

The Smart CIO's Guide To Choosing The Right AI Tech Stack

Why understanding AI's layers is your competitive edge,
and the three questions every IT leader must ask vendors.

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Al is the new electricity, but for CIOs, the real power lies not just in plugging into it, but in understanding the grid. Vendors will say they're "powered by AI." But ask a few deeper questions, and you'll uncover a wide range of capabilities. Some built for lightweight automation, others trained to solve complex industry-specific challenges.

So how can today's IT leaders separate signal from noise? How do you evaluate AI vendors not on their marketing but on their architecture, capabilities, and relevance to your enterprise?

This piece focuses specifically on the enterprise software space where vendors are embedding AI into solutions that promise to optimize workflows, decisions, or business operations. It's not meant to catalog every category of AI technology, like robotics or computer vision. It offers a clear framework to help IT leaders distinguish what kind of AI they're actually buying and whether it's fit for purpose.

Here's how to break it down.

Four Technologies You Need to Know

To make sense of what vendors are really selling, you need to understand the specific technologies they may be marketing as "AI". Here we cover traditional approaches (statistical analysis and machine learning) which are still needed for certain use cases, and frontier technologies (LLMs and purpose-built AI) which are enabling new capabilities.

1. Statistical Analysis

What it is: Techniques involving business assumptions, linear models, seasonality analysis

Example Use Cases:

- Credit and interest rate models
- Pricing elasticity analysis in retail
- Market impact analysis for hedge funds

Best for: When causality or compliance are critical.

Example Vendors:

- **SAS** – widely used in finance and healthcare for structured statistical modeling
- **MathWorks** (MATLAB) – advanced

modeling in engineering and quantitative finance

2. Traditional Machine Learning

What it is: Prediction or classification models trained on structured numerical data—classification, clustering, and prediction models.

Example Use Cases:

- Predictive maintenance in manufacturing
 - Ad ranking systems at Google, Meta, Bing
 - Quantitative finance models for high frequency trading
- Best for: Structured datasets where historical patterns drive future outcomes.

Example Vendors:

- **DataRobot, Dataiku, H2O.ai** – AutoML and predictive analytics platforms
- **Palantir, C3.ai** – Enterprise AI platforms for defense, energy, manufacturing

Note that many vendors in this space are also pivoting to offering enterprise implementations of LLM agents, as

discussed in the next section.

3. Large Language Models (LLMs) & Agents

What it is: Neural networks trained on large unstructured data, such as text, image, or video.

Example Use Cases:

- Generating emails, reports, or product descriptions
- Agents for workflow automation, such as customer support
- Code generation

Best for: Automating communication, classification, or recognition in unstructured data.

Example Vendors:

- **Language model providers:** Anthropic (Claude), OpenAI (ChatGpt) Google (Gemini)
- **Domain specific applications:** Cursor (code generation), Sierra (customer support), Harvey (legal documents)

4. Purpose built AI systems

What it is: Advanced models designed to solve industry-specific problems in search, optimization, and prediction

Example Use Cases:

- Multi-echelon supply chain planning
- Demand forecasting, for physical

goods, software, or financial assets

- Drug discovery for pharmaceutical companies

Best for: Complex, high-dimensional problems where human intuition, statistical extrapolation, or LLMs, fall short, and algorithmic innovation is required

Example Vendors:

- **Omnifold AI** – purpose-built AI for enterprise supply chain forecasting & optimization
- **Isomorphic Labs** –purpose-built AI for drug discovery
- **Harmonic** - purpose-built AI for formal mathematics

The Three Questions Every IT Leader Must Ask an AI Vendor

To navigate this stack and spot the pretenders, ask these three questions:

1. Who Trained the Model?

If a vendor didn't train their own model, they're likely repackaging someone else's capabilities (often OpenAI or Anthropic). That's not inherently bad, but it limits customization.

2. What Data Was It Trained On?

Generic internet data is great for customer service, workflow automation, or document understanding, but won't at all help with optimizing your inventory, logistics, or drug discovery. Ask if the

model can be trained, or fine-tuned, on your enterprise's unique data sets and objectives.

3. What Was the Model Trained to Do? Was the model built to chat? To generate text? Even if the model is fine-tuned on your data, if the model's training objective doesn't match yours, you'll never get the outcomes you need. An ML model can't be a chatbot, and an LLM can't forecast complex demand patterns.

What This Means for CIOs

AI transformation requires you to move beyond buzzwords and into architecture. It's not about buying AI, It's about building the right relationship with AI: one that fits your strategy, your data, and your ambitions.

Co-Elevation in Action

Here's a next step: Share this framework with your C-suite. Invite your vendors into a deeper conversation; not about features, but about fit. Elevate your teams' understanding. And, if you're ready, build a coalition with a partner who can train a model that's uniquely yours.

AI won't transform your business. You will: when you bring together the right people, ask the right questions, and architect a solution built not just for your problems, but for your potential.