Merak.Capital

Venture Capital Guide to Artificial Intelligence

An Industry Report

A Letter From Our CEO

Artificial Intelligence is reshaping how value is created across industries and accelerating the pace at which companies can scale. Leading AI-native businesses are now reaching $1 billion in revenue in as little as two to three years, compared to seven to eleven years for many of the most successful cloud-era companies. This compression of company-building timelines is challenging long-held assumptions around growth, capital efficiency, and time to maturity.

Global investment in AI-first companies exceeded $110 billion in 2024, up 62% year on year, signaling a decisive reallocation of capital. AI is no longer confined to a single sector, with AI-native companies emerging across healthcare, logistics, fintech, cybersecurity, and media. Around 88% of organizations globally had adopted AI in at least one function by the end of 2025. At the same time, scaling of AI startups remains selective: only ~20% of AI startups reach Series A within 24 months, and fewer than ~30% within three years, underscoring the importance of differentiation and execution. As the technology moves from foundational innovation to practical deployment, understanding where value truly resides across the AI stack becomes essential for investors.

We believe the next phase of value creation will be driven by companies operating in the application layer, those that embed AI into core business operations, leverage proprietary data, and build self-reinforcing loops that continuously enhance performance. Competitive advantage will be shaped less by model architecture and more by how effectively AI is integrated to deliver fast, reliable, and differentiated outcomes.

My hope is that this report brings clarity to what matters most in AI investing and highlights the areas where capital can compound most effectively in this new era of intelligence driven growth.

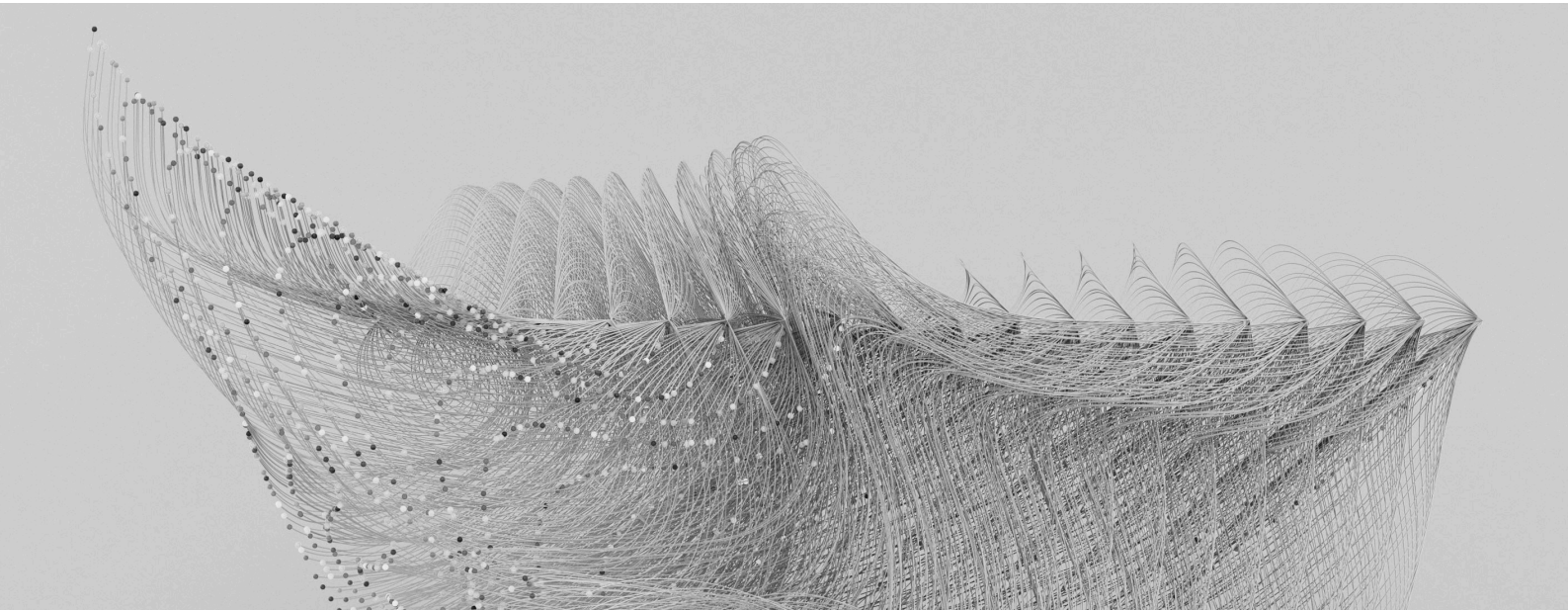
Abdullah Altamami
Founder & CEO, Merak Capital

About Merak Capital

Merak Capital is a Saudi-based multi-strategy investment firm focused on opportunities across multiple stages and industries. Licensed by the Capital Market Authority, the firm manages over SAR 3 billion across 10 funds spanning venture capital, private equity, credit financing, and special projects. Merak is built on deep technological insight and market research, staying at the forefront of digital trends and identifying investments aligned with adoption cycles across sectors locally, regionally, and globally.

The firm partners with visionary founders and enterprises driving transformation, unlocking new markets, and enabling sustainable growth. Merak takes an active approach to value creation, supporting portfolio companies through governance enhancement, operational development, and strategic growth initiatives as they scale toward market leadership.

2020	10	﷼3B+
INCEPTION	FUNDS	AUMS



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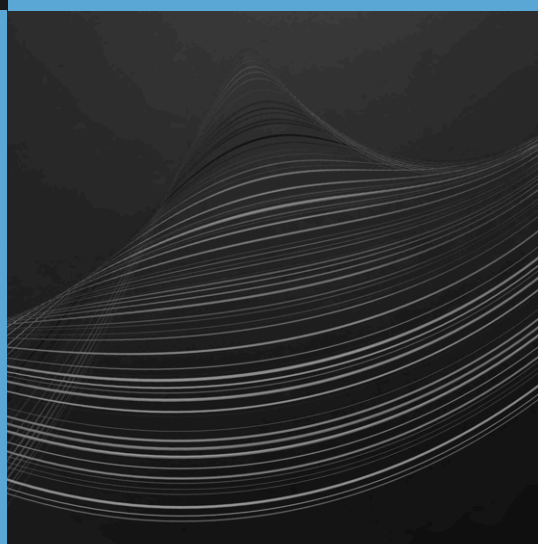
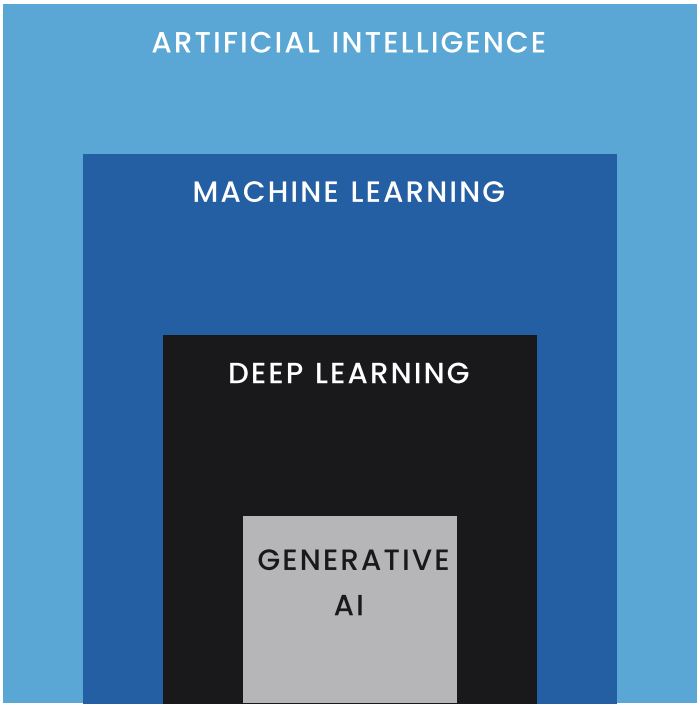


Generative AI Is The Result Of Decades Of Research

From Rule Based Machines To Learning Machines



- **Artificial Intelligence (AI)** is the broad discipline of creating computer systems capable of tasks that typically require human intelligence, such as reasoning, perception, and decision-making.
- Within AI, **Machine Learning (ML)** enables systems to learn from data and improve their performance over time without being explicitly programmed. ML models use supervised and unsupervised learning.
- A subset of ML, **Deep Learning (DL)** utilizing multi-layered neural networks inspired by the human brain to process vast amounts of data and recognize complex patterns with high accuracy.
- A subset of DL, **Generative AI (GenAI)** generates content such as text, images, or code based on user input. Using massive datasets, these models detect patterns and generate output without explicit instruction, using a mix of supervised and unsupervised learning.

A Brief History Of AI Development

BIRTH OF AI

The birth of perceptrons and the Turing Test marked AI's formal scientific beginnings.

RULE BASED SYSTEMS & AI HYPE

Expert systems encoded human knowledge into programmable rules for the first time.

THE RISE OF MACHINE LEARNING

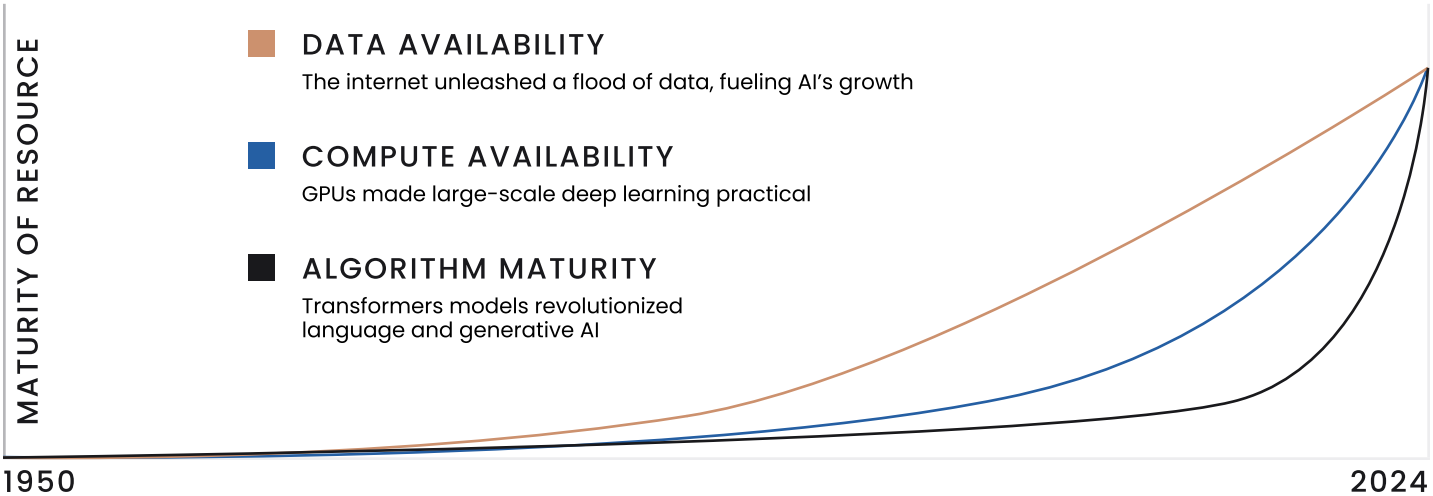
Backpropagation and probabilistic models enabled AI to learn from data, not just rules.

BIG DATA AND DEEP LEARNING EMERGENCE

GPU-powered neural networks and vast datasets drove breakthroughs in vision and speech.

GENERATIVE AI & FOUNDATION MODELS

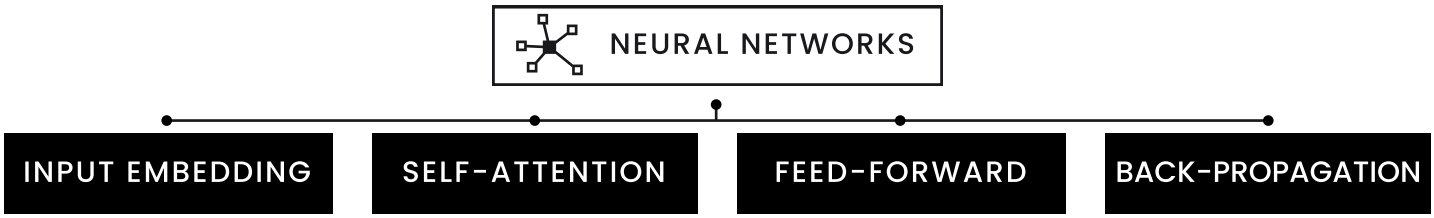
Transformer based models like GPT and DALL-E unlocked versatile, creative, and adaptive AI.



IBM RESEARCH, MERAK ANALYSIS

Neural Nets Evolved Because Of The Transformer

Neural networks, first introduced as perceptrons in the 1950s, marked the shift from rule-based AI to systems that learn from data. As these networks evolved into deeper, multilayered architectures, they enabled AI to recognize complex patterns and adapt to new tasks. This progress culminated in the **transformer** model which bridged the gap to today's large language models (LLMs), which use advanced neural networks to understand and generate human language, powering the latest breakthroughs in AI.



CONCEPT	DESCRIPTION
Input Embedding	Input embedding is converting inputs (like words or images) into numerical vectors that capture their meaning so the AI model can use them
Self Attention	A large comparison process where every word is compared to every other word to determine which ones matter most for the input's meaning and context
Feed Forward	The model fine-tunes its understanding of each word independently using a quick calculation, making the meaning clearer
Back Propagation	After making a guess, the model checks how close it was to the right answer and tweaks itself to do better next time

How Models Are Trained

1. Large Datasets
2. Model Processes Examples
3. Pattern Learning
4. Error Reduction
5. Fine-Tuning
6. Powered by Algorithms & Hardware
7. High-Performance AI Model

Why Transformers Changed The Game

PARALLELIZATION

Enabled models to process data in parallel rather than sequentially, leveraging GPUs over CPUs for efficient large-scale training

SCALABILITY

Allowed models to scale to billions of parameters and train on massive datasets without the bottlenecks of earlier approaches

VERSATILITY

Made it possible to apply the same model design to language, images, audio, and more, establishing transformers as a universal foundation for modern AI

Founders Customize Models In Various Ways

BASE MODEL (PRE-TRAINED, GENERALIZED)

ANTHROP\C OpenAI

FINE TUNING	**Definition:** Training pre-trained models on a smaller, task-specific dataset so that it adapts to a particular application or domain. **Use Cases:** Adapting a general language model to a specialized domain, e.g. medical or legal text
INSTRUCTION TUNING	**Definition:** Fine- tuning a model specifically on datasets composed of instruction-output pairs. **Use Cases:** Enhancing a model's ability to perform multiple tasks by following human written instructions in a more predictable aligned way, making models like GPT3.5 "instruction-following"
LORA & QLORA	**Definition:** Instead of updating all model parameters, LoRA "inserts" trainable low-rank matrices into the model. During fine-tuning, only these matrices are updated while the remaining weights remain frozen, greatly reducing the required memory and computation **Use Cases:** Scenarios where resources are limited, such as research labs or small companies wanting to experiment with massive models without specialized hardware.

RAG
(RETRIEVAL AUGMENTED GENERATION)

External Knowledge Source + LLM = up to date domain specific information

AGENTS / MIDDLEWARE

MiddleWare + LLM = action oriented AI that can call tools and accomplish tasks

How These Techniques Power Real Products

- Chatbots / Co-Pilots – Tuned with Instruction Tuning
- Search tools / dashboards powered by RAG pipelines
- Specialist tools (code, biotech) benefit from LoRA fine-tuning

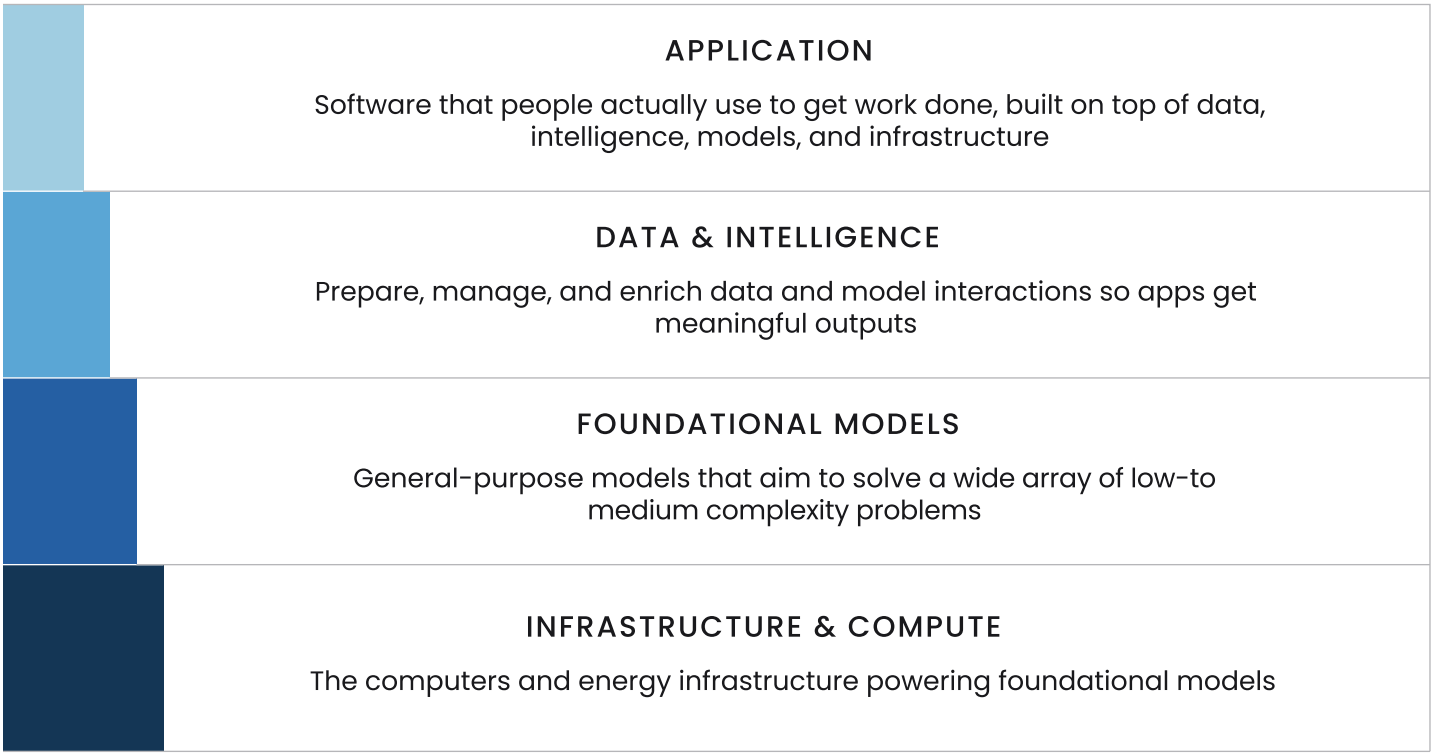
Key Insight

90%+ of AI startups don't train models, they remix and tune existing ones

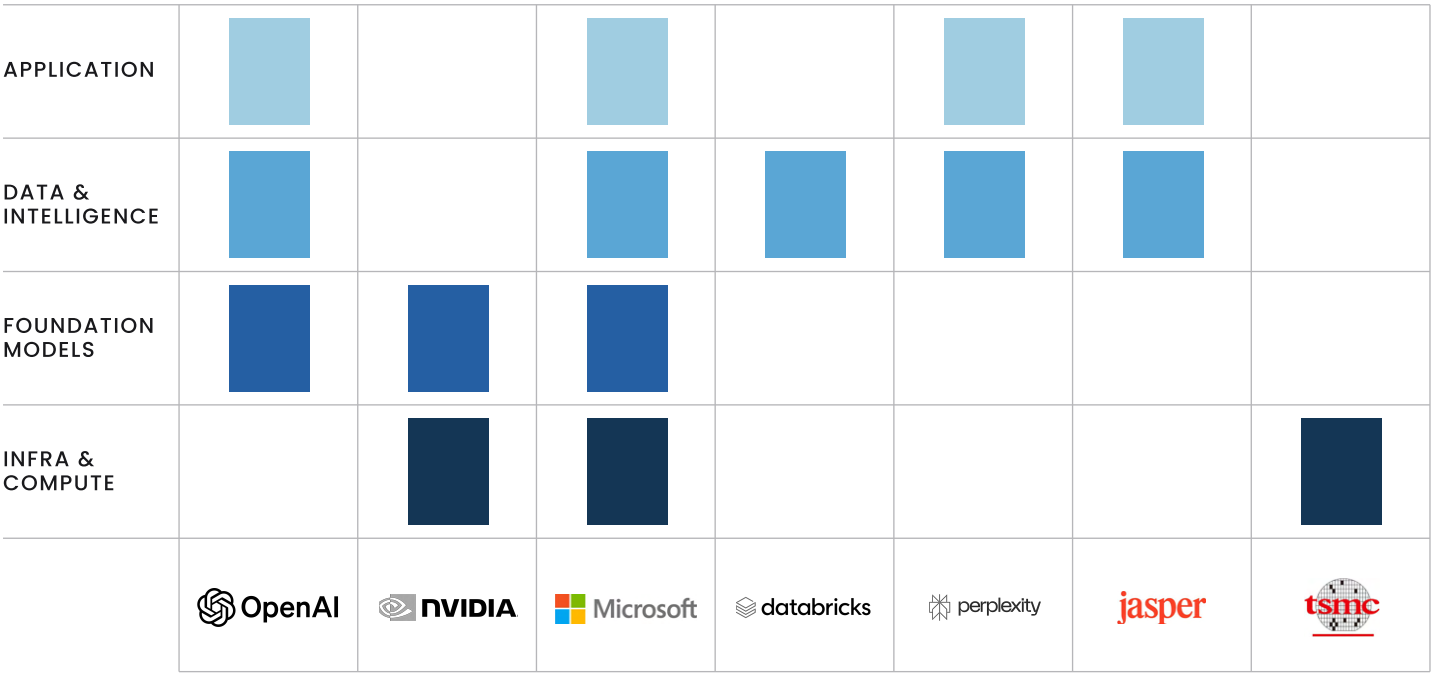
Companies Operate Across The AI Stack

A Condensed Outline Of The AI Stack

The AI stack is the layered mix of technologies, frameworks, and infrastructure that together power artificial intelligence systems.



Very Few Companies Operate In A Single Layer Of The AI Stack

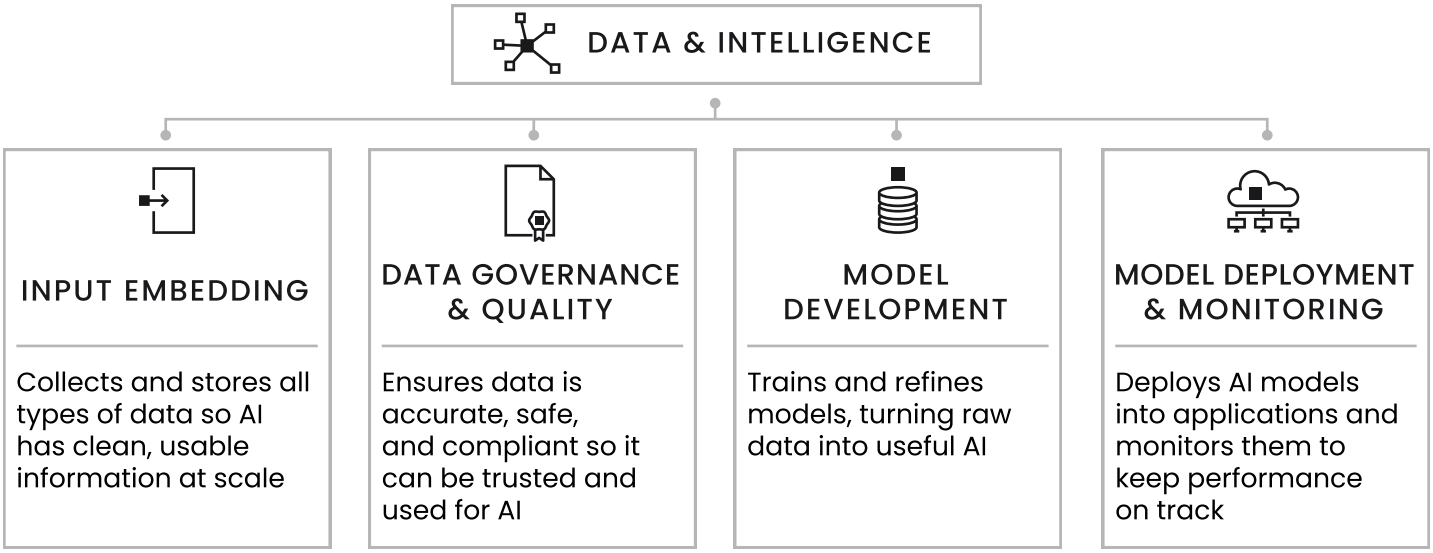


IBM RESEARCH, MERAK ANALYSIS

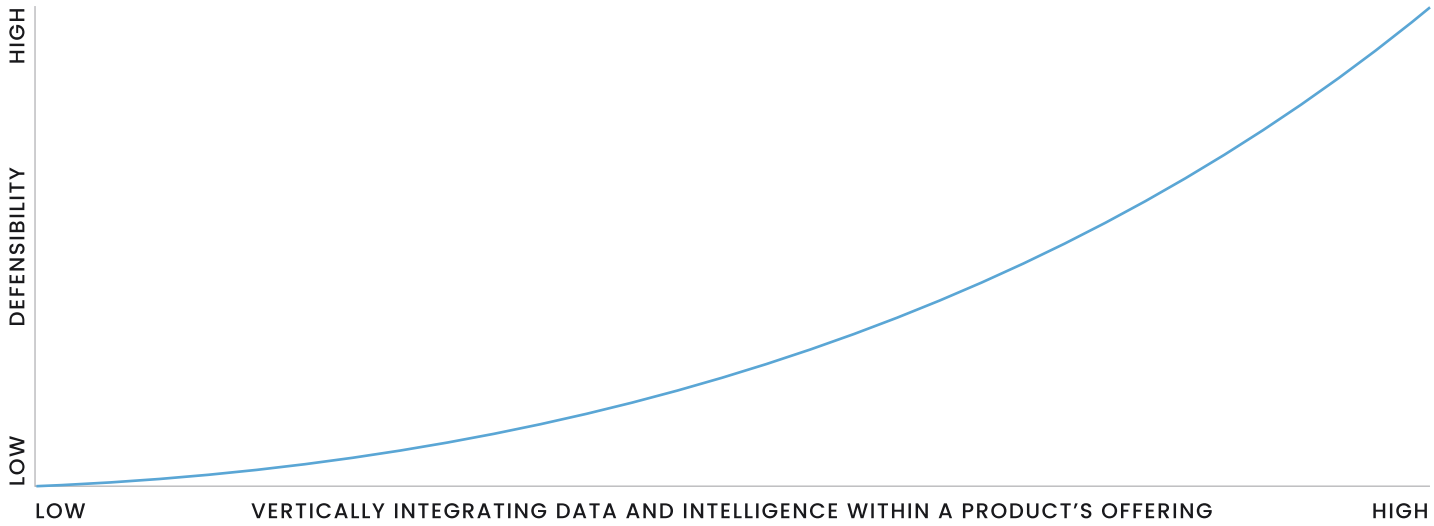
AI Defensibility Is Based On Data And Intelligence

This is where raw information is transformed into usable knowledge and decision-making capabilities. It represents the core differentiation in AI systems and determines the accuracy, reliability, and defensibility of applications built on top.

A Data And Intelligence Primer



Data And Intelligence Creates Defensibility



Key Insight: Compelling value at the application layer is unlocked through customer discovery and sustained by complexity, stickiness, and data-intelligence moats

Infra And Foundation Models Suit Big Investors

Investments in foundation models or the infrastructure and compute layer demand **multi-billion-dollar capital commitments** and entail **long timelines to revenue realization**. These opportunities are best suited for large institutional investors and sovereign wealth allocators capable of absorbing the scale and duration of risk.

Long Time To Revenue And Large Capital Outlays For Foundation And Infra

Foundation And Infra Are Best Suited For Tech Giants And Sovereigns*

INFRA & FOUNDATIONAL MODELS

INVESTORS

Google, Microsoft, SoftBank, NVIDIA, Meta, amazon

COMPANIES	$ RAISED
OpenAI	$13B
ANTHROP\C	$8B
xAI	$6B
Mistral	$2B
THINKING MACHINES	$2B
cohere	$1.5B

APPLICATION & DATA INTELLIGENCE

INVESTORS

SoftBank, Lightspeed, TIGERGLOBAL, Sequoia, Accel, a16z

COMPANIES	$ RAISED
glean	$765M
Harvey	$680M
runway	$540M
synthesia	$330M
replit	$250M
jasper	$140M

*OPPORTUNITIES FOR SMALLER INVESTORS TO ENTER INFRASTRUCTURE AND FOUNDATIONAL MODELS DO APPEAR, BUT THEY DISAPPEAR QUICKLY AS THE SECTOR MATURES

Toolkit For Investing In Artificial Intelligence

For venture investors, the application layer, where AI integrates into real customer workflows, is where defensibility and strong returns are created. This toolkit helps identify startups that possess the essential ingredients for building lasting AI advantages.

Determining Competitive Advantage

1. CUSTOMER DISCOVERY

ASK: Does the company deeply understand its users and how AI changes their workflow?

- Founders have validated clear, recurring, high-value pain points.
- The AI solution improves productivity, accuracy, or decision speed.
- There is evidence of retention (users rely on it repeatedly).

2. PROBLEM DEPTH

ASK: Is the problem hard enough to create a moat?

- Solving it requires high-fidelity data, complex integrations, or domain expertise.
- The solution can't be replicated with off-the-shelf LLM APIs.
- The company benefits from technical defensibility (custom models, data pipelines, or workflow embedding).

3. DATA & LEARNING LOOPS

ASK: Does the company have compounding data advantages?

- Proprietary or hard-to-access data drives better outcomes.
- Feedback loops improve model performance automatically.
- Data collection scales faster than costs.

4. DISTRIBUTION & MOAT FORMATION

ASK: How does the company sustain growth and defend margins?

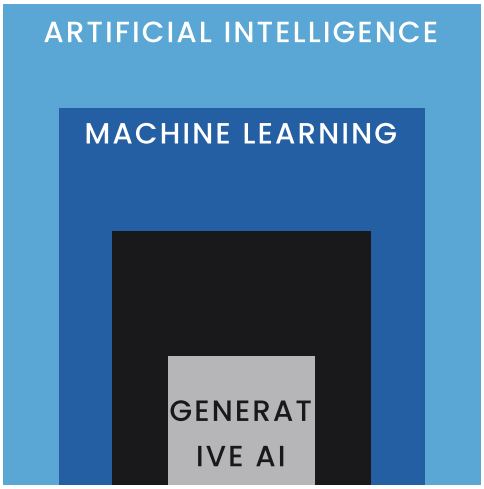
- Distribution is embedded into existing workflows or partner ecosystems.
- Unit economics improve with usage (software-like margin structure).
- Early traction shows stickiness or workflow lock-in.

Green Flags And Red Flags For Investment Opps

GREEN FLAGS IN AI STARTUPS	RED FLAGS IN AI STARTUPS
✓ Founders deeply understand user workflow	✗ Product built around model novelty, not customer need
✓ Proprietary or high-friction data collection	✗ Relies entirely on public or third-party data
✓ Effective use of open-source or fine-tuned models	✗ Fully dependent on a single vendor API
✓ Clear vertical focus and distribution advantage	✗ Broad, unfocused use case ("AI for everyone")
✓ Early evidence of retention and repeat usage	✗ No recurring engagement, weak product adoption

Key Takeaways

From Rule Based Machines To Learning Machines



AI has advanced from rule-based systems to machine learning, deep learning, and now generative AI. These shifts enable machines to learn, create text, images, and code, and handle human-like tasks from perception to decision-making through both supervised and unsupervised learning.

The breakthrough was the **transformer architecture**, which processes data in parallel and uses attention to focus on relevant input, enabling faster, more scalable training.

How Transformers Changed The Game

PARALLELIZATION

Enabled models to process data in parallel rather than sequentially, leveraging GPUs over CPUs for efficient large-scale training

SCALABILITY

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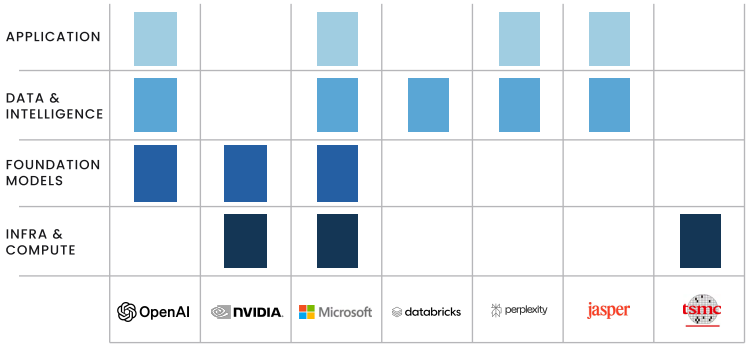

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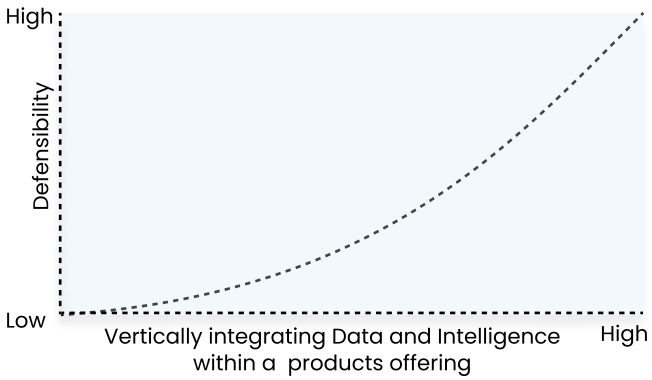

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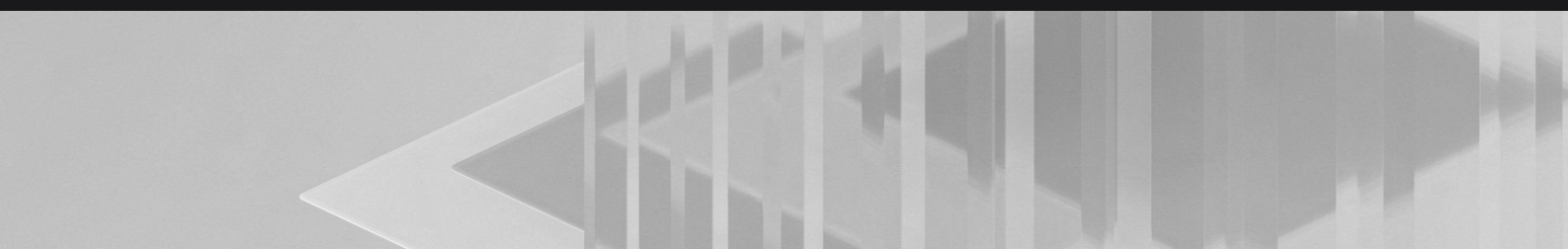

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