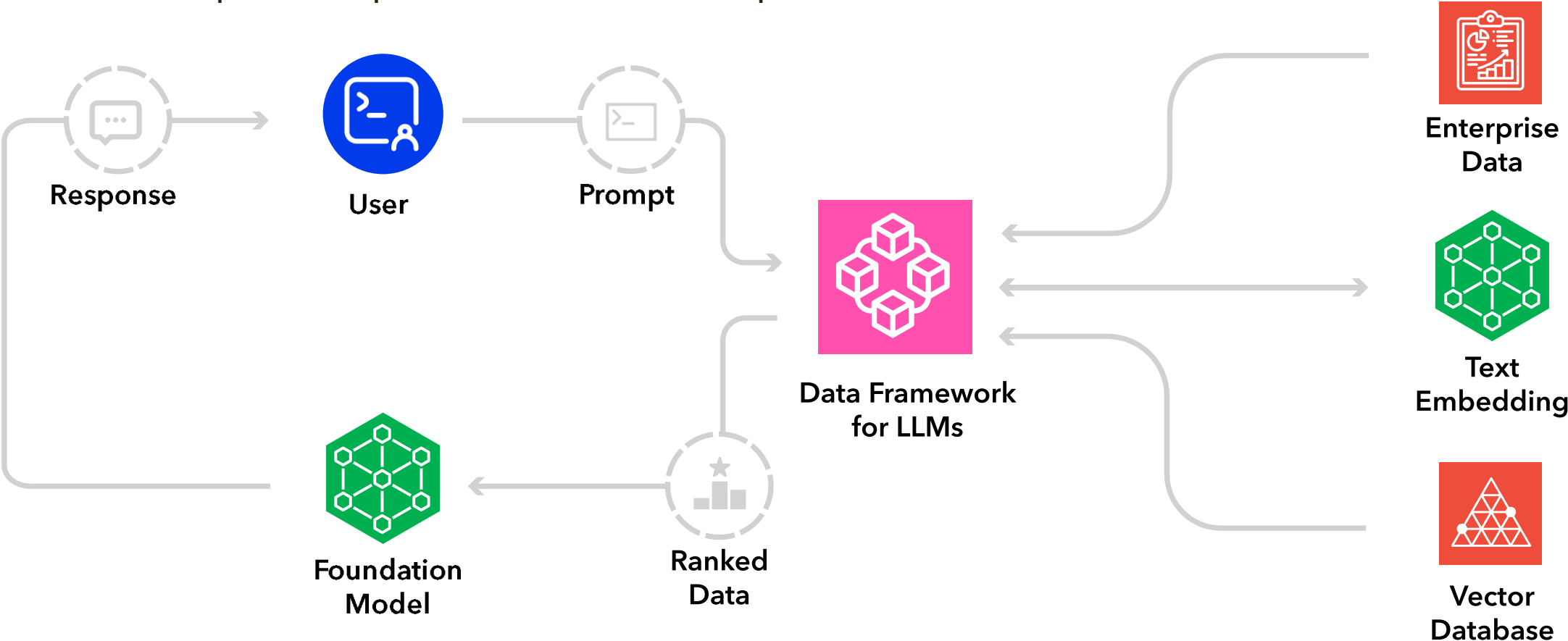


Less Frequent Re-Training

Significant cost and time savings in long-run to maintain LLMs

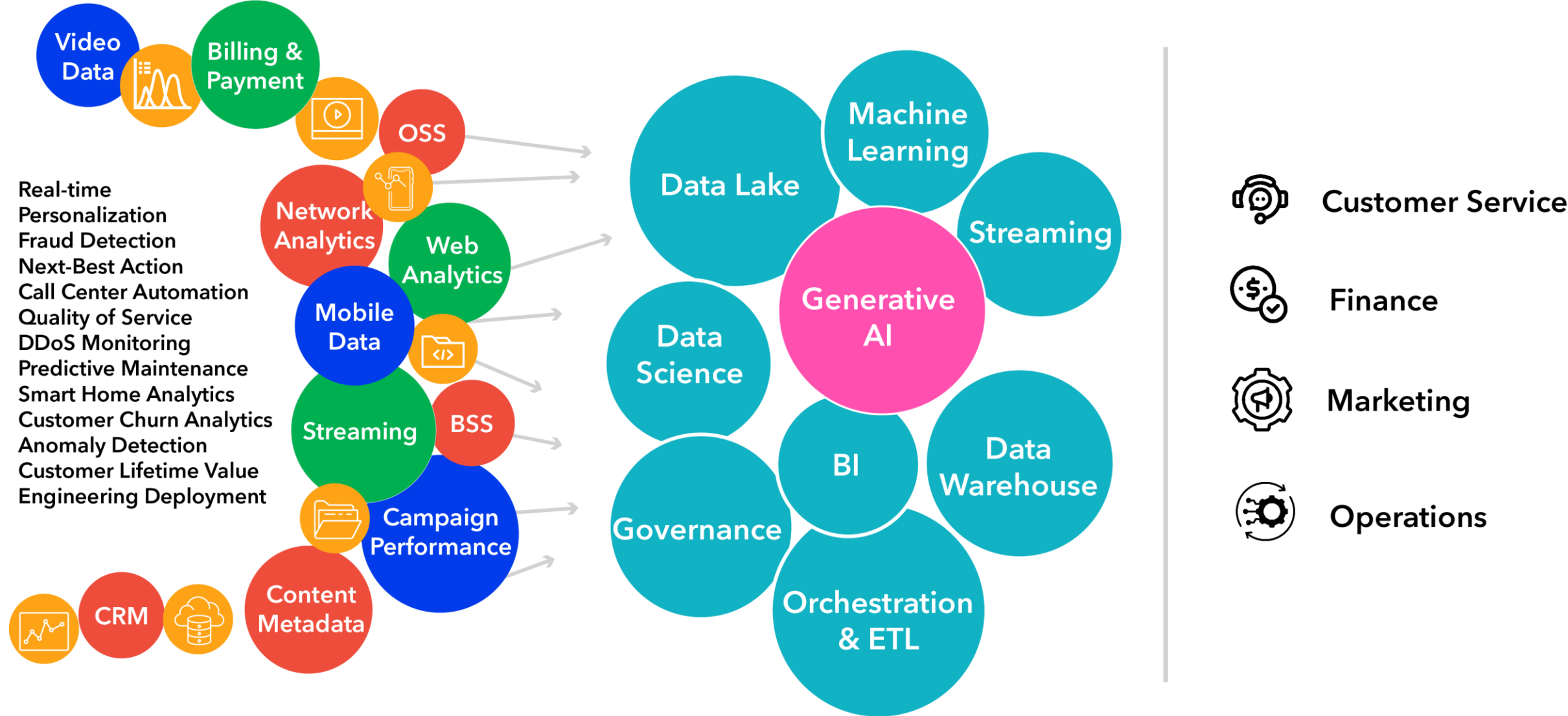
Retrieval Augmented Generation Lets Enterprises Talk to Their Data

Enable LLMs to provide up to date and domain specific answers



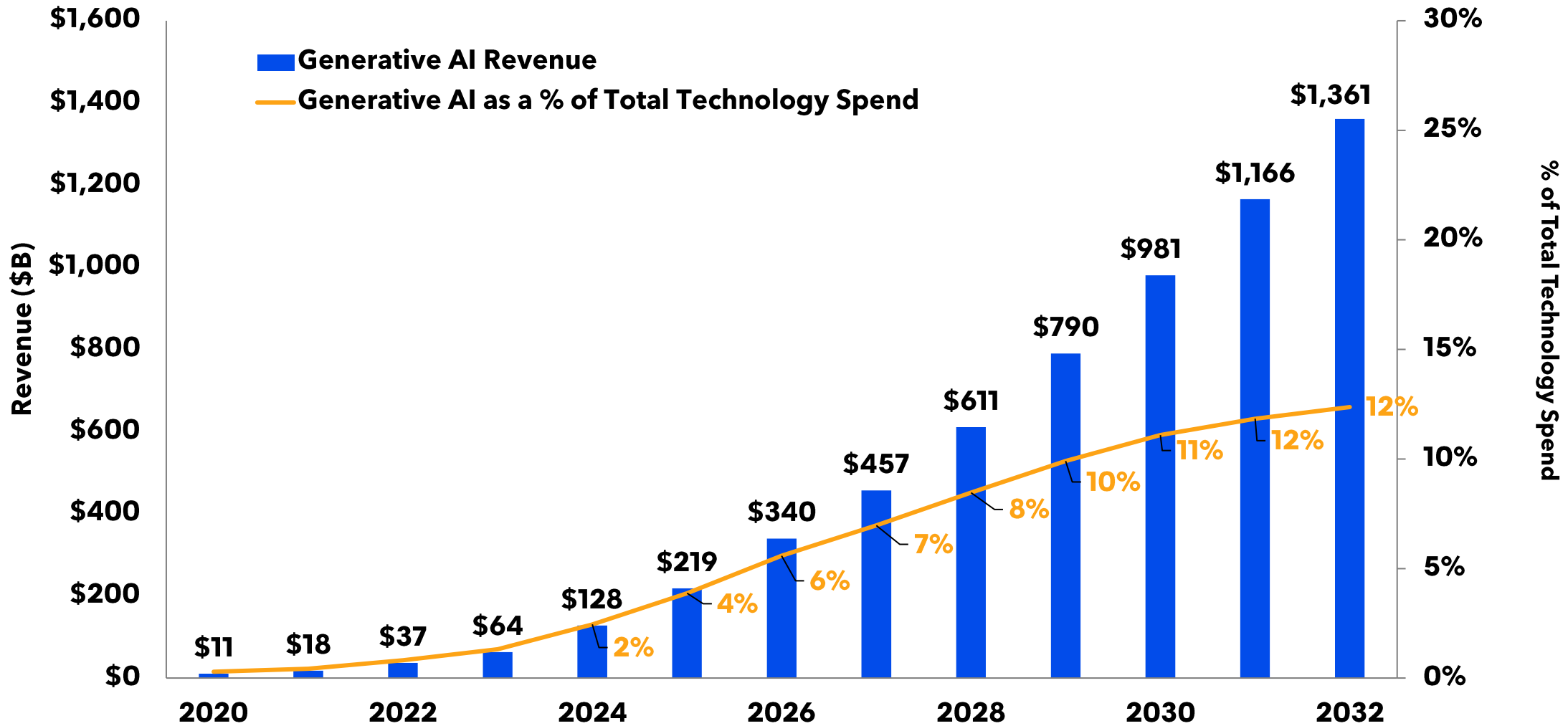
Source: Nvidia

Everything depends on the data platform

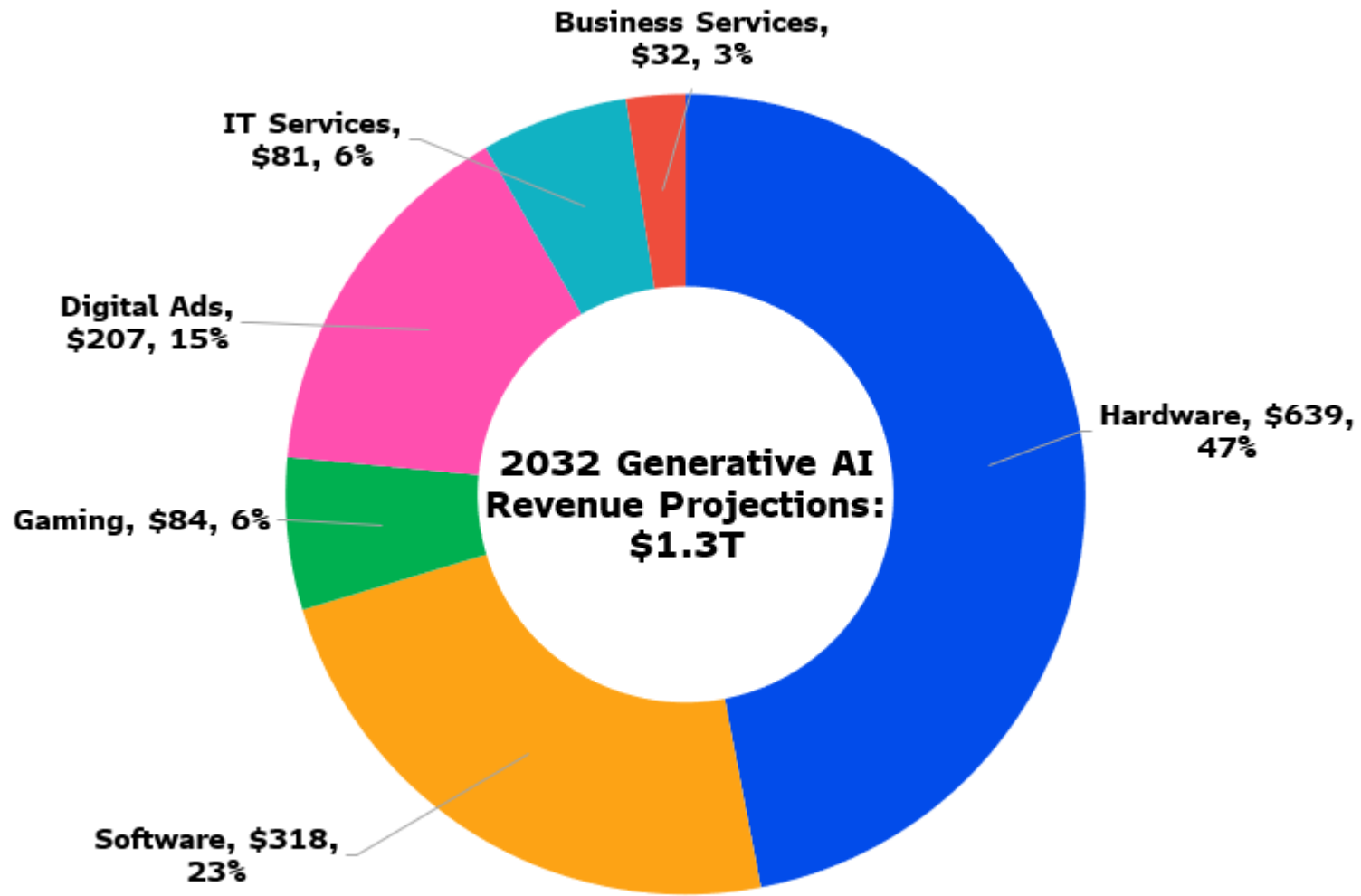


Source: Databricks

Generative AI Market Sizing



Generative AI Segment Splits



Large Language Model Releases

| Company Name | Model | Number of Parameters | Input Token Cost (\$/1M Tokens) | Output Token Cost (\$/1M Tokens) | Context Window (tokens) | Open-Source? | Multi-modal? | Release Date |
|--------------|-----------------|----------------------|---------------------------------|----------------------------------|-------------------------|--------------|--------------|--------------|
| OpenAI | GPT-4 Turbo | 1.76T | \$10.00 | \$30.00 | 128K | No | Yes | Nov-23 |
| | GPT-4 | 1.76T | \$30-60 | \$60-120 | 32K | No | Yes | Mar-23 |
| | GPT-3.5 Turbo | 175B | \$0.50-1.50 | \$1.50-2.00 | 16K | No | No | Mar-23 |
| Alphabet | Gemma | 2B-7B | \$0.10 | \$0.13 | 8K | Yes | No | Feb-24 |
| | Gemini 1.5 Pro | 150-200B | \$7.00 | \$21.00 | 1M | No | Yes | Feb-24 |
| | Gemini Ultra | 1.5-2T | - | - | 32K | No | Yes | Dec-23 |
| | Gemini Pro | 150-200B | \$0.50 | \$1.50 | 32K | No | Yes | Dec-23 |
| | Gemini Nano | 1.8-3.25B | - | - | 32K | No | Yes | Dec-23 |
| Meta | Llama 2 | 7B-70B | \$0.75-1.95 | \$1.00-2.56 | 4K | Yes | Yes | Jul-23 |
| Anthropic | Claude 3 Opus | ~500B | \$15.00 | \$75.00 | 200K | No | Yes | Mar-24 |
| | Claude 3 Sonnet | ~500B | \$3.00 | \$15.00 | 200K | No | Yes | Mar-24 |
| | Claude 3 Haiku | ~500B | \$0.25 | \$1.25 | 200K | No | Yes | Mar-24 |
| | Claude 2 | 130B | \$8.00 | \$24.00 | 200K | No | No | Jul-23 |
| Tencent | Hunyuan | 100B | \$19.00 | - | 8K | No | Yes | Sep-23 |
| Alibaba | Qwen-VL | 1.8-72B | - | - | 32K | Yes | Yes | Oct-23 |
| | Qwen | 1.8-72B | - | - | 32K | Yes | No | Aug-23 |
| Mistral | Mistral Large | TBD | \$8.00 | \$24.00 | 32K | No | No | Feb-24 |
| | Mistral Small | TBD | \$2.00 | \$6.00 | 32K | No | No | Feb-24 |
| | Mixtral 8x7B | 45B | \$0.70 | \$0.70 | 32K | Yes | No | Dec-23 |
| | Mistral 7B | 7.3B | \$0.25 | \$0.25 | 32K | Yes | No | Sep-23 |

Training LLMs, Copilots and Chatbots

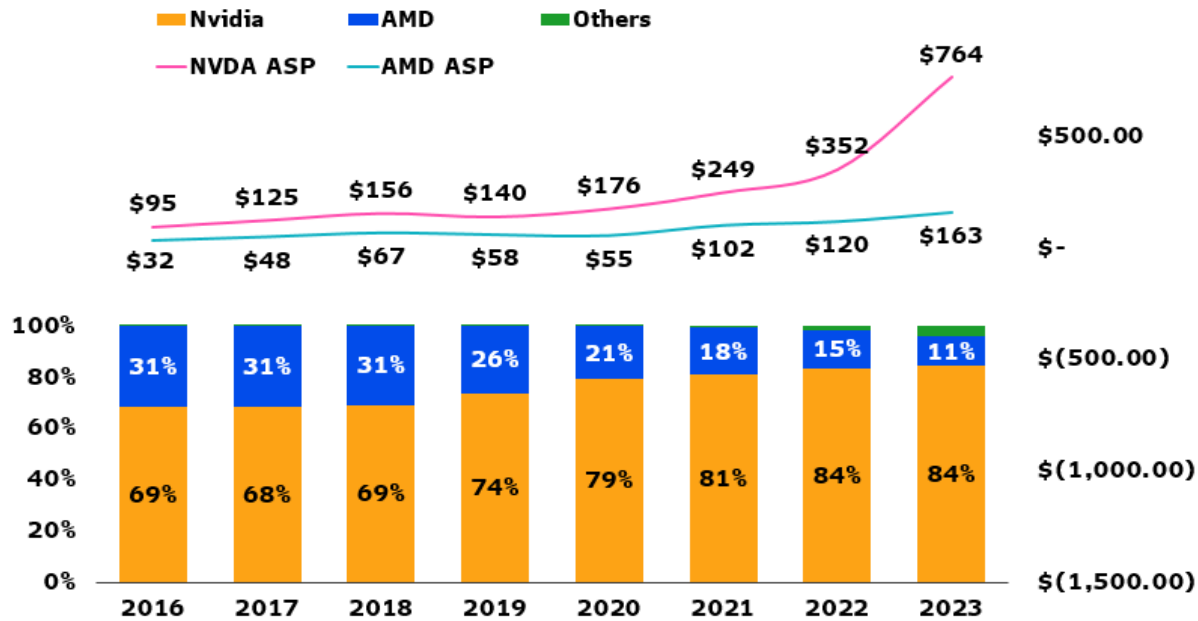
| Company Name | Product | Type | Incremental Revenue Opportunity |
|--------------|------------------------------|------------------|---------------------------------|
| Microsoft | Microsoft 365 Copilot | Copilot | \$3-5B |
| | Bing | Search | <\$1B |
| | Github Copilot | Copilot | \$1-1.5B |
| | Azure AI Service | LLM as a Service | \$1-3B |
| Alphabet | Gemini | Licensing OS | ~\$1B |
| | Search Generative Experience | Search | - |
| | Bard | Chatbot | - |
| | Google Duet | Copilot | \$1-2B |
| | Google Cloud AI | LLM as a Service | \$1-3B |
| OpenAI | ChatGPT | Chatbot | \$2-3B |
| | GPT | Licensing OS | \$1-2B |
| Adobe | Firefly | Copilot | ~\$1B |
| Snap | MyAI | Chatbot | <\$1B |
| Meta | Llama | Licensing OS | ~\$1B |
| Nvidia | GPU Compute | Chips/Servers | \$40-50B |
| Amazon | Bedrock | LLM as a Service | \$1-3B |

Generative AI Subscription Sales

| | | Sep-23 | Oct-23 | Nov-23 | Dec-23 | Jan-24 |
|------------|-----------------------|---------|---------|---------|---------|---------|
| ChatGPT | Annual Run Rate (\$M) | \$1,204 | \$1,308 | \$1,442 | \$1,606 | \$1,863 |
| | MoM Growth (%) | | 9% | 10% | 11% | 16% |
| | Paying Users (m) | 5.02 | 5.45 | 6.01 | 6.69 | 7.76 |
| Claude | Annual Run Rate (\$M) | \$118 | \$288 | \$432 | \$524 | \$624 |
| | MoM Growth (%) | | 145% | 50% | 21% | 19% |
| | Paying Users (m) | 0.49 | 1.20 | 1.80 | 2.19 | 2.60 |
| Perplexity | Annual Run Rate (\$M) | \$1 | \$2 | \$2 | \$3 | \$7 |
| | MoM Growth (%) | | 38% | 9% | 30% | 136% |
| | Paying Users (m) | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |

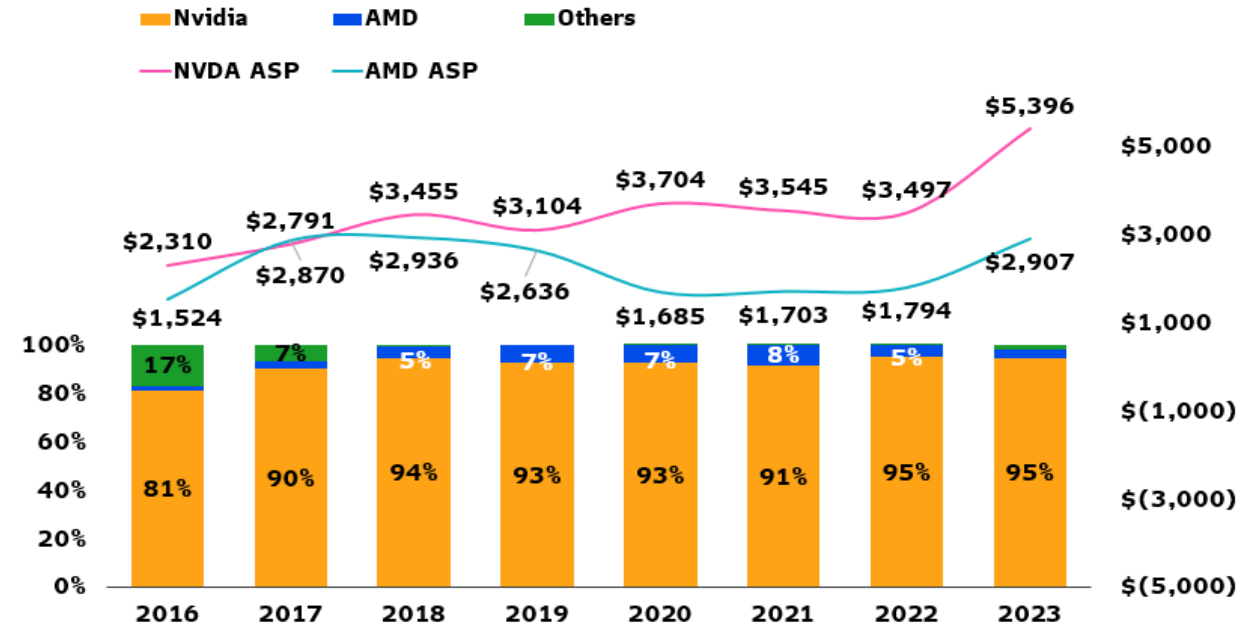
GPU Pricing Trends

Overall GPU Share (Units)



Note: Includes Desktop PC, Mobile PC, Workstation and Server GPU

Server GPU Share (Units)



Conclusion

AI moving beyond picks and shovels focus

Age of assistants, copilots upon us

Language models follow rules and parameters

More creators, developers using AI tools

Faster iterations using conversational interfaces

Survey



Please take a moment to provide us feedback on today's session and share how Bloomberg may be able to help you going forward.

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