VISIUM

[A PRACTICAL ROADMAP]

The C-level guide to kickstart your AI journey
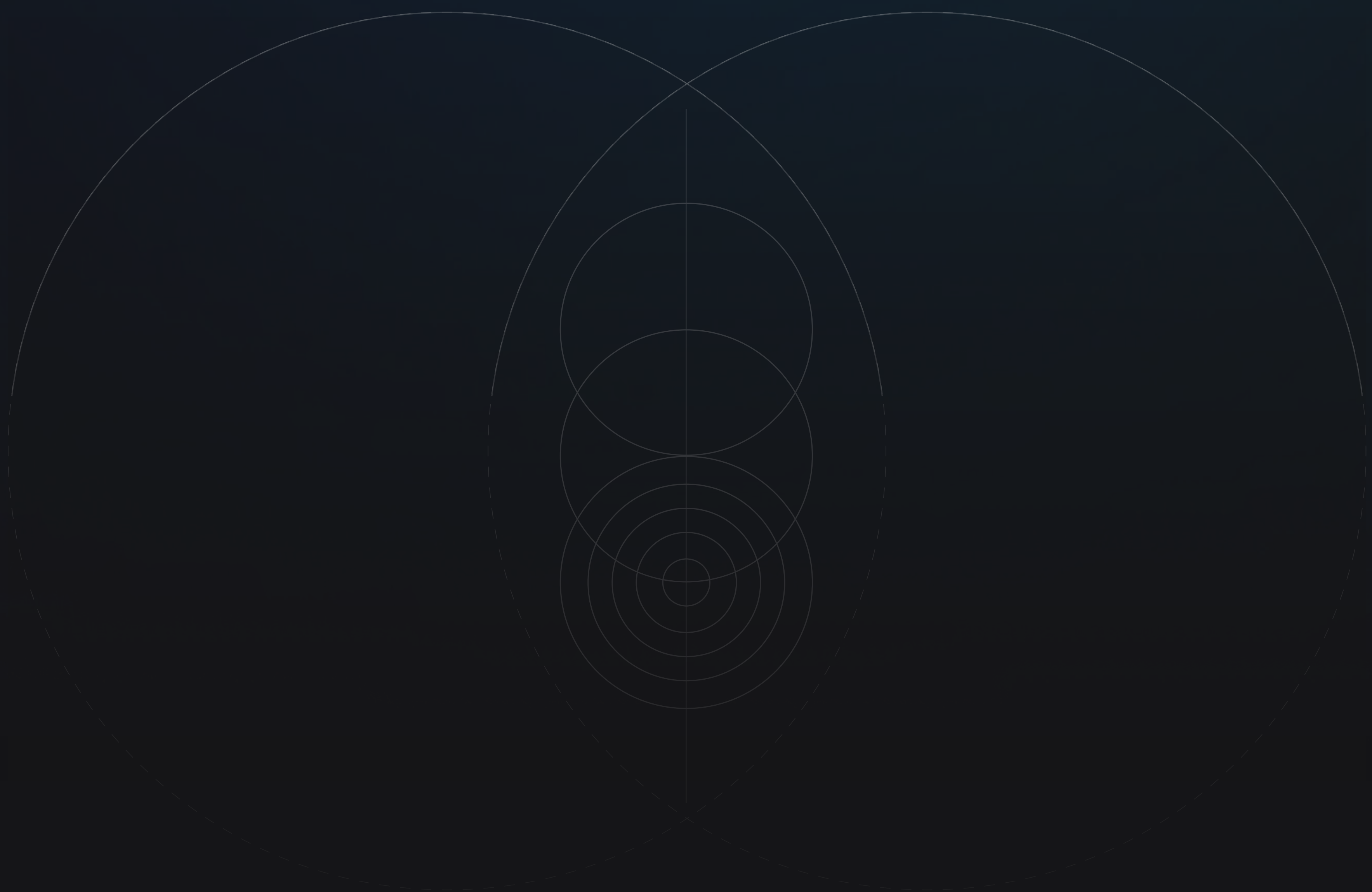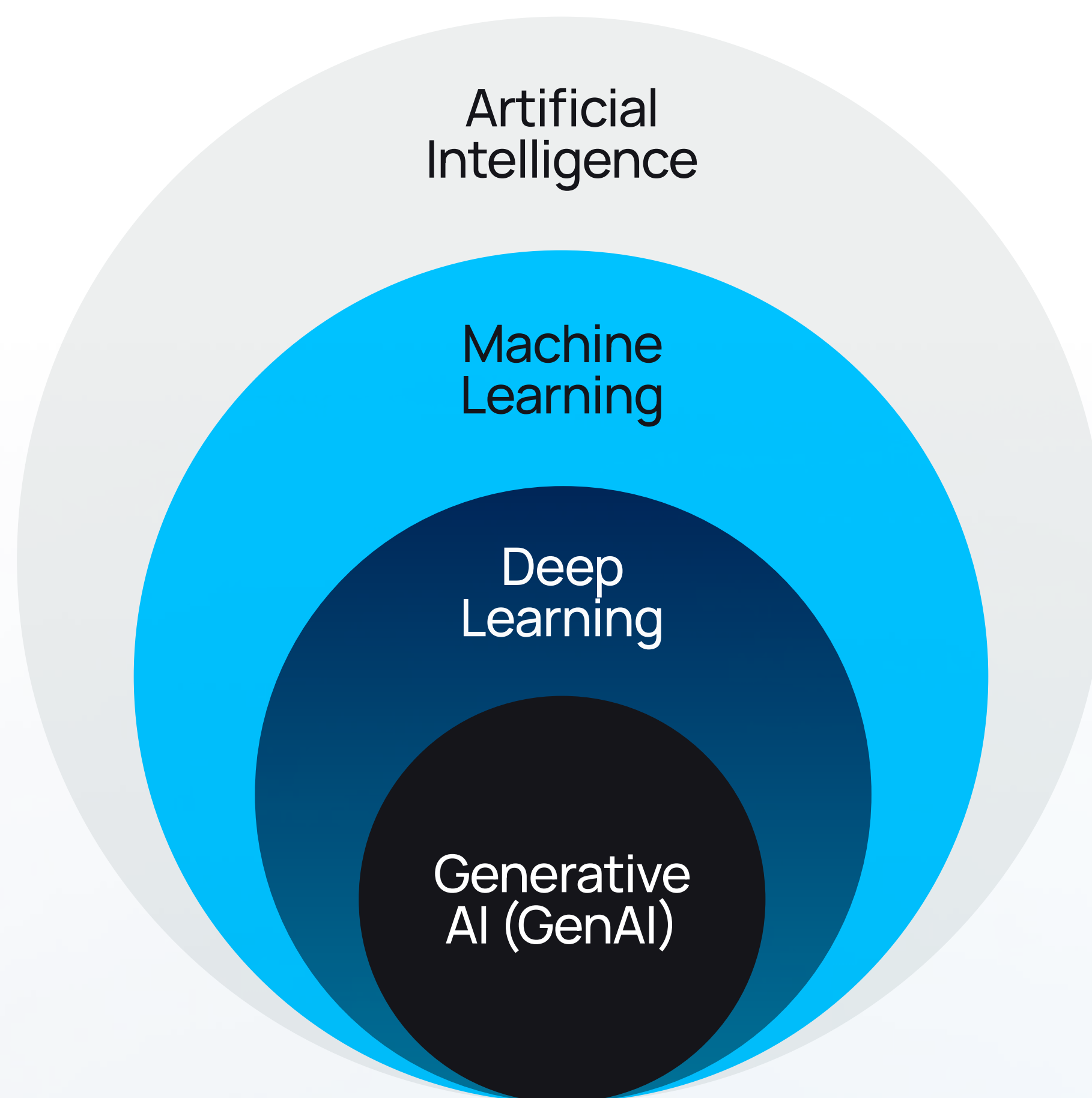
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overview
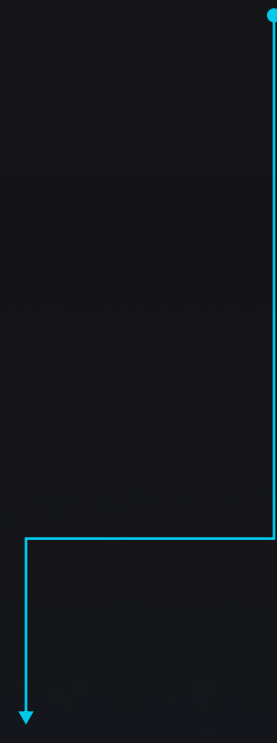
Many companies feel overwhelmed when beginning their AI journey, and as a leader, you may feel the same amid a sea of information and recommendations.

This guide will help you cut through the noise and navigate your AI journey one step at a time.

AI glossary

Artificial
Intelligence

Machine
Learning

Deep
Learning

Generative
AI (GenAI)

Artificial Intelligence (AI)

Refers to a field of computer science that creates machines capable of human-like tasks, such as perception, reasoning, planning, learning, and decision-making.
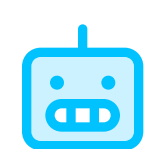
Example: AI optimizes scheduling for tasks like employee shifts or transportation.

Machine Learning (ML)

A branch of AI where machines learn to solve problems by generalizing patterns from provided examples.

Example: ML detects patterns and anomalies to identify fraud.

Deep Learning

A specialized area within machine learning using brain-like neural networks to process complex data such as text or images.

Example: Neural networks process camera sensory data for autonomous driving.

Generative AI (GenAI)

A category of deep learning algorithms focused on creating realistic content from data such as text, images, or audio.

Example: Popular examples are ChatGPT (for text) and DALL-E (for images).

AI Glossary

Understand AI - from data to decisions

Unlike programming that operates on deterministic rules and predefined instructions, AI, particularly Machine Learning (ML), uses a probabilistic approach. Instead of following rigid rules, AI systems learn patterns from data, make predictions, and adapt over time based on feedback and observed outcomes. This adaptive, data-driven method allows AI to handle uncertainty and continuously improve, making it fundamentally different from the static, rule-bound nature of traditional computing.

AI's data dependency - balancing data and expert knowledge

The data needs of AI projects vary based on the specific problem and algorithm used. While having large amounts of labeled data can reduce the need for some types of expertise, expert knowledge remains key in building relevant and usable AI solutions. Experts provide the domain-specific insights needed to structure data, define meaningful objectives, and interpret results accurately. When data is limited, expert involvement becomes even more critical to ensure that AI models are not just technically sound but also tailored to the needs of end users.

Harnessing AI - key metrics for model performance and business value

The true measure of an AI model's success is measured by its technical performance but also by the business value it creates. To effectively assess AI models, it's important to distinguish between model-specific metrics and those that reflect broader business impact. For example, in a classification task like defect detection in quality control, model-specific metrics such as false positives (detecting a defect when none exists) and false negatives (missing an actual defect) are crucial for understanding model performance. However, the ultimate goal is to connect these technical metrics with business-relevant outcomes like operational efficiency and key financial outcomes like cost reduction, revenue growth, and improved profitability.

AI Glossary

Humans AI - augmentation, not replacement

While AI can mimic specific human tasks, it is still just one tool in the broader toolbox for creating value. AI can assist in thinking, planning, and decision-making processes, but it relies on human guidance to define, refine, and apply these capabilities effectively. This distinction is crucial for leaders to understand; AI accelerates and amplifies what humans can achieve but does not replace the nuanced judgment, creativity, and contextual understanding that only humans bring.

Scaling AI - the need for full pipeline support

Unlike traditional software, AI cannot be separated from its data, making it hard to break the system into smaller modules that can be easily managed or updated separately. This challenge is amplified by the lack of specialized tools for managing AI workflows, often turning simple AI pilots into unexpectedly complex scaling efforts, sometimes costing 10-20 times more than the pilot phase. Scaling AI requires continuous management of the entire so-called ML pipeline — a process that oversees every step from data preparation and model training to deployment and user interaction. Mastering AI at scale remains one of the biggest hurdles in business today.

Ownership of AI - make vs. buy

The decision to develop AI in-house or purchase an external solution isn't straightforward due to factors like strategic value, data ownership, customization, performance of external solutions, and total cost of ownership. In-house development offers control and tailored solutions but requires substantial investment in expertise, infrastructure, and continuous maintenance. External solutions provide quicker access to advanced capabilities and ongoing vendor support but may involve compromises on data privacy, integration complexities, and adaptability to specific needs. These implications, especially with their strong financial component, must be carefully considered to align with your business strategy.

Navigating AI ethics - mitigation bias

Ethical AI goes beyond compliance; it's about building systems that are fair, transparent, and aligned with your company's values. Addressing bias is crucial, as AI decisions are deeply tied to the quality and biases of its training data. Principles like 'equal treatment' require human intervention to define fairness, making us rethink whether treating groups 'on average' is sufficient. This underscores the critical role of human judgment as a safeguard, but also as an active guide in ensuring AI decisions are contextually aware and aligned with the broader ethical goals of the organization.

The AI opportunity
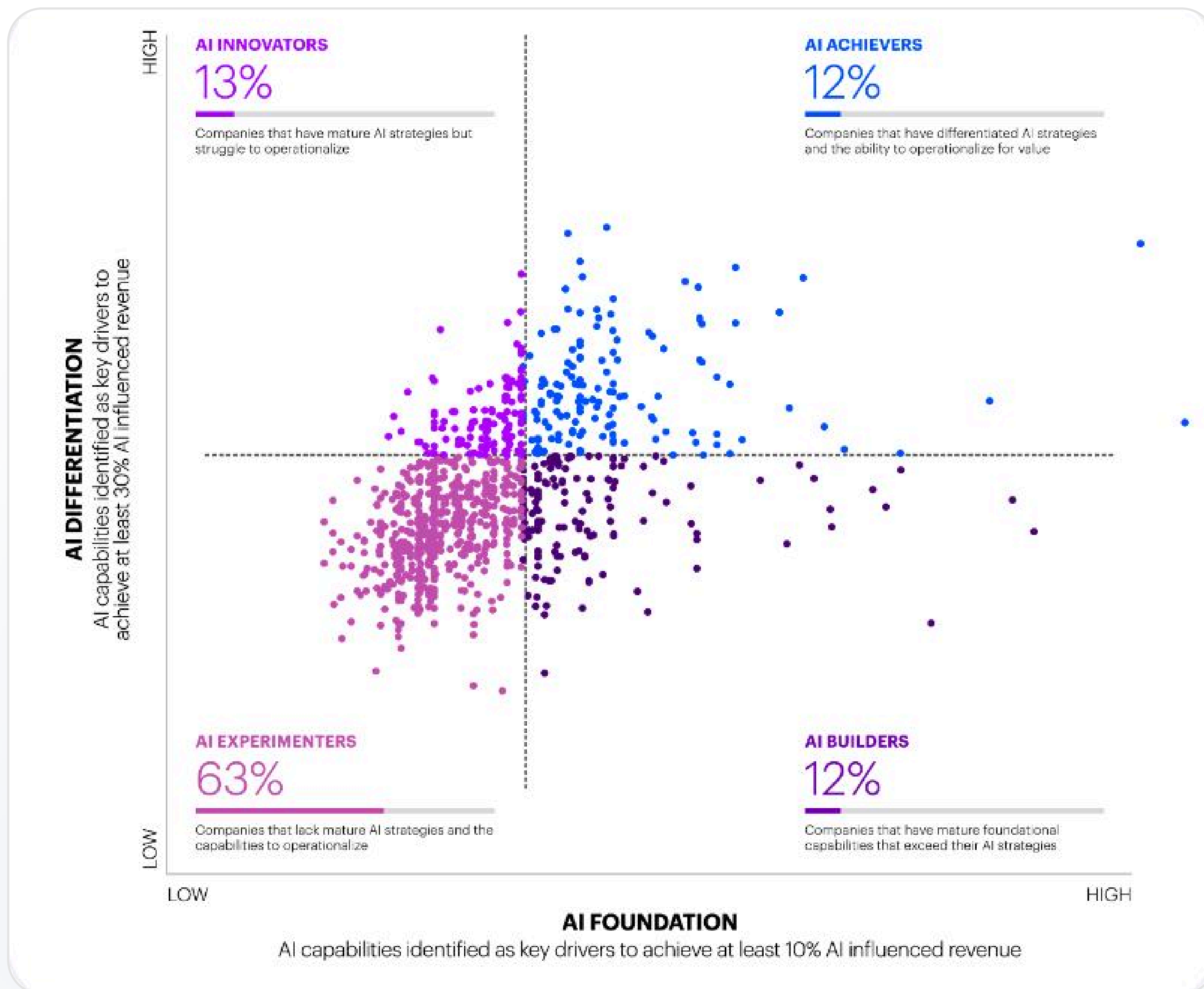
Most companies are still experimenting with AI, facing challenges in strategy and execution.

However, its impact is clear. AI can boost EBITDA by 20-30%, according to McKinsey and Accenture.

AI isn't just a technical upgrade; it transforms businesses at every level. Tools like LLM chatbots (e.g., ChatGPT) are changing how we work and learn. For companies, AI drives efficiency, sparks innovation, and reshapes operations, enhancing competitiveness. At the industry level, AI optimizes processes from R&D to distribution, redefining whole value.

To keep in mind

AI projects differ from traditional IT initiatives due to their experimental nature. The outcomes are not always guaranteed, and success often hinges on iterative experimentation and adaptation. Effective AI adoption requires significant data science expertise, strategic planning, and a shift in how leaders engage with data science.

Implications for the CTO function

Implications for the CTO function

Core responsibilities

01 Technology of new products & services

The CTO faces significant shifts in value drivers and product features as advanced technologies like AI, IoT, and automation transform traditional manufacturing into intelligent, connected systems. This transformation goes beyond adding features; it reshapes how products function, learn, and deliver value over time. To navigate this, the CTO must understand the technical nuances of machine learning algorithms and establish clear guidelines for integrating AI into products. These guidelines should outline safety standards and define appropriate risk profiles for different product categories.

02 Research & development process

Within the CTO's scope of responsibility, numerous AI applications can drive key business areas. Therefore, AI needs to be incorporated into a systematic, strategic long-term plan. This means prioritizing AI applications that drive core areas of the business in areas crucial to the company's future, such as tailored to manufacturing or research needs for example. Given the fast-paced evolution of AI, these plans must be regularly updated. Additionally, cross-functional collaboration becomes essential, as AI-powered technologies require close coordination between R&D, IT, operations and other departments to ensure effective implementation and integration.

03 Collaboration models

To successfully integrate AI into products and development, the CTO needs access to the right skills and resources. A critical task is determining which capabilities to develop in-house (in collaboration with HR) and which to source externally through outsourcing or strategic partnerships. These make-or-buy decisions must carefully consider potential long-term dependencies and risks of becoming locked into specific vendors or technologies.

Implications for the CTO function

Example of AI in action: Use cases

Use cases	Description
Knowledge retrieval	AI knowledge retrieval uses RAG systems to build internal capabilities by integrating existing documentation, code repositories, and past projects into a searchable AI-powered knowledge base. This enables technical teams to efficiently query and access relevant information.
Research & development	AI accelerates product development by using machine learning to analyze design variations and performance data. It enables rapid iteration, automates testing processes, refines product designs early in the development cycle, significantly reducing time to market and dependency on costly trial-and-error methods.
Product innovation	AI can automatically generate and refine chemical formulas to improve material properties, expanding the scope of creative exploration beyond traditional methods. This generative approach accelerates innovation by producing novel compositions based on specific requirements.

AI-accelerated research & development

◎ **The challenge**

R&D teams struggle with the overwhelming task of reviewing extensive research publications, which is time-consuming and repetitive. The process risks missing critical insights, leading to potential compliance failures and increased operational risks.

✺ **The solution**

Visium implemented a platform featuring a robust semantic search engine that enables researchers to efficiently access, sort, and engage with relevant documents. This tool uses advanced Natural Language Processing (NLP) models and bidirectional encoder representations from transformers to deliver direct answers to specific questions, guiding users to the precise sections within documents where the information is found.

⊘ **The outcomes**

- Reduced time to insights by 20%, saving 2 hours per person weekly.
- Achieved 90% accuracy in guiding users to correct document sections.
- Enabled the client to win a Group Level Innovation Award.

AI-powered product innovation

◎ The challenge

Our client's traditional approach to discovering unique chemical formulations was slow and inefficient, relying heavily on manual testing and expert intuition. This process was prone to errors, costly iterations, and delays, ultimately affecting their ability to innovate quickly and meet market demands.

❋ The solution

We integrated advanced analytics and AI-driven modeling into our client's operations, transforming their approach from manual, trial-and-error methods to a data-driven process. This re-engineering allowed for real-time analysis of complex variables, enabling experts to efficiently navigate vast data sets and identify optimal configurations with precision.
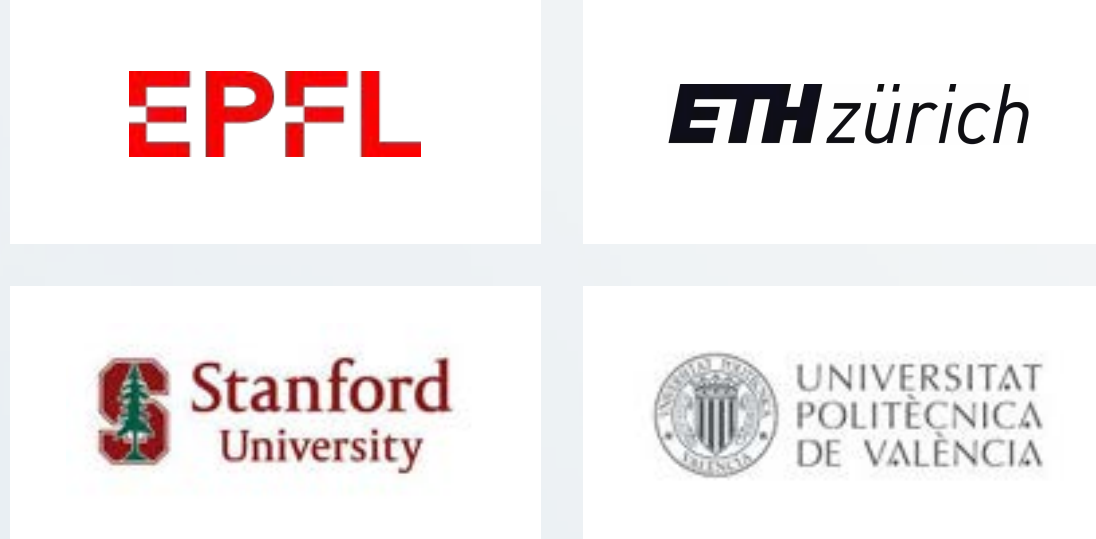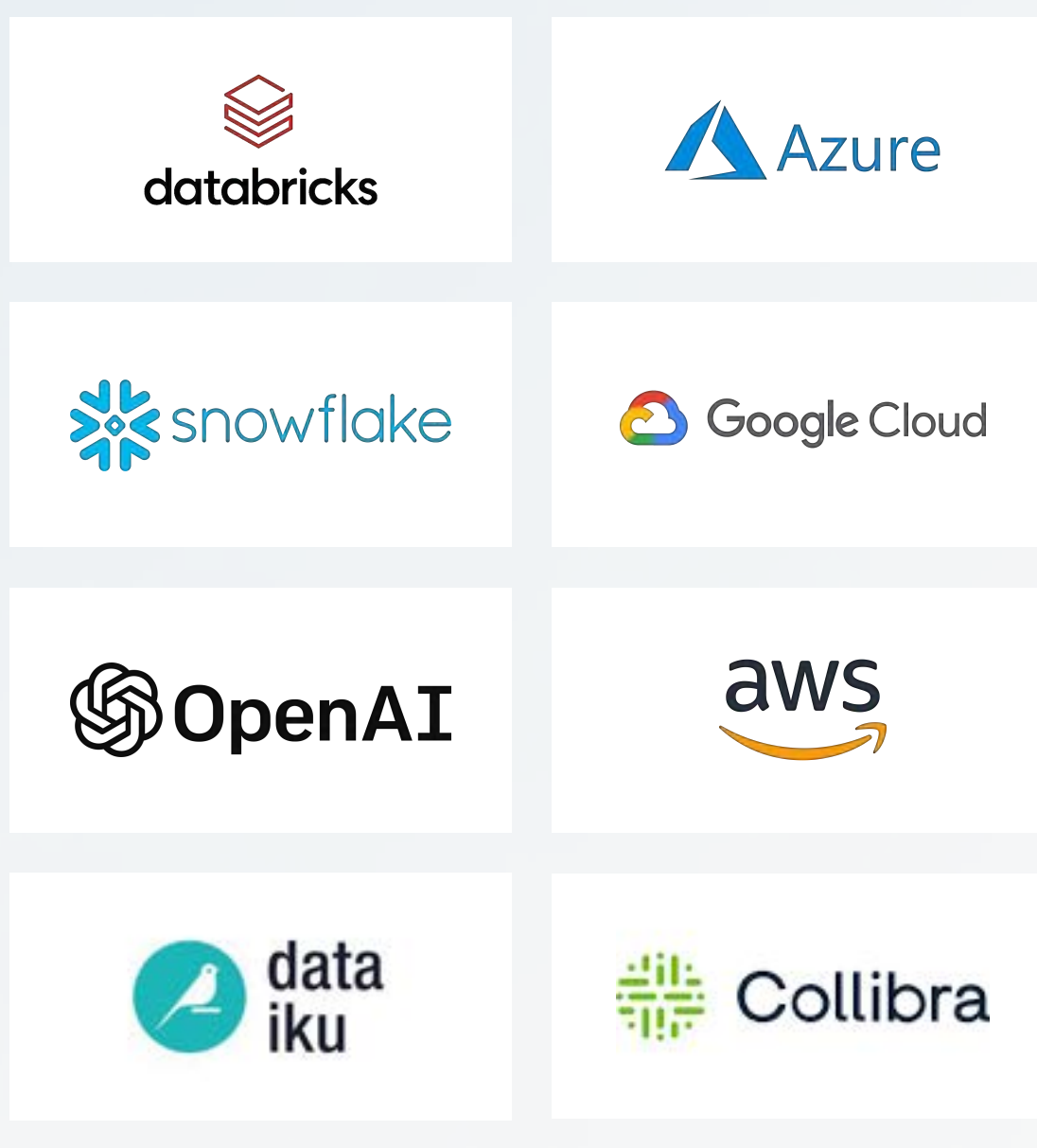
✓ The outcome

- Cut time to market by 50% and reduced development costs.
- Increased the top line and secured more business opportunities, through improved responsiveness to client requests.
- Positioned our client as an industry leader in tech-driven innovation.

About Visium

Visium is a leading Swiss AI & Data consultancy helping enterprises turn their most strategic AI initiatives into measurable business outcomes. Since 2018, we've delivered over 250 solutions for global leaders like Roche, Novartis, Nestlé, and dsm-Firmenich; helping them drive efficiency, unlock new revenue streams, and scale solutions that deliver long-term value.

Built on a foundation of ethical innovation, our mission is to make AI work for business, people, and long-term impact.

70+
Engineers and consultants throughout Europe

50+
Happy enterprise clients

dsm-firmenich ●●●
idorsia   MIGROS
Roche   ABB

Our partners

Academia

EPFL   ETH zürich

Stanford University   UNIVERSITAT POLITÈCNICA DE VALÈNCIA

250+
AI & data engagements

VISIUM

Technology

databricks   Azure

snowflake   Google Cloud

OpenAI   aws

data iku   Collibra

Pan-European presence

Zürich
Lausanne   Sarajevo
Valencia

Recognized leaders

2nd fastest growing company in Europe by Financial Times

FT FINANCIAL TIMES

Get in touch

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AI initiatives delivering real impact at scale

www.visium.com